TOURIST SATISFACTION

WITH PERSONALISED INFORMATION SERVICE

VOLCHEK EKATERINA

PhD

The Hong Kong Polytechnic University

2020

The Hong Kong Polytechnic University

School of Hotel and Tourism Management

Tourist Satisfaction with Personalised Information Service

Volchek Ekaterina

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

August 2019

CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

_____

Volchek Ekaterina

Abstract

The rapid integration of the Information and Communications Technologies (ICTs) in everyday life and customer travel experience, increase tourist expectations towards the capabilities of travel services to satisfy their immediate needs. In the context of high volumes of heterogeneous travel information, it becomes critical for the industry to provide tourists with highly relevant solutions that would simplify tourist decision-making and enable time savings. Personalisation of information services has been widely recognised as one of the emerging tourist requirements. It also leads organisations to adopt corresponding business strategies to remain competitive in the tourism market. However, the implementation of personalisation is associated with the increased risks of customer frustration, related to the lost customer control and perceived insecurity to personal data application.

The existing research is the domain of tourist service personalisation is heavily influenced by the assumption that the match between service characteristics and the needs, that motivate the customers to interact with the service, determines customer experience. Such assumption drives the development of new methods, aimed at advancing the context recognition and customer segmentation in order to enable service personalisation. However, the comprehensive explanation of the role that the whole scope of tourist interactions with the personalised information service have on their experience, is still missing. To fill the gap, this study aims at explaining the way how personalised information service characteristics affect tourist perceptions on the service performance, value and overall satisfaction.

This thesis integrates service-centric and customer-centric frameworks of service performance. It redefines them under the perspective of Service-Dominant Logic and proposes a comprehensive model of tourist satisfaction with personalised information service. Guided by pragmatism, it

accepts three-phases sequential qualitative-quantitative research design. To propose a conceptual framework, the research conducts conceptual literature review. To explain tourist reasoning towards value co-creation by personalised information service, to determine appropriate indicators for operationalising co-created service performance and value, the study triangulates the results of the qualitative semi-structured interviews. To refine the proposed measurements and validate the hypothesised model, the study applies quantitative analysis of the online customer survey results.

The main findings demonstrate that different functional characteristics of the personalised information service make different contribution to value co-creation, satisfaction and loyalty. Rather than focusing solely on performance of the personalised content, tourists attribute primary importance to the smooth interactions with the information system (IS) interface and to the presence of control over the personalised content and interactions with the system, followed by the personalised content and customer service support. The perceptions on co-created personalised information service performance have major effect on satisfaction directly and indirectly via co-created value. Managing the dimensions of the co-created value with the primary focus on utilitarian and experiential components is identified as more efficient way to increase tourist satisfaction rather than managing the processes of the service provider and tourist resources integration.

The findings create original contributions to the Service-Dominant Logic, service management and user experience. First, this thesis expands Service-Dominant Logic by redefining performance of the information service as being co-created alongside with value. It operationalises the concepts of personalised co-created service performance and co-created value for the context of the personalised tourism website. Second, the study advances service management and proposes the framework that integrates service-centric and customer-centric parameters, thereby, creating a

more complex but comprehensive approach to assess the performance of the information service. Third, the study expands understanding of user experience and unveils the insights of tourist interactions with the personalised website. The practical implications of the thesis are related to the possibility to apply the developed model as a framework and tool for the service assessment and for further improvement of personalisation as a strategy and an element of the IS design.

Publications Arising from the Thesis

Volchek, K., Law, R., Buhalis, D., & Song, H. (2020). Exploring ways to improve personalisation: The influence of tourist context on service perception. *e-Review of Tourism Research*, *17*(5), 737-752.

Volchek, K., Law, R., Buhalis, D., Song, H. (2019). The good, the bad, and the ugly: Tourist perceptions on interactions with personalised content. *e-Review of Tourism Research*. (Proceedings of ENTER19 Conference)

Volchek, K. Tourist Satisfaction with Personalised Information Service. In *Proceedings of ENTER2019 PhD Workshop* (p. 35).

Volchek, K. Mobile-centric User Context Recognition Systems as a Personalisation Tool for Tourism and Hospitality. In *Proceedings of ENTER2017 PhD Workshop* (p. 45).

Acknowledgments

This thesis would not be possible without the assistance of multiple people and organisations. They provided me with the required support and guidelines and contributed to this study with their time and expertise. In this section I would like to take the opportunity to acknowledge their participation and to express my sincere gratitude for the help I was provided.

First of all, I would like to thank my Chief Supervisor. Professor Haiyan Song guided me through the process of this research, providing me with the freedom to grow intellectually as a researcher, but ensured that I go within the planned schedule. He also introduced me to Asian culture and way of thinking and doing. I am very grateful for these lessons.

My thesis would not be possible without the role of my co-supervisors, Professor Rob Law and Professor Dimitrios Buhalis. While having rather distinct perceptions on the doctorate study, these great people let me grow intellectually, taught me to behave strategically and supported me with the right advice in the difficult moments of my PhD journey. I would not be sincere if I do not express the special gratitude to Professor Dimitrios Buhalis for inspiring me to start academic career and for becoming a mentor along this journey.

I would like to express my sincere gratitude to the Hong Kong Research Grants Council. My PhD would not be possible without a more than substantial financial support, which allowed me to achieve the research objectives, to share the acquired results with the peers at the conferences, as well as to support my own living expenses.

Speaking about support, I would like to thank you my dearest father, Alexandre Volchek, who did everything possible and impossible to help me to go through the challenges of the PhD journey.

Thank you for your unconditional love, for adopting the role of the reviewer, proof-reader and well as counselling service expert for me. I love you!

I am very grateful to my academic peers Dr. Ksenia Kirillova, Dr. Barbara Neuhofer, Mr. Mattia Rainoldi and Dr. Juho Pesonen, who became not only advisors but also the dear friends. Thank you for supporting me, for listening me, for sharing your own experience and for believing into my mental capacity to become a Doctor of Philosophy.

Last, I would like to thank the School of Hotel and Tourism Management team for all the arrangements, administration and technical support.

Short Table of Contents

Full Table of Contents

List of Tables

List of Figures

List of Abbreviations

BCa CI - bias-corrected and accelerated confidence intervals

CB-SEM – Covariance-based structural equation modelling

CTA - confirmatory tetrads analysis

d_ULS - squared Euclidean distance

d_G - geodesic distance

HCI – Human-computer interactions

HOK – Higher-order construct

HTMT - heterotrait-monotrait ratio

ICT – Information and communication technology

IPMA – importance-performance map analysis

IT – Information technology

IS – Information system

LOK – Lower-order construct

MGA – multi group analysis

NFC – Near field communication

NFI - normed fit index

PLS-SEM – Partial least square structural equation modelling

POI – Point of interest

RMS_{theta} - root means square covariance

SRMR - standardised root means square residual

UX - user experience

VIF - variance inflation factor

Chapter 1. Introduction

1.1. Research Background

The fourth industrial revolution, powered by artificial intelligence and robotics, has started to disrupt the industries. While revolutionising the opportunities for service production, it challenges the existing business models and creates the need for the new sources of competitive advantage (World Economic Forum, 2019). The combined capabilities of Big Data, advanced analytics, service design and distribution channels drive market innovations, including individually developed and delivered services (Flavin & Heller, 2019). Personalisation is named among the key future drivers of business success, because of its potential to maximise value for customers and to boost business profits (Boudet, Gregg, Rathje, Stein, & Vollhardt, 2019 ; Buhalis & Sinarta, 2019). In the tourism industry, personalisation has not yet reached its full potential (Skift, 2018, 2019). However, its capability to immerse tourists into real-time memorable experiences at a global scale, is expected to make it one of the main directions for investments (Amadeus IT Group SA, 2019; Boudet et al., 2019).

Tourism is one of the most information-intensive industries (Chung & Buhalis, 2008). Organisation of a trip and ongoing travel activities requires tourists to access different types of travel-related information, such as description of a destination and available attractions, description and price for hotels, transportation (Choe, Fesenmaier, & Vogt, 2017). To meet the demand for information, the tourism market offers a range of digital information services, which aim at supporting customer decision-making. The providers of such services aim at meeting tourists' heterogeneous needs and requirements, which may arise before, during and after the trip (Buhalis & Law, 2008; Xiang, Wang, O'Leary, & Fesenmaier, 2015). Often not being the owners of information, but its aggregators, they accumulate a selection of options for each types of the

travel service within one digital platform in order to provide tourists with the relevant choice. As a result of interactions with the information service interface, tourists are exposed to a broad selection of travel service options, such as hotels, restaurants, attractions, aimed at satisfaction of their needs.

Each tourist has unique needs. Need vary depending on the tourist personal characteristics, as well as on the real-time conditions of a trip within a specific destination (Buhalis & Foerste, 2015; Buhalis & Sinarta, 2019; Pearce, 2011). The presence of multiple alternatives enables tourists to choose the best suitable option to satisfy them. Service differentiation and the design, targeted at the particular customer segment, rather than at the whole market, has long been acknowledged as an effective competitive strategy (Porter, 1998). Proliferation of smart technologies allow to advance service differentiation, modifying service attributes automatically and according to the tourist real-time context. Personalisation is a process of creating and adjusting services and related customer experiences to the individual customer needs, preferences, tastes or restrictions in the context of dynamically changing customer environment (Asif & Krogstie, 2013; Borras, Moreno, & Valls, 2014; Meehan, Lunney, Curran, & McCaughey, 2013). The strategy of service personalisation serves for creating higher customer value than service standardisation (Arora et al., 2008; Kotler, Bowen, & Makens, 2014).

The tourism environment has been dynamically disrupted by information and communication technologies (ICTs) (Buhalis & Law, 2008; Law, Buhalis, & Cobanoglu, 2014), and, later, by smart technologies (Buhalis & Amaranggana, 2015; Choi, Ryu, & Kim, 2019; Gretzel, Ham, & Koo, 2018). Such technologies became available for both customers and service providers. In addition to facilitating the interactions between them, new technologies transform the demand and

supply for information service and reshape the interactional environment between the two parties (Tung & Law, 2017).

For the tourism information service providers, technological innovations create new opportunities to develop highly personalised services, which are be capable in meeting individual tourist needs, identified in the real time at the exact situation (Buhalis & Sinarta, 2019). Availability of high volumes of real-time data, which describe human offline and online behaviour, and the environment they act in, can be used to hypothesise immediate tourist needs. Smart technologies create a potential for dynamic and accurate adaptation of standardised services according to the needs of the specific tourists (Adomavicius & Tuzhilin, 2015; Hoseini-Tabatabaei, Gluhak, & Tafazolli, 2013; Sun, May, & Wang, 2016). As a result, personalisation serves as a mean of transforming a service and increasing its relevance for a particular customer or a group of customers (Blom & Monk, 2003; Nguyen & Ricci, 2017). It is described as capable in improving perceived service performance and increasing of customer value (Ball, Coelho, & Vilares, 2006; Kasanoff, Rogers, & Peppers, 2001; Piccoli, Lui, & Grün, 2017; Salonen & Karjaluoto, 2016). Relevant information, delivered to a tourist in the right moment, increases his satisfaction in comparison to a standardises set of travel-related options (Grün, Neidhardt, & Werthner, 2017; Marchesani, Piccoli, & Lui, 2017).

The occurred changes in technology also affect tourist expectations toward information services. Massive pervasion of ICTs both in everyday life and in tourism, made mobile devices the primary platform, used to retrieve information and to communicate with external environment, including service providers, friends, relatives, etc. (Gavalas, Konstantopoulos, Mastakas, & Pantziou, 2014a; Murphy, Chen, & Cossutta, 2016; Wang, Xiang, & Fesenmaier, 2014). The proliferation of multiple computing devices with a range of applications, such as information search service,

mobile guides, mobile payment, social media, etc., created customer 'mobile mind shift' (Bernoff, 2014). Tourists are becoming aware of the potential experience ICTs can create and expect this experience to be delivered (Missaoui et al., 2019; Neuhofer, Buhalis, & Ladkin, 2015; Shen, Deng, & Gao, 2016; Wang, Fesenmaier, & Park, 2012). Highly individualised real-time information, adapted to individual preferences and real-time context, loses its role of being a source of competitive advantage. Instead, personalisation become a tourist requirement service providers should meet to survive competition (Barragáns-Martínez & Costa-Montenegro, 2014; Buhalis & Sinarta, 2019; Höpken, Fuchs, Zanker, & Beer, 2010; Skift, 2019).

Tourism faces new challenges related to interactions with personalisation technology. Data-driven and technology-driven methods of personalisation allow service providers to come up with new, individually-designed value propositions (Aguado, 2016). However, the application of technological advancements modifies the way tourists interact with the services and brings new monetary and non-monetary costs to them. More specifically, there are concerns, associated with the process of personal data collections and arising privacy and security (Benson, Saridakis, & Tennakoon, 2015; Lee & Cranage, 2011; Sigala, 2012). Personalisation has also been associated with the loss of real and perceived customer control over decision-making process and the choice (Asif & Krogstie, 2012b; Ho, 2009). Regardless of the effect that personalised information has on satisfaction of immediate customer needs, interactions with the personalised information service may have a deflating effect on tourist satisfaction.

Maintaining high level of customer satisfaction and understanding the ways to improve information services remains critical for businesses and, specifically, for their profitability (Solomon, 2015). This is especially relevant for the tourist industry, which is characterised by the prevalence of the small and medium enterprises, and high competition between them (Kotler et al.,

2014). The ultimate goal of personalisation is maximisation of value for tourists (Buhalis & Amaranggana, 2015; Chandler & Vargo, 2011; Höpken et al., 2010; Lu, Wu, Mao, Wang, & Zhang, 2015) and the increase of their satisfaction (Arora et al., 2008; Marchesani et al., 2017). However, it is acknowledged that interactions with personalised information service do not always bring positive experience (Borras et al., 2014; Shen & Ball, 2009). Regardless of the quality of the provided information, such interactions are observed as causing customer frustration (Kardaras, Karakostas, & Mamakou, 2013; Wattal, Telang, & Mukhopadhyay, 2009). Therefore, it is critical to have a comprehensive knowledge of how tourist interactions with personalised information, performed through the information service interface, affect value co-creation and satisfaction in the exact context of consumption.

1.2. Research Gap

Due to the value it can provide for customers and, in turn, for businesses, personalisation has been in the focus of theoretical and empirical research since the beginning of massive pervasion of ICTs (Garcia, Torre, & Linaza, 2013; Höpken et al., 2010; Kabassi, 2010; Kurata & Hara, 2013). The phenomenon of personalisation has been explored within the domains of Information Technologies & User Experience, Service Management and Marketing, including the context of tourism (Al-Khanjari, 2013; Garcia et al., 2013; Höpken et al., 2010; Kabassi, 2010; Kurata & Hara, 2013). However, the research lacks a generalised view on the whole scope of customer interactions with personalised services. More specifically, a comprehensive explanation of the way how the attributes of personalised service, determined by the strategy and the technology, affect tourist satisfaction, is still missing. This prevents elaborations of the strategies, which would allow to increase effectiveness of personalised information service and to minimise the risk of customer frustration.

In the context of tourism, the most widely explored personalisation-related topics are the design and methodologies, which can serve develop personalised services, including the actual prototypes of personalised information services (Ananthapadmanaban & Srivatsa, 2011; Batet, Moreno, Sánchez, Isern, & Valls, 2012; Gavalas & Kenteris, 2011; Grün et al., 2017; Höpken et al., 2010; Kardaras et al., 2013; Kurata & Hara, 2013; Piccoli et al., 2017). Context-awareness and user modelling became the key factors that enable effective personalisation (Adomavicius & Tuzhilin, 2015; Gil, Giner, & Pelechano, 2012). For better understanding of the capabilities of personalised information services, the research in tourism domain pays much attention to customer data and classification methods, which can be applied for personalisation. The studies provide an extensive overview of personalisation principles, and propose new methods, which can be applied to maximise the accuracy of personalised content selection (e.g. Höpken et al., 2010; Kabassi, 2010; Kardaras et al., 2013; Rust & Huang, 2014). They also reveal some empirical insights of tourist interactions with different personalised information services.

Overall, the existing studies reveal high level of satisfaction with the personalised solutions among tourists. It is also acknowledged that interactions with the personalised information service may lead to the opposite outcome. Customers are observed abandoning information services because of being frustrated by recommended options (Brusilovsky, Kobsa, & Nejdl, 2007; Gavalas, Konstantopoulos, Mastakas, & Pantziou, 2014b). Another reason of customer dissatisfaction is the experienced loss of control over personalised outcome and travel choice (Asif & Krogstie, 2012b). Though, these observations are related to different cases and contexts with different variables and measurement approaches being applied. In other words, the existing research lacks the generalisable explanation of the way how tourist satisfaction is formed in the case of interactions with personalised information service.

The performance of an information service is commonly analysed with a help of three dimensions: the performance of information, of user interactions with the digital service interface and with service the service provider (Delone & McLean, 2016; McLean & Wilson, 2016; Petter, DeLone, & McLean, 2013). The methods, engaged in explanation of tourist interactions with personalised information services, mainly focus on the assessment of the relevance of the information for the specific customers and on the capability of the applied technology to create value (Adomavicius & Tuzhilin, 2015; Nguyen & Ricci, 2018). The analysis of the personalised information service performance includes application of the different indicators, or sets of indicators, which are used to assess the personalised information service output. In other words, the applied approaches focus on in-depth analysis of separate dimensions of personalised information service and their contribution to customer satisfaction. However, the existing frameworks, aimed at holistic assessment of an information service (e.g. Delone & McLean, 2016; Petter et al., 2013), exclude such parameters as privacy, security and control, which are associated with the customer frustrations. As a result, a holistic view on the service performance is missing.

The research in tourism domain engages a range of concepts to explain the performance of personalised information service and of tourist satisfaction with it. The selection of concepts mainly depending on the purpose of the study. First, the common trend is evaluation of the personalised digital interface, such as tourism website or mobile application, towards its usability (Höpken et al., 2010; Nguyen & Ricci, 2017). This approach is advantageous to illustrate tourists experience with an information system (IS) and the perceived performance of human-computer interactions the IS provides. Second, the research pays much attention to satisfaction with the quality of recommendations, selected by the personalisation technology. The measurements include such parameters as usefulness, relevance or accuracy of the recommendations for

satisfaction of a need (Chiang & Huang, 2013; Grün et al., 2017; Kurata & Hara, 2013), and their influence on tourist satisfaction with the choice, that have been made with a help of the personalised information (Braunhofer, Elahi, Ricci, & Schievenin, 2013). Some studies integrate both dimensions of the personalised information service performance, namely, information and IS performance. Sometimes, these two dimensions are supplemented with the parameters, which are specifically developed for personalisation (e.g. the level of personalisation) (Kardaras et al., 2013) or for the specific context of the study (e.g. repeated search behaviour as an indicator of the low relevance of the content) (Grün et al., 2017; Kurata & Hara, 2013). In other words, the methodologies, engaged to explain tourist interactions with personalised information service, mainly target content-specific and application-specific dimensions.

The advantage of these methods is the possibility to assess the direct influence of specific personalised information service attributes on customer satisfaction (Lin, Tsai, & Chiu, 2009). More specifically, these approaches enable in-depth evaluation of personalisation outcome effectiveness towards satisfaction of the need to interact with information service (e.g. the need to find information), and satisfaction with the quality of these interactions. Same as in other domains, tourism-specific research does not provide a tool for a holistic explanation of the scope of customer interactions with the personalised information service attributes. Moreover, the existing research lacks understanding of the mutual effects that the attributes, which tourists experience, have on created value and satisfaction. This prevents the development of the explanation of the reasons why and in what contexts relevant personalisation can cause negative experience. A holistic framework, which would explain the mutual contribution of all personalised information service parameters, exposed to tourists, to customer value and satisfaction, can become a valid and

rigorous tool for personalised information service assessment (Wang & Liao, 2007). Such tool may also reveal the ways to minimise the risks of customer frustration with the service.

1.3. Research Aim and Objectives

The study aims at *explaining how the essential attributes of personalised information service influence tourist satisfaction and intension to use the service again*. The study accepts customer perspective on the research phenomenon and puts the following objectives to meet the aim:

1. *To conceptualise tourist interactions with personalised information service*
2. *To propose an integrative model of tourist satisfaction with personalised information service*
3. *To refine and further elaborate the proposed measurement scales for the model of tourist satisfaction with personalised information service*
4. *To explain the cause-effect relationships and hierarchy within the model*
5. *To explore possible mediating and moderating effect on the hypothesised cause-effect relationships within the model*
6. *To validate the proposed measurement model*
7. *To assess the proposed model of tourist satisfaction with personalised information service*

To fulfil the objectives, this thesis focuses on information services, which aim to provide customers with personalised travel information. The study employs a three-phase sequential research design, which includes the conceptual development, the explanatory and confirmatory qualitative and quantitative inquiries. The first phase applies conceptual literature review and elaborates an integrative conceptual model of tourist satisfaction with personalised information service. The second phase builds on empirical qualitative analysis, which engages the data from in-depth semi-structured individual interviews and triangulation of tourist experience, industry

expertise and academic theory. It verifies the hypothesised model, proposes further explanation of the way how tourist perceptions on the interactions with the specific attributes of personalised information service contribute to the overall judgement about the service performance, customer value and satisfaction. The second phase also helps to revise the hypothesised specification of the model. The third phase builds on empirical quantitative analysis, which applies customer survey data, analysed with the Partial Least Squares Structural Equation Modelling techniques of model assessment and relationships analysis. This phase validates the proposed model, further reconfirms the hypothesised relationships between tourist expectations towards the personalised information service, this service performance, customer value, satisfaction and loyalty.

1.4. Contribution of the Thesis

This study extends the classic framework of the information service performance, which initially includes the dimensions of information, of IS interface and of service provider support (Delone & McLean, 2016; McLean & Wilson, 2016). It proposes the additional dimension of tourist participation and control over the personalisation. The study provides a comprehensive explanation of the role of the personalised information service attributes have in the formed customer value, satisfaction and intention to use the service again.

The findings create original contributions to the Service-Dominant Logic, service management and user experience. This thesis expands Service-Dominant Logic by redefining the performance of personalised information service as being co-created alongside with co-created value. It further operationalises the concepts of co-created service performance and co-created value for the context of a personalised website in tourist context. In the domain of user experience, the thesis provides the insights in tourist reasoning towards experienced interactions with personalised information service. It further demonstrates the relative contribution of personalised information service

attributes to the formed value and satisfaction and identifies the parameters that should be taken into consideration to ensure high satisfaction with the service. In the domain of service management, the study proposes a comprehensive framework that integrates service-centric and customer-centric parameters. This framework creates a more complex but comprehensive approach to assess the performance of the personalised information service.

The study additionally creates contribution to practice. The proposed model can serve as an instrument for the personalised information service effectiveness analysis. It comprises the unified parameters and enables assessment regardless the applied strategy and technology. Such instrument also enables comparison between services within the tourism industry, thereby, creating practical value for the tourism information service providers and user experience designers.

1.5. Structure of the Thesis

The thesis is further organised as follows. Chapter 2 represents the literature review, conducted to define personalised information service in tourism context, to explain the research gap and to elaborate the conceptual model of tourist satisfaction with the service. Chapter 3 proposes a review of the applied research methodology. It includes explanation of the accepted research paradigm, reasoning and explanation for the chosed mixed-method sequential research design, and discusses the specifics of the applied methods of data collection and analysis. Chapter 4 presents the findings of the qualitative and quantitative resarch inquiries. Chapter 5 integrates the findings of all three phases and discussesthe aquired results, their quality and the limitations of the study. Finally, Chapter 6 summarises the findings, reflects of the quality of the thesis and provides suggestiong for the future research.

Chapter 2 Literature review

2.1. Introduction

Personalisation has been in the focus of conceptual and empirical research for the last decades (Al-Khanjari, 2013). It is commonly understood as a process of creating or modifying services according to individual customer characteristics, preferences, tastes, restrictions, and according to the factors of dynamic customer environment (Asif & Krogstie, 2013; Borras et al., 2014; Meehan et al., 2013). By creating the service, relevant for fulfilment of individual and dynamic customer needs, personalisation can provide higher value for customers (Kotler et al., 2014) and increase their satisfaction (Arora et al., 2008; Lemke, Clark, & Wilson, 2011).

Shaped by the need to adjust services to the particulars of consumer behaviour on the one hand, and by the technological developments on the other, the concept of personalisation has evolved in a multidimensional phenomenon (Salonen & Karjaluoto, 2016). It builds on the theory of consumer behaviour, which can be defined as 'a process of acquiring and organising information in the direction of a purchase decision and of using and evaluating products and services' (Moutinho, 1987, p. 4). Understanding of specific tourist motives, attitudes, and resulting satisfaction for each individual customer enables the development of individually designed information service. Available customer data and context-recognition technology determine the capabilities of advanced personalisation strategy. For the academic research, such complexity results in the need to integrate multiple theories and look for innovative ways to explain tourist motivation, reasoning, and contexts. Application of one concept separately from other theories cannot give a robust explanation for the events (Cohen, Prayag, & Moital, 2013) and can inhibit the research progress (Mazanec, 2009). For the industry, the complexity of consumer behaviour and personalised service strategy development leads to the need for understanding of the dynamic

changes in tourist behaviour, and for development of effective solutions to personalise tourism information services accordingly.

Academic knowledge requires application of the clear and formal definitions of all terms and concepts applied in the research (Crane, Henriques, Husted, & Matten, 2016; Wacker, 2008). Lack of consistency, exaggerated role of several dimensions of concepts under investigation or poorly articulated concepts can become a barrier for the development of robust theoretical contribution (Mintzberg, 2005). Taking into consideration the multidimensional character of personalisation, related to the specifics of service development and consumption in tourism, Chapter 2 addresses the main theoretical foundations, related to information service personalisation. It aims to meet the first two objectives of the study by conceptualising tourist interactions with personalised information service towards its capabilities to affects tourist satisfaction and integrating the identified dimensions of the process in the conceptual model.

Chapter 2 is organised as follows. First, it conceptualises personalised information service in tourism context by integrating the perspectives on personalisation as a service strategy of satisfaction of tourist information needs and as a feature of information service design strategy of providing tourists with the personalised outcome. Second, it summarises the main approaches to explain the effect of tourist interactions with personalised information service on tourist satisfaction. It further identifies the gap between these approaches and the specifics of personalisation. Third, it redefines personalisation from the perspective of Service-Dominant Logic and value co-creation and reviews the logic of personalised information service performance assessment within the cognitive process of customer satisfaction. The chapter concludes with the proposed conceptual model of personalised information service.

2.2. Information Service in the Context of Tourist Information Needs

Rapid development of ICTs enabled the appearance of multiple ways for information to be transmitted (Xiang, Magnini, & Fesenmaier, 2015; Zins, Gretzel, Hwang, & Fesenmaier, 2012). Information service is generally defined as any service, which provides information as a primary object of exchange between actors of service system (Campbell, O'driscoll, & Saren, 2013; Rust & Lemon, 2001). Digital information is delivered via content, which can be presented in a static form or as a dynamic hyperspace, feed, search results, etc. (Filimowicz & Tzankova, 2018; Germanakos & Belk, 2016). A range of online information sources, including single-service websites, brand websites, directories, search engines, social media, etc. can provide tourists with the available information (Asif, 2014; Gali, Istodor, & Fränti, 2017; Law et al., 2014).

2.2.1. Tourist Information Needs

A distinctive characteristic of the modern tourism is its information-intensive nature and extensive Internet usage (Adomavicius & Tuzhilin, 2015; Candela & Figini, 2012; Choe et al., 2017). Information can be either the target of tourist activity (e.g. information about attractions), or a supporting asset for travel (e.g. choice of accommodation, transportation), or entertainment (e.g. social media). Not only does information allow to make travel arrangements, but also helps to enhance the quality of the trip, to avoid potential risks, and to maximise benefits from visiting certain places (Vogt & Fesenmaier, 1998). The proliferation and advancements of ICTs have affected the nature of information search behaviour, significantly increasing its importance and enlarging the scope of information search activities (Choe et al., 2017; Fesenmaier, Xiang, Pan, & Law, 2011; Zarezadeh, Benckendorff, & Gretzel, 2018).

With a certain difference in the stages, human motivation and consumer behaviour literature agrees that customer activity is triggered by certain needs (i.e. need – goal – decision – action -

satisfaction) (Ryan & Deci, 2017; Solomon, 2015). Tourist needs determine particulars of customer journey, such as specifics of motivations, choices, travel-related activities, and service consumption (Swarbrooke & Horner, 2007). The need for information does not belong to the primary human needs, and, therefore, is not limited to pure rational behaviour. Motivation to use information service comes from the physical and social environments. It is identified after the expectations are set and the purpose of information use is defined by customer (Drew, Woodside, Huang, & Hsu, 2009). The existence of a specific purpose, such as improving knowledge about a phenomenon or entertainment, increases the importance of relevant information to be available for customers (Liang, Lai, & Ku, 2006).

Due to existence of multiple purposes of information use, there is no commonly applied classification of information needs. Depending on the motivation that triggers tourist interaction with a certain type of information, is it possible to distinguish utilitarian, hedonic, innovation, sign, and aesthetic needs (Choe et al., 2017; Chung & Buhalis, 2008; Vogt & Fesenmaier, 1998). Utilitarian needs have functional and goal-oriented nature. They are raised by lack of knowledge, by perceived risks or uncertainty, as well as by attempts to increase the utility and efficiency of planning efforts (Buhalis & Sinarta, 2019; Case Donald & Given, 2016). The usage of multiple types and sources of information can be additionally motivated by the perceived low quality of information or the trustworthiness of an information source (Tsiotsou & Wirtz, 2015). Hedonic needs reflect emotional, sensory, and pleasurable part of travel experience, and can be satisfied through entertainment (Kennedy-Eden & Gretzel, 2012; Wang, 2016). Availability of personal computing devices with constant connectivity to the Internet additionally created the phenomenon of unsystematic information search, aimed at entertainment rather that extension of knowledge (Asif & Krogstie, 2013; Wang, 2016). Innovation needs reflects tourism-specific phenomenon of

acquiring novel, creative and varying experiences from a trip. Sign needs are realised in social, interpersonal, and symbolic interactions. The introduction of Web 2.0 protocol additionally triggered realisation of the need for sharing information (Chung & Buhalis, 2008; Leung, Law, van Hoof, & Buhalis, 2013). Aesthetics are used to describe tourist dreams and imaginary associations with the desired tourism service. The presence of different types of information determines the capability of the information service to satisfy different types of information needs and to contribute to creation or destruction of the corresponding dimensions of value from the interactions with the information service.

Regardless of the particular type, information needs are addressed along the whole travel customer journey, including before-, during-, and post trip stages (Tan & Goh, 2015). While different needs may co-exist, and one service may satisfy either one or a group of information needs along the customer journey, the stage of travel usually determines tourist information search and information consumption behaviour. Pre-trip information search is usually motivated by utilitarian motives of making travel arrangements. ICTs, including mobile devices and social media, increased the importance of hedonic, sign, and innovation information needs, which may prevails over the utilitarian information consumption during and after the trip (Choe et al., 2017; Xiang, Wang, et al., 2015). Information needs, identified at a certain stage of the trip in the specific context of application determines the use of information services (Adomavicius & Tuzhilin, 2015).

2.2.2. Information Service as a Mean of Tourist Information Need Satisfaction

Information service providers aim to apply knowledge and capabilities to understand tourists needs for information, to provide relevant information to facilitate their activities, thereby, increasing value for them (Chiang & Huang, 2013). Depending on the problem it solves, information services include general and specialised domains such as search engines, travel-related portals, OTA and

Online Reservation Systems, social media, news, communication and interaction facilities, such as phone and messengers, etc. (Buhalis & Law, 2008; Kennedy-Eden & Gretzel, 2012; Liu, Yang, & Pu, 2015; Sun, Law, Luk, & Fong, 2017). They aim to support tourists with different types of information services in order to satisfy different needs (Table 2.1).

Table 2-1 Examples of Information Services in Tourism

Information needs	Information Service	Examples of tourism and tourism-related online activities	
Sign needs **Utilitarian needs**	Communication and social interactions services	• Messages • Web 2.0 services and Two-way sharing content • Phone and video call	• Email 'Presence'-services (to specify location)
Hedonic needs	Entertainment services	• Games • Music services	• News • Movies • Internet surf
Utilitarian needs **Innovation needs** **Aesthetic needs**	Information: Search engines	• Search	• Browse
	Information: travel facilitation services	• Timetables • Traffic information • Flight info	• Recommender systems/ Guides • Weather forecasts
	Transaction services	• Travel service booking and payment • Check-in service	• Online shopping • E- banking
	Marketing	(company-initiated communication)	

Adapted from: (Aguado, 2016; Asif, 2014; Chiang & Huang, 2013; Fan & Poole, 2006; Germanakos & Belk, 2016; Heinonen & Pura, 2006; Kennedy-Eden & Gretzel, 2012; Nikou & Mezei, 2013; Rust & Huang, 2014; Sunikka & Bragge, 2008; Tan, Voon Hsien, Binshan, & Keng-Boon, 2017; Wang, 2016; Wu, Im, Tremaine, Instone, & Turoff, 2003)

The capability of an information service to satisfy tourist needs can serve as an indicator of its performance. More specifically, the performance of information service reflects its relevance for meeting tourist objectives of interactions with the service within the available time and within cognitive and emotional efforts and other costs, which tourists are ready to invest in this service consumption (Kroenke & Boyle, 2017). High information service performance, therefore, should demonstrate its appropriateness for problem solving (Cole, 2012). Such appropriateness is related both to the characteristics of information, including accurate, comprehensive, detailed, and up-to-date description of the object (Kuo, Wu, & Deng, 2009; Pitt, Watson, & Kavan, 1995; Stacie,

DeLone, & McLean, 2008; Yang, Cai, Zhou, & Zhou, 2005). At the same time, in the context of high volumes of travel-related information and of multiple information services, high-performing information service should support efficient decision-making, minimising the load of the travel choice (Delone & McLean, 2016; Wang & Liao, 2007).

2.2.3. Conclusion

To sum up, tourism is information-intensive industry. Tourists tend to access travel-related information via multiple computing devices along the three phases of travel. Information, which is relevant and efficient for satisfying individual and dynamic tourist information needs, can facilitate decision-making and maximise value for tourists.

Information service is generally defined as any service, which provides information as a primary object of exchange between actors of a service system. Information services vary depending on their functionality and the travel activity they support. To minimise ambiguity, this thesis focuses on information services, which aim at supporting tourist decision-making by providing them with travel-related information. Such services include but not limited to search engines, meta search engines, recommender systems, fare aggregator websites

2.3. Personalisation of Information Service in Tourism

2.3.1. The Concept of Personalisation

In the most basic view personalisation can be defined as a 'process of preparing an individualised communication for a specific person based on stated or implied preferences' (Vankalo, 2004). Service consumption is motivated by a range of needs and motives (Heinonen et al., 2010). Personalisation aims to adjust an existing service or to develop a new on in order to increase the

match between individual needs and the service capabilities to satisfy them (Kuzgun & Asugman, 2015; Naudet, Yilma, & Panetto, 2018).

Theoretical developments in the topic of personalisation mainly belong to the domains of information system and human-computer interactions (HCI), followed by marketing and consumer behaviour studies (Salonen & Karjaluoto, 2016). Tourism field both borrows the existing concepts from other sciences, as well as develops its own propositions. The existing research stream mainly focuses on technological aspects of recommender systems performance (Al-Hassan, Lu, & Lu, 2015; Grün et al., 2017; Nguyen & Ricci, 2017) and on the increase of tourist satisfaction through the identified quality attributes. However, there is a lack of comprehensive conceptualisation of the phenomenon, which is common for the developing scientific fields with the empirical research prevailing over conceptual development (Corley & Gioia, 2011).

Due to the multiplicity of domains, which explore personalisation, there is no commonly accepted definition of the concept (Asif & Krogstie, 2013; Blom & Monk, 2003; Kumar & Desai, 2016). It is explained from different perspectives, and through the range of concepts. Table 2-2 summarises the definitions of personalisation, derived from the existing literature of marketing, HCI, and tourism domains.

Table 2-2 Definitions of Personalisation

Definition	Author	Derived characteristics and comments
'Personalization techniques aim to provide customised information to users based on their preferences, restrictions, or tastes'.	(Borras et al., 2014)	Object of adaptation: Information The purpose of adaptation: n/a Applied resources: customer data on preferences, restrictions, and tastes
'Personalization, the ability to tailor products, services, and the transactional environment to individual customers' needs, is a general process that occurs in many aspects of business (e.g., software customization) and social life (e.g., selecting the right gift for a sibling).'	(Piccoli et al., 2017)	Object of adaptation: products, services, and the transactional environment The purpose of adaptation: to meet individual customer's needs Applied resources: software, mental ability

‘Service personalization is the process of using individuals' own information to tailor the service and the transactional environment to improve the benefits accruing to them’.	(Shen & Ball, 2009)	Object of adaptation: personalised service and transactional environment The purpose of adaptation: to improve the benefits accruing to them’ Applied resources: customer data
Personalisation is the capability to provide users, customers, partners, and employees, with the most relevant web experience possible	(Kasanoff et al., 2001, p. 15)	Object of adaptation: n/a The purpose of adaptation: to provide all actors of the service system with relevant experience Applied resources: n/a
‘Personalization is predicate based on sufficiently detailed customer data and analytical tools that help in recognizing differences in behaviour between consumers and in identifying marketing opportunities.’	(Rust & Huang, 2014, p. 395)	Object of adaptation: n/a The purpose of adaptation: to identifying marketing opportunities Applied resources: details customer data, analytical tools
‘A personalised service can be described as one that is able to provide evolving, tailored assistance to a user based on their unique preferences, needs or desires.'	(Roh & Jin, 2012, p. 1300)	Object of adaptation: service The purpose of adaptation: to provide evolving, tailored assistance Applied resources: individual data on preferences, needs or desires
‘Personalisation is a specialised form of product differentiation, in which a solution is tailored for a specific customer'	Hanson, 2000, p. 450 cited by (Vankalo, 2004)	Object of adaptation: product The purpose of adaptation: to provide individual solution for customers Applied resources: n/a
‘Personalisation involves the firm itself tailoring the marketing mix to the customer, based on available customer information’	(Arora et al., 2008)	Object of adaptation: marketing mix The purpose of adaptation: n/a Applied resources: customer data
‘Personalisation is the explicit user model that represents user knowledge, goals, interests, and other features that enable the system to distinguish among different users’	(Brusilovsky & Maybury, 2002)	Object of adaptation: n/a The purpose of adaptation: to segment customers Applied resources: user model, user knowledge, goals, interests, and other features
‘Personalisation is a process whereby products and services are tailored to match individual preferences utilising consumer data. The process of personalisation consists of learning customer preferences and synthesising the gathered knowledge into offers, recommendations, and multiple versions of interaction touchpoints’.	(Salonen & Karjaluoto, 2016)	Object of adaptation: marketing mix The purpose of adaptation: to match customer preferences with the service Applied resources: data on customer behaviour, synthesis of knowledge
‘Personalisation is a process that changes the functionality, interface, information access and content, or distinctiveness of a system to increase its personal relevance to an individual or a category of individuals.’	(Fan & Poole, 2006)	Object of adaptation: functionality, interface, information access and content, or distinctiveness of a system The purpose of adaptation: to increase its personal relevance to an individual or a category of individuals Applied resources: n/a
‘Personalisation is a strategy which present tailor-made information, content, and design of the web site to the user based on the users implicit and explicit needs. Personalisation can be used to match advertisement and promotion with customers' individual needs and	(Kumar & Desai, 2016)	Object of adaptation: information, content, and design of the web site The purpose of adaptation: to match advertisement and promotion with customers' individual needs and preferences Applied resources: n/a

preferences in targeted or behavioural advertisement.'		
'Personalisation is a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to an individual'	(Blom & Monk, 2003)	Object of adaptation: functionality, interface, information content, or distinctiveness of a system The purpose of adaptation: to increase its personal relevance to an individual Applied resources: n/a
'Web personalisation is an automated process, which identifies system users, collects their navigation patterns, analyzes known preferences of other similar users, and estimates the specific preferences for each individual user to tailor content for him'	(Bodoff & Ho, 2015)	Object of adaptation: content The purpose of adaptation: to provide personalised content Applied resources: individual customer and target market data on navigation patterns, algorithm to estimate specific preferences
'Web personalisation is an adjustment and modification of all aspects of a web site that are displayed to a user in order to match that users' needs and wants'	(Wu et al., 2003, p. 2)	Object of adaptation: all visible aspects of a web site The purpose of adaptation: to match information with users' needs and wants Applied resources: n/a
Personalisation deals with adapting the content presentation (e.g. length and style of textual information) and behaviour of an application (e.g. filtering of menu items based on usage history) to the user profile (demographic data and preferences), and history.	(Höpken et al., 2010, p. 117)	Object of adaptation: content presentation and behaviour of an application The purpose of adaptation: n/a Applied resources: customer demographic data, preferences, and history
'Personalization is generally defined as an organizational capability to adapt products and purchasing experiences to the preferences of individual consumers based on their personal information '	Chellappa and Sin, 2005 cited by (Morosan & Defranco, 2016)	Object of adaptation: products and purchasing experiences The purpose of adaptation: to adapt service to customer preferences Applied resources: personal data
'Web personalization refers to the adapting both the content and the presentation of web sites, so that to deliver the maximum effect to the user in the most appropriate way. A main objective of web personalization is to adapt the presentation of the web in a manner that increases the user's perceived quality'	(Kardaras et al., 2013, p. 25)	Object of adaptation: content and the presentation of web sites The purpose of adaptation: to increase the perceived quality of the service Applied resources: n/a
'Personalization is driven by the computer which tries to serve up individualized pages to the user based on some form of model of that user's needs'	(Nielsen, 1998)	Object of adaptation: content Actor, who performs adaptation: The purpose of adaptation: to meet customer needs Applied resources: user model
'Personalisation in a general context was defined as a technology that represents the online experience for individual purposes by generating personalised web page based on user's profile.'	(Al-Khanjari, 2013)	Object of adaptation: web page The purpose of adaptation: to represent the online experience for individual purposes Applied resources: technology, customer data
'The process of providing relevant content based on individual user preferences'	(Ho, 2009)	Object of adaptation: content The purpose of adaptation: to provide relevant content Applied resources: data on individual user preferences

'Modification of the content, interface, or physical appearance of the smartphone that persist beyond one session'	(Tossell, Kortum, Shepard, Rahmati, & Zhong, 2012)	Object of adaptation: content, interface, or physical appearance of the smartphone The purpose of adaptation: n/a Applied resources: n/a
'Adaptation of a user's mobile experience to better suit their individual needs'	(Aguado, 2016, p. 191)	Object of adaptation: mobile experience The purpose of adaptation: to better suit their individual needs' Applied resources: n/a
'Personalisation involves tailoring applications and services specifically to an individual's needs, interests, and preferences'	(Poslad, 2011, p. 169),	Object of adaptation: applications and services The purpose of adaptation: to adapt services to individual needs, interests, and preferences Applied resources: n/a
'Personalisation of a service means that the mechanisms exist to allow a user U to adapt, or produce, a service A to fit user U's particular needs, that after such personalisation, all subsequent service rendering by service A towards user U is changed accordingly'.	(Jørstad & Do Van Thanh, 2004)	Object of adaptation: service The purpose of adaptation: to fit user's particular needs Applied resources: system
'Personalisation is a controlled process of adaptation of a service to achieve a particular goal by utilising the user model and the context of use'	(Asif & Krogstie, 2012a, p. 1)	Object of adaptation: service The purpose of adaptation: to achieve a particular goal Applied resources: user model, data on the context of use
'the ability to tailor products, services, and the transactional environment to individual customers' needs'	(Marchesani et al., 2017, p. 377)	Object of adaptation: products, services, and the transactional environment The purpose of adaptation: to meet individual needs Applied resources: n/a

The examined definitions confirm the presence of heterogeneity in the concept of personalisation. It can be observed that personalisation strategy is shaped by various purposes and methods. Companies develop service propositions in the form of a standardised service, which is adjusted by personalisation strategy and a relevant technology for the needs of individual tourists (e.g. Asif & Krogstie, 2012a; Blom & Monk, 2003; Bodoff & Ho, 2015). Regardless of the domain of the study, the purpose and the objectives personalisation activities are explained either from service perspective as a value and experience creation, or from information service design perspective as an adaptation of a service to make it more relevant for customer.

From the service strategy perspective, the purpose of personalisation is to deliver an individually 'desired outcome' (Borras et al., 2014; Höpken et al., 2010; Tossell et al., 2012). Overall,

personalisation can target information about the service (Borras et al., 2014), service itself (Roh & Jin, 2012), interactional environment between a customer and a business (Ball et al., 2006; Bodoff & Ho, 2015; Piccoli et al., 2017; Salonen & Karjaluoto, 2016), or the entire marketing mix (Blom & Monk, 2003; Fan & Poole, 2006; Piccoli et al., 2017; Reis, 2015; Salonen & Karjaluoto, 2016). More specifically, it aims to tailor a service, which would satisfy individual customer needs, wants, and desires, interests, and restrictions (Bodoff & Ho, 2015; Borras et al., 2014; Kumar & Desai, 2016; Morosan & Defranco, 2016; Salonen & Karjaluoto, 2016). Accurate personalisation, which creates the match between customer needs and service capability to satisfy them, increases customer perceptions about this service performance (Kardaras et al., 2013).

From the perspective of information service design, personalisation is consistently associated with application of information, which describes customer internal and external environment (Mehra, 2012; Vesanen, 2007). It concerns the capabilities of information system (IS), which enables data input, automated process of service adaptation and human-computer interactions to deliver the resulting service (Al-Khanjari, 2013; Blom & Monk, 2003; Bodoff & Ho, 2015).

As a result, personalisation is a process of interactions between a customer and a service provider via the encounters with the IS. The outlined features allow to conclude that the performance of service personalisation is determined by a company's service adaptation strategy to satisfy customer needs (Kumar & Desai, 2016) and by the IS design and its capability to transform the service for individual customers (Brusilovsky & Maybury, 2002). The next two sections aim to provide the detailed explanation of personalisation concept from both perspectives.

2.3.2. Personalisation within the Service Strategy

Personalisation ‘is a process whereby products and services are tailored to match individual preferences utilising consumer data’ (Salonen & Karjaluoto, 2016). The concept of matching service attributes with individual needs is not new (Al-Khanjari, 2013). Business strategy recognises personalisation as a type of differentiation strategy (Vankalo, 2004; Wattal et al., 2009), which supports high production flexibility (Dewan, Jing, & Seidmann, 2000). Classic theory on generic business strategies, proposed by Porter (1980), argues that differentiation allows company to achieve high performance by focusing on the perceived quality for different target markets, and by changing specific components of the service for that (Bray & McClaskey, 2012). Adjustments are made so that new service becomes partial substitute to the standardised one. In this case both existing and new service meet identical need, but personalised service can deliver higher satisfaction that a standardised one (Candela & Figini, 2012).

Theoretically, there exist two major strategies of horizontal and vertical differentiation. Regardless of the size of the target market, differentiation strategies serve as guidelines for service modification based on the demand for certain type of the service, level of quality and price (Kotler & Keller, 2016). The main idea for differentiated service development is targeting heterogeneous demands rather than providing niche service for a specific client, which is the distinctive feature of personalisation of information services (Dickson & Ginter, 1987; Wattal et al., 2009). At the early stage, differentiation strategies were associated with additional production expenses for businesses in comparison to the group of cost leadership strategies. However, technological advancements enabled more flexible manufacturing and more efficient targeting (Pine & Gilmore, 1999). Together with the proliferation of personal computing devices, and simultaneous increase of customer demand for variety and better fit to their requirement, technologies enabled the

opportunities for mass customisation (Sigala, 2012; Tseng & Hu, 2014). Availability of individual level data advanced capabilities for information service differentiation to an individual level, enabling personalisation in the form of individually designed solutions. Taking into consideration the common purposes and similar logic of implementation of differentiation and personalisation strategies, personalisation can be placed within the group of differentiation strategies (Vankalo, 2004).

In the context of differentiation strategy, digital information service is distinctive from other services in terms of its capability to deliver high quality without the increase of company expenses, and, in turn, in the cost for consumers. Originally, differentiation strategy is grounded in the product strategy and the assumption of limited nature of resources (Sutton, 1986; Wauthy, 1996). Differentiated service can deliver higher value for a market segment and business profitability. However, modification of service design requires additional investments from the service provider. According to the product strategy, companies with similar assets are expected to be able to produce services of a similar quality and similar attributes. The need for high investments together with the risks of the new service design to be copied by competitors, decrease the efficiency of high service differentiation (Candela & Figini, 2012).

In the case of information service in tourism, travel-related content, customer data and digital technology, which enables aggregation, modification and exchange of content, are the major resources of the service provider. Content may be presented by a range of POIs, such as attractions, hotels, restaurants, and their description. Apart from the case of information asymmetry, when one company owns unique information about the market or the service (Candela & Figini, 2012), content as a resource is often shared with an information service provider by multiple stakeholders, such as destinations management organisation, hotel and restaurant owners. Personalisation of

information service applies customer personal data, knowledge and company capabilities to match service with specific needs enable co-production of unlimited number of personalised information sets. While personalisation algorithm itself requires an up-front investment (Telang, Rajan, & Mukhopadhyay, 2004), it does not require new inputs to return the adjusted service to each customer as (Dewan et al., 2000; Wattal et al., 2009). Therefore, digital information service has capabilities of creating individually-designed solutions without additional monetary investments for each version of the service (Vargo & Lusch, 2008a; Wieland, Polese, Vargo, & Lusch, 2012). Therefore, personalisation strategy is economically efficient for information service and can be a source of competitive advantage for a company (Day & Montgomery, 1999; Vargo & Akaka, 2009).

When practically implemented, horizontal and vertical strategies are closely interrelated and can be implemented simultaneously for one service (Telang et al., 2004). However, theoretically they are commonly analysed separately (Wattal et al., 2009). The majority of studies from the domain of information service personalisation explore personalisation only as a horizontal differentiation strategy. They look at the influential service attributes and the possibility to improve their performance and provide customers with higher satisfaction (e.g. Braunhofer et al., 2013; Kardaras et al., 2013; Nguyen & Ricci, 2017). Despite different perspectives on the place of personalisation in differentiation strategies' hierarchy do co-exist (Bray & McClaskey, 2012), its application is known both within vertical and horizontal strategies (Candela & Figini, 2012).

2.3.2.1. Personalisation within Vertical Differentiation Strategy

2.3.2.1.1. The Strategy of Vertical Differentiation

Vertical differentiation is the strategy that creates a range of services with the same functional attributes, but different quality characteristics and price. The strategy proposes the idea that a

business may develop series of services, which target same need, but range by performance and, therefore, by price. Production of a service with high level of quality increases the cost of production and the market price of the service. Customers are presented with an opportunity to select a service with the optimum ration for price and performance. Therefore, the price for a service becomes an indicator of this service performance (Serio, Tedeschi, & Ursino, 2016; Xia & Zhang, 2016).

A distinctive feature of information service, which requires specific interpretation in the case of vertical differentiation strategy, is the nature of costs, paid by customers for satisfying their information needs (Bhargava & Choudhary, 2001; Varian, 2004). The costs of information service for tourist can be expressed either in monetary equivalent (i.e. cost of Internet traffic), or in opportunity costs (i.e. cost of the time, spent for choosing the right information instead of being spent for satisfying other needs, including traveling) (Liu et al., 2015). Within the product strategy, vertical differentiation is realised in the form of improved quality of an existing service. Customers can make judgements about the quality of the service based on its price. A maximum price, which a customer can afford, leads to the comparison and the choice of a service within an interval of a minimum and a maximum affordable price. Price in this case becomes a determinant of choice, and the stopping rule for vertical search process (Candela & Figini, 2012).

Most of the tourism information services, including search engines and recommender system, are provided to customers for free (Huang, Lin, & Fan, 2015). The business models, commonly applied in digital tourism, allow information service providers to profit from advertisement revenues, as well as from commission, paid by the owners of information for their information being displayed by at the information service provider's digital platform. In this case, the role of monetary costs and the trade-off between price and quality as a service quality regulator for

customers disappears (Telang et al., 2004). On the contrary, interactions with the digital information service, such as a recommender system, increases the opportunity costs for customers. The increased amount of information from multiple suppliers requires tourists to invest more time to explore them and to find the content, relevant for satisfaction of the information need. Moreover, maintaining high quality requires a service to meet certain elaborated standards. Digital content, being an outcome of information service, might exist in high and low quality without being regulated by price (Liu et al., 2015). The uncertainty of travel context and the perceived risks of receiving low-quality (e.g. incorrect, outdated or irrelevant) information leads to the increase of the time and cognitive efforts, spent for decision-making. Therefore, the maximum acceptable cost of the search process affects the choice of the information together with other perceived quality attributes of the service (Candela & Figini, 2012). However, the cost of interactions with an information service in the form of time and cognitive efforts is not attributed to a selected item of information and does not serve as an indicator of quality of this item. Instead, it is invested in the decision-making process and interactions with the whole scope of hotels, attractions, restaurants or other travel services. As a result, in the case of digital information service, the cost of the service for customers is the opportunity cost to acquire high-performing information. To ensure efficient decision-making, tourists face the need to identify the optimum time and efforts, required to ensure the relevance of the information for their need satisfaction.

2.3.2.1.2. Personalisation and the Problem of Information Overload

According to vertical differentiation strategy, a buying decision is taken through the trade-off between desired quality and affordable cost (Bhargava & Choudhary, 2001; Wauthy, 1996). The problem tourism faces is the growing amount of heterogeneous and often not structured information tourists are exposed to. Information overload, which is defined as the cognitive state,

triggered either by quantity, by quality of information, or by its presentation (Liang et al., 2006), affects tourists decision making. The principle of least effort, proposed by Zipf (1949), states that users tend to minimize the possible time and cognitive costs of the relevant information acquisition. Tourist would choose the way, which requires minimum effort, even if it would result in less quality or quantity of information (Chang, 2016). As a result, tourist can receive low quality information, miss the right option, or be distracted from identifying information as relevant (Liang et al., 2006).

The role of personalisation as the case of vertical differentiation is seen in reducing time and cognitive efforts, required for accomplishing certain tasks by providing customers with the relevant service rather than exposing them to the whole market offer (Desai, 2016; Piccoli et al., 2017). It is observed that the more options an information service provides, the more customer attention will be switched from the decision-making and the benefits of the service, to the issues of their interactions with the website (Rust & Thompson, 2006). The decreased non-monetary costs of information service consumption can improve customer perceptions of the performance of experienced content. The implicit delivery of the information. Selected for the individual tourists, instead of exposing customers with the whole range of travel-related options can decrease of the time and of the cognitive load of interactions with information, and can create higher perceived value and higher level of satisfaction (Rust & Thompson, 2006).

Satisfaction with the decreased scope of information strongly depends on the accuracy of the provided recommendation (Kwon & Kim, 2012; Liang et al., 2006). The primary purpose of interactions with information is satisfaction of individual needs. This brings the requirement of information relevance to the user. As a result, vertical differentiation strategy as optimisation of the time and efforts, required for receiving and processing certain amount of information and

arriving at a decision, needs to be implemented with the consideration of the perceived quality of information itself. Limited amount of highly relevant information is often believed to be an efficient tool to optimise tourist decision-making (Garcia et al., 2013; Piccoli et al., 2017).

2.3.2.2. Personalisation within Horizontal Differentiation

2.3.2.2.1. Horizontal Differentiation of Information Service

Horizontally differentiated service aims to meet customer needs and wants more accurately, than the standardised one (Dickson & Ginter, 1987). The differentiation strategy makes changes to service attributes to increase their relevancy, and, therefore, perceived performance and value to a homogeneous target market segment (Murthi & Sarkar, 2003) and heterogeneous demands (Wattal et al., 2009). As it was discussed above, information service outcome is the content, and personalisation aims at editing this content according to customer needs and idiosyncratic preferences (Candela & Figini, 2012). In other words, personalisation of information service is a case of the horizontal differentiation strategy.

To deliver a set of key benefits specifically to a target market, horizontal differentiation strategy relies on the concept of customer segmentation according to the identified differences in demand (Dickson & Ginter, 1987). Customer segments are identified based on the well-defined behaviour patterns, which are determined by a range of internal and external factors. In general, service consumption varies depending on culture, age, gender, family and social status, personality, and other factors (Liu et al., 2015; Solomon, 2015). Higher horizontal differentiation and relevance to the individual demand lead to higher perceived service quality and increased customer satisfaction (e.g. Song, 2009; Telang et al., 2004; Vargo & Lusch, 2004).

2.3.2.2.2. Personalisation and the Relevance of Information

The need for personalisation as an adaptation of the service to the individual needs rather than for segmentation is determined by existence of individual preferences, and by their dynamic nature (Buhalis & Sinarta, 2019; Riemer & Totz, 2001). Consumer behaviour, including needs, wants, and preferences change under the influence of different types of context (Adomavicius & Tuzhilin, 2015). The value for customer, which can be delivered by service, would dynamically change depending on its relevance.

In terms of the information service in the tourism context, the volume of the available heterogeneous information and services, aimed at supporting different needs, is increasing. For this reason, the popularity of such information services, as recommender systems, has increased dramatically. Tourists actively engage with the websites and mobile applications, which focus on creation of recommendations for the trips (Chiang & Huang, 2013), tourist attractions (Shen et al., 2016), and range of points of interest (POI) (Braunhofer et al., 2013; D'Amico, Ercoli, & Del Bimbo, 2013; Grün et al., 2017; Kabassi, 2010), travel package tours (Ananthapadmanaban & Srivatsa, 2011), events (Barragáns-Martínez & Costa-Montenegro, 2014), hotel services and facilities (Kardaras et al., 2013; Piccoli et al., 2017),. The role of personalisation in the context of horizontal differentiation strategy can be seen in reducing the volume of irrelevant information tourists are exposed to (Piccoli et al., 2017). In other words, it creates value when the content, being the output of personalisation, is transformed to provide tourists with the solution, which is most relevant particularly for them (Borras et al., 2014).

To deliver satisfactory experiences, service output should be continuously adjusted according to individual customer situation (Chandler & Vargo, 2011; Greer, Lusch, & Vargo, 2016). Following the demand of escape from daily routine, tourists change everyday environment to a new

destination. Importantly, they can also change their values and expectation towards the services for the duration of the trip (Cohen, 1979). So does information search behaviour, which is a dynamic process, shaped by extrinsic needs and intrinsic motivations (Füller, 2010; Heinonen & Pura, 2006; Tan & Goh, 2015). Different information services and their outputs are required for each tourist at the exact place, stage of the trip, and other contextual factors (Buhalis & Sinarta, 2019). Therefore, understanding of tourist context is among the determinants of personalisation within a horizontal differentiation strategy.

2.3.2.2.3. Individual Context as a Determinant of Information Relevance

The whole scope of the factors, which can be used for segmentation, can be described by individual internal and external contexts. The most cited definition of context, which is used to show the conceptual breadth of the concept, is the one given by Dey et al. (2001). According to them, context is "any information that can be used to characterize the situation of an entity. An entity could be a person, a place, or an object that is considered relevant to the interaction between a user and an application, including the user and the application themselves." While not providing precise specifications, which might be applied in the analysis (Carmagnola et al., 2008), such definition points on the dependence of perceived information quality on its relevancy towards tourist objectives, time, costs, as well as its accuracy (Kroenke & Boyle, 2017). The concept, proposed by Dey et al. (2001), brings certain flexibility to the research. It allows to incorporate a variety of available data types, which are suitable for application by businesses, humans and machines. Broad context data are acknowledged as a determinant of the efficient business and marketing communications (Mehra, 2012).

Context is a multidimensional concept (Adomavicius & Tuzhilin, 2015), which incorporates both customer internal (e.g. socio-demographics, self-image, personality, travel-personas) parameters

and external (e.g. physical, social, task, information and technical) environment. Conceptually, there exist two opinions. Several studies attribute personal traits, emotional states, individual knowledge, and personality to the dimensions of the context (Jumisko-Pyykkö & Vainio, 2012; Neuhofer, Buhalis, & Ladkin, 2012). Another point of view distinguishes individual characteristics and intrapersonal state of mind as an independent category, which is a complement to the concept of context (Germanakos & Belk, 2016; Höpken et al., 2010).

Tourism context has its specific attributes in terms of the way context influences tourists' behaviour within a destination (Fletcher, Fyall, Gilbert, & Wanhill, 2013), and their interactions with computing devices (Neuhofer, 2014). Generally, the tourism context includes environment, where tourists act, and where data about them are generated. It can be described from the perspective of a destination (e.g. urban, rural, coastal, etc.), type of tourism (e.g. cultural, leisure, business, adventure, etc.), mode of transport, type of accommodation and activities tourists take at a destination, and other parameters (Swarbrooke & Horner, 2007). The major contextual and situational factors are geographical, environmental, financial, and technological attributes of a destination itself. In relation to a particular tourist, they may include location and mobility history, distance from POIs, time, date, route, and itinerary, purpose of the trip and applied mode of transport, as well as the present parties, and tourist personality (personality, cultural background, and knowledge) (Gavalas et al., 2014a; Höpken et al., 2010; Neuhofer, 2014). In terms of the task context, different destinations and travel factors may influence tourist needs and goals and trigger their communication with tourism service provider. Together, such factors determine tourist information needs in real-time and lead to the search for the specific type of information.

Information service providers mainly incorporate geolocation data (Garcia et al., 2013; Ricci, 2011), and temporal context, such as time and season (e.g. Carmagnola et al., 2008; Gavalas et al.,

2014a; Meehan et al., 2013), as a filtering factors of travel recommender systems. The listed contextual factors may affect the decision-making in tourism. Figure 2.1 summarises the commonly applied dimensions of context with the reference to the tourism domain.

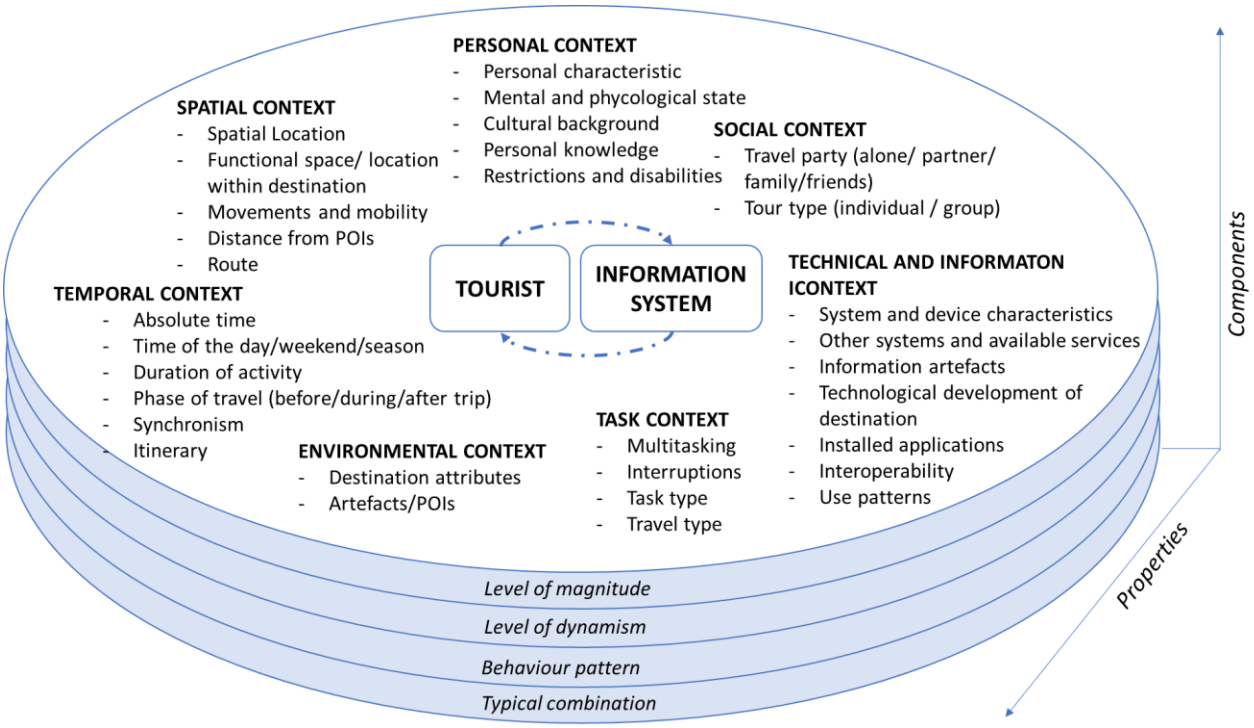


Figure 2-1 Context of use dimensions

Adapted from: (Buhalis & Foerste, 2015; Jumisko-Pyykkö & Vainio, 2012; Lamsfus, Xiang, Alzua-Sorzabal, & Martín, 2013; Neuhofer, 2014).

Internal Context

Personal context is related to recognition of individual habits, personality, real-time emotions and psychological conditions, which allow to define humans as individuals (Asif & Krogstie, 2013). Those factors are formed under the influence of an individual relatively stable characteristics, attributed to the person and not affects the factors of external environment. Human behaviour is simultaneously affected by cognitive reasoning, and affective states, and both are important for development of the relevant user models (Germanakos & Belk, 2016). Such parameters as human

age, gender, religion and acquired level of education are widely recognised as making contribution to long-term behavioural patterns, such as travel needs, customer expectations and perceptions on co-created value (Pearce, 2011).

Self-Image

One of the characteristics, used in service differentiation, is self-image, or personal identity. Self is explained differently by a range of theories of psychanalysis, cognitive and behavioural psychology. The concept of self-image explains how people characterise or perceive themselves (Moutinho, 1987). Often self-image is related not to the actual behaviour, but to ideal picture of how a person what to see himself or herself. Cognitive orientation suggests that self is the central point of the information system, which determines the way information is processed. In relations to service management and marketing, it refers to beliefs, which an individual would have towards the service, and which he or she would use to evaluate it (Solomon, 2015).

Self-image can be applied to predict choice and behaviour within the destination, because tourists are expected to play a certain role depending on their self-image (Moutinho, 1987). Services can be chosen because they are perceived as tools to play that role, or as consistent with a certain self-image. Self-image is used to recognise customer preferences and to deliver the relevant service to support the role he or she plays (Solomon, 2015). However, there is no common agreement on the rules to match self-image and service attributes. O'Brien, Tapia, & Brown (1977) argue that to deliver satisfactory experience a service should correspond to the 'expected self-image', which is intermediate option between realistic and ideal images. Another opinion is that the type of service and the case of use should be a determinant for the matching procedure, i.e. hedonic consumption would be better evaluated if the correspond to the ideal self, while functional services should be more suitable for real self (Solomon, 2015).

In tourism domain research explores applicability off self-image concept as a determinant of tourist behaviour (Cohen et al., 2013). Tourists may ascribe personal characteristics to a destination (Usakli & Baloglu, 2011) and choose a place to visit accordingly. Several studies have proved the existence of statistically significant correlation between self-image congruity and intention to visit destination, cruise, hotel, or restaurant attributes, as well as with satisfaction and loyalty (Beerli, Meneses, & Gil, 2007; Ekinci, Dawes, & Massey, 2008; Hung & Petrick, 2011; Sirgy, Prebensen, Chen, & Uysal, 2014).

At the same time, a range of studies failed to provide consistent results of the role of self-congruity in the tourism context (e.g.Boksberger, Dolnicar, Laesser, & Randle, 2011; Kastenholz, 2004; Litvin & Goh, 2002; Murphy, Moscardo, & Benckendorff, 2007). It is argued that direct operationalisation of the self-concept in the form it exists in marketing, is not acceptable because of the particulars for tourist behaviour (Boksberger et al., 2011). Tourism research often borrows concepts from other disciplines, which is a natural process for the developing fields. The analysis of the research shows that sometimes these concepts are applied without checking of their applicability in tourism domain (McKercher, Denizci-Guillet, & Ng, 2012).

While self-image can affect decision-making process, travel decision preferences, emotions and interactions with others (Carver & Scheier, 2008), tourist behaviour is dynamic (Swarbrooke & Horner, 2007), so that tourists might have multiple ‘selves’ (Cohen et al., 2013). It is characterised by escape from society and everyday roles (MacCannell, 1976; Turner, 1974), and specific states of mind, different to normal behaviour (Ryan, 2015). As so, it is not possible to conclude that adaptation of the service to the individual ‘self’ would bring positive results and increase satisfaction with a service.

Personality

Personality is a set of recognised individual characteristics and behaviour patterns, which triggers relatively consistent and stable human behaviour and his or her reaction to the factors of external environment (Kotler et al., 2014; Moutinho, 1987). It is differentiated and complex structure of mental and behavioural traits (Cattell & 2008), which is resulted in the unique profile of each tourist (Frew & Shaw, 1999). A trait represents relevantly homogeneous group of people. Together with self-image, personality is a part of the self-concept (Cohen et al., 2013; Stokburger-Sauer, 2011). It is formed under the influence of cultural norms, gender, time of the lifespan, past events, as well as biologically inherited traits.

Despite the existence of minimum of eight theories, which explain human personality, none of them fully cover all the existing aspects of human nature (Tan & Tang, 2013). A range of studies attempts to explain and categorise personality by the critical factors that would shape human behaviour (e.g. (Cattell & Mead, 2008; Holland, 1997; Iso-Ahola, 1980; Maddi, 1993; Madrigal, 1995). While different frameworks and groups of factors exist in each domain, tourism research mainly focuses on one or several specific traits (Frew & Shaw, 1999; Plog, 2002). Holistic understanding of personality on tourist behaviour, which is enabled by established scales (e.g. International Personality Item Pool Goldberg et al., 2006 or HEAXCO (Sohn & Lee, 2012), is required (Cohen, 1979).

All of the theories that explain human personality, agree that personality is a determinant of tourist behaviour, including motivations and perceptions (Swarbrooke & Horner, 2007), and as well as the antecedent of tourist emotions (Faullant, Matzler, & Mooradian, 2011). Personality influences tourist interactions with website (Von Der Pütten, Krämer, & Gratch, 2010), and evaluation of web design attributes (Leung, Rong, Li, & Law, 2011), so that tourists with similar personality traits

would have similar tastes and preferences (Leung, Rong, Li, & Law, 2013). For example, when applying the five-factor personality model, language selection and certain combination of media is preferred over simple text content by tourists with low score of neuroticism and high scores of conscientiousness, agreeableness, openness (Leung et al., 2011). Another example is the dependence between the identified need and web content preferences. Need for cognitions, need for uniqueness, and variety seeking are accepted in marketing literature as personality traits and are user to characterise innovative consumers (Ho, Davern, & Tam, 2008; Schiffman Leon & Wisenblit, 2015; Schultz & Schultz, 2016). Customers with high needs for cognition and for uniqueness show preferences towards highly personalised content, while variety seekers were not satisfied with filtered content. The availability of stable preferences for each group would allow to develop a service, relevant for the representatives of a particular personality (Leung et al., 2011).

Personality traits can be used as a parameter to match service attributes with human personal characteristics (Asif & Krogstie, 2013). For this reason, it is widely discussed as a tool for service personalisation (e.g. Asif & Krogstie, 2013; Germanakos & Belk, 2016; Grün et al., 2017; Neidhardt, Seyfang, Schuster, & Werthner, 2015). Application of personality traits together with transaction history of 'like-minded' users can be especially beneficial for creating a personalised service on the early stage of customer journey, when the individual customer data are not yet available (Ho et al., 2008). Thus, anthropomorphic personalisation aims to change service presentation based on user intrinsic factors, such as personality traits, style of cognition, cognitive processing abilities, and current emotions (stress, anxiety) (Grün et al., 2017; Neidhardt et al., 2015).

Personality trait is often considered as a measurable concept to explain human behaviour (Cohen et al., 2013; Moutinho, 1987). At the same time, personality trait is a stable and consistent pattern,

which may remain unchanged for the major part of human life (Leung & Law, 2010; Tan & Tang, 2013). On the contrary, tourist behaviour is dynamic (Horner & Swarbrooke, 2016) and tend to have liminal nature. The term 'liminal' is defined as a 'transition from known to unknown' (Nisbet, 1969, p. 4, cited by Pritchard & Morgan, 2006). In tourism, liminal behaviour describes spatial and temporal escape from normal place of residence, daily routine and social responsibilities (Ryan & Hall, 2001), and everyday roles (MacCannell, 1976; Turner, 1974). As a result, there are three major stages of change from the normal state of mind and back (e.g.Epstein & Kheimets, 2001; Jafari & Brent Ritchie, 1981; Ryan, 2015). In terms of the place, spatial liminality can be associated with different places (e.g. whole destinations, resorts, cities, hotels) outside normal environment (Pritchard & Morgan, 2006; Ryan, 2015). The time span for transition from normal behaviour to the tourism liminal stage and back are not clearly defined. Another distinctive feature, which is often associated with the proliferation of ICTs, is the increasing number of activities, done right before the trip, or, increasingly, during the trip (Fesenmaier et al., 2011). These specifics of tourism internal environment additionally increase contextual dependence of tourist motives, the demand for information services, and service consumption.

Travel personas

Travel phycology and behaviour is widely recognised as not similar to everyday life. On the one hand, tourists can exhibit relatively stable behaviour patterns, related to the way how they perceive risks of travel decision-making. The research in tourism came up with the domain-specific personality traits, i.e. travel personas, which are relevant specifically for this domain. Personality traits can be interpreted by two major types of tourists, namely, allocentric and psychocentric, and midcentric, which is a transitional type between them (Plog, 1987). Psychocentric tourists are more focused on their internal world, inhibited, and anxious (Moutinho, 1987). Allocentric personas

often behave in a more adventurous and self-confident way. This typology is proven to be for effective tool for current tourist behaviour explanation with the view on customer segmentation (Li & Cai, 2012).

At the same time, tourist behaviour is recognised as potentially liminal (Ryan, 2004), when a person undergoes a ‘transition from known to unknown' behaviour (Nisbet, 1969, p. 4, cited by Pritchard & Morgan, 2006). Despite the time span for transition from normal behaviour to the tourism liminal stage and back are not clearly defined, it is widely acknowledged that everyday values and behaviour patterns might change during travel. This can explain the reason why a predictive power of allocentric and psychocentric personas as a tool to explain destination choice is not widely confirmed (Cooper, 2008; Litvin & Smith, 2016). As a result, a range of studies, argue that travel behaviour can only be interpreted in the exact context of travel, because travel context can radically change personality traits and every day behaviour (Park, Tussyadiah, Mazanec, & Fesenmaier, 2010; Pearce & Lee, 2005; Plog, 2002; Pritchard & Morgan, 2006; Ryan, 2015).

External Context

The nature of tourism and the motives to travel in general and the specifics of real-time decision-making are dependent on the long-tern attributes of the destination and the immediate changes in tourist external environment. The choice of the destination or travel services can reveal tourist preferences towards the mode of travel in general, and the specific parameters of these services, which can bring high satisfaction. At the same time, tourist behaviour at the destination is highly

dependent of the changes of the destination environment, affecting their perceptions on the relevance of the received information and the value it can create.

Physical Context

Physical context is one of the most widely used types of the contexts. Spatial, temporal, and environmental factors have long been recognised among the determinants of human behaviour (e.g. (Dey, 2001; Germanakos & Belk, 2016; Jumisko-Pyykkö & Vainio, 2012). It includes a range of metrics, which describe location, surrounding physical objects and human situations, temporal variables, movements, and mobility, as well as their attributes (Adomavicius & Tuzhilin, 2015; Asif & Krogstie, 2013; Jumisko-Pyykkö & Vainio, 2012; Mehra, 2012). These parameters are applied in different industries for customer context-recognition (Wiredu, 2014). The typical example of context data application is a context-aware application, which tracks geographical location of the person to provide him or her only with the information, relevant for the current place (Bacha, Oliveira, & Abed, 2013; Ricci, 2011). The example of advanced application is recognition of user mobility, which is abstraction level of user body activities in relation to a certain location and time. They help to understand current user environment and to provide him or her with better experience (Lukowicz, 2014).

Social Context

Social context summarises social relationships of individuals, which are relevant for description of their situation. Such relationships include one-to-one, one-to-many and many-to-many interactions together with interpersonal and situational characteristics, attitudes, behaviours, and roles. They end up in shaped goals, cultural values, social communication, and, consequently, created experiences (Dey, 2001; Germanakos & Belk, 2016; Jumisko-Pyykkö & Vainio, 2012).

Social context incorporates interaction in both physical and virtual environments, which are direct communication between an individual or two or more individuals, and communications between and within persons, enabled by computer devices (Benyon, 2014). Physical presence can be recognised with a help of in-build sensors and wireless technology, e.g. near-field communication technology (NFC) and Bluetooth signals (Lukowicz, 2014). Social media and content sharing created new opportunity to analyse user social activity to provide deeper personalisation (Germanakos & Belk, 2016).

Task Context

Task context includes relationships of a person with other objects, people, or devices, which are conducted to achieve a certain goal. Various factors, namely, benefits and restrictions, may shape the way each person achieves one or several identified goals (Bradley & Dunlop, 2005). This may include the trigger of a goal, or the factor, which interrupts person from performing the task. Task context can describe the entire situation, and multiple interactions within it. This can be characterised by multitasking activity, by technical, physical, and social interactions, where contextual factors can play primary and secondary role in shaping task performance (Jumisko-Pyykkö & Vainio, 2012). This dimension receives lots of attention in HCI because task performance directly influences the design features, functionality, and interface of the information system (Germanakos & Belk, 2016).

Information and Technical Contexts

Information and technical contexts incorporate the details and attributes of human communication with an information system (Germanakos & Belk, 2016). It describes system and device characteristics, such as existing applications, network services and interoperability between and across computing devices and applications (Jumisko-Pyykkö & Vainio, 2012). First, the

capabilities of the device determine the performance of the information service and its functionality. Second, technical and information context and the availability of certain type of device are associated with the specific user behaviour. For example, in comparison to desktop usage behaviour, mobile sessions are more often triggered by the cause or by problem solving intentions. For this reason, information and technical contexts are often used as indicators for selection of the certain type of user interface (e.g. desktop vs mobile version of the website) or certain version of the software (e.g. with higher vs lower requirements for the hardware technical specifications).

2.3.2.2.4. Context of Use in Tourism

Each situation can be characterised by a different set of context attributes, and no single relevant set of parameters can exist. Holistic view on the context dimensions allows to identify the essential set of contextual parameters and properties (Jumisko-Pyykkö & Vainio, 2012). The more dimensions and detailed characteristics are incorporated in a context description, the more potential it creates for precise understanding of the situation and, consequently, for delivering personalisation and enhancing communication between a customer and an organisation (Mehra, 2012). Depending on the purpose of research and the specifics of a field, context components may be regrouped in a different way, as well as may incorporate additional attributes, relevant for the exact situation or the purpose of the research (Germanakos & Belk, 2016; Jumisko-Pyykkö & Vainio, 2012; Poslad, 2011).

The main distinction between travel context and other possible contexts of use of personalised information services is the dynamic nature of travel needs under the influence of real-time changes in the external factors, such as time, weather, traffic, social environment, etc. (Buhalis & Foerste, 2015; Buhalis & Sinarta, 2019). As it was discussed earlier, another feature of tourism context is

a possible liminal nature of tourist behaviour, when a stable behaviour patterns, determined by socio-demographic characteristics, change to a new behaviour only for the duration of a trip (Pritchard & Morgan, 2006; Ryan & Hall, 2001). The distinct characteristics of tourism context indicate that the needs, identified in everyday life or in the previous trips, may become irrelevant for the next trip. Therefore, application of several data types, such as location, time, existing commitments, etc., is believed to be advantageous for recognising tourist needs (e.g. Carmagnola et al., 2008; Gavalas et al., 2014a). Such extended, i.e. 'large context' (Mehra, 2012), has high potential in application for personalisation of ongoing communication between a customer and organisation, and for creation of a long-term value (Aguado, 2016).

The complexity of service system and the influence of multiple internal and external factors on customer preferences and service co-creation leads to the potential impossibility to answer the precise research question, and create the risk of misinterpretations (Gavalas et al., 2014a; Lamsfus et al., 2013). Moreover, not all the context attributes can be observed and their influence on individuals explained, so that the inference may be required to explain the events (Dourish, 2004). The relevance of the information, which context may unveil, depends on the goals and tasks of the person and his or her activities (Dey, 2001). To minimise the ambiguity of context as a social phenomenon, the analysis can be limited to the dimension, which are essential in understanding person situation and particulars (Höpken et al., 2010; Mehra, 2012). Depending on customer activities, they may comprise the episodes of use, i.e. interaction sessions with the service rather than considers the entire system together with all the factors of the external to application environment (Jumisko-Pyykkö & Vainio, 2012). Additionally, each type of context can be characterised by several properties, which are the level of magnitude of the context, customer behaviour patterns within it, level of dynamism of the context, and typical combinations of the

contextual factors (Jumisko-Pyykkö & Vainio, 2012). Consideration of these characteristics provides deeper understanding of tourist's situation (Höpken et al., 2010; Mehra, 2012), and potentially allows to understand the influence of each factors on consumer behaviour.

2.3.3. Personalisation within the Information Service Design Strategy

While technology and applied data may vary, personalisation is a knowledge-based and technology-driven phenomenon. Personalisation of information service represents a complex technological process (Piccoli et al., 2017; Reis, 2015), which involves mutual resource input from the service provider and a tourist (Roh & Jin, 2012). Figure 2.2 illustrates the process of personalised information service creation with a help of the three-layer architecture framework (D'Amico et al., 2013; Höpken et al., 2010; Microsoft, 2017; Vatovec, 2008). The data layer schematically explains that personalisation system accesses and aggregates user and context data. Then these data are transmitted to the analytical centre with the business logic of personalisation strategy being applied. The identified patters are used to develop user and context model to hypothesise tourist needs and preferences. They, in turn, are applied to adapt the standardised service to a personalised one (Vatovec, 2008). The presentation layer explains that the created solution reaches a user (Liao, Li, & Xu, 2005) in the form of different types of content and adaptive user interface (Germanakos & Belk, 2016)(Skillen, Liming Chen, Nugent, Donnelly, & Solheim, 2012). The framework allows to summarises the principles of continuous iterations of between a tourist and a service provider via the IS and to explain the process of personalisation from the perspectives of (1) receiving and processing customer's data; (2) applying it to the context and user models, which describe the logic of service personalisation following the external and internal customer environment, accordingly, to adapt the service and transactional environment; and (3)

delivering the personalised outcome via a website or mobile interface (Al-Khanjari, 2013; Otebolaku & Andrade, 2016) to create value (Vesanen, 2007).

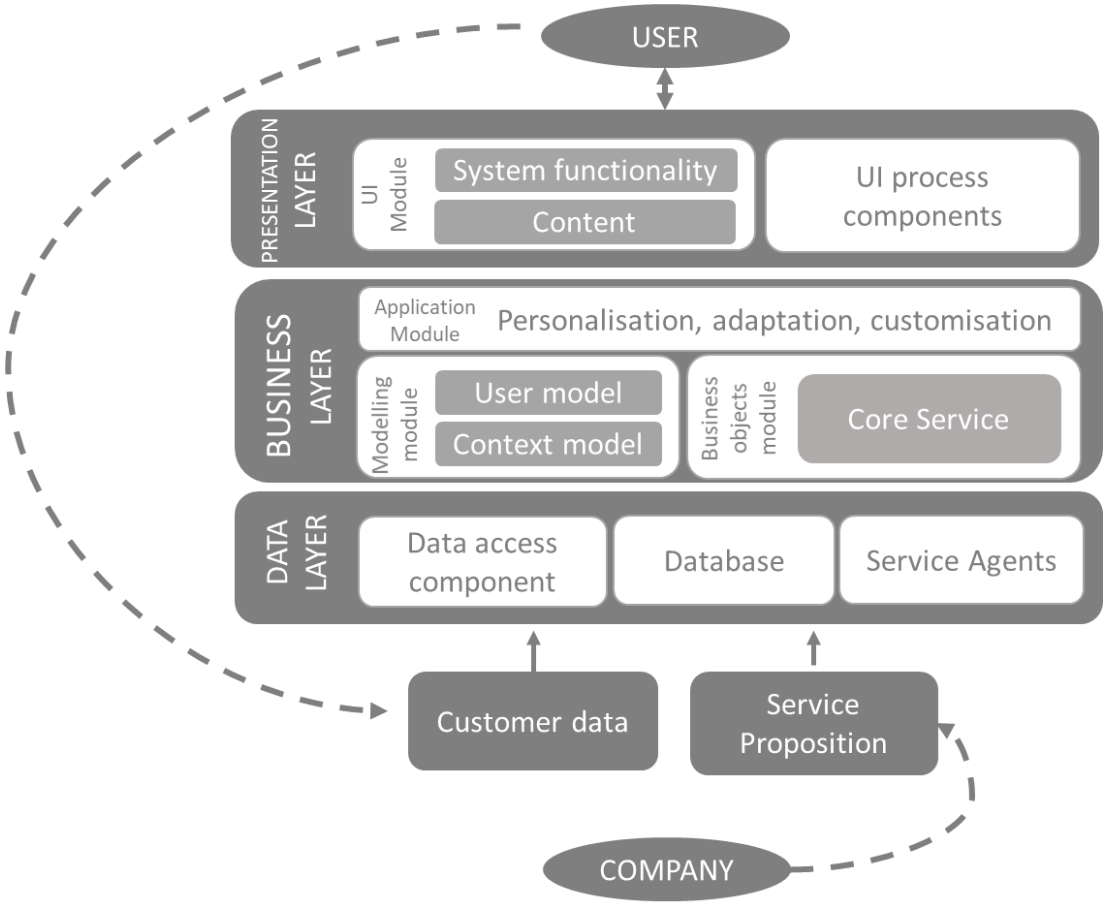


Figure 2-2 Personalised IS Layer Architecture

Adapted from: (D'Amico et al., 2013; Germanakos & Belk, 2016; Höpken et al., 2010; ISO, 1996, 2017; Microsoft, 2017; Otebolaku & Andrade, 2016; Rust & Huang, 2014; Skillen et al., 2012).

2.3.3.1. Data Layer: The Role of Context Data in Personalisation Process

Adaptation of information to individual needs requires precise understanding of these needs within a certain content of use, which became possible with the massive pervasion of personal computing devices and capability to track individual level data, which can be used to describe the context. The major advantage of Big Data are real-time insights it can provide about user and his or her

situation with the help of ubiquitous computing, machine learning and context-aware computing techniques (Andrejevic & Gates, 2014; Fan, Lau, & Zhao, 2015; Gavalas et al., 2014a). Such data as location and mobility history, distance from POI and transport, time, date, weather and season, social environment, etc. are proved to be useful for application in tourism (Gavalas et al., 2014a). Proliferation of mobile devices with embedded sensors, which generate a broad variety of data, created the concept of 'Mobile Big Data', which is a component of 'Big Data' (Aguado, 2016). Contemporary devices are equipped with multiple inertial, positioning, and ambient sensors (e.g. accelerometer, gyroscope, compass and GPS unit, timer, camera), which could constantly track user contextual data (Hoseini-Tabatabaei et al., 2013; Otebolaku & Andrade, 2016). They create the potential to consider broad range of parameters to build complex understanding of environment (Fuchs, Höpken, & Lexhagen, 2014; Perera, Zaslavsky, Christen, & Georgakopoulos, 2014). Another advantage of mobile data is their higher consistency in comparison to the aggregated historic data. There is high probability that the acquired information describes single user behaviour, because mobile device is mainly applied by one individual (Aguado, 2016). The widely-applied synchronisation of personal accounts also allows to advance understanding of the different contexts, where a person operates (Aguado, 2016), creating new opportunities for accurate service personalisation.

Personalisation technology primarily applies individual data to identify personal details, and the context this person operates in. Such data are usually acquired from user profiles (Al-Khanjari, 2013), navigation history (Bodoff & Ho, 2015). Application of one or several types of data, which is advantageous because of its simplicity from access and computation capacities' point of view. This allows to recognise 'simple' personal context (Otebolaku & Andrade, 2016), such as moving within a certain destination or sitting at a certain place. Different types and combination of special

and temporal, environmental, personal, social and technical contexts together with context modelling and user modelling are the approaches, used to recognise 'high-level' customer contexts (Otebolaku & Andrade, 2016) and to personalise the information service accordingly (Asif, 2014). Table 2.3 summarises the commonly applied types of digital data and its common application in tourism. As it can be seen, the presence of individual data can reveal information about tourist real-time context, enabling transformation of a service in a relevant one.

Table 2-3 Big Data Application for Personalisation in Tourism

Context type	Description	Examples of applied data	Examples of derived information	Examples of system content and functionality
Physical (spatial) context	Describes apparent features of a situation or physically sensed circumstances, and user behaviour within them	GPS and GSM coordinates, Rotational motion, Movement, Vibrations, Photos, Video, Beacons signal.	Location, Speed, Distance, Directions of movements, Device orientation, Modes of locomotion High accuracy activity recognition (i.e. walking or speed running)	Personalisation of textual, graphic, multimedia content; Directions to POIs and infrastructure objects; Recommendation of POIs and infrastructure objects (by location filtering POIs), Tagging, Required time to/out of the place, Availability of parking/ gate/ bus stop, etc. Personal assistant
Physical (environ-mental) context	Describes the entities, which can be used to describe human surrounding, physical objects, or services	GPS, GSM signals, Temperature, Light, Wind, Humidity, Noise, etc.	Objects and functional areas (i.e. historical centre of the city), Weather, etc.	Personalisation of textual, graphic, multimedia content Personal assistant Recommendation and directions
Physical (temporal) context	Describes user interaction with a mobile device or environmental objects in relation to the past, present of future situations	Time of the day (week, month, etc.), Season, Duration,	Time, Duration, Sequence of events; Behaviour patterns (habits and preferences); Real-time situation in terms of events (e.g. waiting, normal behaviour, synchronous or asynchronous activity); Action in relation to time	Personalisation of textual, graphic, and multimedia content; Personal assistant; Recommendation of POIs and infrastructure objects
Personal context	Aims to describe a human state, e.g. mental and physiological contexts	Electrodermal activity, Voice, Pulse, Blood pressure, Weight,	Emotional state recognition (mood, excitement, anger, stress), Speaking patterns of ongoing conversations (engagement);	Personalisation on textual, graphic, and multimedia content Personal assistant Recommendation of POIs and infrastructure objects (by location filtering POIs),

		Blinks frequency	Calling patterns; High accuracy activity recognition;	Language adaptation
Task (cognitive) context	Describes current human activity and cognitive state of mind	User ID, Name, Address, Purchase and banking data, Health related data, Photo, Video, Call metadata	Explicit goals, Task breakdown structure, Behaviour patterns	Personalisation of textual, graphic, and multimedia content
Social context	Describes the situation if user is currently alone, or the fact and the roles of other people presence around the active user	Bluetooth ID, Tweets, Facebook posts	The number of people in the near environment; Tourist social activity	Personalisation of textual, graphic, and multimedia content
Information and technical context	The available information space	Search query logs, Cookies, transactional data, Device physical characteristics, Software description, Use frequency and stickiness	Device type, IS type, Installed apps, Use patterns and habits	Personalisation of textual, graphic, and multimedia content; Language adaptation; Personal assistant; Recommendation of POIs and infrastructure objects (by location filtering POIs),

Adapted from: (Adomavicius & Tuzhilin, 2015; Aguado, 2016; Asif & Krogstie, 2013; Gavalas et al., 2014a; Germanakos & Belk, 2016; Höpken et al., 2010; Jumisko-Pyykkö & Vainio, 2012; Lu et al., 2015; Lukowicz, 2014; Mehra, 2012; Neuhofer et al., 2012; Poslad, 2011; Redmond et al., 2014; Tan & Goh, 2015; Tan & Tang, 2013; Xiong, Dixit, & Waller, 2015; Yovcheva, 2015)

The presence of relevant context data for personalisation does not guarantee the increase in value and the overall satisfaction (Sutanto, Palme, Tan, & Phang, 2013). While being one of two main resources of personalisation, which enables creation of utilitarian, hedonic, social and contextual value from a service (Asif & Krogstie, 2013; Shen & Ball, 2009), context data are also observed as a cause of customer frustration. Personalisation creates additional interaction between IS and customers, as they are required either to submit some of the personal information or to grant IS permission to track the data from the personal device, increasing tourist awareness and raising concerns about the personal data being used for other purposes apart from personalisation and

against the customer. On the one hand, the misuse of personal data poses the real threats to individual wellbeing. To ensure data protection in digital environment, a range of laws and technical standards (i.e. encryption technology) is being developed and updated worldwide. On the other hand, intangible nature of an information service only allows tourists to form perceptions on the service performance rather than to assess it according to the objective parameters. Therefore, regardless of the real situation including the probability of data misuse and the level of protection, customers fear that context data application by the personalised information services can be stolen and applied for fraud (Asif & Krogstie, 2013; Ho, 2009; Salonen & Karjaluoto, 2016; Vesanen, 2007). This creates a trade-off between the desired personalised information service on the one hand, and the perceived interruption into the privacy, on the other. Customer control over the data to decrease the anxiety, related to the perceived threat to privacy and security (Asif, 2014). However, there is lack of understanding on the way to optimise this trade-off and to maximise value for tourist.

2.3.3.2. Business Layer: The Process of Personalisation

2.3.3.2.1. User and Context Modelling for Personalisation

Technological capability to tailor personalised services is based on matching the identified customer needs, wants, preferences, and restrictions either directly with a service characteristics, or through the models, which aim at recognising consumer behaviour and context, and match them with the service capabilities (Ho, 2009). Depending on the availability and the type of available data, user and context models, which serve as a background for personalisation, range from static to active modes, and from manual to purely automated data collection and analysis. Depending on the principle of personalisation, applied data, and technology, it is common to distinguish three levels of personalisation (Figure 2.3).

Level	Applied data	Principle	Advantages for user	Drawbacks for user
Context-based	User profile, transaction history, sensed context data	Both user modelling and context modelling techniques	• Adaptable • Real-time • Most accurate modelling • Greater choice and flexibility • Brings higher satisfaction • Easier to use • Higher perceived effectiveness	• More privacy and security awareness • Less perceived and real control over personalisation outcome • Possibly inaccurate result in case of small received amount of data
User-profile based (transaction driven)	Personal data, stable interests and preferences derived from personal profile, previous transactions, search history, used devices, subscribed networks, etc.	User modelling	• Does not distracts user from tasks • Provides choice and flexibility • Easier to use	• Privacy and security issues • 'Cold start', i.e. time, required for application to learn customer details • Less perceived and real control over personalisation outcome • Data can be manipulated • Possibly inaccurate result in case of small received amount of data and past data • Context-free
Basic (user-driven)	Does not require raw data about the user and its context	Manual settings input by user himself	• Perceived control • Perceived accuracy	• Cognitive overload • Possible distraction from the environment • Cold start • Extended time of interactions with mobile app • Context-free

Figure 2-3 Personalisation Typology based on the Context Modelling and User Modelling

Adapted from: (Arora et al., 2008; Asif & Krogstie, 2012b, 2013; Ho, 2009; Kurata & Hara, 2013; Lee, 2013; Rust & Huang, 2014; Sun et al., 2016).

Simple, or basic, personalisation technologies are user-driven (Kumar & Desai, 2016). The methods that enable basic personalisation are based on manual input of preferences, are controlled by consumer himself (Asif & Krogstie, 2012b). It is often referred as 'customisation' of services (Shen et al., 2016). User-driven personalisation is perceived to be more accurate and as being able to provide consumers with the perception of self-efficacy, because a customer himself rather than system is expected to make a cognitive choice among the existing alternatives (Shen et al., 2016; Sun et al., 2016). Though, studies show that users often fail to customise application effectively, because they either are not aware about their own preferences, or not being able to clearly articulate them (Piccoli et al., 2017). Another drawback of user-driven personalisation is the 'cold start' (Kurata & Hara, 2013). In other words, personalised solution is not available for tourists immediately after they start interaction with an application. Customisation requires user to spend time to input the required information, e.g. to state the preferences, or to answer the set of questions (Lee, 2013). Though, customisation is widely applied together with other personalisation technologies because of its simplicity and accuracy.

Transaction-driven personalisation is more advanced method in terms of the capability to understand customer needs and match them with service properties (Ho, 2009; Kumar & Desai, 2016). These methods apply data from customer profile and previous transaction, such as online search and browsing history, online purchases, etc. to develop model of possible user preferences or needs (Rust & Huang, 2014). The advantage of these methods in comparison to the user-driven one are their implicit character, which do not require consumer participation, but can provide him or her with a quick solution (Asif & Krogstie, 2013). The major drawback of the transaction-driven personalisation is the application of potentially not complete and outdated data. Firstly, the developed user models might not deliver accurate and reliable personalisation by default (Poslad, 2011). Secondly, personalised solution might not meet the

changing user requirements and dynamic condition of the environment (Rust & Huang, 2014), which is especially critical in tourism context (Shen et al., 2016). The problem of 'cold start' is also applicable for this type of personalisation because it requires the history of previous transactions to be recorded in advance. Context modelling refers to identification of the influential factors of user physical, social, and technical contexts. User modelling is used to create the knowledge about each individual customer, his or her background, interests and goals, i.e. personal and task contexts (Germanakos & Belk, 2016). Context-driven personalisation is capable of real-time sensing of one or several types of context data and context modelling. Context-aware solutions do not limit personalisation to predefined option (Chiang & Huang, 2013; Poslad, 2011). They create new dimensions of real-time, personalised services (Asif, 2014) and complex scenarios both for daily and tourism activities (Ho, 2009; Lamsfus et al., 2013). To provide tourists with relevant information, context modelling should consider holistic perspective on customer experience, dynamic travel process, and multiple social interactions between tourist and other actors of tourism and daily environment (Lamsfus et al., 2013). Context-driven personalisation is enabled by mobile pervasiveness, the Internet of Things, mobile computing, context modelling and behaviour analysis techniques (Germanakos & Belk, 2016; Hardian, 2012; Lamsfus et al., 2013). The models, which are developed based on multidimensional context data, can have deeper and more focused nature that those, based on the simple context (Fuchs, Abadzhiev, Svensson, Höpken, & Lexhagen, 2013), which is especially important in tourism (Buhalis & Amaranggana, 2015). They are believed to be the key element of effective and advanced personalisation (Asif, 2014), because it can be based on both individual-level and aggregated context data, and can be effectively used to develop context-aware models (Chiang & Huang, 2013). Tourists tend to make travel-related decision on the go and without being totally aware

of their needs and motivation. For these reasons, context-driven real-time personalisation is particularly important for tourism domain (Piccoli et al., 2017).

The depth of personalisation and incorporation of contextual information positively affects customer satisfaction with a service (Sun et al., 2016), and, consequently, acceptance of personalisation technology (Bodoff & Ho, 2015; Piccoli et al., 2017). Real-time automated personalisation has higher potential to create value and enhance customer experience in comparison to manual customisation techniques (Ho, 2009) and static adaptation (Asif, 2014), because it is capable for capturing not only the life patterns, but real-time situation (Aguado, 2016; Chihani, Bertin, & Crespi, 2014). Existing input and output capabilities of devices also create interactive capabilities, so the two-way interactions between a user and a software can be performed simultaneously with data tracking (Aguado, 2016).

The discussed types of personalisation illustrate the three levels of the system capability to understand consumer needs and match them with the service features (Ho, 2009). Each technique has its specifics and, consequently, different effect on tourist experience. Thus, effective personalisation and positive experience are achieved through the balance between user-initiated and system-initiated personalisation (Shen et al., 2016), as well as adaptable and adaptive personalisation (Sun et al., 2016).

2.3.3.2.2. Content Adaptation According to User and Context Models

Content is any information, which is available at the website or mobile application (Benyon, 2014). Personalisation of online content refers to any type of changes, such as information itself, its amount, and the mode of presentation (Bacha et al., 2013; Kardaras et al., 2013) based on user internal and external context (Adar, Gearig, Balasubramanian, & Hullman, 2017). Figure 2.4 conceptualises the logic of content personalisation, commonly applied in information service design.

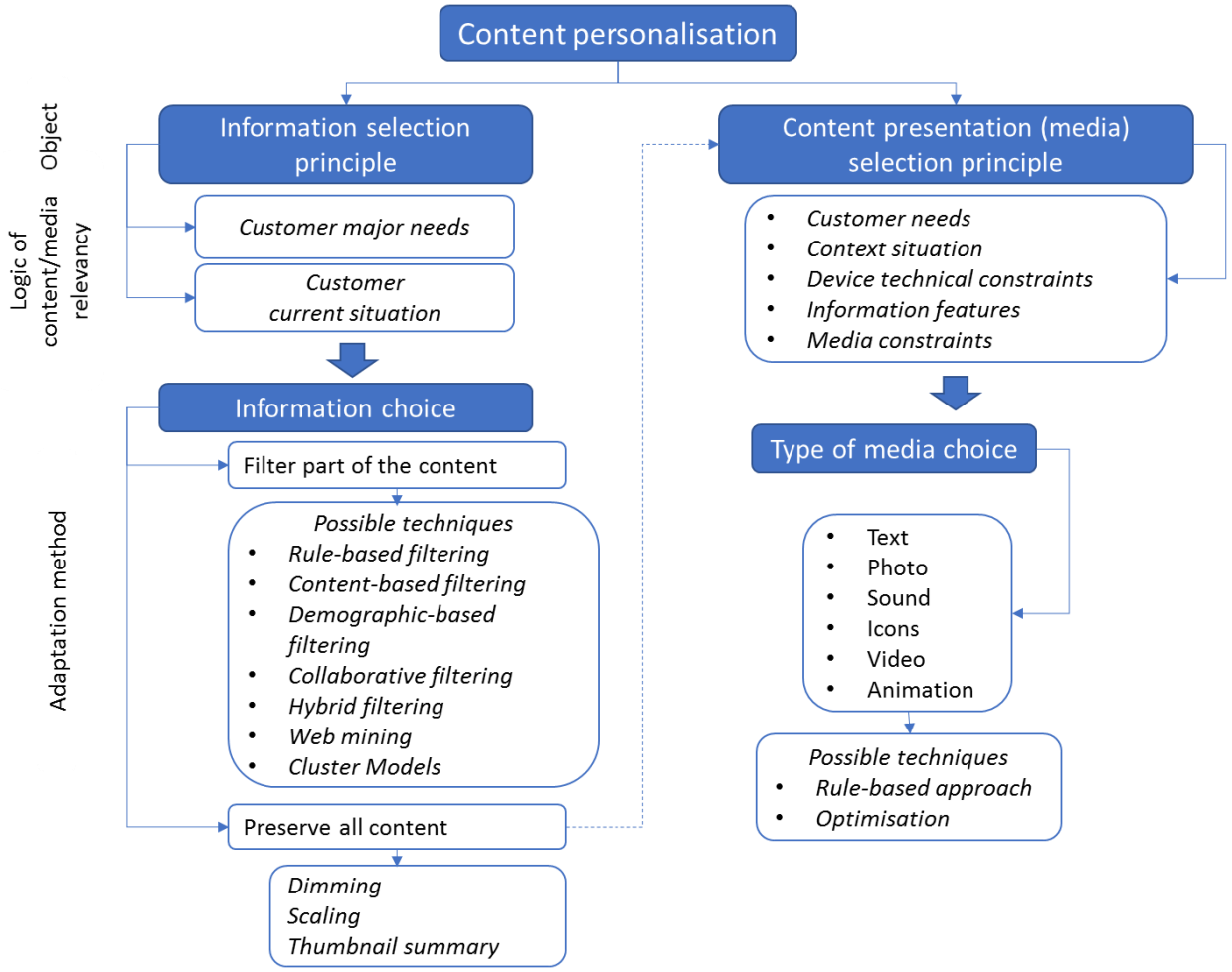


Figure 2-4 Principles of Content Personalisation.

Adapted from: (Adar et al., 2017; Ge, Xiong, Tuzhilin, & Liu, 2014; Germanakos & Belk, 2016; Kardaras et al., 2013; Kumar & Desai, 2016).

Content Selection

In general, personalisation can either adapt the existing, or create the new service (Jørstad & Do Van Thanh, 2004). Information service works with the large number of heterogeneous datasets, available within the IS. Being one of the major solutions for personalisation under the assumption of the information and cognitive overload, content selection techniques filter out or sort information, which is available within a certain dataset, according to provided rankings, identified customer personal details and situational factors (Adomavicius & Tuzhilin, 2015; Grün et al., 2017; Shen et al., 2016). They aim at providing users with only that information,

that is assumed to be relevant for them. As a result, users are exposed with less extensive and more relevant content.

Content filtering methods are the broadest and the most explored group of personalisation tactics (Kardaras et al., 2013). It is also prevalent in tourism recommender systems (Adomavicius & Tuzhilin, 2015; Höpken et al., 2010). Due to different personalisation algorithms and different combination of context data applied for this, each method would present the results of different relevancy for each user (Monk & Blom, 2007). Though, content filtering is proven to have positive influence on user perceptions on usability and ease of use (Kardaras et al., 2013). This is especially relevant in the context of unfamiliar digital environment, when user communicates with the IS for the first time (Höpken et al., 2010), as the decreased amount of information supports easier interactions with the system interface.

The major drawback of content-filtering methods is potentially inaccurate result, as it cannot be adjusted to complexity of customer context, and the dynamic nature of the context and human needs, preferences, and perceptions towards them in comparison to the previously tracked data (Kardaras et al., 2013; Rust & Huang, 2014). Another problem, related to the specifics of application of data for user and context modelling, is the 'cold-start': content-filtering requires time to track the data to apply it for personalisation. Users have no choice but interacting with the standard service till the moment, when IS have enough data to provide personalised content (Rust & Huang, 2014). As a result, the real threat to positive customer experience is incapability of the system to provide the relevant information.

The opportunity to change the result of personalisation can minimise the risks of customer dissatisfaction (Kardaras et al., 2013) as customisation often leads to more accurate content selection together with the perceived control over the content (Shen et al., 2016; Sun et al., 2016). However, the explicit information input is beyond natural human interactions with

environment (Asif & Krogstie, 2012b) and often leads to cognitive overload (Poslad, 2011). As a result, there is a need for the appropriate strategy to ensure customer access to the relevant information with the minimum information overload.

2.3.3.2.3. Content Presentation According to User and Context Models

The presence of differentiating factors of individual context may have a direct influence of the purpose and mode of information acquisition (Kardaras et al., 2013). Such factors may include personal preferences (e.g. preferred colour theme), special needs (e.g. the need for enlarged text), restrictions of physical, social and technical contexts (e.g. a tourist is moving with a group of friends in the crowd and searching for information via mobile device). They create the specific requirement towards the selected information. As a result, personalisation of information without a proper way of its presentation does not always lead to the satisfaction of customer needs (Bunt, Carenini, & Conati, 2007) and the effective decision-making.

Personalisation of content appearance is one of the methods of content adaptation, which can be implemented together with content selection or independently, so that the relevant content, which matches the current user situation, is distinguished by the mode of presentation (Germanakos & Belk, 2016; Kardaras et al., 2013). Personalised content can be presented in the form of static text, interactive space of hyperlinks, adaptive feed of items, search results, etc. (Adar et al., 2017; Höpken et al., 2010). Alternatively, the information can be presented with different types of media, such as text, video, sounds, graphics and animation, delivered in digital, augmented and virtual reality (Gavalas et al., 2014a; Han, Jung, & Gibson, 2013; Yovcheva, 2015). In the context of information, recommended for tourists, content is often presented in the form of a feed, which curates content based on the existing scope of information and according to the user preferences (Germanakos & Belk, 2016). For example, to improve recommendations of tourist services such technique as dimming can be applied to fade the colour of irrelevant content and intensify the colour of the important one. Stretchtext

function can be used to hide the irrelevant content, though, outlining its existence by the header, so that the user can access the full content himself (Bunt et al., 2007). The choice between content to be presented by text or video depends on the content itself, and on device capabilities or constraints, such as appropriateness of the screen size to deliver the large amount of the text content, or effectiveness of the graphic description of an object in comparison to the textual one (Bunt et al., 2007; Kardaras et al., 2013), and can further be personalised to the exact requirement of the user.

Similar to other forms of content personalisation, personalised feed aims at managing the information overload, increase engagement, and improve customer experience by providing only relevant and interesting content and by deleting or hiding the irrelevant one (Brusilovsky, 2013). Effective combination of different media types, which allows easy and pleasant content consumption, directly influences the content presentation quality. Second, personalisation of content and media type influences one another. Therefore, content presentation strategies are used together or sometimes preferred to content selection to minimise the probability of mistake, related to the incorrect context recognition and, in turn, of weak information personalisation (Kardaras et al., 2013). Lastly, it is also observed among the methods that provide user with more control over the content (Bunt et al., 2007). Despite personalisation of content appearance does not solve the problem of information overload as efficiently, as it could be done by content selection methods (Kardaras et al., 2013), it is proven as an efficient way to additionally decrease the complexity of a hyperspace (Brusilovsky, 2013) and increase attractiveness of the interface.

However, content presentation is also outlined as a factor of ruining user experience. Low performance can be caused by the overlap in the displayed information, such as the overlap in topics, feeds, or links, banner ads, video context, etc., which makes it irrelevant for the user

acting in certain context (Germanakos & Belk, 2016). For example, relevant information, presented in the form of a sound or video, can distract user from his social environment. Second, regardless of the capability of media to accurately deliver the relevant content, the choice of the media should match user expectation towards it to avoid misunderstanding and distraction. The increased level of personalisation may sometimes cause confusion because of its difference with the standardised content (Gauch, Speretta, Chandramouli, & Micarelli, 2007). Lastly, regardless of its complexity, different personalisation technologies may fit different needs and situations, and, consequently, different content and system functionality. Therefore, mobile applications often use combination of personalisation technologies to increase overall customer satisfaction (Brusilovsky et al., 2007).

2.3.3.3. Presentation Layer and Tourist Interactions with Personalised Information Service

Presentation layer includes the components of information system interface, which enable and manage user interactions with the personalisation content and the system functionality. An IS interface reflects the way the content and system functionality are presented and communicated to the user. The classic IS functionality requires user to initiate interactions by manually inputting the request and, sometimes, further specifying the requirement (Rust & Huang, 2014). Advanced methods proactively deliver personalised content by either push notifications, messages, or, sometimes, emails (Adomavicius & Tuzhilin, 2015), or by interactive update on the webpage (e.g. the selection of POIs or restaurants depending on user locations) (Hiesel, Braunhofer, & Wörndl, 2016). User experience with the personalised information service depends on only of the personalised content, but also in the components of the presentation layer and, specifically, on the performance of the interactions with the system interface (Microsoft, 2017).

The interactions with the personalised information service is often defined as a linear and finite process (Bodoff & Ho, 2015; Borras et al., 2014; Kumar & Desai, 2016; Tossell et al., 2012; Vallet Weadon et al., 2005). However, the discussed specifics of consumer behaviour and information search reveal that tourists may continuously refer to the information service following the changes in the external consumption environment (March & Woodside, 2005), internal motivations, such as practical benefit from acquired information and the interest itself (Jacobsen & Munar, 2012), or previous experience in digital communication (Sun, Law, et al., 2017). Information search can be a continuous and iterative process, when individuals shift their online behaviour from searching to browsing and back (Choe et al., 2017; Tan & Goh, 2015). These changes can be stimulated by external consumption environment (March & Woodside, 2005) and internal motivations such as practical benefit from acquired information and the interest itself (Jacobsen & Munar, 2012), or previous experience in digital communication (Sun, Law, et al., 2017). The proliferation of ICTs enabled more spontaneous nature of information search during the whole stages of the trip (Lamsfus, Wang, Alzua-Sorzabal, & Xiang, 2015; Wang et al., 2014). Therefore, tourist interactions with the IS can be better described as a cycle of information exchange (Vesanen, 2007).

The application of different interactional principles is determined by the capabilities of the system to create, continuously adjust, and send personalised content to users (Kardaras et al., 2013), defined at the business layer, assumed advantageous for user experience. The cycle of information exchange allows continuous receiving and processing of new customer data, modelling, adapting the information service, and delivering it via the system interface back to customers (Al-Khanjari, 2013; Hiesel et al., 2016), thereby, enabling the development of the dynamic and highly-individual outcome with a continuous input of the real-time context data and their analysis (Fan & Poole, 2006; Germanakos & Belk, 2016). The advantage of proactive personalisation techniques is their capability to deliver relevant content at the appropriate time

and place (Adomavicius & Tuzhilin, 2015). At the same time, intuitiveness and non-intrusiveness of the interactions are among the basic requirement of the presentational layer (Shen et al., 2016) and the determinants of the positive user experience (Nielsen & Budiu, 2013).

In terms of push notifications, it has been observed that proactive personalisation gets positive feedback only in case it delivers the required content at the appropriate time and place (Vico et al., 2011 cited by Hiesel et al., 2016), or in case mobile user is bored (Pielot, de Oliveira, Kwak, & Oliver, 2014). Otherwise, it is considered as intrusive and destructive from tourist external environment, leading to the demand for more freedom and control over the application (Hiesel et al., 2016; Poslad, 2011).

In terms of the system-initiated update of the earlier requested content, there is an overall positive feedback, related to the relevance of the provided information to the immediate needs and time saving, provided by dynamic content-filtering. However, the dynamic adaptation of the system has been reported being the cause of frustration among tourists. More specifically, they are not able to find the outcome (e.g. same search results) they were exposed to in the different context and cannot control or change these results (Oulasvirta & Blom, 2008). As a result, it causes the perception of the lost control over the interactions with the website and the resulted personalised outcome. At the same time, user control leads to the increased engagement with the IS (Salonen & Karjaluoto, 2016), decreasing the IS intuitiveness and increasing the cognitive load from the interactions.

2.3.4. Conclusion

To sum up, from customer perspective the unique advantage of digital information services is their convenience because of capability to provide the required information anytime, quickly.

In addition to convenience, information services are characterised by relatively low costs and low monetary risks. Personalisation aims at further improvement of the information service performance by optimising customer decision-making. It created new or adjusts the existing information to the specific needs, wants, requirements, and restrictions of individual customers. Being a specific case of and combination of vertical and horizontal differentiation strategies, personalisation of information service has a twofold purpose: (1) it targets the increase of the perceived relevance of information, and (2) the decrease of information overload caused by interactions with information service. Personalised information service, which optimises the relevance of information and the efforts, required for decision-making, would create higher value and trigger higher satisfaction than a standardised one.

The capability of personalised information service to meet its objectives of delivering the relevant content and of decreasing the information overload, is determined by the IS capability to track relevant context data, to integrate them in the business logic of recognising the individual tourist real-time needs and preferences, to select and present the content in the way, that is relevant to the satisfaction of the identified needs, and to deliver this content to the end user. At the same time, high performance of each of the outlined capabilities does not guarantee tourist satisfaction with the personalised information service. The advancements in some capabilities may lead to the decreased performance of others, causing tourist frustration. Tourist perceptions on their role in personalisation is believed to be a tool to leverage the occurring risks of frustration with the personalised information service. However, such participation brings additional cognitive and emotional load to users. Therefore, the holistic approach and the balanced strategy that will take into consideration all the attributes and capabilities of the personalised information service into consideration it required. Though, current research lacks understanding of the ways to achieve such balance.

2.4. Tourist Interactions with Personalised Information Service Performance

2.4.1. Customer Satisfaction as Service Performance Indicator

Service performance in general, and information service effectiveness in particular, can be accessed from perspectives of its usage, critical success factors, cost/benefit analysis, and customer perceptions on satisfaction (Wang & Liao, 2007). Satisfaction is one of the key concepts, applied in marketing and management to assess services, including its perceived quality, service system performance, and effectiveness of business and marketing strategy for marketing segments (Cohen et al., 2013; Pascale & Simon, 1997; Wang & Liao, 2007). It represents customer judgement about consumption and its integral parts. In comparison to other measurement units, such as service usefulness, or service quality, satisfaction reflects a range of customer needs, benefits, and costs**.** For these reasons, it is acknowledged to be one of the most effective indicators of service system performance (Delone & McLean, 2003a; Wang & Liao, 2007).

The research distinguishes transaction-specific satisfaction, and overall satisfaction with a service (Chan et al., 2003; Flint, Blocker, & Boutin, 2011; Kuo et al., 2009; Um, Chon, & Ro, 2006). Transaction-specific satisfaction shows customer evaluation with each single interaction with a service (Chan et al., 2003). This evaluation comprises cognitive judgement and short-term emotional reaction to a specific experience (Kuo et al., 2009; Um et al., 2006) within a specific context (Bowen, 2001). The assessment can be built on operational and functional characteristics of the system (Cohen et al., 2013; Vargo & Akaka, 2009). Functional approaches emphasize the influence of service performance attributes on satisfaction. They enable systematic evaluation of service design specification and are used to identify valid predictors of the overall service quality (Pascale & Simon, 1997). A range of studies adapted the models of SERQUAL and SERVPERF for the specifics of a particular service (e.g. Huang, Lin, et al., 2015; Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry,

1985; Parasuraman, Zeithaml, & Malhotra, 2005; Santos, 2003; Yang, 2001), as well as the Information Success Model, develop specifically for the case of the information service (Delone & McLean, 2003a; Delone & McLean, 2016; Petter, DeLone, & McLean, 2008). These approaches take more service-centric view, by measuring customer perceptions on service performance, but disregarding customer role in service co-production and value creation. Therefore, satisfaction with specific events is defined not as the consequence, but as the antecedent of the overall service quality (Tribe & Snaith, 1998) and overall value (Kuzgun & Asugman, 2015; Pitt et al., 1995), created from the service. In the context of the present study such approach is advantageous as it allows to reflect the effect of the specific attributes of the personalised information service on tourist satisfaction.

Overall satisfaction from customer perspective is a 'global' assessment of the outcome (Flint et al., 2011) and a cumulative entity (Cohen et al., 2013). The process of interaction between actors of the service system results in long-term outcome (Spohrer, Vargo, Caswell, & Maglio, 2008). Overall satisfaction summarises consumer cognitive and emotional evaluation of the service including perceived service performance, including all aspects of relationships with a service provider (Flint et al., 2011), and acquired value (Chan et al., 2003; Chenet, Tracey, Don, & Sullivan, 2010; Kuzgun & Asugman, 2015; Song, Li, van der Veen, & Chen, 2011). Definition of satisfaction as a long-term and cumulative entity provides more fundamental and comprehensive approach for analysis, which is required for understanding of the whole scope of customer interactions with the service (Akaka, Vargo, & Wieland, 2017). In comparison to transaction-driven satisfaction, overall satisfaction is placed in more general context of service consumption and tourism environment (Bowen, 2001). To maximise satisfaction, service should contribute to identified goals and fulfilment of needs (Moutinho, 1987). Personalisation, therefore, can bring higher customer satisfaction than the standardised service, because tourists perceive provided information as being specifically adjusted to their needs and wants within a

certain context (Sun et al., 2016), information overload as being decreased by service (Wattal et al., 2009), and, sometimes, system usability being improved (Morosan & Defranco, 2016), so that perceived value from information service increases. Though, technical context adds another dimension of security concerns and privacy issues, which may also affect customer perceptions of a service. Due to the described complexity, overall satisfaction is believed to be useful concept for personalised information service assessment.

2.4.1.1. Overall Satisfaction with the Service

2.4.1.1.1. Dimensions of Overall Satisfaction

Satisfaction is a multidimensional and complex construct (Kozak, 2000; Moutinho, 1987; Vega-Vazquez, Revilla-Camacho, & Cossío-Silva, 2013), so that consideration of the influential dimensions are critical within tourism context (Tribe & Snaith, 1998). There is no commonly accepted measurement scale for the overall satisfaction with service. Table 2.4 summarises some of the approaches to conceptualise satisfaction from the service.

The observed measurement approaches can be grouped under the two principles. The first one accepts single-dimension approach, which is advantageous because of its simplicity and convenience. Though, single-item measurement neither provide a holistic view on the concept (Alegre & Garau, 2010; Delone & McLean, 2003a; Yi & Gong, 2013) nor an effective measures of service performance (Wang & Liao, 2007). Methodologically it also does not allow to assess reliability of the construct of satisfaction (Chan et al., 2003).

Table 2-4 Overall Satisfaction

Reference	Service Satisfaction Dimensions
	Single-dimension Scale
(Oliver, 1980)	Overall satisfaction
	Multidimensional Reflective Scale
(Chan et al., 2003) **(Song, 2009)** **(Pitt et al., 1995)** **(Chae, Kim, Kim, & Ryu, 2002)**	Overall satisfaction Satisfaction degree in comparison to expectations Satisfaction degree in comparison to ideal service
(Teas, 1993)	Overall satisfaction Satisfaction in comparison to the perceived importance of service attributes Satisfaction in comparison to the forecasted performance Satisfaction in comparison to the ideal performance Satisfaction in comparison to the deserved performance (taking into consideration the input customer investments) Satisfaction in comparison to the equitable performance (ought to receive gives a perceived set of costs) Satisfaction in comparison to the minimum tolerable performance ('must be'
(Tribe & Snaith, 1998)	The overall performance Service performance in comparison to the perceived importance of the service attributes Service performance in comparison to the ideal performance Service performance in comparison to the anticipated attributes of the specific service within the certain time and tourism context
	Multidimensional Scale
(Kano et al., 1984 cited by Alegre & Garau, 2010)	Basic Factors (lead to dissatisfaction) Excitement Factors (lead to satisfaction) Performance Factors (can work in both dimensions)
(Noam (2004) cited by Chen, Zhang, & Qiu, 2013)	Insaxtmental factors (related to the features and functions of the service, the absence will lead to dissatisfaction, the presence does not contribute to satisfaction) Expressive factors (related to value manifestations and unique attributes of the service, the presence sufficiently contributes to satisfaction, but the absence does not lead to dissatisfaction
(Buttle, 1996)	Summary affective response (with varying intensity) Time of determinations (which varies by situation but is generally limited in duration) Satisfaction focus around product choice, purchase and consumptions

The second approach sees overall satisfaction as a being composed of several dimensions. It is defined as a result of multiple interactions and different cognitive and emotional mental processes and states (Chan et al., 2003; Cohen et al., 2013), and summarises cumulative assessment of personalised information service (Song, 2009). The complexity of evaluation is determined by the fact, that satisfaction cannot be measured by objective variables, because it is an aggregated phenomenon, and the result of psychological processes of perceptions (Chan et al., 2003; Pitt et al., 1995; Song et al., 2011). To capture the nature of satisfaction, and enable

analysis, a range of studies (e.g. Chae et al., 2002; Pitt et al., 1995; Song, 2009; Teas, 1993) apply retrospective approaches on the concept by evaluating satisfaction towards the existing expectations and comparison to the ideal performance of the service. Such approach is advantageous because its simplicity and, at the same time, capability to reflect the nature of satisfaction. Though, limitations remain due to the individual nature of affective states, which can be influences by multiple factors, and evaluated towards a range of attributes, and due to the contextual dependence of satisfaction.

The complexity of consumer behaviour and motivations means that the insights of decision making cannot be fully captured by single variable, like service quality, or by straightforward, sequential approach (Cohen et al., 2013; Smallman & Moore, 2010). The factors that determine satisfaction can have simultaneous and mutual influence on the overall perception, creating ambiguity in explaining the resulting affective state. Therefore, processual approach for analysis of decision making (Cohen et al., 2013) with non-linear explanation of the process (Gummesson, 2008b; Smallman & Moore, 2010) is required to provide more insights satisfaction formation.

2.4.1.1.2. The Tourist Satisfaction Model as a Tool for the Personalised Information Service

The service satisfaction model is one of the widely applied frameworks, proposed as a customer-centric tool for company economic performance analysis (Chan et al., 2003). It analyses mutual influence of customer expectations towards a service, perceived service quality, and value, on the overall satisfaction with this service, and, consequently, on tourist behavioural intensions. To incorporate non-linear evaluation of the service, the model is built on the combination of several theories and concepts (e.g. Fornell, 1992; Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001; Wallin Andreassen & Lindestad, 1998). Mutual relationships between the dimensions of customer lifetime values are considered to be the advantage of this framework (Cohen et al., 2013; Smallman & Moore, 2010). One of the

drawbacks of the model is a general nature of each construct, which does not allow to consider the distinctive characteristics of each type of service. At the same time, the constructs of expectations, perceived quality, value, and satisfaction are too fuzzy, which might create the overlap in the meanings. Despite this model cannot illustrate the full meaning of each construct, and the full scope and process of mutual influences, it reveals customer subjective judgement on the elements of service system. It allows to capture tourist satisfaction with a proposition, co-produced service, and co-created value at a certain moment of assessment. For these reasons, the model is applied with several modification along the industries (e.g. Fornell, 1992; Johnson et al., 2001; Wallin Andreassen & Lindestad, 1998), including industry and destination levels in tourism (e.g. Deng, Yeh, & Sung, 2013; Song, 2009; Song et al., 2011).

The tourism satisfaction model is beneficial for the conceptualisation of satisfaction with personalised information service in tourism domain. As it was discussed, personalisation is an integral part of the service, which aims to increase perceived service performance and provide customer with higher value. This goes in line with the operational dimensions of satisfaction model. Customer-centric perspective should provide the insights on the cognitive process of decision making and motives, and, therefore, on the influence of personalised information service on customer satisfactions. Though, there are debates on the optimal number of variables and their mutual influence on affective states and post-purchase behaviour (Chen et al., 2013; Gummesson, 2008b; Oh, 1999). Different contexts and levels of analysis may require adjustments of the variables, which are proposed for analysis.

2.4.1.2. Transaction-Specific Satisfaction with the Service

As it was discussed, satisfaction is a context-dependent phenomenon. Its assessment benefits from the holistic approach and incorporation of all possible determinants of the affective state. The extensive research, which aims to elaborate measurement scales for different types of services, is triggered by multifaceted phenomenon of service itself, and by the need to adjust

critical quality dimensions to each type of service or industry (Kuo et al., 2009; Wang & Liao, 2007). It discusses and proposes new service performance dimensions for the specific fields including tourism and hospitality (Tribe & Snaith, 1998), online service (Parasuraman et al., 2005; Santos, 2003), mobile service (Huang, Lin, et al., 2015), self-service (Yen, 2005), etc. Parasuraman et al. (1991) groups service quality attributes under five major groups: reliability, responsiveness, assurance, empathy, and tangibles. Despite the identified attributes are proven to be unstable (Lu, Zhang, & Wang, 2009), the dimensions of SERQUAL framework are believed to be among the most influential (Huang, Lin, et al., 2015). At the same time, they do not illustrate the outlined multiple dimensions of the customer interactions with the information service.

To provide a holistic evaluation of the service from customer perspective, it should take into consideration different dimensions of service performance. Several studies propose frameworks for assessment of online recommender systems (Pu, Chen, & Hu, 2011), information system (Pitt et al., 1995), and digital information service (Delone & McLean, 2003b; Stacie et al., 2008). With the small differences in groupings and applied terminology, the studies agree that overall service performance comprises the performance of the information, of the service, and the of IS, which is believed to be the most comprehensive framework, specifically developed for the assessment of customer satisfaction in the context of interactions with information service. However, despite the role of the customer contribution to service performance and its effect on satisfaction formation has been observed (Heinonen et al., 2010), it is not included in the performance assessment of the discussed frameworks (Gummesson, Lusch, & Vargo, 2010).

To sum up, customer satisfaction is used in several different meanings and contexts to explain the overall judgement and emotional state of the customer after the interactions with the

service, or to summarise the transaction-driven performance of the service. Both approaches have advantages and limitations, and their application may vary depending on the purpose of the study. The framework that would provide the most comprehensive approach for service assessment, which is contextualised for the specific case, is desirable.

2.4.2. Research Gap in the Explaining Tourist Interactions with Personalised Information Service

The analysis of personalisation effectiveness in tourism applies a range of methods and parameters, which focus on different attributes of the personalised information service. Some of these parameters are borrowed from other domains, while some are developed specifically for the context of personalisation. However, none of the approaches is identified as the most relevant for the context of personalisation.

The first group of studies specifically focuses on the performance of personalised content, and, specifically, on its relevance. The measurements include such dimensions as satisfaction with the service capability to provide useful, relevant or interesting recommendations for satisfaction of the needs that motivated tourists to use the information service (e.g. Batet et al., 2012). The alternative measures include the accuracy of the provided personalised information towards the existing preferences (Chiang & Huang, 2013), satisfaction with the choice that has been made (Braunhofer et al., 2013), and repeated search request as an indicator of the low relevance of the content (Grün et al., 2017; Kurata & Hara, 2013).

The second group of studies solely analyses the performance of tourist interactions with the personalised information service interface. The mainly follow the parameters of IS usability (e.g. Höpken et al., 2010; Nguyen & Ricci, 2017), and their consequences, such as perceives performance of the personalised information service, tourist satisfaction, behavioural intention

towards the personalised information service and the actual tourist behaviour at a destinations after choosing certain recommendations. In addition to the usability parameters, the analysis sometimes includes such criteria as level of personalisation, making it more relevant for the case of personalisation technology (Kardaras et al., 2013). Lastly, several studies combine the performance of the content and the interactions, looking at the accuracy of the tourist context recognition, usefulness and ease of use of the IS, as well as time, required for decision-making, etc. (Garcia et al., 2013; Piccoli et al., 2017). Such parameters allow to understand the direct contribution of the assessed personalised information service attributes to customer satisfaction and actual behaviour (Lin et al., 2009).

However, there is lack of holistic understanding of the mutual effects of personalised information service attributes on resulting value, satisfaction and loyalty. None of the studies from tourism domain take the integrative approach to analyse the joint performance of the parameters of all personalisation processes, engaged in the service along the discussed layers of IS architecture. As it has been discussed earlier in this section, application of personal data for advanced personalisation can cause create fear of security and privacy oppression regardless of the accuracy of context recognition techniques. Proactive real-time personalisation may cause customer frustration with the updated information. However, neither these parameters themselves, not the interplay between them have been explained.

As a result, there is a gap in understanding of the mutual effect of the personalised information service performance, including the parameters, related to personalised content, customer context data acquisition, context recognition and adaptation of the content according to it, and delivery of the personalised content to the target customers. While personalisation is not possible without tourist participation as a data provider, his role in changing the performance of the personalised information service and contributing to satisfaction is also underexplored.

To fill the gap, this thesis aims at *explaining how the essential attributes of personalised information service influence tourist satisfaction and intension to use the service again*. The next section aims at synthetizing the discussed specifics of personalised information service into a model to enable empirical research though answering the following research questions:

- *What are the essential attributes of personalised information service?*
- *How tourist interactions with personalised information service attributes influence tourist satisfaction?*

2.5. Conceptualisation of Tourist Satisfaction with Personalised Information Service

The previous sections discussed the specifics of personalisation as a strategy and as a technology and explained their effect on the scope and the nature of tourist interactions with the information service. It also explained the approaches, commonly applied for the assessment of customer interactions with a service.

To enable the analysis of tourist interactions with a personalised information service, this section conceptualises its performance within the cognitive process of satisfaction formation, framed by Service-Dominant logic. The section proposes a conceptual model of tourist satisfaction, which enables the holistic assessment of personalised information service. The instrument for personalised information service effectiveness analysis would comprise the unified parameters to conduct assessment from customer perspective regardless of the applied strategy and technology, and to enable comparison between services.

2.5.1. Personalised Information Service under Perspective of the Service Dominant Logic

2.5.1.1. The Concept of the Service Dominant Logic

The existing literature conceptualises service under two distinct perspectives. The classis view, often referred as goods-dominant logic (G-D logic) (Kuzgun & Asugman, 2015; Vargo &

Lusch, 2011; Wieland et al., 2012), explains goods and services as means of exchange is order to receive value. Services are defined either as purely intangible resulting goods, delivered to customers (Hunt & Morgan, 1995), or as supplements, embedded in product in order to increase its utility and value (Lovelock, 1996; Normann, 2001), and to enable consumption (Shostack, 1977). Therefore, according to the classic theory, value for customer and the satisfaction with the service comes from the subjective assessment of the service performance, delivered by the service provider

The advantage of theoretical knowledge, developed under the G-D logic, is the possibility to provide a unidirectional and unambiguous explanation of the service outcomes. However, it does not allow to address the complexity of relationships of the modern service economies (Chandler & Vargo, 2011; Lemke et al., 2011; Ranjan & Read, 2016). In the case of analysis of customer satisfaction with personalised information service, G-D logic can only explain how service provider uses available competences and resources for personalisation. However, it creates limitations in incorporation of the contribution to the performance tourists make through participation as the providers of data for personalisation and as the investors of cognitive efforts and time to receive and, sometimes, modify personalised outcome.

Service-dominant (S-D) logic is a relatively new concept that explain the creation of value in the contemporary service economies (Chandler & Vargo, 2011; Kuzgun & Asugman, 2015; Vargo & Lusch, 2004; Wieland et al., 2012). It defines service as ‘application of competences for the benefit of another’ (Vargo & Akaka, 2009, p. 2), emphasising value as being the key purpose of interactions between the entities and highlighting the importance of the unified process of resource exchange between a company, a customer, and other involved parties in order to create value (Greer et al., 2016).

S-D logic explains value as being co-created by a customer, a service provider and any other stakeholder (i.e. actors) of market and social environment (Vargo & Lusch, 2011). Value is enabled by operand (tangible) and operant (intangible) resources (Greer et al., 2016; Vargo & Lusch, 2008a), invested by the actors along the longitudinal process of interactions. In comparison to G-D logic, where a company is assumed to have control over service production and its efficiency by creating the desired outcome based on its capabilities and delivering it for a customer (Vargo & Lusch, 2008a), S-D logic postulates that a company only elaborates the service proposition to initiate resource exchange and co-creation (Vargo & Akaka, 2009). The service outcome is determined by the capability of the actors to properly integrate the available resources determines. Therefore, value can be either co-created or co-destructed by a service provider, by the technology or by the customer himself (Echeverri & Skålén, 2011), which is advantageous in the context of the identified research gap of the present study.

S-D logic is initially driven by information technology and proliferation of information services (Rust & Thompson, 2006). The main advantage of S-D in the context of service economies (Wieland et al., 2012), technology-enabled services (Payne, Storbacka, & Frow, 2008; Rust & Thompson, 2006), and tourism (Payne et al., 2008) is conceptualisation of service as a process of application of skills and knowledge, rather than a residual of a tangible product (Vargo & Lusch, 2004). Yet, S-D logic does not contradict early concepts and empirical findings, but provides deeper and more inclusive understanding of service by focusing on the process of its creation and resulting outcomes for customer (Tsiotsou & Wirtz, 2015). For these reasons, S-D logic is a necessary concept both for theoretical explanation of service effectiveness, and for the analysis of business performance (Vega-Vazquez et al., 2013), and is accepted by the current study to analyse personalised information service.

2.5.1.2. Service Ecosystem as a Framing Tool for Analysis

According to S-D logic, services are co-created and consumed within the environment of different actors, which is an open, dynamic, self-adjusting and relatively self-contained system, referred as 'service ecosystem' (Akaka et al., 2017; Prahalad & Ramaswamy, 2004; Spohrer et al., 2008; Vargo & Lusch, 2011). Service ecosystem is a collection of operant and operand resources, inputted by these actors via the process of interactions, which co-creates value through the shared resources (Spohrer et al., 2008). It integrates organisations, people, information, and technology via value proposition (Maglio & Spohrer, 2008; Payne & Frow, 2005) and the process of co-creation (Füller, 2010) to perform a service (Mele & Polese, 2011). Moreover, it is a dynamic entity, which adjusts itself to contextual factors, related to these entities (Wieland et al., 2012), and, therefore, defines the scope of interactions and the details of the context, co-creation occurs in and determines the capability of value co-creation by and for different actors.

Tourist activity is associated with the consumption of activity-specific services and with the interactions with multiple actors of tourism ecosystem, which together frame the value, resulted from service co-creation and consumption. Tourist information service provider involves tourists' and other stakeholders' resources in the process of value co-creation through their interactions with online platform (Mele & Polese, 2011). Analysis of resulting value and satisfaction, co-created from the interactions with the personalised information service, therefore, requires dynamic and holistic system view (Wieland et al., 2012).

The level of analysis may vary from the evaluation of the total macro environment, meso-level of the entire industry, to the smallest unit of analysis, centred around an individual customer (Greer et al., 2016; Vargo & Lusch, 2017; Wieland et al., 2012). The macro-level represents the generic view on value, co-created by all actors of the service ecosystem (Vargo & Lusch,

2011). The advantage of such approach is that it enables holistic analysis of service co-production and value co-creation, where resources are provided by, and value is co-created for all actors of the ecosystem. Taking into consideration the discussed complexity of tourist decision-making and of the specifics of the personalised information service co-creation, such approach would provide the most realistic picture of value co-creation. The problem of the macro view is the multiplicity of influences and mutual dependence of interactions, performed by actors, so that the measurement is complicated.

The micro-level of analysis, allows to narrow the scope of interaction to the customer – supplier relationships, performed via service encounters (Payne et al., 2008). When limited to such dyadic relationships, information service ecosystem analysis allows to consider only three types of interactions and resources integration processes: service provider co-creation processes, customer co-creation processes and encounter co-creation processes between them via IS interface (Payne et al., 2008). Other actors, as well as the factors of meso- and macro environment, are assumed as non-existent.

In the context of the present study, the existence of other actors may have a potential influence on the process of interactions and resulting affective and behavioural outcome, service attributes, applied resources, and system processes are known to be the determinants of customer satisfaction or dissatisfaction. However, the attributes of personalised information service and the logic of tourist interactions, which tourists perceive, mainly depends on the service provider strategy. The scope of tourist interactions includes those with value proposition, with the service, including personalised content and the consent to track personal data, communicated through IS interface. It results in a the long-term result of their relationships for the tourist, which can be expressed with the created value in the context of satisfaction of information needs, satisfaction with the service and commitment to the service

provider (Kuzgun & Asugman, 2015). Therefore, the limited view on the service ecosystem as a dyadic interactions on the micro-level is assumed as relevant to understand the process of value creation and satisfaction formation (Payne et al., 2008).

2.5.1.3. The Process of Interactions and Resource Exchange within the Service Ecosystem

Regardless of the number of accessed services and consumer intention to stay loyal to the company, any customer journey can be conceptualised as a set of communication, usage, and service types of encounters (Payne et al., 2008). Classic marketing theory states that communication encounter comprises information delivery, usage encounter – service consumption, and service encounter – consequent interactions with the personnel. From the perspective of S-D logic, which sees service as being co-created with the mutual input of operant resources (Vargo & Lusch, 2017), customer journey and the process of encounters goes in line with the process of resources integration and value co-creation, which is based on the articulated service proposition and results in the long-term relational outcome (Figure 5.2).

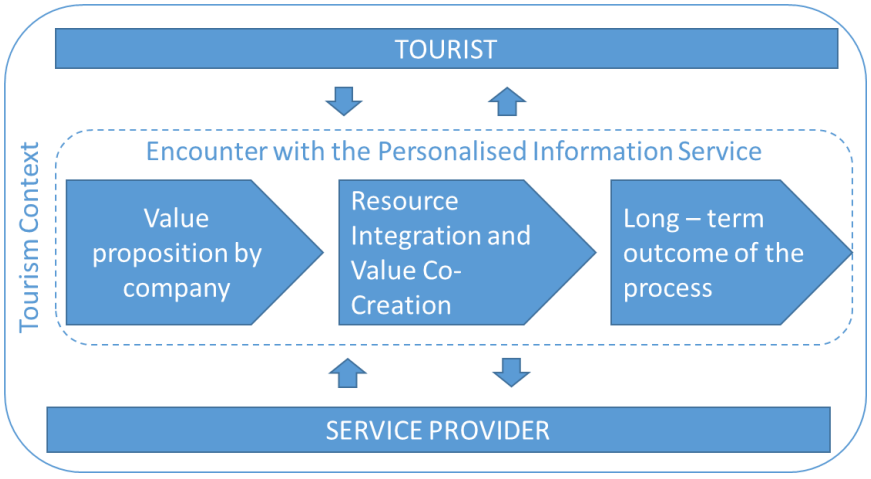


Figure 2-5 Value Co-Creation within the Dyadic Relationships between the Tourist and Tourism Information Service Provider. Adapted from: (Chandler & Vargo, 2011; Kuzgun & Asugman, 2015; Spohrer et al., 2008)

S-D logic postulated that value is not created immediately, but is built during the long-term relationships (Kuzgun & Asugman, 2015). The process of interactions between a customer and a service provider involves ongoing two-way evolving encounters, aimed at receiving the

desired outcomes and accompanied with the resource integration process (Greer et al., 2016; Vargo & Lusch, 2011). The service provider can support service system with information, technology, knowledge and organisational capabilities to fulfil value proposition. Customers, in turn, can contribute to value co-creation with time and monetary inputs, physical, cognitive and emotional efforts, information, knowledge and other resources. Created for these resources exchange, service system aims to facilitate long-term process of value co-creation (Greer et al., 2016).

As it was discussed earlier, tourist information search is not always a linear process (Cole, 2012; Mill & Morrison, 2002; Swarbrooke & Horner, 2007). Regardless of this specific feature, customer, service provider and encounter processes of value co-creation in the context of the personalised information service can be conceptualised as interactions between a tourist and a tourism information service provider via the personalised IS interface. During these interactions the tourist acquires a dual role. First, he acts as a consumer of the personalised content, who invests time, cognitive and emotional efforts to retrieve information and to make a choice. Second, it is the role of the provider of personal data to enable personalisation, and sometimes, of information and knowledge together with the additional efforts to revise the personalised IS output and manage the settings (Payne et al., 2008; Smith, 2013). Service provider uses its capabilities to aggregate tourist context data, to apply it for accurate tourist context recognition, to elaborate user and external context model, to select the relevant content for this case and to present it in the way, that would be relevant for the exact tourist. Depending on the business logic, applied to the personalised information service, the service provider can further include customer support service, incorporated in the application or delivered via different types of communication channels. The digital interface in the form of the website or mobile application is used to enable the encounters between the two actors and enable information and data exchange. As a result, value is co-created not only from the personalised

content, but also from all the three types of resource integration processes: service provider processes, tourist processes and encounter with the IS interface processes along the customer journey (Figure 2.6).

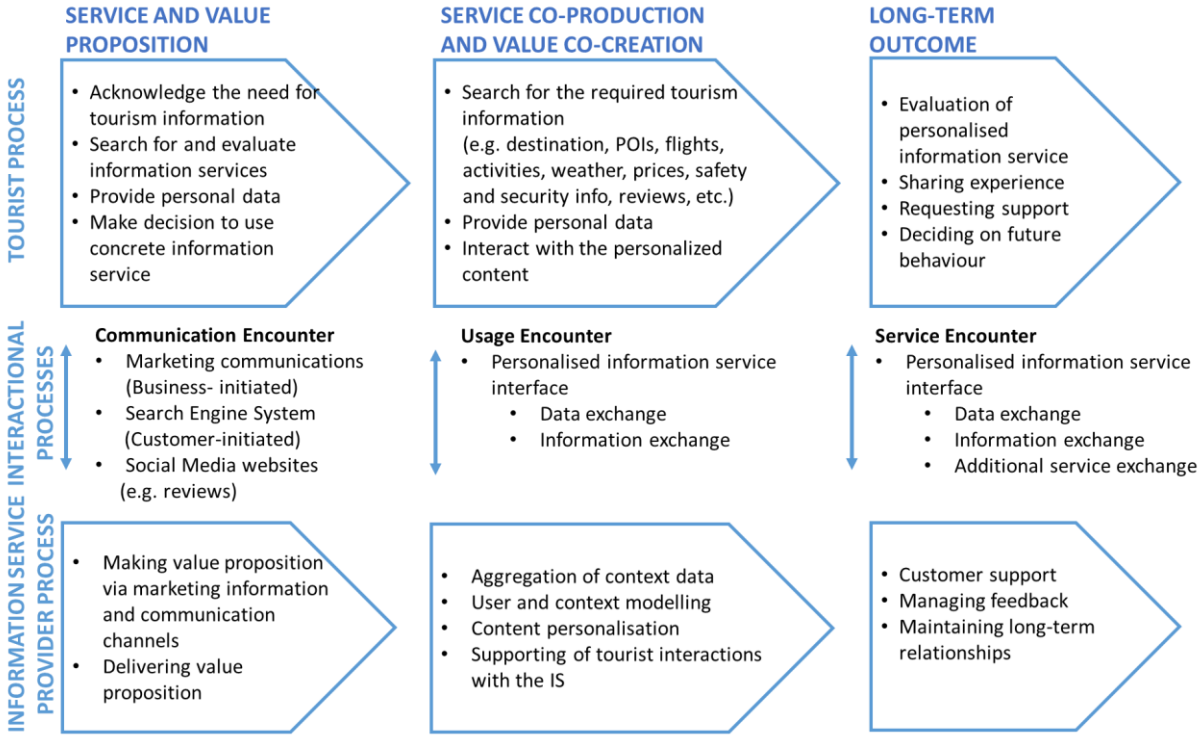


Figure 2-6 Service System and Value Co-Creation Processes of the Personalised Information Service. Adapted from: (Payne et al., 2008; Tsiotsou & Wirtz, 2015)

2.5.1.4. Customer Assessment of Resource Integration and Formed Value

2.5.1.4.1. Value Co-Creation and Co-Destruction through Personalised Information Service

S-D logic defines value co-creation and co-destruction as an improvement and decline in the wellbeing of at least one of the actors, accordingly (Plé & Chumpitaz Cáceres, 2010; Smith, 2013). Each service system is a dynamic arrangement of resources, that continuously adjusts itself to the new inputs (Wieland et al., 2012). The improvement in customer well-being occurs when all resources are properly integrated, so that the service ecosystem delivers the service, that is effective in customer need satisfaction (Plé & Chumpitaz Cáceres, 2010) while supporting efficient interactions between customers and service providers (Skålén & Edvardsson, 2016). Value co-destruction happens because of misuse of resource in their

integration in service ecosystem (Heinonen et al., 2010; Plé, 2016), when the service processes are either inappropriate or unexpected (Echeverri & Skålén, 2011; Smith, 2013). Therefore, each resource integration process within the service ecosystem has either creative or destructive effect on co-formed value.

When defining the discussed specifics of personalisation as a service strategy and as an element of the information service architecture from the perspective of the S-D logic, it is possible to conclude that the overall performance of the personalised information service can be positively or negatively affected not only by the performance of the personalised content, but by the performance of each resource integration process of the IS at the data, business and presentation layers. In other words, the personalised information service performance and customer value is formed based on tourist judgement about the appropriateness of data usage by the service provider in order to support each step of content personalisation and its delivery to the user. The holistic approach that would allow to consider the total influence of these parameters is required.

2.5.1.4.2. Tourist Capability to Assess Service Performance and Value

The idea of customer-centric service assessment is grounded in the assumption that customers are able to provide their judgements about the service attributes (Tsiotsou & Wirtz, 2015). Each service can be described by one or several objective parameters, which can be assessed in order to understand service performance (Pu et al., 2011). In comparison to products, services are characterised by variable, perishable, inseparable from the moment of consumption, and intangible nature (Kotler & Keller, 2016; Shostack, 1977; Vargo & Akaka, 2009). Objectivity of service evaluation depends on customer capability to assess its influential attributes.

First, intangible nature of the service, the complexity of resource integration processes and the absence of relevant competences in this process (Tsiotsou & Wirtz, 2015) creates situation,

when customers can be unaware about some of the value co-creation processes. Some of the interactions between actors of service ecosystem can be categorised as direct, i.e. experienced by the actor face-to-face encounters. Some of them are indirect, i.e. the processes, which are unexposed processes to the actor and can be completely or partially unknown to him (Plé & Chumpitaz Cáceres, 2010; Smith, 2013). While service ecosystem is a dynamic entity and continuously accepts new resources and adjusts itself to any changes of the context, customers are only able to observe those interactions, which they have experienced (Heinonen, Strandvik, & Voima, 2013).

Second, the degree of customer value co-creation and co-destruction are subjectively determined by them based on their expectations towards value proposition and perceptions on resource integration appropriateness processes (Smith, 2013). The intangible, inseparable and perishable nature of service leads to impossibility to objectively assess service performance. When applying the existing classification of good to the attributes of the service (e.g.Candela & Figini, 2012; Paswan, Spears, & Ganesh, 2007), it is possible to distinguish the search, experience and credence attributes of the service (Parasuraman et al., 1985; Zeithaml, 1981).

The first group comprises qualities, which can be precisely assessed directly because of their either standardised or credible nature before and during consumption (Candela & Figini, 2012), enabling customers to form precise expectations towards such service attributes. Expectations are formed by comparison to the previous experience, or announced specification (del Bosque, San Martín, & Collado, 2006). Experience attributes (Parasuraman et al., 1985) can be evaluated only during consumption and only by indirect criteria, such as perceived ease of use, reliability, customer support, etc. (Paswan et al., 2007; Tsiotsou & Wirtz, 2015), as well as more general criteria, such as customer satisfaction (Zeithaml, 1981). Credence attributes cannot be objectively recognised neither before, nor during and after consumption (Candela & Figini, 2012; Lovelock, 1996; Parasuraman et al., 1985) because customer do not have proper

experience or competence to provide a reliable evaluation of the service (Tsiotsou & Wirtz, 2015), as well as because of impossibility to apply a standardised criterion for it. Services with both experience and credence attributes should be assessed with several approaches and criteria (Zeithaml, 1981) to increase the objectivity of analysis.

In the case of personalised information service, this means that tourists, who do not have the expertise in the IS design, will likely build their judgements about the service performance and assess the benefits they have received or lost, only based on those direct interactions they have experienced. Following the discussed specifics of information service architecture and the roles, tourists may acquire in the service co-creation processes, they are capable in building perceptions on the four dimensions:

(1) *Personalised Content Performance*: as consumers, they can evaluate the appropriateness of personalisation by assessing the performance of the personalised content in terms of its capability to provide relevantly selected and presented information to satisfy their information needs and to decrease information overload;

(2) *Service Provider Co-Creation Processes Performance*: As consumers, tourists can evaluate the appropriateness of the resource integration by the service provider only by assessing the experienced performance of the customer support service in terms of its reliability and the capability to solve problems. The specifics of the personalisation strategy and the logic of context data application remains unexposed.

(3) *Interactional Co-Creation Processes Performance*: As consumers, tourists can evaluate the appropriateness of the IS processes and the business logic of information delivery by assessing the performance of the interactional processes with the system interface in terms of its capability to deliver the personalised content in an intuitive and non-intrusive way to decrease the time, cognitive and emotional load;

(4) *Customer Co-Creation Processes Performance*: as resource providers, they can evaluate the appropriateness of their data, information, time and other operant resources integration by the service provider by assessing the degree of the change, that occurred after the resource input, or, in other words, the performance of customer control over resource integration processes.

The discussed assessment of personalised information service does not represent the objective reflection of the service attributes towards the planned strategy and applied technology standards. Instead, it can be defined as subjective tourist perceptions, formed during the process of interactions with the service and relevant for the context of consumption. Moreover, the specific feature of personalised content is its unique features, created according to the identified individual tourist context. Specifically, it can be described with the characteristics of the credence performance attributes, so that the comparison of the personalised content to the standardised criteria or previous experience is impossible. As a result, tourists would not be able to form any specific expectations towards the set of the personalised information service performance attributes. Such attributes can only be assessed during or after interactions with the service. Moreover, the presence of such attributes in personalised information service therefore requires additional incorporation of the reflective approach for them, or application of customer-centric parameters together with the service-centric performance indicators.

2.5.2. Conceptual Model of the Personalised Information Service in Tourism

2.5.2.1. Redefining Personalised Information Service

The reviewed concepts allow to develop the following definition of the personalised information service personalisation in tourism domain:

Personalisation of information service is a strategy and a set of techniques, which serve to select the available information and to present it in the way that the resulting content fits the

tourist individual needs, wants, requirements, preferences, and restrictions, identified in the real-time within the context of tourist and travel activities, thereby, decreasing cognitive and emotional efforts, required to satisfy information needs.

Personalised information service is the information service that applies personalisation strategy to deliver individually selected and presented content to the tourist. Effective personalisation would result in the increase of the perceived performance of the information service and would provide tourists with higher value and overall satisfaction than a standardised information service can create.

Personalised information service is mutually co-created by the service provider and the tourist through the process of their resources' integration and exchange via the IS interface, performed in order to produce benefits for themselves and for other parties. The input of tourist resources, including personal data, information to enable personalisation and knowledge, time, cognitive and emotional efforts to retrieve the information or to modify the system settings and the result of personalisation, determines the overall performance of the personalised information service, alongside with the resources of the service provider. Therefore, the performance of the service can be conceptualised as co-created by both parties.

2.5.2.2. Co-Created Performance of the Personalised Information Service

The classis framework of information service performance aggregates the performance of the three separate dimensions: the performance of the content, of the IS and of the service (Delone & McLean, 2003b; Delone & McLean, 2016; Petter et al., 2013). When compared with the discussed co-creation processes (Heinonen et al., 2013; Payne et al., 2008; Ranjan & Read, 2016), it is possible to match the dimension of IS performance with experienced interactional processes and service performance – with experienced service provider co-creation processes. The performance of personalised content in this case represents resource co-creation outcome. Importantly, S-D logic allows to explain customer control, which is missing in the information

service success model, through the experienced customer co-creation processes (Figure 2.7), which assessed through the perception of participation and executed control over the resource integration (Bhatnagar & Ranjan, 2010). As a result, the study extends the existing framework of information service performance assessment and hypothesises the co-created personalised information service performance as a four-dimensional construct.

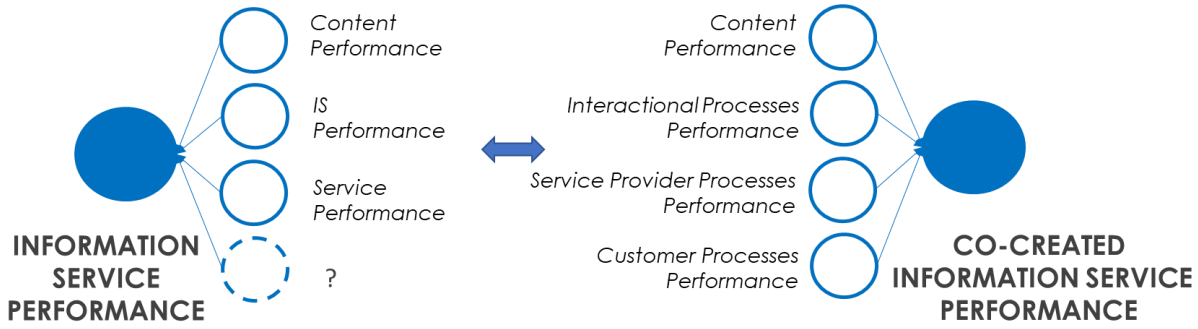


Figure 2-7 Information Service Performance vs Co-Created Information Service Performance

As it was discussed earlier, the assessment of co-created service performance is highly subjective, therefore, benefits from being placed within the cognitive process and emotional mental states of interactions with the service, as it would provide cumulative assessment of personalised information service (Song, 2009). Moreover, interactions with information service are motivated by the presence of the certain needs, identified in the exact context of consumption. Co-created performance of the service should be evaluated not only towards the proclaimed performance attributes (Tsiotsou & Wirtz, 2015), but also towards the capability of a service provider to fulfil the needs and motives, which triggered user interaction with the service at a certain moment of customer journey, i.e. towards co-created value (Füller, 2010; Payne et al., 2008; Tsiotsou & Wirtz, 2015). Therefore, to enable the holistic analysis of the personalised information service in tourism context and to enable explanation of the way the specific performance of the service attributes effects tourist satisfaction, the study places the proposed four-dimensional co-created performance within the tourist satisfaction model. The

model explains the process of customer cognitive judgements formation from articulation the expectations towards the service via assessment of the experienced performance, acquired or lost value to the resulting satisfaction and loyalty (Figure 2.8).

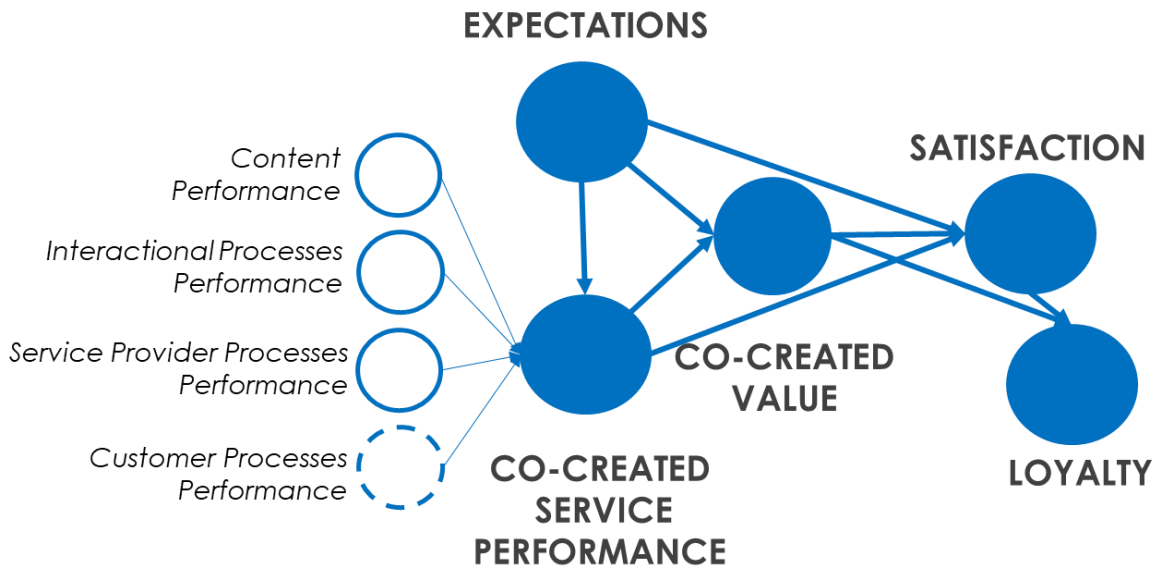


Figure 2-8 Conceptual Model of Tourist Satisfaction with Personalised Information Service

2.5.3. Operationalisation of the Model under Perspective of S-D Logic

2.5.3.1. Tourist Expectations towards Personalised Information Service

Expectations describe customer wants and feeling of what benefit would service provide them. The feelings arise based on the previous experience, personal characteristics, existing motivations and attitudes, as well as interactions between customer on the one hand and supplier and brand on the other, held before service consumption (e.g. advertising) (Cohen et al., 2013; Füller, 2010). For this reason, expectations are acknowledged to be among the antecedents of resulting satisfaction (Wirtz & Bateson, 1999).

2.5.3.1.1. The Concept of Expectations

Several concepts and definitions of expectations currently co-exist in the literature (Cohen et al., 2013; del Bosque et al., 2006; Oh, 1999; Wirtz & Bateson, 1999). The difference mainly

lies in the standard for comparison to make a judgement about the service (del Bosque et al., 2006). Different studies name 'predictive' expectations, 'experience-based' norms, expectations, 'desired' expectations, 'minimum' expectations or 'ideal' expectations. Cohen (2013) groups them under two major categories, which go in line with the discussed properties of the service. The first concept reflects a standard, used by customers to evaluate service characteristics. In the context of S-D logic, such standard may be represented by value proposition the company enters the market with. This approach is experience-based, so that service proposition is compared to the earlier experienced option, set as a standard. Though, intangible and perishable nature of service, and the presence of experience and credence attributes makes comparison to the previous experience complicated or irrelevant for objective judgements.

The second approach defines expectations as customer understanding of what a supplier should offer (Parasuraman, Zeithaml, & Berry, 1988), or ideal service. Expectations in this case can affect perceptions on service efficacy, and conviction that it can successfully produce the required outcome (Bandura, 1977 cited by Cohen et al., 2013). This approach is desired-based and predictive in nature (del Bosque et al., 2006). A customer expresses his or her suggestions about the service, interactions, and transactions (del Bosque et al., 2006). In other words, expectations may reflect customer views on the potential of co-created service outcome in meeting individual needs and requirements. Expectations as an idea of what a service provider should offer to meet customer desires and needs is widely used in tourism, because it is helpful in evaluation of intangible nature of tourism service. The problem of this concept is the ambiguity of the meanings (Cohen et al., 2013), as the central idea is based on customer anticipation of service performance. In practice, it is difficult to differentiate between several types of expectations (Oh, 1999) as tourists may follow both a 'standard' and an 'ideal' principles to form expectation in relation to different attributes of the service. As a result,

expectation may vary not only between services, but between particular service attributes (Wirtz & Bateson, 1999).

2.5.3.1.2. Tourist Expectations as an Antecedent of the Formed Perceptions

As it was discussed earlier, the logic of assessment of experience and credence service attributes is relevant for personalised information service. Tourists might not be able to form the specific expectation towards the personalised information service attributes without prior experience with the same or similar information service and without awareness about the presence of personalisation technology in the information service design. Currently there is no research, which would provide the insights of tourist expectations towards personalisation. Overall, ICTs have increased tourist expectations towards information services and the value they can create (Neuhofer et al., 2015; Shen et al., 2016; Wang et al., 2012). Therefore, the study preliminary defined tourist expectations with the personalised information service as understanding of what a supplier should offer, or as an '*ideal'* service.

To explain decision-making process and resulting satisfaction, tourism applies a range of models and concepts, borrowed from marketing, and developed specifically for the domain (Cohen et al., 2013; Correia, Moital, Oliveira, & da Costa, 2009). They are grounded in motivation theories, and are based on the assumption, that tourist behaviour can be at least partially explained by the sequence of states from the attitude via intention to the experience, and, consequently, satisfaction and post-consumption behaviour (Mathieson & Wall, 1982). There co-exist several approaches explain the influence of expectations on tourist perceptions on service performance, on co-created value, and resulting affective state. The most important of them are discussed below.

Expectations – Co-Created Service Performance

Due to its focus on tourist process of satisfaction formation rather than on the specific service attributes, tourist satisfaction model accepts the 'equity approach', which explains that tourist expectations affect perceptions on the experienced service performance and that customer satisfaction is being influenced both by customer expectations and their perception on the experienced service performance (Rust & Thompson, 2006). 'Disconfirmation' approach, which states that tourists form the perception of service quality as a difference between the experienced performance and expectation, is also known as a simple and reliable explanation of customer perceptions in the case, when customers are capable to form expectations towards each of the service performance attributes (Parasuraman et al., 1988; Tribe & Snaith, 1998; Wirtz & Bateson, 1999). However, following the discussed specifics of the personalised information service, the general nature of tourist expectations and the focus of the study on the performance of multiple functional attributes of the service, disconfirmation as a way to explain the formation of customer satisfaction is believed to be not applicable. On the contrary, equity principle is advantageous because it allows to incorporate the chain of non-linear mental processes and changing attitudes of each customer, as well as to acquired additional information, which can be used to understand the optimum service performance and value (Chen, 2012). It is used in tourism to compare different services, or satisfaction among different customer segments (Cohen et al., 2013), and considered as a comprehensive and flexible tool to analyse satisfaction service (Rust & Thompson, 2006). Though, in addition to the limitations, discussed earlier in relation to the expectations construct, expectations-performance approach may create certain ambiguity in relationships, which may complicate statistical analysis.

Expectations - Co-Created Value

The nature of expectations determines its influence on co-created value and resulting satisfaction. According to S-D logic, value is co-created during the whole process of tourist interactions with a service provider (Kuzgun & Asugman, 2015) in case customer expectations

are congruent with the service system capability to incorporate resources and to produce service (M. Smith, 2013; Plé & Chumpitaz Cáceres, 2010). In case a service cannot not meet customer expectations, consumers perceive the service as unsatisfactory (Oliver, 1980). Service ecosystem not only creates, but accidently or intentionally co-destructs value from the service (Plé & Chumpitaz Cáceres, 2010). As a result, expectations would have direct influence not only on perceptions towards the service performance, but also directly on value creation (Chan et al., 2003; Churchill Jr & Surprenant, 1982; del Bosque et al., 2006; Flint et al., 2011; Song, 2009; Song et al., 2011). Though, similar to the situation with co-created service performance, the nature of relationships between expectations and co-created value can be explained by several theories.

Expectations - Satisfaction

Despite customer expectations are dynamic, the overall satisfaction with a service occurs when a range of experiences from a service meet or exceed these expectations (Gummesson et al., 2010; Vega-Vazquez et al., 2013). Similar to perceived service performance and value, disconfirmation may trigger adjustment of post-consumption evaluation (del Bosque et al., 2006). Direct influence of customer expectations of satisfaction with a service have been repeatedly confirmed empirically (Chan et al., 2003; Churchill Jr & Surprenant, 1982; del Bosque et al., 2006; Flint et al., 2011; Song, 2009; Song et al., 2011). The topic of satisfaction was investigated for several decades with the application of different theories and concepts and mainly quantitative methodologies (Chen et al., 2013). However, there is no common agreement on the single principle to explain the influence of expectations on the process of satisfaction formation. The co-existing theories support both positive (del Bosque et al., 2006; Voss, Parasuraman, & Grewal, 1998; Yi, 1993) and negative service (Chan et al., 2003; Chen et al., 2013; Lee, Jeon, & Kim, 2011; Song et al., 2011) influence of customer expectations on resulting satisfaction in tourism, which is believed to depend on the context of service

consumption (Cronin Jr & Taylor, 1992) and on the character of expectations (Söderlund, 2002).

2.5.3.2. Tourist Perceptions on Co-Created Service Performance

Service performance is commonly defined as service efficiency in fulfilling a certain promise to satisfy tourist needs and to support their activities (Huang, Lin, et al., 2015). Therefore, it can be evaluated towards co-created benefits, as well as towards preliminary identified parameters, formulated in service proposition before customer becomes a participant of the service system (Kuzgun & Asugman, 2015). As is was discussed earlier, this study has redefined the classic model in information service success (Delone & McLean, 2016; Stacie et al., 2008) under the perspective of S-D logic and extended it with the fourth dimension. As a result, it considers the performance of personalised content itself, of experienced service provider co-creation processes, of acknowledged customer co-creation processes and of experienced interactional co-creation processes with the interface.

2.5.3.2.1. The Performance of Personalised Content

Providing customers with high-quality information is the main target of information services, as well as the key determinant of these services success (Chae et al., 2002). Information quality can be defined as desirable characteristics of content, exposed to tourists as an information system output (Germanakos & Belk, 2016; Huang, Lin, et al., 2015). It mainly reflects utilitarian purposes, i.e. usefulness of information for filling the gap, that exist between the tourist current state of knowledge and its scope, required for satisfying the need for information (Cole, 2012), and, consequently, for completing task, which triggered interaction with the service (Chae et al., 2002; Wang & Liao, 2007). High service performance therefore, should demonstrate its appropriateness for problem solving (Cole, 2012), such as comprehensive, detailed, and up-to-date description of the object (Kuo et al., 2009; Pitt et al., 1995; Stacie et al., 2008; Yang et al., 2005).

As it was discussed, tourists have individual and dynamic needs, shaped by the factors of internal and external context (Füller, 2010; Payne et al., 2008; Tsiotsou & Wirtz, 2015) and the main purpose of personalisation of increasing the relevance of the provided information for better satisfaction of the immediate needs. Satisfaction with the provided information is interrelated with its appropriateness to a particular customer (Telang et al., 2004), the fit to a particular situation, and, importantly, to the dynamic changes in these situations (Flint et al., 2011). Therefore, the performance of personalised content is primarily its capability to provide relevantly selected and presented information to satisfy their information needs.

Secondly, personalised information service targets the decrease of information overload and to minimise related cognitive and time efforts for information search and the choice decision. The availability of high volume of travel-related information requires tourists to spend long time searching and choosing an appropriate alternative c (Liang et al., 2006). Consumer behaviour explains stopping point as the moment, when a balance occurs between relevantly valuable information received and costs spent (Candela & Figini, 2012). In case of simultaneous search for a range of tourism services, such as travel package, tourist decision and the stopping point for the search process is predetermined by the amount of information, which is necessary to make a decision. It is unclear how long tourists would search for the relevant information. The difference may be observed between the types of services. Experience services entail relatively high marginal search costs in comparison to the search goods category. The optimal number of online search sessions for experience services, may be lower, than for the search goods (Candela & Figini, 2012), increasing the probability for tourists to miss relevant travel information because of information overload. Thus, capability of information service to decrease time and cognitive load by providing fewer, but relevant travel options (Liang et al., 2006) with a help of real-time personalisation without ‘cold start’ (Rust & Huang, 2014) influences tourist perception on information service quality.

By increasing the relevance of content, personalisation can support tourist activities with more useful information (Ho, 2009; Höpken et al., 2010; Liang et al., 2006), which may bring higher satisfaction with information service. Though, this direct influence may also cause dissatisfaction in case of inaccurate results of context recognition (Wattal et al., 2009). The opportunity to personalise information does not necessarily leads to higher satisfaction and better decision making (Rust & Thompson, 2006), so that high quality of interactions with information service and of the information system performance, which deliver personalised content to a customer, are also required.

2.5.3.2.2. The Performance of Interactional Co-Creation Processes

The performance of interactional processes from customer perspective is the capability of the service provider to maintain efficient communication and value co-creation (Stacie et al., 2008; Vargo & Lusch, 2004). The execution of information service in general, and personalisation as a technology, in particular, depends on the IS functionality. As it was discussed, tourists are exposed only to those resource integration processes, which occur at the presentation layer of IS architecture within the context of occurring interactions (Reis, 2015), i.e. of the system interface. Despite gratification from personalised information is primary associated with the perceptions of provided information performance (Nguyen & Ricci, 2017), it can be additionally mediated by IS effectiveness to deliver the service.

The most fundamental requirements for user interface are formulated by the usability principles, which require learnability, user error prevention, interface aesthetics, appropriateness recognisability, accessibility and flexibility of the IS interface. They aim at increase of ease of use and speed of learning of the way to perform interactions correctly (Nielsen & Budiu, 2013). The development of the new ecosystem of players among software providers with the strong leadership of several dominant platforms (i.e. iOS by Apple, Android by Google, and Windows Phone by Microsoft) led to consolidation of the applications and

establishment of the standardised interface principles (Marcus, 2015). As a result, mobile application design for different devices follow the concepts, requirements, terminology, design parameters, and tools, provided by one of the existing operating systems (Aguado, 2016; Marcus, 2015). The requirements for the software depend on the context and evolve within time. While there is no single set for usability parameters being accepted as universal, such practically-driven frameworks as ISO (ISO, 2011) and the Nielsen group usability (Nielsen & Budiu, 2013), as well as theoretically-based parameters (Palmer, 2002) aim at minimising user confusion with the IS interface.

2.5.3.2.3. The Performance of Service Provider Co-Creation Processes

As it was discussed, tourists are not exposed to all the resource integration and co-creation processes, performed by the service provider. They can evaluate the appropriateness of the resource integration by the service provider only by assessing the experienced performance of the customer support service in terms of its reliability and the capability to solve problems. This is consistent with the perspective of the service support performance of the applied information service success model. Service provider performance is initially defined as service support, provided by the IT or sales departments to the website or mobile application users (Delone & McLean, 2016; Stacie et al., 2008). Service performance, which does not meet customer expectations, leads to low satisfaction or frustration with the service and intention to abandon the service. The presence of human-to-human communication with the company personnel can be efficient for problem-solving. In the cases of positive solution, personal communication can convert the initially unsatisfied customer to the loyal one. Therefore, the parameters of service quality, including the adapted dimensions of SERQUAL model, such as competence, reliability, responsiveness (e.g. Parasuraman et al., 1991; Parasuraman et al., 1985; Parasuraman et al., 2005) are among the influential parameters of service support performance in the context on information service (Delone & McLean, 2016).

2.5.3.2.4. The Performance of Customer Co-Creation Processes

Overall, customer participation in value co-creation is associated with participation in resource integration and control over it (Ranjan & Read, 2016). Participation is realised via shared skills and knowledge (Vargo & Lusch, 2004), via the transfer of labour by self-arranging the trip or co-designing activities (Payne et al., 2008), via implicit or explicit sharing of personal data (Vargo & Akaka, 2009), via investing time to self-select the relevant option from the proposed list of alternatives (Payne et al., 2008), as well as risks sharing (Vargo & Akaka, 2009). Tourists influence service efficiency and effectiveness by co-creating its design and shaping the resulting outcome into the unique offering, that would correspond to his or her dynamic need and situation (Vargo & Lusch, 2004). Tourist perceptions on his operant resources' integration for value co-creation can vary depending on the type of resource and the resulting outcome.

Digital information service is a type of low-contact encounter, which is characterised by low level of face-to-face with the company personnel, high proportion of the self-service and online interactions with the IS (Tsiotsou & Wirtz, 2015). This leads to the change of the balance between a customer and a service provider in value co-creation. It increases customer cognitive involvement in the co-creational processes and intensifies his role in creation of satisfactory experiences (Prahalad & Ramaswamy, 2004). Self-service can bring more satisfaction because of the feeling of self-accomplishment and enjoyment of the process (Kroenke & Boyle, 2017). On the contrary, in case of technology failure or poor service, which are the determinants of client's dissatisfaction, low-contact encounters reduce opportunity to get immediate emotional feedback from customer and improve situation, which can worsen the gratification.

As tourists are exposed to information service outcome and to service provider co-creation processes, it is suggested that the control over them might play essential role in influencing the personalised information service performance. First, as it was discussed at the beginning of this

chapter, application of personalisation technology does not guarantee accurate user and context recognition, and, therefore, relevant selection of the option. Manual adjustment of the filtering setting, often referred as customisation, often allows to acquire more accurate results. Therefore, while personalisation can increase value by providing relevant solutions, decreasing cognitive load, or time, spent for the search, customer control over the content is observed to be beneficial to avoid frustration (Kardaras et al., 2013).

Second, consumer behaviour and psychology describe affective costs, related to acknowledgements of forgone options (Carmon, Wertenbroch, & Zeelenberg, 2003). This may lead to different perceptions on personalised information service performance. In case of customisation, tourists make decisions on their own, and manually set rules for information filtering, thereby, creating the perception of cognitive choice and to emotional attachment to the chosen option. In case of implicit personalisation, which automatically changes content, provided by information service, tourists do not cognitively participate in the process of information filtering, which might be perceived as losing the variety of choices (Carmon et al., 2003).

Third, adaptive and implicit personalisation changes content in real time, so that sometimes finding previously seen option would require additional time and cognitive efforts (Kardaras et al., 2013). As a result, same functionality of personalised information service, aimed at fulfilling its proposition, may cause frustration because of perceptions of the lost control (Kardaras et al., 2013).

Fourth, despite the existing standards on data security, there are objective and perceived risks of customer data leakage. As a result, created value and gratification from information personalisation are additionally affected by security and privacy concerns, so that satisfaction is not guaranteed even in case of its high efficiency and usefulness (Sutanto et al., 2013)

(Aguado, 2016; Sutanto et al., 2013) even in case of its high efficiency and usefulness (Sutanto et al., 2013). Therefore, it is suggested that tourist will form higher perception on the personalised information service performance in case they experience the perceived control over their personal data.

2.5.3.3. Tourist Perceptions on Co-Created Value

Customer value is one of the central concepts of marketing and service management (Smith & Colgate, 2007). It is explored under several paradigms, and dimensions, and can be explained from the perspectives of a customer, of service provider, and of many stakeholders, and, more recently, of balanced centricity, which focuses on the value co-creation process by all actors of service system (Chandler & Vargo, 2011; Gummesson, 2008a; Mele & Polese, 2011). Taking into consideration, that this study accepts customer perspective on personalised information service, the following part aims to summarise relevant dimensions for its measurement.

2.5.3.3.1. The Concept of Value

One of the most straightforward approaches to define value for customer is to identify net gain of all benefits over all costs (Zeithaml, 1981). Product-centred concepts focus on value as the overall utility, provided by the consumed services (Mele & Polese, 2011) and exchanged for monetary and other costs sacrifices at the moment of consumption (Kuo et al., 2009). Value becomes a trade-off of service, social benefits, time, expertise, and monetary and processual costs, that arises from the process of service use and resource exchange (Mele & Polese, 2011). It is seen as a single entity, which is accumulated from precedent encounters (e.g. Chan et al., 2003; Heinonen et al., 2010; Song et al., 2011). Such approach is beneficial for analysis because of its simplicity and universal nature suitable for different contexts (Smith & Colgate, 2007). The dual perspective on cost-benefit ratio provides robust empirical results when seeing it within system of relationships with other constructs (e.g. Chan et al., 2003; Song, 2009; Song et al., 2011). Though, there is no clear proof that value is the ratio of benefits and costs, rather

than the difference between them (Kuo et al., 2009; Parasuraman, 1997; Smith & Colgate, 2007). Taking into consideration that the consumption of information service is triggered by a range of utilitarian, hedonic, relational and other needs, and is rarely associated with the monetary expenses for the information, the product-related concept, commonly applied in the tourist satisfaction model, is not applicable.

From the perspective of the S-D logic, applied as a core theory in this study, value is defined as an increase in service ecosystem viability and well-being of all actors. It is achieved via constant interactions between these actors during resource integration processes (Wieland et al., 2012). As a result, value formation is an interactive, longitudinal, and dynamic process of accumulating experiences, held within a certain context (Flint et al., 2011; Payne et al., 2008). Co-created value in the case of personalised information service has several specifics. First, as the acquired value is the perception on the appropriateness resource integration, it can be either co-created or co-destructed during each of experienced interaction with the service (Echeverri & Skålén, 2011; Smith, 2013). In other words, tourists can experience either the improvement of wellbeing, worsening of wellbeing, or no change in it as a result of interactions with any of the value formation processes. Second, the fact that value is co-created, and, importantly, realised by customer during this process (Heinonen et al., 2010), makes it individual and idiosyncratic phenomenon, determined by the customer at the moments of interactions with the service (Flint et al., 2011; Heinonen et al., 2010). Considering that tourists start interactions with the service, driven by the specific set of information needs, the overall value is an accumulation of the utilitarian, hedonic, experiential, sign and aesthetic contributions or losses for needs satisfaction (Kuzgun & Asugman, 2015; Smith, 2013; Smith & Colgate, 2007). Each time and for each customer, value dimensions could vary depending on the process of its co-creation, the input resources and the needs that motivated tourists to interact with the service

(Vargo & Lusch, 2008a). Therefore, understanding of co-created or co-destructed value dimensions requires exploration within a certain context of use.

2.5.3.3.2. Value as an Antecedent of Satisfaction

Co-created value usually results in certain kind of long-term outcome (Vargo & Lusch, 2004). By reflecting utilitarian, sign, and hedonic and other needs of a customer, that triggered interaction with a service (Mele & Polese, 2011; Smith & Colgate, 2007), it results in a certain level of satisfaction with information service, as well as trust, and potential long-term commitment to the company (Chenet et al., 2010; Kuzgun & Asugman, 2015). Mutual resource exchange, including sharing data, determines the borders of innovation and possibilities to co-create value (Greer et al., 2016), which leads to the increase of customer satisfaction from participation (Aguado, 2016; Greer et al., 2016; Ranjan & Read, 2016).

2.5.3.4. Customer Loyalty

2.5.3.4.1. The Concept of Loyalty

Customer loyalty is a widely applied concept, which serves as additional indicator of service performance. Value and satisfaction, created from service, can be extended beyond the cycle of consumption into the future processes (Ranjan & Read, 2016). Loyalty is commonly incorporated in the analysis of consumer behaviour (Cohen et al., 2013; Kim, Cha, Knutson, & Beck, 2011) and his interactions with the service as the consequence of satisfaction for customer (e.g. Chan et al., 2003; Song, 2009; Song et al., 2011), thereby, service as an important economic indicator for business performance (Tronvoll, 2012).

The complexity of the applied concept leads to the existence of several different way to define loyalty (Chuah, Marimuthu, & Ramayah, 2014). First, loyalty can be explained a psychological disposition of the customer, which can be expressed through the favour or goodwill to a specific service provider or a type of service (Bowen, 2001). This perspective is advantageous because

it illustrates cognitive process of human reasoning. However, positive attitude does not guarantee the return of the customer to the brand, which investigation is central from service perspective (Yi & Gong, 2013). Another perspective on loyalty is a behavioural intention or the willingness to systematically return to the service provider or the specific type of the service (Chuah et al., 2014; Odin, Odin, & Valette-Florence, 2001). Despite this perspective does not illustrate the complexity of customer reasoning, it serves as a straightforward way to analyse service performance. However, in the context of tourism, one of the main triggering factors in tourism service consumption is the novelty of experience (Drew et al., 2009; Pearce, 2011; Ryan & Hall, 2001). Tourists, who are motivated by the need to explore new sights, and to experience new interactions, may avoid repeating services regardless of the level of satisfaction with the previous experience. Multiple studies, including those from the ICT and HCI domains (Heinonen & Pura, 2006; Karjaluoto, Jayawardhena, Leppäniemi, & Pihlström, 2012), incorporate both perspectives. Lastly, there is a composite approach of integrating attitudes and behavioural intentions in one concept of loyalty, which is claimed to be more accurate and comprehensive to explain loyal behaviour (Day, 1976; Song, 2009).

2.5.3.4.2. Composite Loyalty as an Outcome of Co-Created Value and Satisfaction.

Classic theory explain that the overall satisfaction is the determinant of loyalty (Chan et al., 2003). The specifics of tourist behaviour reveal that repeating consumption is not only determined by loyalty. For example, Um et al. (2006) found that revisit intention is more strongly motivated by the attractiveness of destination, rather than by satisfaction with the previous trip. Alegre & Cladera (2006) summarise that repeat service consumption in tourist is determined by feeling of inertia, risk aversion, indifference, place attachment, and combinations of the perceived service performance, value and satisfaction of the experiences service. The specifics of information service consumption also reveal that the purpose of interactions with the website or application are mainly utilitarian. Co-created utilitarian value

is supposed to have major influence of the revisit intention to the website. Therefore, it is suggested that consideration of both direct influences of the co-created value and of the satisfaction on tourist loyalty to the personalised information service it essential to explain the specifics of tourist reasoning.

Chapter 2 Conclusion

To sum up, Chapter 2 proposed the conceptual review of the personalised information service in tourism context. Personalisation can be defined as a strategy and an element of the IS design. Application and successful implementation of personalisation strategy requires complex approach, which affects multiple parameters of the information service performance and actively involves tourist in the process of co-creation of this service performance. While it is proven that accurate selection of the content according to the customer context by personalisation algorithm fulfil the goal of providing relevant information to the user, it has been observed that accurate and implicit personalisation can trigger customer frustration. It has also been noticed that the presence of control from the tourist side can have positive effect on tourist perceptions on the service performance. However, the existing framework, used for this service assessment, fail to incorporate all the parameters tourists interact with, as well as the logic of customer participation in the process of personalisation. As a result, there is lack of comprehensive explanation of the way how tourist interactions with the personalised information service contribute to the overall satisfaction.

Chapter 2, therefore, proposed an integrative conceptual model of tourist satisfaction with personalised information service. The model expands the classic framework of information service performance assessment with the fourth dimension, which explains tourist participation in the process of personalisation and his role in the co-created service performance. It then places the new framework of co-created personalised information service performance within

the tourist satisfaction model, thereby, combining service-centric and customer-centric approaches to assess service performance. However, the context-dependent nature of the service and the multiplicity of the factors of internal and external environment, which can shape tourist behaviour and, therefore, his judgement towards the experienced events, does not allow to provide a complete specification of the proposed theoretical framework. Empirical research is required to answer the following research questions:

- *What are the specific attributes, relevant to describe tourist expectations, performance, value, satisfaction and loyalty in the case of personalised information service?*
- *What are the specific relationships between overall perceptions expectations, perceived performance, and value, satisfaction, loyalty?*
- *How specific tourist context may shape tourist expectations towards personalised information service, the assessed service performance and value affect their satisfaction and loyalty to the service?*
- *What is the appropriate measurement scale for the dimensions of tourist satisfaction model to reflect the specifics of personalised information service?*
- *What are the significant cause-effect relationships between the identified factors and satisfaction with the personalised service?*

Chapter 3 . Research Methodology

Theoretical knowledge development requires solid and consistent set of methods to ensure the reliability and validity of the acquired results (Creswell, 2013b). This chapter proposes the methodology used to answer the formulated research questions. Firstly, the chapter discusses applied research paradigm in relation to the research objectives and specifics of tourist perceptions analysis within personalisation phenomenon. Secondly, it explains the three-stage research design. Lastly, it provides discussion on each of the applied methods, describes specifics of their implementation and the ways to ensure research quality, as well as discusses the limitations, related to each method of data collections and data analysis.

3.1. Research Design

Research methodology is a theory that describe how research would be undertakes. It includes philosophical and theoretical assumptions, which serve as a background for a study. It is also used to summarise data collection and data analysis methods, which are applied to answer the research question, and to reflect implications that philosophical and theoretical assumptions create for the applied methods (Creswell, 2013b; Saunders, Lewis, & Thornhill, 2012).

3.1.1. Research Aim and Objectives

Following the literature review and the identified gap, the research aims at *explaining how the essential attributes of personalised information service influence tourist satisfaction and intension to use the service again*, and puts the set of research questions and consequent objectives, summarised in the Table 3.1:

Table 3-1 Research questions and objectives

	Research Question	Research Objectives	Data collection/ data analysis
	Phase1: Conceptual development		
RQ1	What are the essential attributes of personalised information service	To conceptualise tourist interactions with personalised information service	Literature review/ Conceptual development
RQ2	How tourist interactions with personalised information service attributes influence tourist satisfaction?	To propose an integrative model of tourist satisfaction with personalised information service	Systematic literature review/ Qualitative content analysis of the literature
	Phase 2: Empirical Explanatory and Confirmatory Inquiry		
RQ3	What are the specific attributes, relevant to describe tourist interactions with personalised information service in tourism context?	To refine and further elaborate the proposed measurement scales for the model of tourist satisfaction with personalised information service	Individual in-depth semi-structured interviews / Qualitative content analysis
RQ4	How interactions with the identified attributes influence tourist perceptions on the co-created personalised information service, co-created value, satisfaction and intention to use the service	To explain the cause-effect relationships and hierarchy within the model	Individual in-depth semi-structured interviews / Qualitative content analysis
RQ5	How specific tourist context may shape tourist expectations towards personalised information service, the assessed co-created service performance and value affect their satisfaction and intention to use to the service?	To explore possible mediating and moderating effect on the hypothesised cause-effect relationships within the model	Individual in-depth semi-structured interviews / Qualitative content analysis
	Phase 3: Empirical Confirmatory Inquiry		
RQ6	What is the appropriate measurement scale for the dimensions of tourist satisfaction model to reflect the specifics of personalised information service?	To validate the proposed measurement model	Online tourist survey/ PLS-SEM
RQ7	What are the significant cause-effect relationships between the identified factors and satisfaction with the service?	To assess the structural model of tourist satisfaction with the personalised information service	Online tourist survey/ PLS-SEM

3.1.2. Rationale for Multiple Method Research Design

The articulated research questions lead to both explanatory and confirmatory objectives, which often require application of a combination of research methods (Silverman, 2011). Multiple method research design is commonly applied is the studies with complex objectives and in the

situations, when single method cannot ensure reliability and validity of results (Salmons, 2014). The common problem of single method application is that is creates methodological bias by limiting research objectives to a rational of a specific method (Davis, Golicic, & Boerstler, 2011). Each method enables different insights of the problem (Morse & Cheek, 2014). Therefore, application of multiple methods often allows to produce more robust, complete and comprehensive results (Davis et al., 2011; Stewart, 2009). They also enable triangulation, supplementing each other and minimising the limitations of each approach, applied separately (Bryman & Bell, 2015; Saunders et al., 2012).

Application of multiple and mixed methods to meet multiple objectives often leads to the necessity to oppose epistemologies (Bryman & Bell, 2015). The critique of multiple and mixed method research is related to possibly contradicting ways to explain reality as valid and reliable scientific knowledge production requires consistent development under one research paradigm, consistent definition of knowledge, as well as its creation, contradict each other (Bryman & Bell, 2015). Multiple methods design requires an integrated approach under a suitable research paradigm, which would enable logical combination of different perspective to make sense of an inquiry and research outcome (Freeman, 2007).

The technical drawbacks of multiple method research design are related to availability of resources, such as financial and time constraints, as well as the need for expertise in the applied methodology (Creswell, 2013). It is also outlined that such studies might face difficulties during publishing process, related to the expertise of reviewers in both methods, and journal constrains for reporting results (Davis et al., 2011). It is therefore recommended that multiple and mixed method research design are applied only in case they are required to answer the research questions and application of single method is not feasible (Bryman & Bell, 2015). However, in case of complex objectives, the advantages of mixed method research prevail over

limitations they can create. For this reasons, researchers often assume that all methods are interconnected, and, therefore, one method can be used as a background for another (Bryman & Bell, 2015).

Taking into consideration the nature of the research questions, the study accepts multiple-method research design with both qualitative and quantitative inquiries. To minimise potential limitations, associated with the gap in philosophical assumptions and complexity of application of qualitative and quantitative methods, the research places the inquiry under single research paradigm and elaborates clear research strategy, which will be discussed in the next subchapters.

3.1.3. Research Paradigm

3.1.3.1. Philosophical and Research Paradigms Overview

Scientific knowledge development requires systematic approach, guided by a certain philosophy (Creswell, 2013). Philosophy defines the nature of knowledge within the context of research problem and sets epistemological and axiological assumptions, which, in turn, inform the process of research (Lincoln & Guba, 1985). Contemporary science accepts a range of paradigms, which have diverse views on the meaning of knowledge and the ways it can be derived.

Interpretivist philosophy enables explanation of the full scope of social relationships and influences, that shape individual behaviour and judgements. It reflects existing viewpoint on knowledge in the social science, and consumer behaviour domain in particular. Specifically, constructivism and constructionism paradigms postulate that knowledge is individually co-created within social environment (Saunders et al., 2012), which is an important assumption to explain the idea of personalisation. Though, these paradigms stress the phenomenological and subjective nature of knowledge, which creates limitations from the point of view of the

generalisability of the acquired results (Bryman & Bell, 2015), and possibility to outline the common trends.

Positivist philosophy accepts the view on reality as being objective, singular, and independent from an individual (Quinlan, 2011). Social phenomenon can be observed, and the meaning of the explored phenomenon and its attributes can be clearly and similarly defined by all individuals (Saunders et al., 2012). In this case, interpretation of meanings does not depend on the context. Such assumptions enable generalisation of findings, which is advantageous for academic knowledge development and confirmation of the observed trends. In the context of the present study, application of positivism would allow to identify distinctive characteristics of personalised information service, relevant for the target population, and to use them as a measurement items to explain common trend of satisfaction formation within this population. On the other hand, positivism creates the gap between scientific findings and normative background of social science (Bryman & Bell, 2015). Human feelings and attitudes, such as perceived value and satisfaction, are social phenomena, which cannot produce externally free and objective judgement (Saunders et al., 2012), so that consumer individuality and resulting meanings together with complex motivations cannot be fully explained under positivist philosophy.

Pragmatism is an alternative research paradigms, which defines meaning as being derived from the experience and practice (Biesta & Mälardalens högskola, 2010). It is built on the postulate that knowledge is constructed within the context (Saunders et al., 2012; Silcock, 2015), and the truth exists within a certain period of time and circumstances (Creswell, 2013). The structure of social relationships is determined by action, which is the only way to change the existence (Goldkuhl, 2012). As a result, knowledge is derived from the action in the form of value,

satisfaction, experience, etc., and the meaning is created from the experienced consequences of inquiry, rather than from its antecedents (Creswell, 2013).

The research phenomenon of the present study is personalised information service. It is distinctive not only because of the potential difference in customer evaluation, but because the service itself changes for each tourist based on the assumption of individuality of customer need. Therefore, any personalised service acquires phenomenological features itself, because it is uniquely co-created for each customer within the context of interactions and according to it. At the same time, the analysis of the influence of customer expectations and perceptions on resulting satisfaction with the service requires common trends to be identified. As so, the present study requires an integrative approach in research paradigm (Goldkuhl, 2012), that would provide the way to develop knowledge taking into consideration the occurring difference in research phenomena and the unified measurement system. Therefore, the study accepts pragmatism as a research paradigm as it supports the idea of individuality and context dependence of tourist needs that requires the existence of multiple solutions for multiple realities, but also defines valid and reliable knowledge as being generated by multiple subjects within a certain context of inquiry.

3.1.3.2. Specifics on Knowledge Development under Pragmatic Research Paradigm

Pragmatism explains that knowledge is intuitive and is acquired not from the facts, but from its interpretation (De Waal, 2005). Pragmatism see truth as anything that can be corroborated, validated, and verified by practice and events (Talisse, 2011). Everything, that is not confirmed, is false (Talisse, 2011). However, in comparison to value-free positivist paradigm, pragmatism defines truth as drawn from the existing values. Visions, values, cultural differences should be predefined for each case. Knowledge, therefore, is built of the consequences of these values (Teddlie, 2009). Pragmatic truth is a reflection of culture and situation, and it cannot be absolute

because it is the result of experience within context (De Waal, 2005). In other words, knowledge starts from individual beliefs, which are established by habits, social norms, historical experience, religion, politics, and other factors, with are accepted as necessary or idea by certain communities or society (Malachowski, 2013). As a result, knowledge is a sum of conceivable practices interpretation (De Waal, 2005) and is valid when there are no contradictions (Talisse, 2011) with existing beliefs and cultural prerequisites (Malachowski, 2013). The truth is, therefore, a result of interpretation within the realities of a culture and a society (Malachowski, 2013), that is satisfies the person who's settled beliefs it illustrates.

However, truth does not vary from individual to individual because it is seen as collectively accepted vision on the experienced reality and facts (Malachowski, 2013). Knowledge is derived from the examination of the community of inquiries (Peirce, 1931-1958 cited by Constantinides, Chiasson, & Introna, 2012). The reality contains multiple causal relationships, but they are temporary, and may not be identified (Teddlie, 2009). Pragmatism looks for plural position instead of identifying the polar opinions (Salmons, 2014) as truth is defined as anything that is clearly and distinctly recognised by community (De Waal, 2005). The purpose of analysis is systematisation of knowledge and the process of knowledge creation (Goldkuhl, 2012). Theory can be true to a different degree depending to its applicability and predictability at a certain situation (Teddlie, 2009). In pragmatism, there is no distinction between a subject and an external environment. On the contrary, truth is seen as derived from the process and transactions, which are part of the environment (Teddlie, 2009). Therefore, pragmatism requires the balance between subjective and objective valid knowledge, and between internal and external validity rather than an attempt to maximise external validity and generalise results to a maximum of populations.

Truth is value-oriented and endorsed by shared norms. At the same time, it is acquired from real experience. Therefore, truth is valid in a certain context, generalisation can be made to the

level of population with the similar historical, cultural, economic, and political environment, as well as to the similar context of service consumption. In other words, impossibility to generalise the results of a study to any context in not a limitation, but the condition of validity under pragmatism paradigm.

Pragmatism takes into consideration intersubjective attitudes, so that it stands in the middle between objective and subjective knowledge. It supports abductive reasoning, moving from induction to deduction. Therefore, pragmatism creates intersection with several research paradigms including positivism and constructivism (Constantinides et al., 2012; Goldkuhl, 2012; Gruender, 1982) under the condition that applied reasoning is conducive to the main aim of the knowledge improvement (Constantinides et al., 2012). Being the paradigm, which synthesises positivist and interpretivist philosophies (Goldkuhl, 2012), pragmatism accepts integration of different methods under one research design to provide the in-depth explanation of the phenomenon, and generalisation to the communal inquiries within the certain context (Creswell, 2013b; Saunders et al., 2012). It is used in research, related to organisational and job-related topic, including satisfaction with creativity (Sacchetti & Tortia, 2013). It is also one of the major paradigms in information service and IS design domains (Biesta & Mälardalens högskola, 2010; Constantinides et al., 2012; Goldkuhl, 2012; Kettinger & Lee, 1997), because it defines knowledge as having the functions of understanding, explanation, prescription, and prediction (Goldkuhl, 2012).

Accepting pragmatism as a research paradigm enables application of mixed methods design to meet both explanatory and confirmatory objectives of the study. Regardless of the type of research methods (i.e. qualitative vs quantitative), pragmatism dictates that a trend, relevant for a target group in a specific external context should be identified to be accepted as a valid and reliable knowledge. Guided by pragmatism, the answers to the articulated research questions

(Table 3.1) would be relevant for the exact personal, cultural, social, technical, travel context until major changes occur in at least one of the context dimensions. It also means that the findings about the exact cause-effect relationships between tourist perceptions on personalised information service may or may not be relevant to different contexts, and generalisation of the findings to the wider contexts is beyond the scope of the study.

3.1.4. Research Quality

To develop a theory, or to contribute to the existing concepts and theories, research should ensure the quality of findings, so that acquired inferences represent objective and replicable knowledge. The major concepts, applied in academic research, are reliability and validity. Reliability stands for repeatable results regardless of the context (Bryman & Bell, 2015). It should provide transparent analysis and same conclusions if conducted by different researchers (Saunders et al., 2012), at different context, period of time, as well as different samples, derived from one population. Validity stands for the integrity of the findings and possibility to generalise them to other contexts (Quinlan, 2011) .

Broadly, quantitative research validity includes internal and external validity, measurement validity, and ecological validity. Measurement validity describes the construct validity, i.e. if the measures does reflect the concept. Construct validity is directly related to reliability, pointing that an unstable measurement cannot provide valid results (Bryman & Bell, 2015). Internal validity states for valid causal relationships between explored variables and concepts (Bryman & Bell, 2015; Saunders et al., 2012). External validity is concerned with generalizability of results beyond specific context a research was done in (Quinlan, 2011). Ecological or social validity refers to validity of findings within a natural environment and everyday life, i.e. apart from the context of research. In quantitative research, these criteria can be ensured by the strict sampling procedures, and checked with statistical indicators and

additional manipulations with data, such as Cronbach's alpha and split-half method to test the internal validity (Anderson & Gerbing, 1988).

Despite the impossibility to make large generalisations for pragmatic knowledge, qualitative research must ensure the quality of acquired findings. Taking into consideration subjective nature of knowledge and context-dependence in pragmatic paradigm, the concepts of reliability and validity have slightly different meanings when applied with qualitative and quantitative inquiry (Leung, 2015). For example, such indicator as external validity cannot be fully applied in qualitative research (Saunders et al., 2012). While there is no common agreement between qualitative researchers on the exact meanings and procedures of validation (Creswell & Poth, 2017), qualitative research usually addresses the issues of credibility, which goes in line with internal validity and defines believability of findings; transferability of results, which is consistent with external validity and ensures applicability to other situations and conditions; dependability, i.e. reliability within a time period; and confirmability, which means objectivity and minimisations of the influence of researcher values on the results (Bryman & Bell, 2015; Lincoln & Guba, 1985). Consistency of results and appropriateness of collected data, of applied processes and tools, can be ensured by correct combination of applied methods, by constant comparison of data, by systematic and logical content analysis, guided by identified paradigm, and by triangulation of findings (Leung, 2015; Silverman, 2011).

Assessment of mixed method research requires the assessment of methodology of each stage and of the overall quality of the mixed method research outcome. The qualitative and quantitative findings in terms of data validity and reliability and the rigor of the applied procedure. Minimisation of probability of sampling and non-sampling errors and development of valid results also require not only additional financial, labour and time investments, but additional assumptions to be applied during data collections and data analysis procedures. A

research design with a balance between steps to increase quality of results and research investments is required (Biemer, 2010; Toepoel, 2015).

The assessment of mixed method research does not require application of all the parameters of qualitative and quantitative stage (Watkins, 2015). The specifics of the mixed methods research is the rational and transparency of the research design to efficiently answer the research questions, and, therefore, relevant integration on findings according to the proposed (Creswell, 2013b). Therefore, the systematic approach in analytical procedures should be carefully considered and integrated in one system rather than applied as two independent enquiries. Next subchapter presents the research strategy that aims to ensure systematic approach of mixed methods application. The specific steps to ensure validity and reliability of the findings will be discussed at each phase of the research.

3.1.5. Proposed Research Strategy

The studies, which require validation of theoretically proposed models commonly follow a strategy of sequential research design. Sequential design (Davis et al., 2011) applies primary method to expand the existing knowledge and to explain the phenomenon, enabling its results to be subsequently implemented for the development of the second one. In the case a conceptual model validation is required, it allows to determine correct variables or relationships between constructs (Creswell, 2015), so that it can be tested with the second method (Davis et al., 2011).

Sequential research design can apply different combinations of research methods, which can be incorporated independently or in the hierarchy, thereby, enabling different solutions and supporting different research objectives. In the case when development and validation of a measurement scale and testing complex relationships between the variables, one method or set of methods serves to verity the hypothesised variables and cause-effect relationships between them, as well as to generate or/and refine measurement scale for the context of the study

(Rossiter, 2002). Another set of methods is used for validation of hypothesised measurement scale and relationships between variables. In the most cases, a sound conceptual development precedes field research to define research phenomenon and hypothesise potential relationships between variables, thereby, minimising the limitations of empirical data. Such a complex approach allows to ensure reliability and validity of the findings (Saunders et al., 2012), and, therefore, is commonly applied in marketing and business management research for development and validating conceptual models (Diamantopoulos & Winklhofer, 2001; Edwards & Bagozzi, 2000; Petter, Straub, & Rai, 2007; Roberts & Thatcher, 2009; Rossiter, 2002).

Importantly, there is no universal set of research methods, applicable for all cases. Some studies rely on the validation, done by previously published studies and deductive reasoning to generate a pool of attributes, further used to describe latent constructs. A set of statistical tests follows to assess the quality of the selected measurement scale and test the relationships between the constructs (Chae et al., 2002; Huang, Lin, et al., 2015; Wang & Liao, 2007; Yen, 2005). Another approach includes combination of inductive and deductive reasoning, and both qualitative and quantitative methods. The major stages include scale purification and refinement with a help of expert assessment, followed by statistical assessment (Kim & Eves, 2012; Lu et al., 2009; Ranjan & Read, 2016; Yang et al., 2005). Several studied applied pure qualitative approach, such as the series of focus groups with the consequent content analysis to define the factors and an interest and provide in-depth explanation of the relationships between them (Santos, 2003). The final choice of applied procedures of sequential research design depends on specific objectives of study, on the novelty, and complexity and hierarchical structure of proposed models, the mature of hypothesised latent constructs (i.e. formation vs reflective), on the number of identified attributes, on availability of resources for research and other factors (Davis et al., 2011; Rossiter, 2002).

Figure 3.1 provides the scheme of the three-phase research strategy. Following the idea, accepted by pragmatism, the study builds on the combination of inductive and deductive reasoning. Taking into consideration that the research aim includes both explanatory and confirmatory components, application of both qualitative and quantitative methods would enable fulfilment of all objectives (Davis et al., 2011).

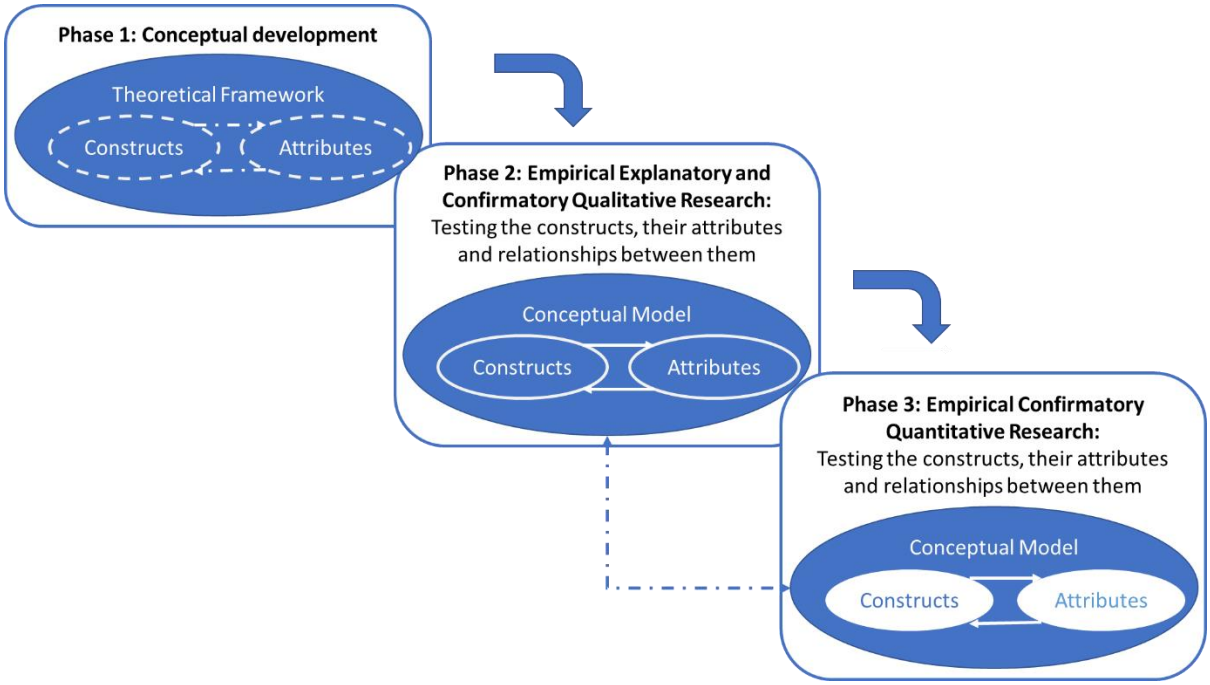


Figure 3-1 Research Strategy

Qualitative stage of this study aims to verify the conceptualised dimensions of expectations, co-created service performance, co-created value, satisfaction and loyalty. It further targets purification the scale, if necessary, and provision of the explanation to the cause-effect relationships between the researched variables within the tourism context with the potential to adjust the quantity of hypothesised relationships. Quantitative research aims at statistical confirmation of the proposed measurement scale, and at reconfirmation and further explanation of the cause-effect relationships between the constructs by testing the constructs, the nature and strength of the hypothesised relationships between them, and by assessing of the validity

and reliability of the findings. It is believed that such sequential research strategy, where results are based on two or more data sources and applied analytical techniques (Creswell, 2013), would increase reliability of findings.

3.1.6. Research Ethics

Academic research should be guided by the principles of beneficence and non-maleficence. Beneficence explains that any research should aim at improving the life of the society, which creates the requirement for research aim and objectives of contributing to public wellbeing (Brenkert & Beauchamp, 2010; Resnik, 2018). The principle of non-maleficence explains the necessity of not making harm to research participants by the process of research, as well as by its findings, so that potential risks of human beings participation in the study should be carefully evaluated (Resnik, 2018). While physical harm may be avoided, social science research always brings the risks of creation of mental pressure to research participants. Such pressure is related to the potential effect of researcher on the factors of natural context of individuals, to the potential invasion into private environment and being observed, as well as to creation of perceived threads to individual security and privacy by using personal data. This might consequently affect participants' psychological wellbeing. The interaction with personal data also creates the objective thread of revealing or misusing personal data.

To minimise potential disruption while meeting research objectives it is recommended that all potential benefits and costs the research may bring to the society, to research participants, and to researcher are clearly articulated and balanced towards to optimum solution (Resnik, 2018). The research design was developed according to the commonly applied ethical standards and procedure, related to data collection, management and analysis, as well as reporting the results (Creswell & Poth, 2017). The specifics of the design will be discussed further in this chapter in relation to each phase of the study. To crosscheck that the research and, specifically, the data

collection methods, comply with the ethical standards, the proposed research design together with the developed information sheets and informed consent forms for both stages of data collection were submitted for the approval of the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University. The data collection was done after the approval (HSESC Reference Number: HSEARS20180228003) was granted. The involved third parties (i.e. researchers, hired for codes validation) gave their concept follow the agreed procedures of data management and analysis. To inform the participants about potential costs and benefits of the study for the society and for them, relevant information was delivered to them in the written form (i.e. information sheets and informed consent forms (Appendix 3.1). In case of individual interviews, the main issues were repeated at the beginning of the meeting prior to the interview.

3.1.7. Conclusion

To fill the identified gap and to meet the articulated research aim and objectives, the study proposes three-phase sequential research design. Being guided by pragmatism, the research adopts mixed methods research with conceptual literature review, qualitative content analysis and quantitative PLS SEM analysis. The elaborated multiphase research strategy and compliance with the ethical requirements allow to ensure high-quality research and unbiased findings.

3.2. Phase 1: Conceptual Model Specification

The literature review (Chapter 2) presented the theoretical framework of tourist satisfaction with personalised information service, which redefined tourist expectations, perceptions on service performance, value and satisfaction for the case of personalised information service as being co-created both by a customer and a service provider, and explained the way how tourists overall satisfaction with personalised information service and loyalty and formed, thereby,

answering the Research Question 1. To answer RQ2 and enable further research the proposed framework needs to be further specified on the level of perceptions and relationships between them.

Phase 1: Conceptual development			
RQ1	What are the essential attributes of personalised information service	To conceptualise tourist interactions with personalised information service	Literature review/ Conceptual development
RQ2	How tourist interactions with personalised information service attributes influence tourist satisfaction?	To propose an integrative model of tourist satisfaction with personalised information service	Systematic literature review/ Qualitative content analysis of the literature

3.2.1. Measurement Model Specification

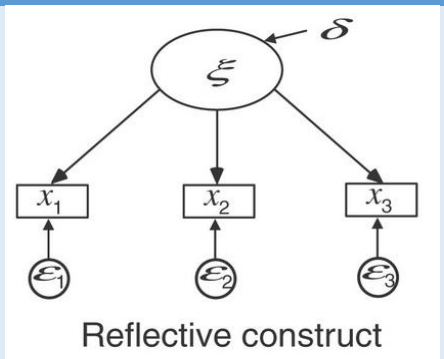
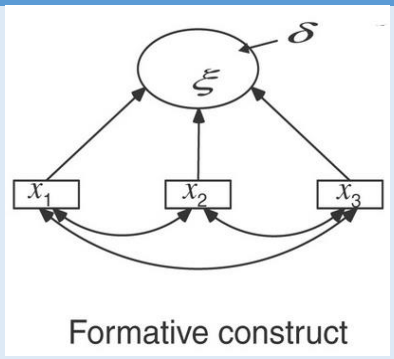
To enable further analysis and, especially, confirmatory quantitative inquiry, each latent variable should be correctly defined from the measurement perspective. Heterogeneity of consumer behaviour, which leads to the existence of multiple ways do specify measurement models, together with the lack of knowledge and awareness on this topic and related procedure, causes massive misspecification of the applied models and adaptation of the wrong measurement perspective in marketing and consumer behaviour science (e.g. Diamantopoulos, Riefler, & Roth, 2008; Diamantopoulos & Siguaw, 2006; Edwards & Bagozzi, 2000; Jarvis, MacKenzie, & Podsakoff, 2003). The wrong latent construct specification leads to different principles of measurement scale development and purification, reversed causality within the construct and, in turn, to potentially different set of the chosen items and inadequate latent construct scores. Therefore, construct misspecification leads to Type I and Type II errors accordingly, which causes wrong conclusions about the observed events (Diamantopoulos & Siguaw, 2006), including the judgements about customer expectations and perceived service performance (Jarvis et al., 2003). To ensure correct measurement model specification, both the type and the hierarchical level of applied latent constructs should be carefully considered.

3.2.1.1. Reflective and Formative Constructs

The specifics of such domains as consumer behaviour and information technology and, therefore, the needs of marketing and product management require application of complex models with different principles of latent variables measurement. Reflective and formative measurements (Table 3.2) represent two latent constructs specification principles, which support different definitions of the concepts and, therefore, can serve for different managerial purposes (Cheah, Sarstedt, Ringle, Ramayah, & Ting, 2018).

Reflective measurement theory names the latent variable as common cause of researched phenomenon. This cause should be shared by all indicators, used to measure the latent variable (Diamantopoulos et al., 2008). In this case, measured items represent and describe one unidimensional conceptual domain. They can be illustrated by linear functions of a latent construct, which contribute to explain variance and contain independent measurement errors, caused by inability of measurement indicators to fully explain the change in construct (Hair Jr, 2010). Measurement items are derived from a pool of all possible items that belong to a domain of an interest (Wilcox, Howell, & Breivik, 2008) and may be dropped from the analysis in case of low covariance with other indicators without affecting the meaning of a latent construct, and, consequently, construct validity. Remaining indicators are assumed to be interchangeable and equally valid reflections of an explored latent construct.

Table 3-2 Conceptual Explanation of Reflective and Formative Constructs

	Reflective	Formative
	 Reflective construct	 Formative construct
Nomological net of items/ indicators	- Items have same antecedents and consequences	- Indexes are not required to have same antecedents and consequences
Direction of causality between the latent variable and measurement items/ indexes	- Indicators are manifestations of the latent variable - All items are caused by one factor, and, therefore, belong to single dimensions and are related conceptually - Direct cause-effect relationship from latent construct to measured items: o Change in the latent variable causes the change in all items o Change in an item should not change the latent variable	- Indexes are predictors of the latent variable, not the result - Indexes form the latent construct, and can represent different concepts, therefore, there is no need for relationships between them - Direct partial cause-effect relationship from each index to the factor: o Change in an indicator causes the change in latent construct o Changes in the latent variable do not cause the change in indexes
Relationships between items/ indexes	- Items should be interchangeable as they represent common theme of the latent variable - Deletion of an item does not affect the meaning of the latent variable - Items are expected to covary - Change in one item is associated with proportional change in other items	- Indexes are not interchangeable as each of them explain a standalone dimension of a latent variable and don't share common theme. - Deletion of an index changer conceptual meaning of the latent variable - Indexes do not necessarily covary - Change in one index does not cause change in others
Generation of items/ indexes	- Chosen items represent the sample of all possible measurements - Items can be acquired from the pool of all potential measurements - Items are interchangeable - Items can be dropped without affecting the meaning of the construct	- Requires strong theoretical background and conceptual definition of each construct and each of the index - Requires exhaustive set of all possible items so that they cover the entire scope of the factor - Indexes cannot the dropped from the factor without affecting the meaning of the construct
Choice between reflective or formative measures	- By the principle of item generation - By result of item purification - By comparing correlations between measures and outcome variable for both - By comparing covariances between the indicators (Confirmatory Tetrad Analysis, CTA)	
Principle of scale development	- Item generation: Literature or empirical in-depth qualitative interviews or focus groups to generate	- Item generation: theory and in-depth qualitative interviews or focus groups to improve theoretically specified measurement model

	all possible reflections of the phenomenon - Item purification: can be done purely by statistical methods by omitting the indicators with low loadings	- Item purification: mainly guided by conceptual definition of the phenomenon, which is crosschecked by statistical methods.

Adapted from: (Diamantopoulos & Siguaw, 2006; Hair Jr, Sarstedt, Ringle, & Gudergan, 2017; Jarvis et al., 2003; Petter et al., 2007)

Formative latent variable is defined as a result or a sum of the observed measures, observed variables as being integral parts of multidimensional construct (Jarvis et al., 2003; Wilcox et al., 2008). Jointly, measured indicators form the construct, and determine its conceptual and empirical meaning. The measures, in turn, have linear cause-effect relationships with the latent variable (Hair Jr, Hult, Ringle, & Sarstedt, 2016). Each of observed indicator represents one dimension or unique characteristic of formative construct, and its partial cause, so that together observed indicators should form the entire population that explains a factor. Therefore, there is no requirement for intercorrelations between observed indexes, they might represent different conceptual dimensions and sometimes to be mutually exclusive (Jarvis et al., 2003). The change in observed variables leads to the change in formative construct, so that they cannot be dropped form the list without substantial reasoning. The error in measurement is attributed to the whole latent variable, and is defined as an inability of the set of observed variables together to fully explain the formative construct (Diamantopoulos et al., 2008).

Constructs are inherently neither formative nor reflective. Conceptual difference between the applied approaches lies in the exact definition of a construct, in the context of study and two distinctive types of indicators, used to measure the construct (Wilcox et al., 2008). Practically, reflective measurements are advantageous when the research requires customer global perceptions on an existing phenomenon (Borsboom, Mellenbergh, & Van Heerden, 2003). Formatively-defined latent constructs are useful in the cases, when the relative impact of each subdimension of the explored phenomenon is the focus of the research (Diamantopoulos et al., 2008). Justification of the choice between formative and reflective measurement principles and

minimisation of the possibility of Type I or Type II errors requires both strong theoretical background and the procedures of measurement items generation, relevant purification and validation procedures (Diamantopoulos & Siguaw, 2006).

3.2.1.2. Higher-Order Constructs

Hierarchical latent constructs can be defined as explicit representation of a multidimensional concepts are a high level of abstraction (Becker, Klein, & Wetzels, 2012). Many concepts can be operationalised at a global level, at a level of major dimensions, and, if required, at further levels of abstraction with further details provided for each dimension. Each level of abstractions, including higher-order construct (HOC) and lower-level constructs (LOC) can be characterised by either as reflective or formative measurement principle. In other words, when looking at the second-order latent variable, four types of specification are possible: formative constructs on both levels of abstraction, formative measurement at a lower level and reflective at a higher level, both reflective levels and reflective measurement on the lower level and formative on the higher (Figure 3.2).

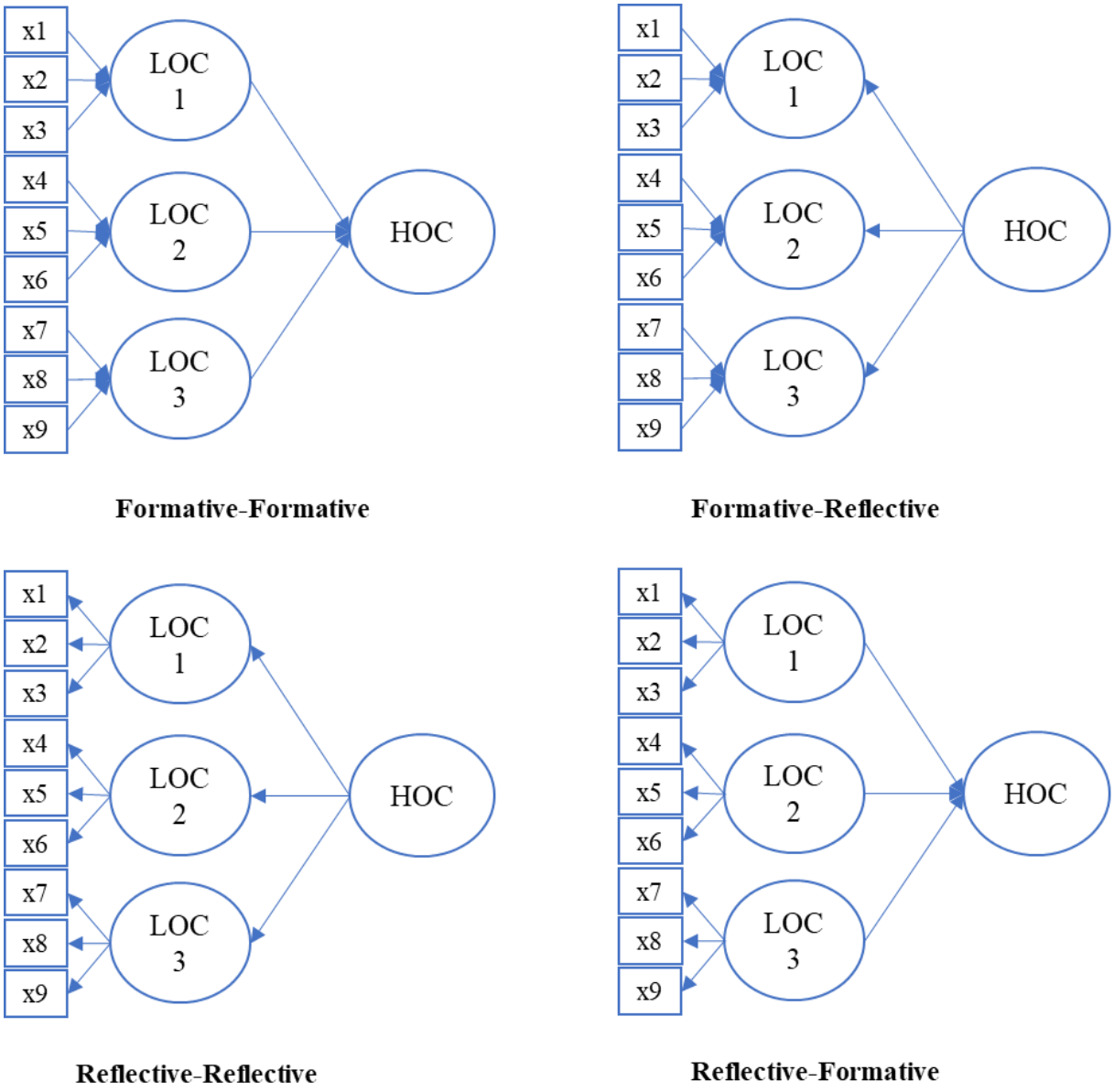


Figure 3-2 Types of Hierarchical Component Constructs. Adapted from: (Becker et al., 2012)

Higher order constructs often serve as better predictors of complex concepts (Hair Jr et al., 2016). When arranged in accordance with theoretical definition, hierarchical component models allow to decrease the number of structural relationships in the model, making the hypothesised model more parsimonious and avoiding potentially false conclusions, made when subdimensions of a single concept are presented as independent variables. Practically, they also allow to handle high collinearity between indicators by rearranging them in the logical groups.

However, higher-order constructs potentially create complications in incorporating the effect of a predictor, as well as interpreting the role of lower-order constructs in estimating endogenous constructs (Hair Jr et al., 2017). Therefore, the choice between a single and multiple levels of abstractions primarily depends on the phenomenon under investigation and research objectives.

3.2.1.3. Specification of the Measurement Model of Personalised Information Service

The chosen level of abstraction, used to build a construct, and the measurement principle at each of these levels should depend on applied theories and concepts, as well on the objectives of the model (Hair Jr, 2010). Each of the applied concepts might be defined as a first- or second-order, defines as formative and reflective indexes (Jarvis et al., 2003). Appendix 3.2 reviews different operationalisations of customer expectations, perceptions on service performance, value, satisfaction and loyalty, applied by the studies, associated with the performance of information services. The scope of the studies was determined following the saturation principle. Following the proposed conceptualisation (Chapter 2), Table 3.3 summarises the major characteristics of the applied constructs in relation to the possible options to specify the models.

Table 3-3 Choice Criteria for Reflective and Formative Constructs

	Nomological net of indicators: presence of same antecedents and consequences for indicators	Direction of causality between construct and indicators: - The role of indicators - Dimensionality - The trigger of the change	Relationships between indicators: - Belonginess to the common theme - Interchangeability - The presence of covariance	Conclusion
Expectations	May vary depending on previous experience and context	- A change in each indicator may trigger the change in general expectations and vice versa - Do not represent one concept - Deletion of an attribute is not supposed to affect the meaning of expectations	- Indicators belong to different themes - Indicators are not interchangeable - Indicators may covary	Preliminary hypothesised as reflective
Co-Created Service Performance *HOC*	Indicators are derived from different concepts and have different antecedents from different domains	From the defined attributes to the overall performance - indicators define the construct - indicators represent different dimensions - the change in each attribute should trigger the change in the overall performance	- Indicators belong to 4 different dimensions - Indicators are not interchangeable - Covariance between them is not required	Hypothesised as formative
Co-Created Service Performance *LOC*	Indicators are derived from different concepts and have different antecedents of information service technical features	From the defined attributes to the construct - indicators define HOC - indicators represent different dimensions - the change in each attribute should trigger the change in HOC	- Indicators belong to different concepts - Indicators are not interchangeable - Covariance between them is not required	Hypothesised as formative
Co-Created Value	Indicators are derived from different concepts and have different antecedents of different dimensions of information service performance	From the defined attributes to value construct - indicators define construct - indicators represent different dimensions - the change in each attribute should trigger the change in the overall performance	- Items belong to different dimensions - Not interchangeable - covariance between them is not requires	Hypothesised as formative
Satisfaction	Indicators represent one concept	From satisfaction construct to items: - Indicators are manifestations of the overall satisfaction - Indicators represent same dimension of satisfaction - Changes in overall satisfaction should result in the change in each index	- Indicators are interchangeable conceptually - Indicators describe same concept - Dropping or changing any item does not affect conceptual meaning of value	Hypothesised as reflective
Loyalty	Indicators represent one concept	From the construct to items: - Indexes are manifestations of the intention to use service - Indicators represent same dimension of app usage - Changes in the attitude should result in the change in each indicator of behavioural intention	- Indicators are interchangeable conceptually - Indicators describe same concept - Dropping or changing any indicator does not affect conceptual meaning of loyalty	Hypothesised as reflective

3.2.1.3.1. Expectations towards Personalised Information Service

Similar to perceived service performance, the construct of expectations can be defined from both perspectives of reflective and formative constructs. As it was discussed in Chapter 2, in the most general meaning expectations are customer wants and feeling of what benefit interactions with the service can provide. Therefore, first-order construct is the most appropriate operationalisation that correspond the way customer judgement is formed. Expectations are based on the previous experience and knowledge, existing motivations and attitudes, and other factors (Cohen et al., 2013; Füller, 2010). In other words, each of the expected benefits may have different causes, which, in turn, points on the formative nature of the construct. Also, expectations can be formulated towards each of the functional attributes, which would represent formative indicators, and constitute the whole construct (Cronin Jr & Taylor, 1994).

On the other hand, by definition, expectations reflect consumer ideas on service outcomes in comparisons, and can be expressed as reflective indicators (Khalifa & Liu, 2002). Taking into consideration the nature of expectations of being customer anticipation rather than knowledge about certain characteristics, and the critical role of previous experience and available information in forming them**,** it is possible that the change in one indicator will trigger the change in others measurement items. This, in turn, is the attribute of reflective measurement principle. Following the definition, accepted from the previous studies on customer satisfaction (Chan et al., 2003; Song et al., 2011) the study preliminary hypothesises tourist expectations about personalised information service as reflective latent construct. However, this viewpoint requires further justification, which can be acquired empirically in the exact context.

3.2.1.3.2. Perceived Performance of Personalised Information Service

The extensive research related to service performance and service quality demonstrates that these concepts can be operationalised in a variety of ways. The early framework (Parasuraman et al., 1985) defines service performance with a range of attributes. However, its later development demonstrates that such attributes can be grouped in major dimensions (Parasuraman et al., 1991), clearly pointing at the opportunity to operationalise service performance as a first – or second-order construct.

An argument for first-order construct is the decreased complexity of the model and the questionnaire. A number of studies (e.g. Collier & Bienstock, 2006; Dickinger & Stangl, 2013; Hsu, 2008), that investigated perceived service performance in the context of digital environment, confirmed direct relationships between some of the proposed attributed and overall perceived performance. While emphasising more global influencing forces of a construct, single level of abstraction would not allow to assess specific effects of personalisation on perceptions on service performance.

The hierarchical view of information service performance, including the framework of information system success (Delone & McLean, 2003a; Delone & McLean, 2016; Stacie et al., 2008), accepted as a theoretical background of this study, emphasise that the attributes of perceived performance are derived stepwise from different processes of value formation within service ecosystem. This creates the second-order latent construct, where the HOC is represented by global dimensions of information service performance, and LOC is a detailed specification of each dimension. While higher-order presentation of information service performance is also possible, the LOC of information system success dimensions is the level of personalised information service attributes, experiences by tourists. Taking into consideration that the study accepts customer-centric view,

second-order construct specification is believed to be beneficial to answer the articulated research questions.

Depending on the definition and, more specifically, on the way each technical or functional sub-dimension is described and their interchangeability, service performance can be conceptualised either as second-order formative-reflective or formative-formative construct (Hair Jr et al., 2017; Petter et al., 2007). According to the accepted customer-centric definition of service performance, it is formed by customer evaluation of observed technical of functional service attributes (Grönroos, 1984; Santos, 2003), i.e. customer perceptions on it are built after experiencing certain independent functional or technical characteristics of the service (Becker et al., 2012). Unfortunately, due to the complexity of estimations, existed before, as well as lack of awareness about alternative approach, a range of studies still follow previously accepted practice of using the procedures, relevant for reflective constructs, to validate service performance measurement (Diamantopoulos et al., 2008; Hair Jr et al., 2016). Comparison of the properties of personalised information service major dimensions (HOC) and their attributes (LOC) with the properties of formative and reflective measurement principles (Table 3.3) demonstrates that both levels of abstraction correspond to formative on. Therefore, personalised information service performance is conceptualised by this study as a second-order formative-formative latent construct.

3.2.1.3.3. Co-Created Value-in-Context and Satisfaction

Customer value can also be operationalised in several ways. A range of studies define value as a global overview of the cost-benefit acquisition and, in turn, as a first-order reflective construct (e.g. Chan et al., 2003; Song et al., 2011). However, according to SDL, customer value is a multidimensional phenomenon, which is co-created or co-destructed at each of the experiences resource integration process (Akaka, 2007). Therefore, each time value is caused by different

events and the overall perception of value is formed as a sum of acquired or lost benefits, which corresponds to the characteristics of formative measurement principle.

In terms of the levels of abstraction, it is also possible to define co-created value as a first-order or second order constructs. When exploring the specifics of value co-creation and consequent behavioural change, Barroso & Picon (2012) and Gallarza et al. (2017) follow reflective-formative second-order approach, assuming that value is a sum of acquired costs and benefits, where the change in tourist perceptions on each dimension may trigger different behaviour intentions, but each dimension is a reflection of conceptually-similar perceptions, that change according to the change of the overall dimension. When focusing on the exact principle of multidimensional value co-creation by multiple processes of resource integration experiences, Ranjan & Read (2016) operationalised the concept as a second-order, formative-formative latent construct. In the context of information service, such approach is also consistent with the framework of tourist information needs (Choe et al., 2017) with the assumption that perception of acquisition or loss partially reflects the needs that triggered interactions with the information service. Therefore, second-order specification provides more comprehensive view on the way overall perception of co-created value is formed.

However, the focus of the present study is the process of satisfaction formation with value being one of the hypothesised predictors under perceptions of information service that are influenced by personalisation. Specification of the constructs as higher-order entities add complexity to the conceptual explanations of the hypothesised relationships, as well as to the questionnaire design and statistical validation (Becker et al., 2012; Hair Jr et al., 2017). To focus on the articulated objectives, the study follows the accepted definition of co-created value as being multidimensional concept and specifies the latent variable as a first-order formative construct.

3.2.1.3.4. Satisfaction and Loyalty

Satisfaction with service in the meaning of the overall judgement on the interactions with the service is usually conceptualised as being described with tourist reflections on this service. As it was discussed in Chapter 2, the study accepts this perspective, as well as the construct operationalisation of being defines as first-order reflective construct with the 3 validated indicators. Considering that the meaning of loyalty in service management and in information technology management is similar and reflects customer intention to use the service again and the willingness to recommend the service to others, the study hypothesises Loyalty as a first-order reflective construct.

3.2.1.3.5. Reflective Scales for Testing Convergent Validity

To generate the reflective scale, the study followed the deductive approach of hypothesising the meaning based on the theory and supporting or further elaborating it based on the empirical study (Cheah et al., 2018). Drawing from the definition of personalisation and an assumption that it may improve or decrease information service relevance for an individual in a certain context, the study proposed 4-item scale related to the usefulness, convenient and reliability of the app for app-related task completion in a travel context for Co-Created Service Performance. In terms of Co-Created value, the items were hypothesised as reflecting the efficiency to contribute to travel experience.

3.2.2. Specification of the Structural Model of Tourist Satisfaction with Personalised Information Service

The study builds on the widely accepted model of tourist satisfaction. Following the process of mutual resource integration and value co-creation along customer journey (Greer et al., 2016), tourists first develop pre-consumption expectations towards the service, then experience

interactions with the service system, followed by immediate and long-term assessment of service performance and co-created and co-destructed benefits, as well as the overall long-term judgement about the service and related behavioural intentions. The direct relationships between the abovementioned constructs have been confirmed by multiple studies. Specifically, both expectations and post-consumption perceptions on service performance are found to be predictors of value and satisfaction with the service (Churchill Jr & Surprenant, 1982; Oh, 1999; Song, 2009). Being consistent with expectations – perceptions gap (Parasuraman et al., 1985), high expectations in tourism context are observed to lead to low satisfaction with the service (L. K. Chan et al., 2003; Y. Chen et al., 2013; Song et al., 2011). However, the effect is outlined as dependent on the context of service consumption (Cronin Jr & Taylor, 1992) with the relationships between these variables sometimes being not significant.

Value is the concept and the construct, which brings together co-created service performance as a value proposition (Gummesson, 2008b), and satisfaction as one of the long-term outcomes of co-created value (Kuzgun & Asugman, 2015). It is confirmed that there is a direct influence of the perceived service performance on perceived value (Chen et al., 2013; Kuo et al., 2009), and, consequently, overall satisfaction with the service (Flint et al., 2011; Kuo et al., 2009; Ranjan & Read, 2016; Vega-Vazquez et al., 2013). However, depending on the context of decision making, the important antecedents and the consequences of value may also vary (Oh, 1999). Importantly, conceptual development on S-D logic stress the presence of mutual interdependence of the service system components (Vargo & Akaka, 2009). Therefore, possible partial overlap in the meanings of the constructs and partial influences between them, is not the problem of vague definitions, but the realistic illustration of the world (Gummesson, 2008b).

As a result, the present study proposes a preliminary conceptual model of tourist satisfaction with personalised information service (Figure 3.3.) and articulates the following hypothesis to be further explained empirically:

H_1: Tourists expectations on personalised information service have a direct positive influence on co-created performance
H_2: Co-created personalised information service performance has a direct positive influence on co-created value
H_3: Co-Created value of personalised information service has a direct positive influence on tourist satisfaction
H_4: Tourist satisfaction has a direct positive relationship with tourist loyalty
H_5: Tourists expectations on personalised information service have a direct positive influence on co-created value
H_6: Tourists expectations on personalised information service have a direct positive influence on their satisfaction with the service
H_7: Co-created personalised information service performance has a direct positive influence on tourist satisfaction
H_8: Co-created value has a direct positive relationship with tourist loyalty
H_9: Co-created service performance and value mediate the relationships between tourist pre-consumption expectations towards personalised information service and their satisfaction

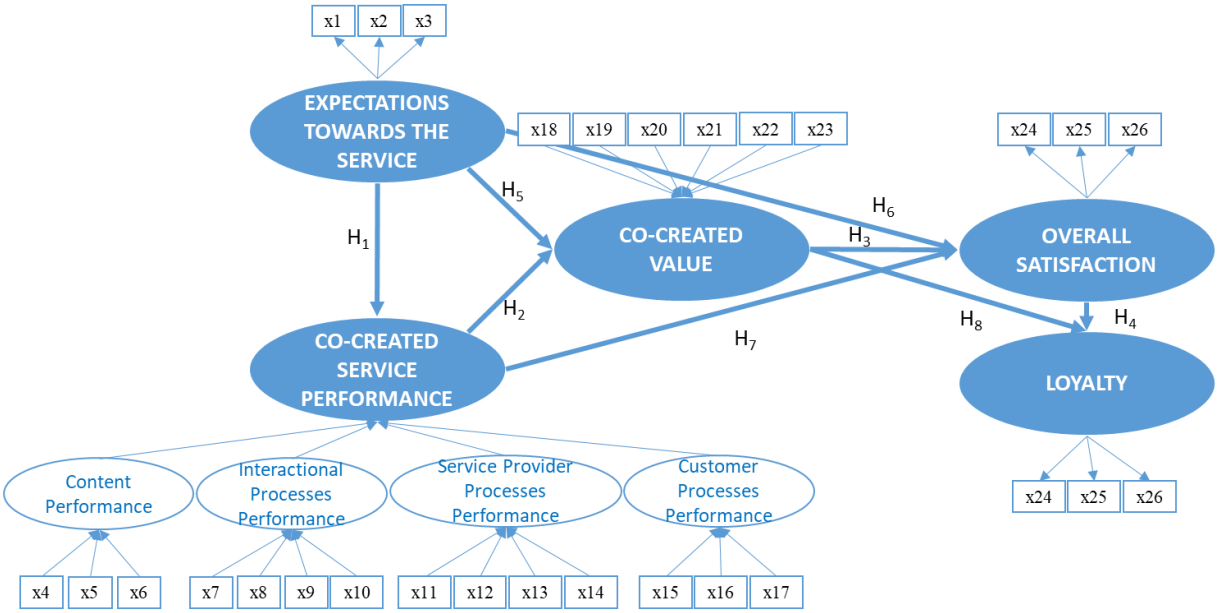


Figure 3-3 Conceptual Model of Tourist Satisfaction with Personalised Information Service

3.2.3. Conclusion

The conceptual literature review proposed an integrative model of tourist satisfaction with personalised information service, which required further specification and operationalisation. Following the systematic literature search and qualitative content analysis of the selected research papers, the study preliminary conceptualised tourist expectations, satisfaction and loyalty as the first-order reflective latent constructs. The proposed co-created service performance is theoretically specified as a second-order formative-formative latent construct. The co-created value is preliminary operationalised in relation to correspondence to tourist information needs. However, in the context of this study is it simplified to the level of the first-order formative latent construct. The structural relationships within the model were hypothesised based on the consumer behaviour theory and previous findings of the classis tourist satisfaction model. It is believed that due to the focus of the study on the performance of attributes of co-created service performance, and due to the arising limitations of the data collection, the above named specification of the

proposed model is the optimum way to explain the relationships within the proposed model in order to efficiently meet the research aim. However, the proposed specification of the model should be empirically verified and, if necessary, refined, for the context of personalised information service in tourist.

3.3. Phase 2: Empirical Explanatory Qualitative Inquiry

Explanation of relationships within a conceptual model and development of a measurement scale requires both a strong theoretical background and adaptation to the context of the explored phenomenon. Taking into consideration that the model of satisfaction with personalised information service has been hypothesised based on the research from different domains, related to IS performance or tourist behaviour or personalisation, its verification and potentially refinement within tourism context is essential to ensure the external validity.

Phase 2: Empirical Explanatory and Confirmatory Inquiry			
RQ3	What are the specific attributes, relevant to describe tourist interactions with personalised information service in tourism context?	To refine and further elaborate the proposed measurement scales for the model of tourist satisfaction with personalised information service	Individual in-depth semi-structured interviews / Qualitative content analysis
RQ4	How interactions with the identified attributes influence tourist perceptions on the co-created personalised information service, co-created value, satisfaction and intention to use the service	To explain the cause-effect relationships and hierarchy within the model	Individual in-depth semi-structured interviews / Qualitative content analysis
RQ5	How specific tourist context may shape tourist expectations towards personalised information service, the assessed co-created service performance and value affect their satisfaction and intention to use to the service?	To explore possible mediating and moderating effect on the hypothesised cause-effect relationships within the model	Individual in-depth semi-structured interviews / Qualitative content analysis

Phase 2 of the present study aims at further explanation and potential refinement of the hypothesised model based on empirical qualitative inquiry, placed in the context of tourist interactions with personalised websites and mobile applications by answering in the RQ 3-5. Figure 3.4. summarises the applied research design of Phase 2.

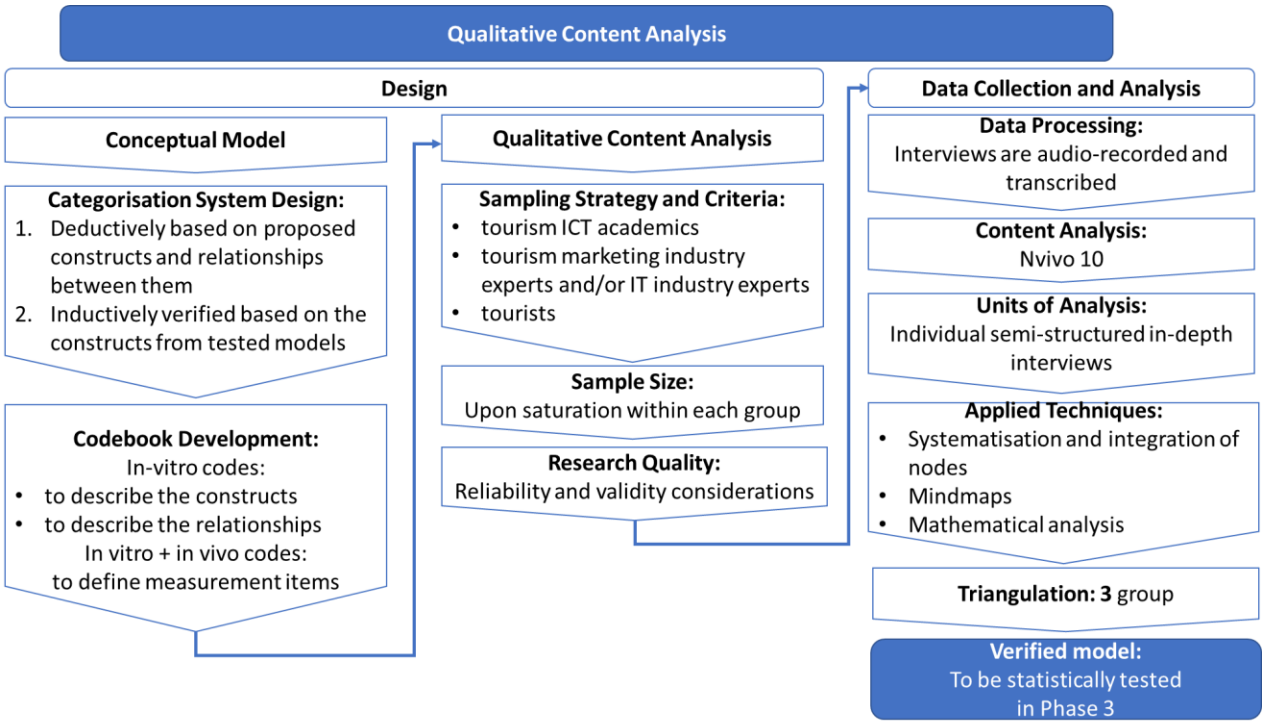


Figure 3-4 Empirical Explanatory and Confirmatory Inquiry Design

3.3.1. Qualitative Content Analysis: The Rationale for In-Depth Semi-Structured Individual Interviews

Qualitative research applied non-quantifiable data in order to answer research question (Saunders et al., 2012). It is advantageous in the situations, when complex and detailed understanding of the phenomenon in the context of inquiry is required. Therefore, qualitative research can be used to create a fit between the articulated problem and quantitative analysis with valid measures (Creswell & Poth, 2017).

Content analysis is one of the methods that is often applied in social sciences (Creswell, 2013a). Content determines the data under investigation, so that its analysis reveals the meaning of this data. Content analysis enables systematic study of acquired information (Prasad, 2008). It is often used to aid measurement and develop measurement scale, as well as to give reliable and credible explanation of hypothesized relationships between variables (Bryman & Bell, 2015). Therefore, content analysis was accepted as an analytical procedure to verify the proposed attributes to be used as a measurement scale for the latent constructs and further explain the relationships between the expectations, perceptions on co-created personalised information service performance, co-created value, satisfaction and loyalty.

Among the variety of qualitative methods, semi-structures individual and group interviews are useful in case a study requires in-depth insights to explain an explored phenomenon. Interviews represent a type of interaction between a researcher and an individual or group of individuals. They allow to explain the phenomenon from human subject's perspective in the way he or she experienced it within a certain context, thereby, constructing knowledge during the process of these interactions (Creswell & Poth, 2017).

Focus group interviews is one of these qualitative data collection methods, widely applied in service management (Quinlan, 2011). It is a free-flowing discussion, that engages a group of participants into active conversation (Dwyer, 2012) to explain, justifying or reject certain point of view (Saunders et al., 2012; Zikmund, Babin, Carr, & Griffin, 2013). The advantage of focus group as a research technique is that it can help to gather multiple perspectives on the topic (Saunders et al., 2012; Zikmund et al., 2013), to quickly identify similarities and differences in the expressed views (Hennink, 2007; Stewart, 2017), to oppose opinions, to dynamically develop new ideas, and to generate unique insights (Hennink, 2007). Therefore, focus group interviews are often used for

diagnostics of conceptual development (Stewart & Shamdasani, 2014; Zikmund et al., 2013) and generation or testing of the key themes or items, that can be used to describe the phenomenon and consequently applied in the confirmatory quantitative stage (Hennink, 2007; Saunders et al., 2012).

However, focus group interviews are associated with several limitations. First, limited time of the conversation (up to 1.5-2 hours) does not allow to focus on multiple issues. Second, the dynamics of data collection is affected by the range of intrapersonal (i.e. demographics, personality, and physical characteristics of an individual), interpersonal (i.e. group compatibility, its cohesiveness, social power, and verbal vs non-verbal communication), and environmental (i.e. physical location and time settings, special arrangements, the role of moderator and interpersonal distance) factors (Salmons, 2009; Stewart & Shamdasani, 2014). Each of these factors might direct individual behaviour of all focus group participants, including interviewees and a moderator, as well as indirectly influence behaviour of other participants within a group (Stewart & Shamdasani, 2014).

In the context of the present study, which is done in the mixed context of industry vs academics vs personal opinions, and in the context of mixed Asian vs. Westerns cultures, application of synchronous focus groups was expected to create a group of limitations. Firstly, belongingness to one industry and potentially pre-existing acquaintances increases probability of subject and authority bias, or prestige bias, which are related to deliberately overemphasised role of meanings, provided by senior participants, and consentient or unexpressed opinions of junior staff (Quinlan, 2011; Saunders et al., 2012). Secondly, peer-related collectivism (Hennink, 2007), and high power distance (Stewart & Shamdasani, 2014), which are especially relevant for Asian societies, might contribute to prestige bias. Thirdly, interviewees, who represent individualistic culture, often adopt low-context communication by expressing their ideas directly and clearly. On the contrary,

collectivistic cultures are associated with high-context communication and less externally articulated thoughts and more passive participation in discussion (Hofstede, 2017).

Individual interviews are especially beneficial in the research with explanatory objectives. Face-to-face conversation enables generation of rich insights to justify cause-effect relationships. Importantly, an interviewer has flexibility to probe in order to motivate the respondent to cover specific topics in more details or to clarify interpretations (Saunders et al., 2012). While providing similar opportunities to compare and oppose opinions, individual interviews create the opportunity to minimise cultural bias by adjusting to each interviewee and establishing close personal contact (Creswell, 2013a). Despite individual in-depth interview method requires sufficient time expenses in comparison to focus groups (Quinlan, 2011; Stewart & Shamdasani, 2014), they are believed to be more advantageous for the present study. In-depth interviews allow direct and non-restricted communication between the research and the interviewee, and, as a result, detailed explanation of the research phenomenon.

The study gives preference to semi-structured type of interview over structured one. This stage of the research has explanatory and confirmatory objectives, and the subtopics with consequent codes have been developed at the stage of conceptual development based on the existing theories. The semi-structured interviews allow to ensure that the interviewees have enough flexibilities to explain the meaning ascribed to the defined phenomena, and that all the required topics are covered (Aaker, Kumar, Leone, & Day, 2013; Saunders et al., 2012). The specifics of the interview design and procedures are discussed below.

3.3.2. Sampling Strategy

3.3.2.1. Target Population

The phenomenon of the study is implicitly personalised content of a website or mobile application. The intangible nature of information and IS in general together with the potential tourist unawareness about personalisation being applied, makes it complicated to match the exact personalised content characteristics with tourist perceptions on them. To acquire a comprehensive understanding of occurred interactions and ensure that no important events are missing due to lack of attention from users at a certain stage of interactions, the study applied triangulation of data sources. It brings together the experience, knowledge and opinion of 3 different groups of respondents (tourists, industry practitioners and academics). Such strategy is also helpful to ensure data validity (Creswell & Poth, 2017).

Purposive sampling in qualitative research enables collection of appropriate data and ensures content validity (Morgan, 1998). To support the research with relevant data, the participants have been chosen according to the set of criteria (Table 3.4). While there is a danger that opinions of professionals will be distinct from the general population (Zikmund et al., 2013), this approach is common in testing conceptual development, because it helps to ensure credibility of acquired data (Corbin, Strauss, & Strauss, 2014).

*Tourists: T*he research is interested in Hong Kong tourist satisfaction from personalised information service, applied in the context of tourist destinations. Therefore, the study invited Hong Kong residents, who used at least one of the personalised travel websites or mobile applications for travel arrangements before and during the trip. Individual perceptions vary depending on the abovementioned factors, thereby, increasing the complexity of analysis.

However, heterogeneity of interviewees experiences within different contexts of tourism is believed to be advantageous for generation of multiple explanations and comparison between them. Therefore, the study did not place any restrictions by race, nationality, education, income, social status, and gender as selection criteria for this stage. The interviewees were encouraged to share the main details to enable better interpretation of their travel experience and the needs that triggered interactions with personalised application in the context of tourist destinations.

Table 3-4 Interviewees selection criteria

Interviewee group	Selection Criteria	Number of Interviewed
Tourists	• Hong Kong citizens or permanent residents • Lived in Hong Kong for at least 5 consequent years • Came of legal age • Have travel experience • Arranged the trip themselves or together with travel companions • Paid for the trip themselves • Used one of the personalised travel websites or applications	6
Industry experts	**Marketing experts:** • Currently engaged in marketing and customer relationships jobs in tourism or hospitality • Education in marketing/ management/ tourist (preferably) **User Experience and IT experts:** • Currently engaged in software development jobs • Have experience with personalisation algorithms/ user interface design/ user experience	4 3
Academics	• PhD in Tourism or Hospitality • Expertise in tourism marketing and ICT	4

Industry practitioners: Experts are assumed to have relevant and up-to-date knowledge in the explored domain. Therefore, their opinion is often applied to verify conceptual development, related to consumer behaviour, and to get the insights of the business processes and company-related expertise. The concept of personalised information service is set on the boarder of consumer behaviour and HCI domains. To ensure the relevance of expertise and holistic overview, the study invited industry representatives from tourism and hospitality digital marketing, whose current job is related to tourist behaviour analysis and digital strategy development, as well as IS

developers, who work with user interface development and user experience improvement. Additional criterion for industry representative's selection was the work experience in the abovementioned domains of minimum of two years.

Academics: Same as industry experts, scientists have specific theoretical knowledge and practical experience. To fill the potential gaps in conceptual development and to provide more holistic explanation of the observed phenomenon, tourism academics were considered as additional target group for data collection. The study invited the experts, who are currently involved in the academic research in tourism & ICT domain, as well as S-D logic and value co-creation. Additional criterion for interviewees selection was completed PhD.

3.3.2.2. Sample size

The main requirement for the qualitative interviews sample size is the capability of data to generate meaningful and reliable findings (Creswell & Poth, 2017). The concept of theoretical saturation explains that data collection should be continued until the acquired sample allows to answer all research questions and no new ideas appear in the preceding units. Such approach is also consistent with the pragmatic research paradigm, which explains that knowledge is derived from commonalities in the inquiries and requires to ensure the presence of repeating ideas in addition to exhaustive explanation.

The exact number of the interviewees can range from few to several dozens, depending on the nature of inquiry, research questions, research context and heterogeneity of participants. Guest et al. (2006) suggest in case of in-depth interviews, each one of about one hour long, twelve interview would be enough to reach saturation. According to Kuzel (1992), homogeneous samples may require from six to eight participants, while heterogeneous samples – from twelve to twenty.

To identify the trends, commonalities and unique ideas within each of the target groups of and decide on the level of saturation, the preliminary analysis of each interview in the form of mind mapping was performed. In case of tourists, the ideas were consistent among the participants regardless of the age, educational level or family status, and saturation was reached at the 5th interview. Taking into consideration that tourists referred to their subjective experiences, one more interview was done to enrich the findings. In case of the academics, whose expertise is already based on the validated theoretical knowledge, 4 interviews were considered as relevant sample to explain tourist judgements and behaviour towards the personalised information service. Lastly, the advantage of the industry experts' opinion is that it is based on the broad knowledge and practically elaborated solutions. The preliminary analysis identified two distinctive sets of ideas on improvement of personalised information service performance, articulated by marketing and IT and User Experience (UX) experts. However, within each group the discussed ideas matched significantly. 7 interviews with the experts allowed to explain the observed perceptions on the service. Due to the discussed reasons and taking into consideration the time limitations, 17 interviews were conducted in Phase 2 of the study.

3.3.3. Data Collection and Management

3.3.3.1. Online and Face-to-face Individual Interviews

Generation of discussion flow requires comfortable and engaging atmosphere to be established. Such atmosphere can be achieved through the combination of certain factors. Though, a balance is required between maximisation of effectiveness of data collection and related costs.

Face-to-face interviews are proven to be an effective tool in assisting communication between a researcher and an interviewee. It creates more trustful atmosphere by supporting one-to-one

interactions, creating the possibility to observe the body language of individuals, and allows an interviewer to moderate the discussion in case the interviewee doe nor feel comfortable (Salmons, 2014). Physical location is one of the major restrictions, which is especially difficult in case of industry professionals and high-ranked executives (Quinlan, 2011; Ranjan & Read, 2016). Accessible and suitable place for an interview, which would be convenient and comfortable for the interviewees, requires additional financial inputs. These limitations become critical in case multiple interviews are required (Morgan, 1998).

Online interviews can be used as effectively as face-to-face discussions, as they support not only information transition, but also socio-emotional communication (Salmons, 2009). The boarder between face-to-face and online communication has been blurred due to massive acceptance of digital technologies and improved connectivity. Synchronous voice and video communication has become daily activity (Stewart, 2017), and do not affect respondents behaviour (Yoon & Vargas, 2014). Moreover, online interviews are proven to create more informal atmosphere, than traditional approach, which is believed to be beneficial in high hierarchy groups or societies (Tuttas, 2015). Online interviews are also beneficial to overcome the major limitations of face-to-face communication, related to physical distance and inflexibility of schedules. Virtual participation greatly expands the pool of potential interviewees (Salmons, 2014), enables sufficient time and monetary savings for participants, as they do not need to travel to any specific physical location, and provides great flexibility for planning (Stewart & Shamdasani, 2014). Online communication bring a range of technical advantages such as simultaneous recording and sharing of data, application of real-time translation, and, and the same time, lower cost than a face-to-face meeting (Salmons, 2009; Stewart, 2017). Therefore, despite some limitations, online interviews

can be used as an effective tool of data collection, and may help to improve sampling strategy, and, in the end, reliability of results (Stewart, 2017).

Taking into consideration the chosen sampling strategy, potentially lack of experience in being interviewed among tourist, as well as the location of the researcher, the interview with the tourists, who are Hong Kong citizens or permanent residents, were conducted via face-to-face appointment. The industry and academia experts, located in Hong Kong, were offered both opportunities of face-to-face and online interview. Those interviewees, located outside Hong Kong, were invited to participate in online conversation at the time, convenient for their time zone.

3.3.3.2. Recruitment Process

To crosscheck organisational issues and minimise disruptions, the recruitment process was done in two stages. At the first stage, the target individuals were invited by email or messenger. Cultural specifics and corporate culture ethics might not always allow an employer to accept invitations for research (Hennink, 2007). Depending on the invitees' job positions, cultures, as well as connections with the researcher, the invitations were sent either directly to the chosen individuals or to the corporate emails. At the second stage, the second email was sent to each participant few days before the event to reconfirm participation, to inform the participants about the planned meeting details, and to test the software for online meeting in the case of online interview (Tuttas, 2015). Following the requests, at this stage the main interview questions were also sent to some of the interviewees to minimise the observed discomfort (Morgan, 1998; Stewart, 2017).

In the case online communication was expected, an invitation letter containing the topic and the purpose of the research, an approved information sheet with the summary of the research format, details of the interview, time, software requirements, and the contact details of the researcher, as

well as informed consent were sent to prospective research participants. This was done to ensure that the interviewees have enough time to familiarise themselves with the research particulars, and to return the informed consent before the actual interview. In case of face-to-face interview, the abovementioned forms were presented to the participants at the beginning of the meeting before the interview to personally explain the details, to emphasise the significant research conditions and ethical considerations, and to acquire the informed consent form before conversation.

3.3.3.3. Interview Questions

Application of a discussion guide aims at providing interviewer with certain flexibility in directing and structuring the discussion to cover the specific issues or particular phenomenon the research is interested in (Saunders et al., 2012; Zikmund et al., 2013) while maintaining balanced representation of themes (Dwyer, 2012). It is also useful for minimising moderator bias and enabling effective interview management (Ayres, 2008; Zikmund et al., 2013). The main interview questions were developed in accordance with the existing research questions and structured in accordance with the common principle: to start with introduction and most general question, then move to a more specific issues, and conclude with the general question (Stewart & Shamdasani, 2014). In consistence with the 'topic' approach (Hennink, 2007; Morgan, 1998), different types of follow-up questions ranging from broad open-ended questions to the specific enquiries were provisionally developed to receive required information and to enable flexible moderation of data collection. To improve comprehension and time management (Stewart & Shamdasani, 2014), the interview questions were pretested by interviewing one academic and one tourist and adjusted according to the acquired results and the feedback from the participants. Appendix 3.4 summarises the discussion guide with the desired structure, topics and provisional interview questions to be

covered, the list of additional keywords to probe, and the time frame (Ayres, 2008; Zikmund et al., 2013).

Appropriate language enables exchange of ideas and transfer of correct meanings, as well as establishes comfortable atmosphere for an interviewee, thereby, enabling reliable findings. Despite English is not the mother tongue for most of the interviewees, the decision to avoid interviews in Mandarin or Cantonese languages was taken because of the following reasons. First, all the participants speak English fluently. The tourists have received education in Hong Kong and use English in everyday communication, as well as for travel. Industry and academia experts use English as the main language of professional communication. Second, the study is guided by pragmatism and aims to investigate the community of inquiries with the task to identify common trends of interactions with personalised information, rather than into unique in-context experiences. Therefore, potential inaccuracies, committed by the interviewees in the presentation of the ideas, did not create limitation for the data validity of the in-depth interviews. Third, despite understanding of questions and expression of ideas is easier in native language, in-depth interviews with the target population would have led to sufficient monetary expenses. Such expenses would have been related with hiring and training of several interviewers, whose native language would be the same with the interviewees, and consequent translation from these languages to English to enable analysis. Importantly, inaccurate translation of specific lexis might affect the meanings, affecting reliability of the findings. As so, the sixteen individual in-depth interviews, where the interviewee had an opportunity to probe the answer to trigger the detailed explanation of the meanings, were conducted in English language. One interview was conducted in Russian language, because the expert felt more comfortable about expressing his ideas in this language. The interview was translated by the researcher, followed by the check, made by professional interpreter.

3.3.3.4. Data Collection and Management Procedures

The procedures of data management may affect the research findings, as well as have ethical and legal implications (Creswell & Poth, 2017; Resnik, 2018). To ensure reliability of findings, qualitative data requires systematic approach in storing, organising, analysis, interpreting, and presentation (Creswell, 2013). In particular, data management should not affect the analysis procedures and research findings. It should also meet the requirement of correspondence to the existing norms and regulations. The researcher must take appropriate steps for acquiring high-quality data, for securing these data from damage or loss, as well as from the unauthorised access of the third parties.

3.3.3.4.1. Interview Arrangements

In case of online interview, applied software should support the required type of conversation, to be available for all participants, to correspond to available technical specifications of researcher's and interviewees' hardware, and, importantly, to be familiar to all focus group participants (Salmons, 2014). A range of popular applications for desktop and mobile computers, such as Skype, WhatsApp, Facebook Messenger, Viber support audio and video synchronous communication between the interviewer and the interviewee (Stewart, 2017). The abovementioned software also supports data encryption, which allows to ensure that discussed information is securely transmitted between participants and without possibility for the third parties to access it. The invitees were offered to choose a suitable application for themselves.

Face-to-face interviews were conducted in Hong Kong. The choice of the place plays important role in creation of comfortable and non-disruptive environment (Creswell & Poth, 2017). Depending on each interviewee preferences, they were invited either to the PolyU SHTM

premises, or the local coffee shops and restaurants for conversation at the chosen by interviewee location.

To enable discussion flow and to ensure content validity of the collected data it is important to familiarise the interviewees with the topic (Salmons, 2014). In addition to the information sheet, at the beginning of conversation each interviewee has been introduced to the purpose of the study, its procedure, and the main concepts, applied in the study. Following the result of the pilot study, industry and academia representatives were introduced to the working definition of personalisation and satisfaction from personalised information service to enable consistency. Due to the fact that tourist may have relevant expertise in the applied concepts, they were asked to briefly introduce themselves and to reflect on their travel experience together with the application of specific websites or mobile application on the different stages of customer journey. This enabled the interviewer to adjust the interview questions so that they stimulate tourists to share their opinion on personalised information service based on experiences cases and examples.

3.3.3.4.2. Data Management

It is essential that acquired data is of high quality, so that no meaning can be lost (Creswell & Poth, 2017). Sixteen interviews were audio recorded with the professional voice recorder, that enables high-quality of record in different environments. Despite being assigned by the senior executive, one of the participants did not granted her consent neither for audio recording, nor for answering the exact interview questions. However, she agreed to share and discuss the practices of her company in relation to personalisation of information service for tourists, and to give her consent for note taking.

Individual transcripts were done by the researcher to enable additional interactions with the data and increase familiarity with the text (Saunders et al., 2012). The transcription was done with the application of Google Voice Typing techniques, which allows the researcher to make notes by dictating the conversation to the machine, enabling sufficient time savings. To ensure the correct transcription, the text was consequently compared with the audio-recording for 2 times. The sample of the transcript is presented in the Appendix 3.5. The interview, recorded in Russian, was transcribes in Russian, and then translated to English language by the professional interpreter. Overall, the 17 interviews involving 6 tourists, 7 industry experts and 4 academics lasted from 30 to 65 minutes and resulted in 12 hours and 55 minutes of records.

The safety of data and anonymity and security of the participants should be protected by data storage and management procedures (Resnik, 2018). The functionality of the cloud storage allows the research to access the data from multiple devices, to recover the files in case of unexpected damage or deletion, and to restrict access to the third parties to the data. The recoded files were saved at the researcher's cloud storage (OneDrive) with no access being granted to any other third parties, and all personal devices of the researcher being protected by the password. The files will be destroyed upon the completion of the research.

3.3.4. Data Analysis

Qualitative data analysis requires systematic approach that constitute of a set of explicit procedures to ensure reliability and validity of findings (Corbin et al., 2014). Such procedures engage a researcher in the spiral process of interactions with the data (Figure 3.5) rather in a linear approach in analysis (Creswell & Poth, 2017).

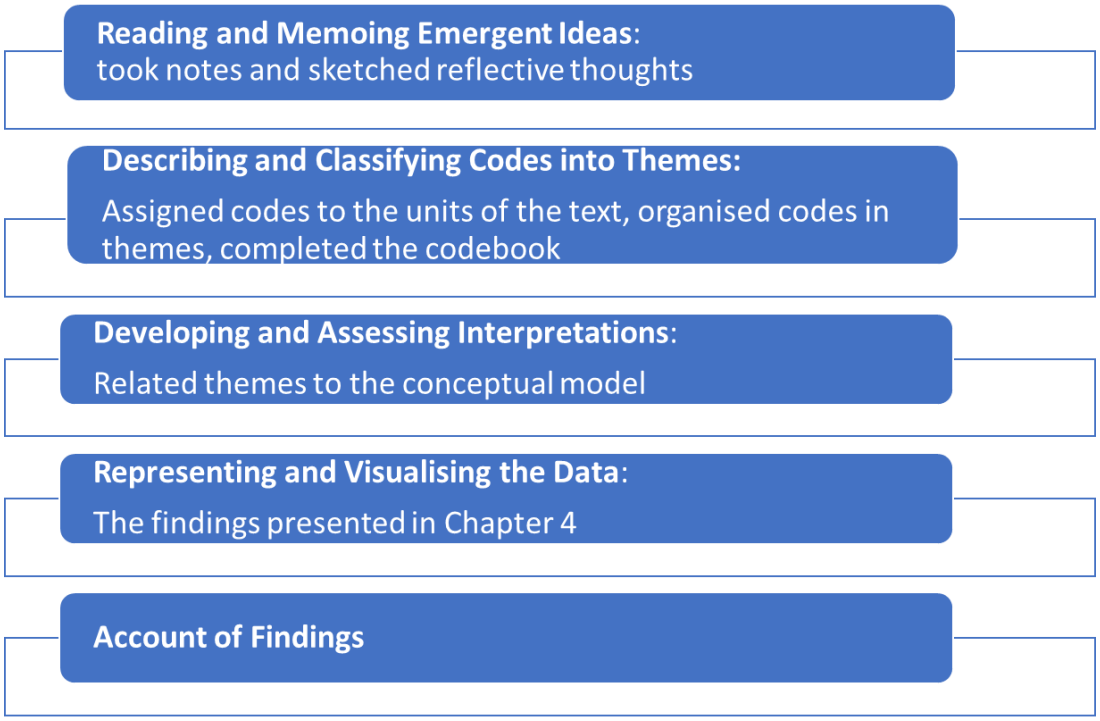


Figure 3-5 Data Analysis Process

3.3.4.1. Reading and Remembering Emergent Ideas:

Notes and sketches are advantageous in qualitative data analysis because they allow to create digital audit trait of the ideas and findings. Retrieving and examining the notes taken over time to compare the findings and clarify inconsistencies is used as one of the validation strategies in content analysis (Creswell & Poth, 2017). The first stage of analysis included reflection and note-taking during and immediately after the interview to outline the milestones and specifics of each interview (Salmons, 2014). The second round was done after transcribing each interview and reading the whole file. The notes and the frameworks were saved in MS Word and MS Power Point accordingly.

3.3.4.2. Describing and Classifying Codes into Themes:

Coding is a central process of data analysis in qualitative research. It includes aggregating content into categories, looking for similar categories along the collected data sources and assigning labels to the codes (Creswell & Poth, 2017). Coding procedures vary depending of research objectives, type of information available for analysis and scope of analysis. It is common to distinguish in vivo and in descriptive coding. In the first case, names and the following description of codes are derived from the content and corresponds to the exact words of participants, which is useful to fulfil the exploratory objectives. In the second case, names and meanings of the codes are developed based on existing literature, which is relevant for focused explanatory and confirmatory analysis.

The units of text, which should be assigned to codes, can be distinguished based on syntactical, physical, categorical, thematic or propositional differences (Krippendorff, 2013). The choice of the distinctive attributes to form text units for coding should be primarily guided by the purpose of the study and the research questions. However, reliability of content analysis directly depends on the naturally occurring and intuitive coding (Krippendorff, 2013).

Syntactical distinctions are based on natural grammatical structures, such as sentences. Physical partitions of text can be identified by volume, length, or size of the text. Same as in case of syntactical coding, physical partitions represent an easy way to form codes. These approaches are convenient for application of automatic coding of large volumes of data. However, neither physical nor syntactical distinctions do not guarantee reliability of data analysis, because the complexity of speech leads to the thread of missing knowledge that should be attributed to the specific code.

Categorical distinctions are based on identified attribute of the text, such as references to a particular person, event, or concept. Categorical coding is therefore advantageous for meeting confirmatory objectives. In comparison to categories, thematic distinctions are based on identifying similar themes, such as reasoning, idea and thoughts, and can incorporate several categories. Text units, based on categories and themes, enable rich description and in-depth explanation of an observed phenomenon. Propositional distinctions can identify units of text by corresponding to specific constructions, such as presence of semantic relationships or grammatic propositional form.

The main research questions of the qualitative phase are explanatory and confirmatory in nature. Therefore, the study applied combination of different types of coding and text units' distinction principles (Table 3.5). To verify conceptual model and to frame the analysis within the borders of the defined phenomena, content analysis applied descriptive codes and categorical distinction of text units for coding based on the concepts. This guaranteed efficiency of content analysis. First, this allowed the researcher to quickly code the collected interviews. Second, extensive research in the field of expectations, perceived service performance and value allowed to minimise potentially unreliable results, related to different interpretations and wording in the text. Therefore, to classify dimensions of each concept, the study utilised descriptive coding and the themes, identifies based on it. Together they were expected to provide rich interpretations to operationalise each dimension and to explain the relationships between them.

The development of a measurement instrument requires the all relevant attributes to be included in the analysis. This is especially important in the case of formative constructs. In vivo coding with categorical distinctions were applied to reflect the views of participants and to minimise the risk of missing an attribute, which was omitted at the conceptual development stage. Lastly, thematic

in vivo coding was applied to analyse the remaining text to identify possible factors, that are not included in the theoretical framework.

Table 3-5 Coding Principle

Types	Descriptive Coding	In vivo coding
Categorical Distinction of units	Expectations, Co-Created Service Performance, Co-Created Value, Satisfaction, Loyalty (factors)	
Thematic Distinction of units	Dimensions of factors	Attributes of factors and their measures
		Relationships between attributes
		Other Emerged topics (moderator)

Generation of reliable findings require multistage coding procedure, which should consider the possibility to revise initial codes to a more general or more detailed categorisation during the next rounds of coding (Creswell & Poth, 2017). The first round of coding was done by the researcher and included assigning descriptive codes and generation of in vivo codes with the consequent comparison of the results with conceptual development. The preliminary codebook Appendix 3.6, which included the names of the code, conceptual definitions of each concept and an example from the text to illustrate the logic of in vivo coding, was developed. Such steps allowed to keep the analysis within the defined boundaries and to ensure the absence of overlapping topics in identified categories (Creswell & Poth, 2017).

The second round of coding, which is one of the ways to ensure reliability of findings in qualitative inquiry (Creswell, 2013a), aimed at matching and comparing the developed and acquired definitions and explanations. Additionally, the data and the preliminary codebook with the required guidelines was shared with the external coder, who had the relevant qualification to perform the analysis. The researcher had a degree in Tourism Management and Marketing, as well as the expertise in qualitative content analysis. The coder was asked to apply the descriptive codes to the text and to develop in vivo codes for the factors' attributes and the content, that was not

included in pre-existing codes. The results of the second round of coding by, done by the researcher, was then compared with the outcome of an external coder. The achieved reliability (KALPHA = 0.883 of intercoder agreement) confirmed the reliability of data and enabled the development of valid findings (Appendix 3.7). The finalised codes and developed themes were used to revise and finale the initial codebook, which was consequently used during the next stage of data analysis to guide interpretations and assist with internal reliability check (Creswell & Poth, 2017).

3.3.4.3. Developing and Assessing Interpretations:

Interpretation in qualitative content analysis refers to organising of identified codes and themes into larger structures. It serves to identify and explain relationships between the observed phenomena, to acquire larger meaning from data and to contrast personal views and existing concepts and theories (Creswell & Poth, 2017). Qualitative content analysis often applies single strategy of making inferences from multiple parts of the text. However, this tactics does not distinguishes among textual properties, and, therefore, only allows to compare same type of inferences from multiple sources (Krippendorff, 2013).

Multiple research questions, which should be answered by Phase 2 of this study, require a set approaches in making inferences to be applied (Figure 3.6). In addition to thematic analysis, frequency analysis was additionally applied within the identified themes, related to the latent constructs' attributes, to identify the most appropriate indicators and wording for questions. The proposed inferences were first compared within the relevant group of respondents (i.e. tourists, industry experts and academics) to identify commonalities. The results were then triangulated between the three groups to construct comprehensive explanation and to draw generalisations. To

acquire peer feedback and further ensure reliability of the inferences the developed interpretations were further discussed with other researchers, who have expertise in the domain of tourism, consumer behaviour and ICT.

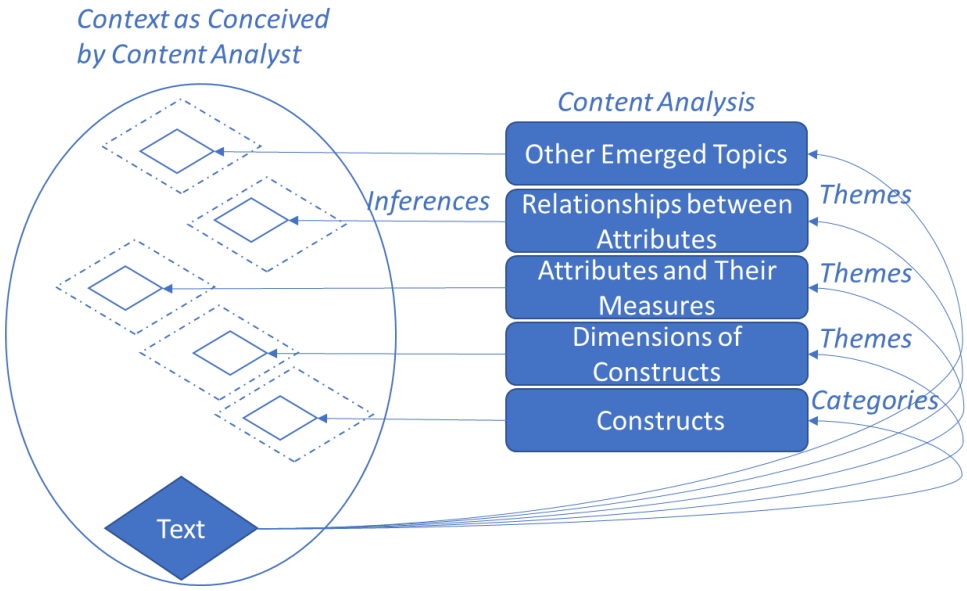


Figure 3-6 Content Analysis Design. Source: Adapted from Krippendorff (2013)

3.3.4.4. Representing and Visualising the Data

The findings were recorded following the research questions and the logic of the codebook. In addition to reflective writing, the study applied a range of techniques, including sketching, mind-mapping and graphic presentation.

3.3.5. Qualitative Research Quality and Limitations

Phase 2 of the present research has implemented a number of techniques to ensure validity and reliability of the findings. Table 3.6 summarises the most essential of them.

Despite multiple steps were applied to ensure quality, there are some limitation, that should be taken into consideration. First, it is the problem of self-reporting techniques. Interview questions

trigger specific memories of the experiences, which were idiosyncratically perceived in the context of use and interpreted later, creating the threat to data validity. However, application of additional data, such as real-time observations, would create additional burden for tourist and additional time and financial expenses for the research, while creating additional limitations for data analysis.

Table 3-6 Qualitative Research Reliability and Validity

Stage of Research	Applied Strategy	
Research Design	Triangulation of methods	Content validity
	Generating precise and rich descriptions of the concepts	Content validity
	Pre-test of the interview questions	Content validity
	Ensuring beneficence and non-maleficence of research: Formulations of the research objective to gain theoretical contribution and sufficient practical implications	Ethical validation
	Ensuring beneficence and non-maleficence of research: Checking correspondence to ethical norms and legislation standards in planning research process	Ethical validation
	Ensuring beneficence and non-maleficence of research: Acquiring permission from the ethical committee	Ethical validation
Data collection	Triangulation of sources	Content validity, Reliability
	Substitution of focus groups by in-depth semi-structured individual interviews	Content validity
	Application of professional voice recorder in a convenient research setting	Reliability
	Acquiring informed consent from the participants	Ethical validation
Data Analysis	Identifying potential researcher bias Triangulation of investigators via intercoder agreement	Content validity
	Codebook development	Findings validity and reliability
	Double coding and multiple investigators, reaching intercoder agreement	Content validity, reliability
	External peer review	Content validity
	Ensuring fairness of the procedures	Ethical validation
Reporting the results	Avoiding plagiarism	Ethical validation
	Presentation of findings in written and graphical forms	Face validity

From theory development perspective, the major limitations of interview as a qualitative data source and practically achievable sample size within given time, human and financial resources, is their incapability to generate results, which can be generalized to a target population (Quinlan, 2011; Zikmund et al., 2013). On the one hand, the qualitative phase of the study followed the principle of theoretical saturation and the requirement of pragmatic knowledge to be a common

idea. In case of the industry experts and academic researchers, the opinions are assumed to be guided by commonly observed and conceptually grounded patterns, accordingly. At the same time, consumer heterogeneity in general and the dynamic nature of tourists needs in different contexts may trigger a range of expectations and perceptions about personalised information service. Despite the findings are grounded in the themes, common for most research participants, it is important to acknowledge that more opinions or reasoning, which might lead to different interpretations, may exist. Larger sample of interviewees, especially of tourists, would be more beneficial to assure reliability of findings.

Another limitation related to purposive sampling criteria and the applied selection criteria for tourists. Tourists of different age may have different values and, importantly, knowledge and experience with personalised information services and other technologies. This, in turn, may shape their expectations and perceptions on co-created service, value and satisfaction. The study did not set age criteria. The age of the respondents varied from early 20s to middle 40s, which is the largest and the most active group of smartphone users (Nielsen Company, 2016). On the one hand, it is advantageous for establishing valid findings as personal and technical contexts are the important determinant of decision-making (Kotler & Keller, 2016). At the same time, according to Census and Statistics Department of Hong Kong SAR (2017), the percentage of smartphone users aged 45-54 in Hong Kong exceeded 95% and aged 55- 64 – 86% in 2017. Therefore, reliability of the findings in terms of representing the entire population of Hong Kong residents of legal age can be compromised.

3.3.6. Conclusion

Phase 2 of this thesis proposed qualitative content as the main data source and thematic qualitative content analysis, supplemented with identified frequencies of mentioning the elaborated themes.

To ensure a comprehensive explanation of tourist interactions with personalised information service attributes, the research design incorporates specific sampling strategy of accessing the opinions of the three distinct groups of participants and of triangulation of their perceptions and expert opinion. Following the conceptual development, the content analysis applies the combination of descriptive and in vivo coding and the predefined logic of making inferences for the elaborated themes and categories. The rigorous procedures of data collection and data analysis are expected to minimise possible bias and to ensure the high quality of the findings. However, several limitations of the acquired data are considered when making generalisations and integrating the findings of the qualitative and quantitative research phases.

3.4. Phase 3: Empirical Confirmatory Quantitative Inquiry

Quantitative research is associated with a range of potential statistical and non-statistical errors, including coverage error, sampling error, non-response and measurement errors. Together they increase the danger of acquiring invalid or unreliable findings (Biemer, 2010). To elaborate the measurement scales for tourist expectations, co-created performance and value for the analysis of personalised information service, and to refine and validate the proposed model (RQ6-7), the 3rd phase stage of the research aims to apply customer survey data analysed with a help of structural equation modelling. The case addresses Google Trips travel planner application as an example of the personalised information service, applied in the tourism context.

Phase 3: Empirical Confirmatory Inquiry			
RQ6	What is the appropriate measurement scale for the dimensions of tourist satisfaction model to reflect the specifics of personalised information service?	To validate the proposed measurement model	Online tourist survey/ PLS-SEM
RQ7	What are the significant cause-effect relationships between the identified factors and satisfaction with the service?	To assess the structural model of tourist satisfaction with the personalised information service	Online tourist survey/ PLS-SEM

3.4.1. Data Collection Methods

Data is one the main determinants of acquiring valid and reliable findings. The following subchapter discussed the specific on data collection with a help customer survey and explain the details of the applied strategy.

3.4.1.1 Sampling Strategy

3.4.1.1.1. Sampling Frame

This study is guided by pragmatism, which states that knowledge is action- and context - dependent. Pragmatic knowledge is derived from practice and experience (Chadwick, 2012). As it was discussed in Chapter 2, the parameters of internal and external context may affect research participants' perceptions on experiences personalised information service. There are observed differences between tourists from different countries and cultures in relation to technology adoption (e.g. Gretzel, Kang, & Lee, 2008; Law et al., 2014; Park, Yang, & Lehto, 2007), preferences towards web design, i.e. information content of websites and its presentation (e.g. Cyr, 2013; Law & Cheung, 2006; Rong, Li, & Law, 2009), demand and related consumption of travel services (e.g. Bae, Hough, Jun, & Ju, 2017; Chang, Kivela, & Mak, 2010; Rosenbaum & Spears, 2005) and information services consumption in the tourism context (e.g. Kang & Mastin, 2008; Law, Leung, & Buhalis, 2009; Rong et al., 2009). In addition to device settings, immediate destination and social context have significant effect on tourist preferences (Buhalis & Foerste, 2015). As such, different context situation may motivate tourists to give different replies on the same question (Harzing, 2006).

Consideration of all parameters of tourist context is problematic due to the time and financial restrictions of the study. Following the definition of the context of use, the context parameters can be limited to the dimensions, which are important for the current objectives (Kjeldskov & Paay,

2012). Considering the research phenomenon, technical context, travel and exact need (task) context of a primary concern of the following study. Multiple differences in perceptions among representatives of different cultures, observed by previous studies, require this internal context parameter, such as culture, to be controlled in addition to travel, technical and task contexts.

Technical Context

Currently travel market presents a range of applications that aim at supporting travel planning. Such applications have different functionality and different personalisation technology being applied to filter the content. Despite the proposed model does not incorporate the assessment of any specific technology, it should be acknowledged that system functionality would provide tourists with different experience (e.g. Cyr, 2013; Law & Cheung, 2006; Rong et al., 2009). Therefore, technical context should be limited to one case of personalised information service to ensure that the phenomenon of the study is the same for all participants, to provide consistent results, and to allow to outline the major trends in tourist perceptions.

The study investigates satisfaction with personalised information service based on the example of Google Trips application. First, it is one of the contemporary and widely used information services, specifically developed for the tourism domain. Google Trips represent the so-called travel planning applications, which aim at assisting tourist with storing the details of the trip in one place and at developing the personalised travel itinerary and attractions advise. This makes Google Trips comparable to multiple information services, that aggregate information from different vendors (e.g. TripAdvisor), which would enable generalisation of the model results to other travel planning tools. Second, the application is available for users via Google Play store and App Store. According to the requirements of these platforms, an application should meet minimum requirement for IS quality characteristics including system functionality and visual design. These requirements

guarantee conformance of an application to the general software quality standards. The trend of platformisation and unification of web designs user and interface principles, as well as massive proliferation of computing devices with high computation capacities, create similar technical experience with other software functions (Ghanam, Maurer, & Abrahamsson, 2012), unifying users expectations towards functional attributes of application. Third, in comparison to its competitors, such as MakeMyTrip or TripIt, Google Trips advances services in the tourism domain by enabling implicit personalisation, and application of the set of historical and real time context data parameters, which are applied to personalise tourist experience (Haselton, 2017). Moreover, being one of the Google services, it shares the same data and privacy agreement as all Google applications (Google, 2017). Therefore, the data, tracked by Google search engine or by smartphone Google applications, is automatically available for analysis in Google Trips. This enables real-time personalisation, which is non-intrusive for users, but allows the system to track the specific details of user context, such as updates in reservations of flight tickets and hotels, location, network details, device storage, etc. (Google, 2017). Lastly, the popularity of Google Trips has been growing in the recent years. Google Trips database with the same personalisation algorithm is available for a variety of tourist destinations. The number of users with the number of downloads exceeding 5 million times (Google, 2017). The application is popular mainly in the US and EU, and its popularity in Hong Kong is also increasing (Google Inc., 2017). It is, therefore, suggested that Google Trips as technical context represents a distinctive case of personalisation to observe its effect on tourist satisfaction, while enables generalisation of the confirmed relationships to other applications with similar functionality.

Travel context

Travel context affects tourist information search and travel planning activities. While such travel activities as package tours and cruise trips are less planned in terms of individual in-destination activities (Xiang, Wang, et al., 2015), digital technologies including mobile applications are applied along the whole customer journey before, during and after trip (Wang, 2016). Despite in-destination activities vary depending on type of a trip, most of the tourists use online services for such activities as hotel and flight ticket search, as well as exploration of travel destination (Xiang, Wang, et al., 2015).

The distinctive feature of research phenomenon is that personalisation technology is expected to create an individualised information outcome for each user. As so, personalised information service output cannot be evaluated towards objective characteristics, such as its capability to provide the list of most popular POIs. On the contrary, it creates individual content for each user, which can be assessed towards its relevancy for tourist decision-making, as well as its capability to decrease cognitive and emotional load from interactions with an information service. This feature makes the exact tourism context is beyond the interest of the study. Instead, general context of travel activities, in which planning is supported by Google Trips app, and which distinctive from everyday life (Pearce, 2011), was suggested as acceptable to acquire valid results.

Cultural Context

Tourists expectations towards a service, perceptions on its performance, and co-created value are known to be determined by multiple factors, including socio-demographic and cultural characteristics, as well as by previous experience from the service. Heterogeneous population of a country might lead to high variance, decreasing accuracy of measurements or leading to controversial findings. To control the influence of these factors on the relationships under

investigation, and to ensure that the results do not represent the unique case, the study explored satisfaction with personalised information service on the example of the Hong Kong residents.

A range of factors, including relatively high income per capita, convenient geographic location and access to transportation, visa-free access to 156 countries and territories around the world, and lack of tourism and recreational resources inside Hong Kong, make Hong Kong residents active travellers. In 2017 outbound departures by Hong Kong residents exceeded 98 million (WTO, 2017), so that Hong Kong had one of the highest propensities to travel in Asia (Master_Card, 2017). The number of outbound departures of Hong Kong residents was 9.8 million in 2017 (UNWTO, 2017). However, the exact number of Google Trips users from Hong Kong is also not available for this research, making random sampling strategy not available.

Hong Kong is a multinational and multicultural city that can be identified as a culturally distinctive from other nations. Historically Hong Kong has been a standalone territory from other Asian countries because of the influence of the British and other economies and cultures on its life. Currently almost 91% of the Hong Kong populations represent Chinese nationality. Other Asian and Western cultures represent less than 3.5% and 1% of the overall population, respectively (C&SD, 2016). There are three major languages (Cantonese, Mandarin, and English) and a few minor languages and dialects co-exist in Hong Kong. According to Census and Statistics Department of Hong Kong SAR (2016) in 2016 88,9% of Hong Kong population used Cantonese language to communicate at home, and 5,7% more was able to speak Cantonese as a second language. At the same time, 4.3% used English as the first language, but more than 52% of the overall population was able to speak English. On the one hand, this creates the requirement of providing questionnaire both in English and in Cantonese languages, because it enables better understanding of questions and decreases emotional and cognitive pressure. On the other hand,

accommodation of a second language stimulates acceptance of this culture norms and values, mitigating cultural differences, and potentially minimising variability of replies for surveys (Gökçen, Furnham, Mavroveli, & Petrides, 2014; Harzing, 2006).

Hong Kong population can be characterised as relatively homogeneous in the meaning that it has common features within the society, which are distinctive from cultures, that surround Hong Kong. By the scores of power distance, individualism, and long-term orientation Hong Kong population can be placed between Mainland China, United Kingdom, and Malaysia (Gökçen et al., 2014; Hofstede, 2017), which reflects the effects of mutual integration between two very distinct cultures. For uncertainty avoidance, and indulgence, Hong Kong is scored lower than these three countries. In terms of masculinity, Hong Kong index is higher than in Malaysia, but lower than in China and United Kingdom. Together the named trends indicate that Hong Kong is not a spontaneous mixture of different cultures representatives. It can be seen as relatively homogeneous and distinctive ethnicity (Nunan & Choi, 2010). Therefore, it is expected that the variability of responses may be high, but this should not indicate representation bias, but reflect the features of Hong Kong population.

There is no common agreement of the factors that guarantee assimilation in a new culture. Over the time, personal identity is displaced by norms and values, accepted by local community (Leonard, 2010). Currently 86.8% of Hong Kong population has permanent residence permit (C&SD, 2016), which requires a person to live in Hong Kong for more than 7 years or to have an offspring of Hong Kong citizen or permanent resident (Region, 2015). Therefore, despite of its heterogeneity, Hong Kong residents are believed to be suitable population to explain the phenomenon under investigation. The status of Hong Kong S.A.R. as an international city is also beneficial in terms representing common, rather than authentic trends.

Task Context

Personalisation is a strategy that aims to adjust information service to individual needs, wants, desires, requirements or restrictions, which, in turn, are determined by the factors of internal and external context, i.e., culture, gender, personality, and current situation. In other words, contextual factors, including culture, are seen by this study as conditions for personalisation, and cultural differences are expected to trigger information service adaptation, and consequent level of satisfaction with the service, adapted for these differences. Though, information service consumption is motivated by existence of certain information needs within travel context. While information needs are different (Choe et al., 2017), to the knowledge of the author, no studies identified differences in the types of information needs, that trigger interactions with information service, among tourists from different countries or cultural contexts. Regardless of the type of travel-related service, interaction with information service and its content are still motivated by one or several information needs (i.e. utilitarian, hedonic, sign, innovation, aesthetic) (Choe et al., 2017; Vogt & Fesenmaier, 1998). Therefore, the applied sampling strategy should not affect the validity of expressed perceptions on satisfied needs.

To access the relevant population, the study considered several measures. First, the survey was shared with the users with Hong Kong IP addresses. Second, the survey included two screening questions, that aimed at identifying Hong Kong residents, who used Google Trips to plan travel activities. Importantly, Google Trips is a travel planning app, which is convenient for trips, but is not designed to be applied for the everyday use at the place of residence. Therefore, the advantage of the proposed sampling strategy is that people, who claimed that they have used Google Trips for travel, are most likely did so. In other words, such strategy allowed to minimise the risk of the coverage error.

3.4.1.1.2. Sample Size

The importance of the adequate sample size in quantitative inquiry is motivated by several reasons. While PLS-SEM does not make any assumptions about multivariate normality, too small sample cannot provide relevant representation of the populations and meaningful parameter estimates for the model (Anderson & Gerbing, 1988; MacCallum & Austin, 2000). Too large sample size is also not efficient from the time and financial perspective. The research in partial least squares structural equation modelling in relations to the capability of the methods to provide valid estimation for the extra-large samples is scares. However, Bagozzi & Yi (2012) demonstrate that for the case of covariance-based structural equation modelling sample sizes (n> 400) exaggerate the power of Chi-square test of model goodness-of-fit. Therefore, careful determination of the appropriate sample size is required. The overall decision on sample size depends on objectives of research, size of the population, and the decision of the researcher on the acceptable variability, precision of results (i.e. confidence interval, sampling error, margin of error), and the accepted confidence level.

Table 3.7 summarises the commonly applied methods to estimate it for SEM. The advantage of PLS-SEM is its capability to perform the analysis with relatively small sample size (Hair Jr, Ringle, & Sarstedt, 2011). According to the prospective methods, the absolute minimum sample size would be 180 cases (Garson, 2012; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). More specifically, due to potentially large variability within the sample, the sample size smaller than n=180 items is not practical (Anderson & Gerbing, 1988). The “rule of 10” (Dwyer, 2012), which is one of the commonly accepted methods of determining sample size for SEM, has to be specified for PLS SEM. In particular, a sample size should be greater than the maximum number of paths of inner, pointing at any latent variable in the model, multiplied to 10 (Garson, 2012; Hair Jr et al.,

2011; Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014). Additionally, sample size should be greater than the largest number of formative indicators used to measure one latent construct, multiplied to 10 (Garson, 2012; Hair Jr et al., 2011; Hair Jr et al., 2014). Following those tests, the sample size should be greater than n=110 and n=180 responses, accordingly. Lastly, a power test indicated that the desired medium effect size F^2=0.15 can be achieved with n=222 responses. The complexity of relationships between constructs (Dwyer, 2012), and communality level between manifest variables (MacCallum & Austin, 2000), and other factors may require larger sample to ensure the validity of results. For these reasons, as well as taking into consideration relatively high cost of online survey for the target population, the study initially aimed at 250 responses. The *post-hoc* test demonstrated that the acquired sample of n=244 valid responses generated the power of f=1.617 with the medium effect size at a 95% significance level, which is large enough in the domain of consumer behaviour. Therefore, the sample of 244 cases is large enough to provide reliable findings.

Table 3-7 Possible methods to determine sample size for PLS-SEM with non-probability sampling

Indicators	Principle How to Estimate the Sample size	Reference	Solution for this study
	Prospective techniques		
Number of relationships	should be greater than the maximum number of paths of inner, pointing at any latent variable in the model, multiplied to 10	(Hair Jr et al., 2011) (Hair Jr et al., 2014) (Garson, 2012)	**>110**
Number of formative indicators	Should be greater than the largest number of formative indicators used to measure one construct, multiplied to 10	(Hair Jr et al., 2011) *(Hair Jr et al., 2014)* (Garson, 2012)	**> 180**
Definition of latent constructs	Each latent construct should include at least 4 indicators	(Kristensen & Eskildsen, 2005)	**250**
Effect size associated with the path coefficient	Higher magnitude of a path coefficient at the population level usually leads to higher effect size of it, and to greater probability that a true effect will be properly detected with a small sample. Sample size is calculated based on the inverse square root method. Based on the past empirical research or a pilot study. *Model complexity:* F^2>0.02 for simple models F^2>0.04-0.25 for complex models *Social science and psychology*: F^2=0.02 (small) F^2=0.15 (medium) F^2=0.35 (large)	(Ned & Pierre, 2018) (Hair Jr et al., 2016) (Kock, 2014) (Cohen, 1992)	**222 with medium effect size of F^2=0.15**
	Post-Hoc		
Statistical Power	Determining the power based on the given sample size and number of predictors and desirable effect size and alpha level assuming that higher sample size increases statistical power. Desirable value of power f > 0.8 Assumption on the effect size: F^2=0.02 (small), F^2=0.15 (medium), F^2=0.35 (large) Calculated with G*Power software: Given: F^2= 0.15, significance level α=0.05; N=244 Achieved: F=1.617, Power $(1-\beta_{prob})$ = 0.972	(Hair Jr et al., 2016) (Cohen, 1992)	**244 cases is large enough**

3.4.1.1.3. Sampling Techniques

Reliability and validity of results are determined by the capability of a chosen sample to represent the entire target population (Saunders et al., 2012; Zikmund et al., 2013). Despite it often has low response rate and leads to sufficient time and monetary expenses, application of probability

sampling is preferred over non-probability approaches. Though, an important condition is that a chosen sampling frame is complete, and all representatives of the target population have equal access to the survey (Gideon, 2012). Considering the existing time and cost limitations of the present study, and the fact that neither the exact number, nor contact details of target population are available, equal access to them is not possible. Therefore, the study aims to apply self-selection non-probability sampling strategy to access the population of Hong Kong. The advantage of this sampling method is relatively low cost and high efficiency in case of online surveys, conducted among the visitors of one web site (Quinlan, 2011). This sampling method belongs to non-probability group of techniques, and, therefore, cannot guarantee that the sample will adequately represent the whole population (Bryman & Bell, 2015).

Another potential limitation is related to the political issues and related restrictions and the availability of Google Trips service. While the number of outbound tourists from Hong Kong exceeds 98 million in 2017, most of the visits are made to Mainland China (WTO, 2017). Tourists destinations of Mainland China are available for search and planning with Google Trips. At the moment when the study was planned Google Trips service was not in the list of the applications, banned in China (Wikipedia, 2017). Though, users report that the application functionality is limited, and its performance is not stable without VPN connection, which might be related to the blocked Google services (e.g. Google search engine, Google Maps, etc.), which databases are integrated in the Google Trips app. However, the specific feature of Google Trips is that it allows to download the planned trip with the entire destination data to the personal device, so that only GPS connection would be required to enable all Google Trips services. Anyway, it is important to acknowledge that not all the users are equally familiar with the app functionality and the perceptions on the service performance and co-created value may be affected.

3.4.1.2. Online Survey as a Data Collection Method

The study accepts customer perceptive. To meet the confirmatory objective, customer-generated data are believed to be the most relevant method to acquire tourist expectations and perceptions towards personalised information service. Being one of the self-reporting methods of data collection, customer survey is an effective instrument for obtain information on individual needs, behaviours, attitudes, values, and preferences (Gideon, 2012; Saunders et al., 2012). Customer survey is also advantageous for acquiring large datasets, which enable statistical analysis and comparison between populations (Bryman & Bell, 2015).

Proliferation of the Internet and personal computing devices created the possibility to conduct surveys online. The advantage of online survey in comparison to other types of customer surveys is convenience as respondents may receive a questionnaire any time and from any location. Another advantage is the minimization of researcher's involvement in acquiring data, so that respondents cannot be confused by the presence of an interviewer, as it can happen during face-to-face communication (Bryman & Bell, 2015; Zikmund et al., 2013). The interviewer variability is excluded as there is no chance for the researcher to ask questions in different order (Bryman & Bell, 2015), which increases the reliability of the results. Technically, the advantage of online data is relatively low contamination and distortion of answers (Saunders et al., 2012; Zikmund et al., 2013) as a software may help to increase correctness on data input and to prompt user in case of no response (Bryman & Bell, 2015; Toepoel, 2015; Zikmund et al., 2013). Lastly, online survey tool provides more control over sampling strategy (Toepoel, 2015). Despite there is no information about the absolute numbers and contact details of all Hong Kong Google Trips users, and, therefore, it is not possible to acquire probability sampling, that would guarantee relevant

representation of the target population, online surveys provide more flexibility in selecting participants to improve representation.

3.4.1.3. Panel Data Source

Online survey can be conducted independently with or via specialised research agencies. Collection of individual responses requires the input of sufficient time and monetary investments. Survey research agencies dispose of a range of tools and experience, including specifically developed online platforms for surveys, that allow to access target population and collect the required number of replies rather quickly (Gideon, 2012).

Research agencies provide users with an established system of incentives, which helps to obtain required number of responses in a short period of time and minimise non-response bias because incentives create relevant stimuli for starting and completing a survey (Gideon, 2012). However, the presence of incentive may potentially increase the number of spontaneous responses (Bryman & Bell, 2015). Despite panel hiring process is based on reciprocity principle, which explains that individuals tend to return favours or gifts, users may participate in surveys just to get benefits rather than to contribute to research (Gideon, 2012). Lastly, in addition to relatively high cost of such cooperation, research agencies pose the risk of not providing reliable results as they might not follow rigorous methodologies to build a questionnaire and to collect data or might not disclose the applied methods. Mutually beneficial cooperation with methodology being developed and verified by academic, and them implemented with research agencies skills and capabilities is named among the reasonable solution to overcome limitations of both approaches (Smith, 2009).

Taking into consideration the capabilities of research agencies, such as access to Hong Kong population and the platform, specifically developed for online surveys, as well as the limited time, the data collection was done with a help of LightSpeed Research agency. The questionnaire was

designed by the researcher with considerations for the survey design to minimise the possible limitations that panel data may create.

3.4.1.4. Questionnaire Design

Customer surveys are normally developed with the assumption that its participants are willing to share their experience and opinion, so that their replies should illustrate their perceived reality (Gideon, 2012). In comparison to other data collection methods, self-completion questionnaires require additional attention because researchers cannot assist, prompt, probe, or explain the meaning of the question to a respondent. For this reason, this type of data collection poses risks, associated different types of non-sampling errors, which can be a result of missing answers, misunderstood question, or simply refusal to reply and irresponsible behaviour (Curran, 2016; Gideon, 2012; Toepoel, 2015). The measures, taken to minimise errors and to improve data validity, should be incorporated in questions design, survey development, visual presentation of the questionnaire to the users.

3.4.1.4.1. Questionnaire Design Principles

The way a questionnaire is designed may affect the answer. Short, precise, clearly formulated with no ambiguous or double-barrelled meanings allow to decrease both unit non-response and to prevent response bias and consequent measurement error, associated with the deviation of the acquired data in comparison to the real situation (Bryman & Bell, 2015; Toepoel, 2015). Table 3.8 summarises the main requirement to a survey design and the ways, they were addressed by the present study.

Table 3-8 Requirement for Questionnaire Design

Step	Requirements	Implementation
1	Clear definitions of conceptual and construct variables, so that they match research objective and do not contradict applied concepts	• Development of conceptual framework based on S-D logic and other concepts • Verification of the proposed constructs based on the analysis of measurement frameworks of related studies and qualitative stage of research
2	Formulation of preliminary survey items according to the defined constructs	• The appropriate items were preliminary chosen based on the previous studies and verified or refined with the qualitative research in Phase 2
3	Examination of the proposed questionnaire items based on the following criteria: • relevance to the research topic • relevance of the question type to the research objectives • relevance to other questionnaire items • logical flow • absence of repetitiveness and overlap in question • simple and direct language • short, precise, and clear phrases • inclusion of all possible answers in multiple choice questions • absence of double-barrelled, loaded and leading questions • absence of biased questions or question with double meanings	The questions were formulated and crosschecked towards the whole model, and towards the definitions of each of the items Pre-tests with the experts and tourists were conducted before piloting the questionnaire
4	Empirical examination on a small sample	Pilot study of 50 responses was conducted
5	Correction of the questions according to the findings	The questions were verified and refined
6	Formulation of an appropriate introduction and conclusion for the questionnaire	Short introduction was included to inform the respondent about the purpose of the study and ethical consideration
7	Final verification and refinement	Additional pre-test was conducted after survey refinement

Adapted from: (Gideon, 2012; Toepoel, 2015).

3.4.1.4.2. Questionnaire Development

Ill-defines concepts and consequent survey questions, which are not grounded in the existing theories, result in the gap between collected data and explored constructs (Gideon, 2012). The top-down approach (Toepoel, 2015) was used to develop a question for each of the defined concept. To minimise the risk of specification errors, the proposed measurement items are deductively derived from the S-D logic and relevant studies on personalisation, defined within the proposed framework, and then verified inductively based on the content analysis of the existing

measurements for related services. On the one hand, such approach creates the advantage of using verified survey questions, which were piloted in the context and proven to be able to generate replies. On the other hand, Chapter 2 identified sufficient heterogeneity in the applied definitions of the constructs, which increases the risk of discrepancy between the defined meaning of an item and the corresponding survey question (Bryman & Bell, 2015). Therefore, the measurement items were refined with the qualitative study.

Specifically, the pool of the main characteristics for each item is created based on the existing concepts and previous studies to enable question development (Appendix 3.2). After matching these attributes and corresponding question from the previous studies with the proposed definitions of each item, as well as with the findings of the qualitative stage of the research, the study either adapts the questions from the previous research or proposed new in case no relevant questions are identified.

Specification errors can be prevented by additional crosscheck that specific constructs, hypothesis, and survey questions are relevant to reflect the explored concepts. Following Creswell's (2013a) recommendation to ensure validity and minimise misinterpretation, the pre-test was conducted by consulting with 5 experts with the relevant experience in self-reported data collection and quantitative data analysis methods. The survey was then exposed to 11 tourists, followed by the questions about the quality of the questions, as well as by clarification of the correctness of the questions' interpretations. This step allowed to crosscheck the questions in terms of the appropriate wording, the order of questions, and their presentation.

Overall, the survey included 4 logical parts: cover letter with the consent form, research phenomenon-related questions, tourist context-related questions, including demographics and

travel experience, as well as contact details of the researcher. Each part included the specific types of the questions.

The phenomenon-related questions incorporated two types of measurement scales. The selection of the scale has been motivated by several reasons. 7-point scale is believed to be advantageous for the service performance-related and wellbeing-related questions, because it creates good capacity to express the perceived experiences (Cohen, 2011; Cummins & Gullone, 2000). Additionally, 7-point scale has the capacity to reduce skewness and minimise kurtosis, normalising data, and providing more reliable results from the statistical point of view (Leung, 2011). Moreover, it increases sensitivity of the tests for detecting small differences between groups (Lewis, 1993), making it a reliable tool for the cases that aim at group comparison. On the other hand, 5-point scale is believed to be less confusing and easier to conceptualise for the respondents, therefore, generating data of a high validity (Bouranta, Chitiris, & Paravantis, 2009). For these reasons it additionally reduces the time, required for interpreting and answering questions (Cummins & Gullone, 2000). Due to the absence of multiple response options, 5-point scale is more user-friendly and generated more consistent and, therefore, more reliable responses rather than larger-point scales (Chang, 1994; Cummins & Gullone, 2000). Taking into consideration that large samples from heterogeneous population, such as the one, applied in this study, tend to produce normally distributed data, together with the relatively long survey and, therefore, the importance to ensure data validity, the study applied 5-point scale.

More specifically, First, the questions about the overall satisfaction, expectations, the perceptions on the experienced co-created service performance and loyalty were articulated with a help of 5-point Likert scale, structured from the negative to the positive meaning with the middle point being neutral perception. Second, co-created value applied 5-point semantic differential scale. According

to S-D Logic, each dimension of value can be co-created or co-destructed, leading to the range of states that vary from highly positive to highly negative. The capabilities of the Likert scale do not always allow to represent the full range of these states for each dimension (Friborg, Martinussen, & Rosenvinge, 2006). For example, in case of hedonic value and the 'happy' item, the 'strongly agree' score would indicate extreme happiness. 'Strongly disagree' score would literally mean that an individual is not in the state of being 'happy', i.e. unhappy or neither happy nor unhappy. However, the proper representation of co-created and co-destructed states requires application of the antonym of 'happy' in the meaning of feeling miserable or dejected. Therefore, this type of the scale was considered as more relevant to reflect the concept.

The direction of the question was chosen with consideration that people commonly tend to provide positive responses to present themselves in a favourable way, to commit to the first possibly appropriate and to the easiest option (Toepoel, 2015). Therefore, such order allows to decrease the risk of the measurement error by minimising the bias toward the positive answer. However, it was also observed that respondents often avoid extreme replies. So, it is important to acknowledge, that the chosen direction might have created bias towards the middle-scale responses.

The study is service-related, and does not include any sensitive topics, which may put respondents under pressure, and create additional risks of non-response bias. To ensure ethical requirements, to stimulate tourists to complete the questionnaire, and to minimise potential response bias, the survey starts with the cover letter, which introduces them to the research, provides them with the guidelines on questionnaire completion. The short cover letter included research topic, explanation of the reason why specific people have been targeted, guarantee of anonymity and data usage only for the purpose of this research, as well as instructions for answering the questions. Before proceeding to the questionnaire, respondents were asked to submit the informed consent on

participation in the survey (Appendix 3.8). Due to the fact that individuals better respond to legitimate authority, rather than to the request from an individual or a company (Gideon, 2012), and following the requirement of the researcher employer organisation, the cover letter illustrate affiliation of the researcher to make survey more attractive to users.

3.4.1.4.3. Survey Translation

One of the reasons for missing answers or misunderstood questions is respondent's lack of knowledge in a specific field (Gideon, 2012). To make respondents comfortable with the questionnaire and to decrease the effect of non-sampling errors, the language in the survey was adjusted and no technical or professional lexes were used (Bryman & Bell, 2015). The draft of the survey was demonstrated to 5 tourists with no expertise in research, ICT or HCI. The wording was adjusted according to their feedback.

Taking into consideration that the main written languages, used in Hong Kong, are Chinese and English, the survey was proposed to the respondents in both languages. To minimise measurement and non-response errors, the survey was developed in English and then translated to Traditional Chinese language by a professional interpreter. To validate translation and to ensure that the meaning is not changed, back translation from Traditional Chinese to English was performed by another professional interpreter. The initial and the resulting versions of the English questionnaire were compared by the researcher. Additionally, both versions of the questionnaire were demonstrated to two individuals, whose native language is Cantonese, and who use English for everyday communications. Such measures were believed to minimise the chance of measurement and non-response bias. The text of the survey in English and Chinese languages are presented in the Appendix 3.8.

3.4.1.4.4. Visual Design

The major platforms for online surveys provide researchers with a range of tools to be used to build different types of questions, while ensuring an appropriate formatting of data and determining its presentation. Clear, attractive, and user-friendly visual design of the questionnaire plays important role in minimising non-sampling errors. Appropriate presentation allows better comprehension of questions, potentially decreasing cognitive load for responders, and, consequently, the number of misunderstood or missed answers (Bryman & Bell, 2015). Together with other factors, attractive and pleasurable presentation influences participants' willingness to finish questionnaire, potentially increasing response rate, which is one of the problems surveys face (Bryman & Bell, 2015). Most of research agencies have adaptive websites, which makes the survey accessible and optimally presented from different devises. Despite mobile users may have distinctive behaviour, availability of the survey both via desktop computers and mobile devices can be beneficial because they create additional convenience for the respondents (Bryman & Bell, 2015). Additionally, this potentially leads to the decrease of non-response rate in comparison to other techniques (Zikmund et al., 2013).

To ensure user-friendly design, the survey was distributed via the Lightspeed Research company online platform, which supports all the required types of questions, provides additional graphic aids, such as emoji, associated with each of the point of the Liker scale, thereby, making the question more intuitive. The visual design of the platform also meets the requirement of desktop and mobile interface, which is expected to have positive effect on user engagement with the survey.

3.4.1.5. Data Collection Procedures

The data collection included two major procedures. First, the pilot test, aimed at crosschecking the quality of the questionnaire (Bryman & Bell, 2015), ensuring the relevance of the sample size

(Gideon, 2012) and preliminary testing the model. A total of 50 responses were acquired. Due to the presence of 46% of straight-line responses, which were also characterised by the extremely short (less than 5 minutes) time of completion of the whole questions, the questionnaire design was adjusted by adding attention check question. The minimum and maximum acceptable time of the survey completion were additionally introduced. The internal consistency along the ordinal variables of the remaining 27 responses was high (Cronbach's α=0.91). Therefore, the remaining questionnaire was retained without changes.

The main data collection was done in one stage and took 2 weeks to acquire 250 responses. Additional screening was performed to ensure data validity. The results of the validity check are further presented I the Chapter 4. In the end, the survey retained 244 valid cases, considered for the analysis, which exceeds the desired sample size, identified by most of the tests.

3.4.3. Data Analysis

3.4.3.1. Data Integrity and Validity

Possibility of mistakes in the dataset and presence of different user motivations to participate in the survey requires rigorous procedure to purify data to make sure that irrelevant responses or cases are deleted while the real opinion of the target population is retained (Huang, Liu, & Bowling, 2015). Data screening procedures aim at ensuring integrity and validity of collected data. Several tests, conducted along cases and variables, can help to verify the meaningfulness of data and identify occasional and systematic errors.

3.4.3.1.1. Case screening

One of the main causes of irrelevant responses or the presence of long-string of consistent responses is irresponsible behaviour of respondents (Curran, 2016; Kung, Kwok, & Brown, 2018). Being motivated by a reward but not by intention to contribute to a research, respondents tend to

complete surveys quickly. To do so, they may avoid reading the question and thinking about their perceptions but put spontaneous or same responses to the survey questions. Therefore, consideration of human ability to comprehend information and the check of respondents' comprehension of survey questions belong to the common principles of ensuring data validity (Curran, 2016; Huang, Liu, et al., 2015).

Exclusion of the cases based on time of survey completion is often applied in research. This method is characterised by simplicity, possibility to compare results with the previous studies and the absence of pre-survey settings or requirements. However, human heterogeneity does not allow to make unambiguous decision about a case validity. Specifically, while low time of survey completion most likely indicates randomly assigned answers (Curran, 2016), extended time may be explained both by irresponsible behaviour and by people being interrupted from the questionnaire. Therefore, time can be used as one of the criteria to detect irrelevant cases with additional check being required to analyse the patterns within each case and make conclusion on the validity of responses. To determine an appropriate time interval, which should provide meaningful results, the study explored previous research, the results of the pilot test, as well as conducted a pre-test to practically determine the minimum possible time of survey completion.

According to the previous studies, an average time of completing the survey of 60-70 questions is about 15-20 minutes for paper surveys and 12-15 minutes for user-friendly online platforms (Toepoel, 2015). The pre-test, which was done by asking 5 volunteers to quickly read and reply to all questions of the survey, uploaded to the online platform, demonstrated that the minimum time of completion was 7,5 minutes. The pilot test confirmed the expected average time as 15.9 minutes with high variability between users. Lastly, too long interval between questions may affect consistency of responses. Therefore, detection of outliers based on the distance from the mean was

considered as inappropriate for this case. Instead, further discussion with the experts allowed to accept 7 minutes as a threshold for the lower boarder and 60 minutes for the upper boarder.

Another way to ensure that the respondents comprehend survey questions is inclusion of attention check into the survey, such as insertion of instructed-response question or psychometric antonym questions with reversed meanings (Kung et al., 2018). The responses are checked for incorrect answers and for the difference between the original and reversed statements, accordingly. The instructed-response question is observed to have disruptive influence on user engagement with the survey (Kung et al., 2018). However, psychometric antonym question creates bias as the respondents may reassess their perceptions during the survey under the influence of additional information about the phenomenon. Moreover, people tend to agree with the statements and give more positive evaluation (Friborg et al., 2006), making it difficult to conclude that the absence of match between the original and reversed statements is caused by irresponsible behaviour. Therefore, instructed-response question was considered as more suitable. The statement 'For this question, please select number two to demonstrate your attention' was exposed to users in the range of co-created service performance questions in the same visual presentation as other questions. Only the respondent, who gave the correct answer to the attention check, were qualified to complete the survey, and these cases where considered for analysis.

The third and additional way to check the engagement with the survey is the check for consistent responses or remaining "straightliners". Consistent scores for multiple questions can either illustrate the real opinion, lack of attention or responsible behaviour (Kung et al., 2018). For this purpose a standard deviation of 0.3 can be accepted as a threshold (Gaskin, 2012), so that the cases with lower standard deviation along ordinal variables were deleted. The dataset was additionally

screened for suspicious visual patterns such as alternating extreme pole and diagonal responses (Hair Jr et al., 2016).

3.4.3.1.2. Variables screening

The quality of data influences the robustness of model estimation. Specifically, CB-SEM requires data to be normally distributed, while PLS- SEM does not make any assumption about the normality of data distribution (Hair Jr et al., 2016; Sarstedt, Henseler, & Ringle, 2011). However, extremely non-normally distributed data can inflate the standard errors of PLS-SEM bootstrapping and decrease the significance of scores for the relationships between variables (Hair Jr et al., 2016). Therefore, the assessment of skewness and kurtosis of ordinal variables quality (acceptable values of skewness usually fall within a range of [-1; +1] and kurtosis – [-2;+2]) is required in both cases (Field, 2018; Hair Jr et al., 2016).

3.4.3.2. Structural Equation Modelling

3.4.3.2.1. Structural Equation Modelling Overview

Structural Equation Modelling (SEM) has high potential for social science theory development (Anderson & Gerbing, 1988). The popularity of the method in comparison to other statistical tools is explained by a range of analytical capabilities and high analytical flexibility it provides, as well as by the ability to account for a measurement error (Dwyer, 2012). SEM is commonly used because it allows to test the set of variables, which cannot be described with a single indicator (Dwyer, 2012). Specifically, it allows to identify the source of group differences among the identified factors within the latent construct (Bagozzi & Yi, 2012) in order to assess generalizability of the proposed measurement instrument (Dwyer, 2012). The advantage of SEM is that it allows to ensure comprehensive evaluation of construct validity (Anderson & Gerbing, 1988) and to test whole system of constructs with multiple relationships between them, increasing

explanatory power of a model (Dwyer, 2012). Therefore, SEM procedures are usually applied for measurement scale development and for assessment of the complex causal relationships between the multiple variables.

SEM is a highly popular technique in tourism (Ali, Kim, Li, & Cobanoglu, 2018). This study aims to explain formation of customer satisfaction under the mutual influence of expectations, perceptions on co-created service performance and co-created value, where each of these variables are defined as complex phenomenon and cannot be assess objectively or with a single variable. Considering the available data, SEM is believed to be the only available quantitative method that allows to meet the objectives of the study.

SEM generally builds on several assumptions, so that its violation restricts reliability and validity of results. First, the common limitation of quantitative methods is related to the need to apply positivist philosophy and to distance from the nature of the phenomenon for the sake of measurements and statistical analysis. By accepting the objective perspective on reality, they ignore that individuals may provide different interpretation not only to the phenomenon, but also the addressed question. As so, the answers, received from the whole sample, are assumed to have same meaning for each individual. This is in the conflict with the social psychology and consumer behaviour, and the findings partially acquire artificial sense. However, an assumption that a group of participants may interpret reality in the same way, fits into the pragmatic research paradigm, accepted by this study. Pragmatism sees reality as context dependent (Biesta & Mälardalens högskola, 2010), i.e. individual for each person within a certain context, but truth as knowledge being derived from a community of enquiries, i.e. from the presence of similar opinions or perceptions (De Waal, 2005). As so, application of SEM in the context of personalised service, which is individually adjusted to each tourist's preferences, does not violate this assumption.

Another assumption of SEM is that modelled data are relevant and complete (Anderson & Gerbing, 1988; Dwyer, 2012). SEM serves as a confirmatory and predictive tool, which allows to justify a hypothesised model. However, it does not have exploratory capabilities. Therefore, proposed constructs and the relationships between them should have solid theoretical background. In this context application of abductive reasoning, when both S-D logic and empirical qualitative data are used to further specify the well-established theoretical model, is believed to be relevant to minimise the potential misinterpretations. However, multiple tests are required to ensure the validity of findings.

3.4.3.2.2. Covariance-Based vs Partial Least Square-Based SEM

SEM is a widely applied technique, which includes the procedures for the assess of latent constructs and for testing the relationships between them. There exist two different types of SEM, which are covariance-based (CB-SEM) and partial least square based SEM (PLS-SEM). The principles of estimation for multiple regressions within a model are based on covariance between variables and variance of endogenous variables, accordingly (Hair Jr et al., 2014). Table 3.9 summarises the major principles of measurement and structural model assessment, as well as advantages and drawback of CB-SEM and PLS-SEM in the context of the hypothesised conceptual model.

Currently, there is no single opinion on whether CB-SEM or PLS-SEM should be applied in the cases, when a conceptual model incorporates both reflective and formative constructs (Hair Jr, 2010). Measurement approach in CB-SEM in based on shared variance and intercorrelation between measurement items. Therefore, it is effective in case of confirmatory objectives and simple models with reflectively measured constructs. While all procedures of CB-SEM are well-elaborated, the drawbacks including bias in estimating the results of the models with complex

relationships and formative constructs, have also been acknowledged (Aldás-Manzano, 2013; Hair Jr et al., 2011).

Table 3-9 CB-SEM and PLS-SEM Advantages and Drawbacks in the Context of This Study

	CB- SEM	PLS-SEM
Model specification	1. Create pass model for indexes and constructs 2. Specify outer models of exogeneous and endogenous constructs and the direction of relationships within reflective or formative constructs	
Outer /measurement model evaluation	Depends on the type of constructs	Depends on the type of constructs
Inner /structural model evaluation	Fit is derived from discrepancy between theoretical (model implied) and identified (empirical) covariances between variables. Applied indicators: 1) Global model fit a. Chi-square b. R^2 c. Root mean square error of approximation (RMSEA) d. Goodness-of-fit (GFI) and adjusted goodness-of-fit (AGFI) statistics e. Root mean square residual (RMR) and standardized root mean square residual (SRMR) 2) Incremental fit indexes: a. Normed-fit index (NFI) and Comparative fit index (CFI) 3) Path coefficients estimates: a. Beta b. T statistics c. P values	Fit is derived from discrepancies between the observed values of manifested or latent constructs of the dependent variable and the predicted value of model. Applied indicators: 1) Path coefficients estimates: a. Beta b. T statistics c. P values d. Bootstrapping results 2) Explained variance a. Coefficient of determination R^2 b. Effect size F^2 c. Predictive relevance Q^2 3) Total Effects a. T statistics b. P values c. Bootstrapping results
Advantages for this study	- Appropriate technique to test a theory and explain measures. - Handles both formative and reflective constructs	- Handles both formative and reflective constructs - Can manage large number of variables - Can be used with complex models - Can be used with small sample size
Drawbacks in relation to this study	- Requires adjustments to estimate model with formative constructs - Requires large sample size - Lack of fit in the model with formative constructs is expected because formative constructs lack of external consistency	- Originally designed for prediction of variance and explorative purposes - Limited generalisability

Adapted from: (Aldás-Manzano, 2013; Hair Jr et al., 2016; Hair Jr et al., 2017; Wilcox et al., 2008)

PLS-SEM incorporates multiple regressions within each construct and between them, so that each variable is specified as a dependent latent construct. As a result, it handles different direction of

relationships, and, consequently, both formative and reflective constructs (Hair Jr et al., 2016). PLS maximises explained variance of the dependent construct and minimises the unexplained one. It treats the scores as perfect substitutes for indicator variables and uses all variance from the indicators to explain endogenous constructs. While assuming that all measured variance of the indicators in the model is useful, PLS-SEM avoids the problem of estimation of stable factor scores and can estimate construct scores more accurately in comparison to CB-SEM (Rigdon, Ringle, & Sarstedt, 2010). Specifically, impossibility to consider the presence of a measurement error of each indicator leads to the situation, when the weights and loadings of an outer model can be overestimated, while the path coefficients of an inner model can be underestimated. This makes PLS-SEM more suitable for predictive rather than confirmatory purposes. However, the difference in estimation made by CB-SEM and PLS-SEM for the simple models is small and does not affect empirical settings (Henseler, Hubona, Ray, Latan, & Noonan, 2017). In the case of complex models, PLS-SEM is expected to outperform CB-SEM (Hair Jr et al., 2016). Moreover, recent advancements in PLS-SEM extended the method capabilities for theory testing (Hair Jr et al., 2017) to be applied in different contexts including tourism (Müller, Schuberth, & Henseler, 2018)

The hypothesised model includes multiple direct relationships between main construct with several additional variables having moderating effect on them. Moreover, two variables are defined as formative constructs. Therefore, PLS-SEM is accepted as appropriate analytical tool for assessment of the measurement (outer) and structural (inner) models of the hypothesised conceptual model. The study applied SmartPLS3 software to perform the analysis.

3.4.3.2.3. Model Estimation Settings

To estimate the construct measures PLS-SEM applies ordinary least square regression, focusing on discrepancies between approximated latent or observed values of dependent variables on the

one hand, and the predicted value, acquired by hypothesised model (Chin, 1998; Hair Jr et al., 2011), thereby maximising explained variance and minimising error term of endogenous variables (Petter, 2018). Therefore, the applied settings of the model slightly but influence the outcome of prediction, potentially affecting the robustness of the outcome.

Hierarchical Model Estimation Approach

The complexity of relationships and the presence of the higher-order construct (HOC) in the model requires application of special considerations to specify and estimate the model. Specifically, in second-order constructs there are two levels of latent variables. The measures, assigned to lower-order latent constructs (LOC), create the situation, when HOC does not have indicators in its measurement model. To handle the problem, there exist two main approaches for HOC specification, which are repeated indicators approach and two-stage approach (Figure 3.7), as well as the hybrid approach (Becker et al., 2012).

In the repeated indicators approach same indicators of the latent construct are used twice, i.e. LOC are formed by the relevant indicators and the higher-order latent variable is composed with the totality of the indicators of all lower-order constructs (Becker et al., 2012). In case of formative constructs, path coefficients between LOCs and HOC are expressed as weights of lower-order latent constructs being assumed as measurement items, to the HOCs. The repeated indicators approach creates the advantage of estimating all factors simultaneously, so that the structural model accounts for this hierarchical component (Ringle, Sarstedt, & Straub, 2012). It is also beneficial in case HOC has an antecedent variable, as one-time estimation allows to assess total effects of this exogenous variable both on lower- and higher-order variables (Hair Jr et al., 2017). However, this method does not allow to perform confirmatory tetrad analysis to verify higher-order construct specification (i.e. formative-formative, formative-reflective, reflective-formative

or reflective-reflective). Lastly, despite providing more accurate results in the case, when all LOC have equal number of indicators, the repeated approach created estimation bias in case LOC constructs include different number of indicators (Becker et al., 2012).

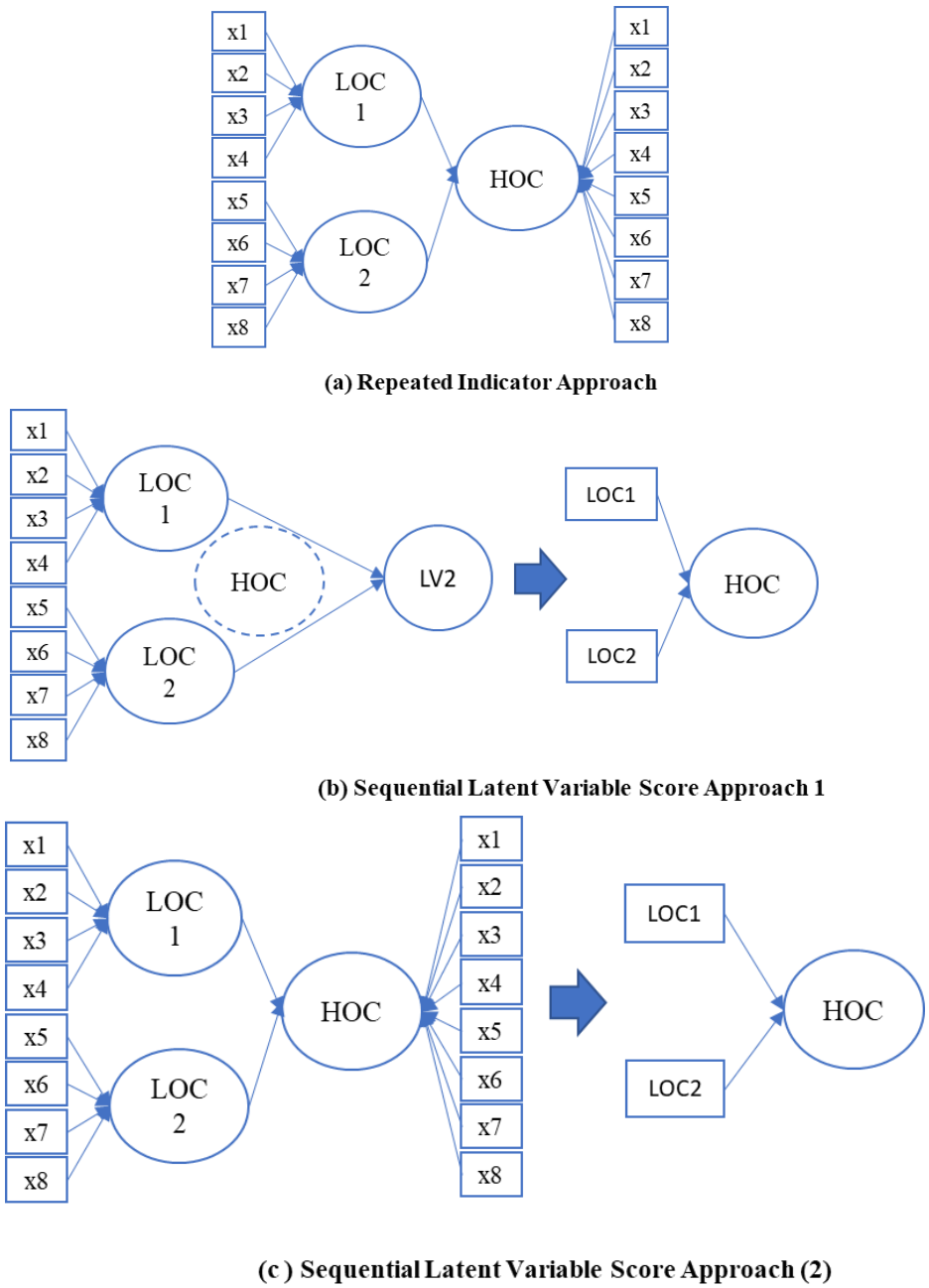


Figure 3-7 Higher-Order Formative-Formative Construct Measurement Approaches. Adapted from: (Becker et al., 2012; Ringle et al., 2012)

In the sequential latent variable score (two-stage) approach, the model is estimated twice (Ringle et al., 2012). First, the scores for the LOC are acquired either by estimating the model without HOC (Figure 3.7b) or by using the repeated approach (Figure 3.7c), and the measurement model of LOC is accessed for validity (Becker et al., 2012). The scores of the LOC are then used as measurement indexes to estimate HOC (Hair Jr et al., 2017). In general, sequential approach is proven to estimate more parsimonious model on the level of HOC (Becker et al., 2012). Second, in the case of formative hierarchical constructs, which indicators are assumed to explain the whole variance of the latent variable, two-stage approach allows to additionally explain partial variance, caused by an antecedent (Ringle et al., 2012). Third, two-stage approach enables confirmatory tetrad analysis (CTA), which is vital in case the model can be specified differently (i.e. as reflective or formative). However, separate estimation of LOCs and HOC creates concerns with interpretations as it does dot considers the nomological network at once (Wilson & Henseler, 2007). Same as repeated indicators approach, sequential method can provide biased results in case the number of indicators in each LOC is different. However, the number of indicators should be primarily dictated by theory rather than by statistically-rigorous results (Becker et al., 2012). As a result, despite some limitation, sequential approach is recommended for the cases of hierarchical formative constructs (Ringle et al., 2012).

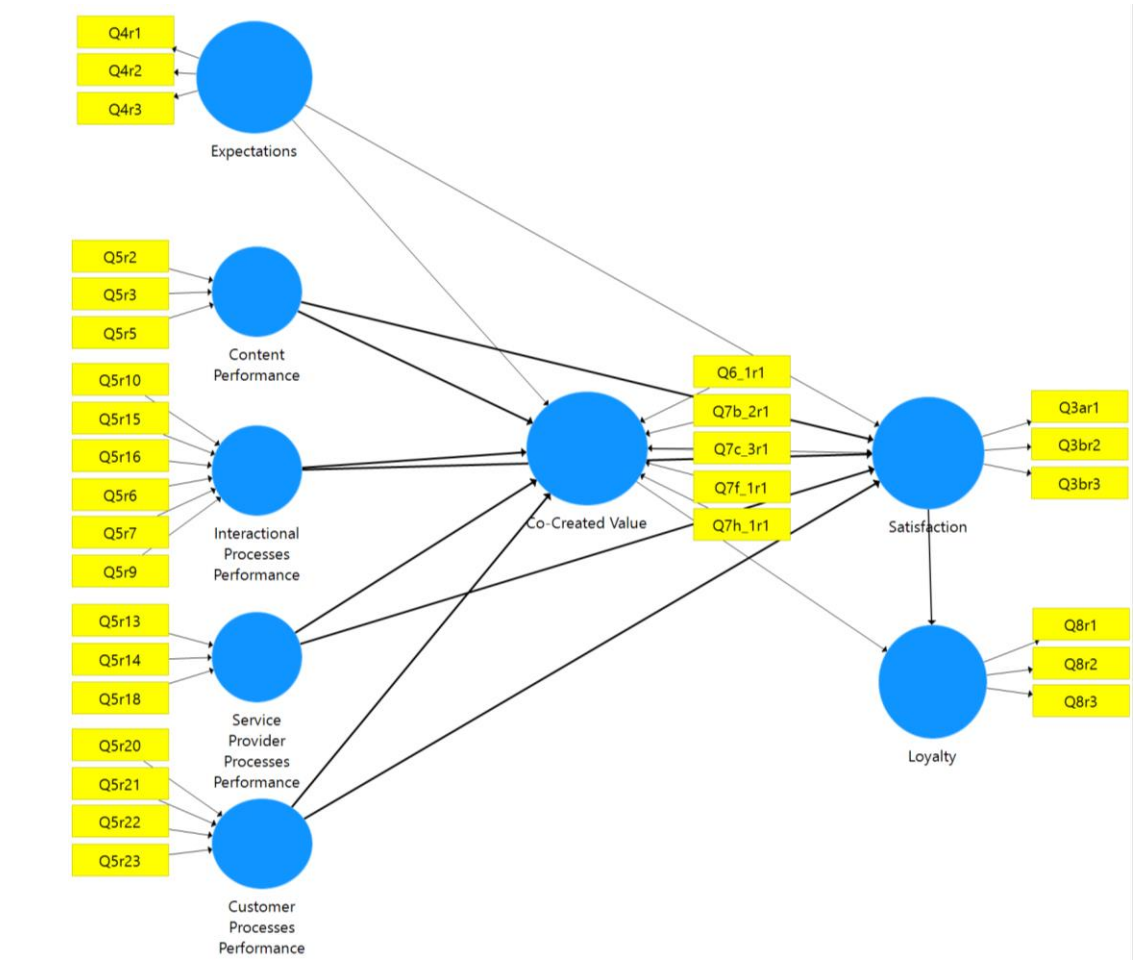
Hybrid approach generates scores using the principle of repeated indicator approach, but then splits the items of each LOC in two parts, so that one part is used to estimate LOC and the second part – to estimate HOC (Wilson & Henseler, 2007). As a result, indicators are used only once, avoiding the problem of artificially correlated residuals (Becker et al., 2012). However, the properties of the hybrid approach are not very well explored, so that most of the authors (e.g. Becker et al., 2012;

Hair Jr et al., 2017; Ringle et al., 2012) believe that further research is required before this method can be securely applied.

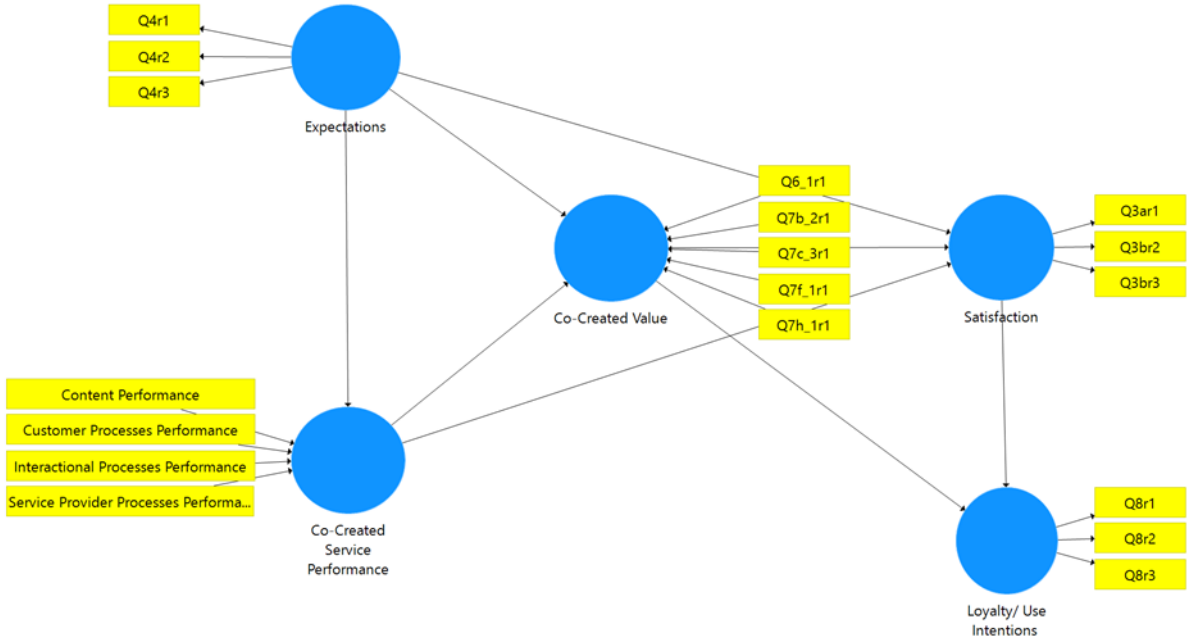
The hypothesised model includes formative-formative hierarchical construct of service performance. Second, customer expectations are defined as an antecedent of tourist perceptions on service performance. Third, while the formative nature of service performance construct is determined by the accepted definition, the confirmatory tetrads analysis (CTA) analysis, which allows to verify this selection, is desirable. Therefore, the study accepted two-stage sequential approach for hierarchical model specification with the influence of expectations being defines on the level of HOC (Figure 3.8).

Model Weighting Approach

To reflect how strongly latent variables are connected, PLS-SEM estimates inner weights for each item within a latent variable (Henseler, Ringle, & Sinkovics, 2009). The specific feature of PLS technique, implemented in the software, is that it uses all values of directly measured latent constructs to estimate the weight and loadings of an outer model and the factor scores and path coefficients of an inner model in one procedure. PLS-SEM includes three approaches to run the algorithm, namely, path weighting, centroid weighting and factor weighting, which vary by the principle of weights estimation and, therefore, slightly affects the result of model estimation (Becker et al., 2012).



Stage 1



Stage 2

Figure 3-8 Accepted Formative-Formative Construct Specification

However, there is no precise guidelines that can securely minimise all bias. Path weighting scheme combined bivariate correlation together with regression analysis based on the computed latent variables' scores. It provides highest R^2 values, which tend to be underestimated by PLS-SEM method (Hair Jr et al., 2016). Also, path weighting is the only scheme, which correctly estimates constructs with the high level of abstraction (Hair Jr et al., 2017). While it is also proven to be superior for reflective-formative hierarchical constructs and repeated indicator approach (Becker et al., 2012), path weighting scheme produces greater parameter bias in case of higher-order formative constructs (Hair Jr et al., 2017). Factor scheme applies correlations between latent constructs. Centroid scheme incorporates the sign of outer correlations between a latent construct and other constructs, adjacent to it. While factor and centroid weighting scheme minimises the bias for hierarchical constructs, they produce bias for structural model estimations. Moreover, centroid scheme is not applicable for the cases of formative measurement models. Therefore, most of the authors agree that path weighing scheme should be preferred in case research is interested in structural model estimations, while Hair et al. (2017) recommend to apply factor weighting scheme for higher-order formative constructs assessment.

The ultimate purpose of the study is estimation of the factor scores and path coefficients of the outer model, where one of the latent variables is hypothesised as second-order formative-formative construct. Therefore, the choice between the path and the factor weighting schemes should be done. At the same time, application of the two-stage approach for model specification enables application of both methods (Gaskin, 2018). To assess the validity of the LOC the model was estimated at the first stage of two-stage approach using factor weighting scheme. Then the structural model was estimated with path weighting scheme with 500 as a maximum of interactions and $1*10^{-7}$ as a stop criterion.

3.4.3.3. Measurement (Outer) Model Assessment

3.4.3.3.1. Formative and Reflective Constructs Assessment

Due to the different conceptual backgrounds, the assessment of formative and reflective latent variables requires different procedures. Table 3.10 summarises the main procedures for measurement and structural model validation. While there exists a range of procedures for construct development and assessment for these types of scales, the domain of SEM is still under development. At the moment, there is no commonly accepted methodology that allows to handle complex models with both reflective and formative constructs.

3.4.3.3.2. Confirmatory Tetrad Analysis

The wrong choice between formative and reflective type of measurement leads to model misspecification and, therefore, to inaccurate parameters estimates (Petter et al., 2007). As it was discussed earlier, the main distinction between reflectively and formatively measured variables is the way they define the observed phenomenon (Wilcox et al., 2008). Specifically, in case of reflective construct, all items aim at describing same phenomenon, so that the change in the construct leads to the change in all measurement items, i.e. they are assumed to be highly correlated. On the contrary, in case of formative construct it is assumed that each item contributed to describing the phenomenon. The change in the measurement item cases the change in the construct, but not vice versa. Also, the change in one item does not affect other indicators. In other words, they are not necessarily correlated as they measure different dimensions of the observed phenomenon (Hair Jr et al., 2017). As so, the presence of correlation between measurement items/indexes cannot serve as an empirical evidence of the construct nature.

Table 3-10 Assessment of Reflective and Formative Constructs

	Reflective	Formative
Decision on the type of construct	Criterion validity applies confirmatory tetrad analysis (CTA), which is done to crosscheck theoretically defines measurement principle and reconfirm the choice between reflective or formative measures	
Item purification principle	- Measurement model and loadings of individual items are estimated by intercorrelations among items and factor loadings. - High intercorrelation between items is desirable. In case of its absence, related items should be dropped form the scale. - Reliable measurement requires the construct to be specified with at least three items	- Measurement model and loadings of individual items are estimated by relationships between constructs in the model. Indexes /items should explain largest portion of variation in the factor and should have high correlation with conceptually related factors - The absence of intercorrelation between indexes is desirable. Its presence indicates conceptual overlap between indexes and leads to multicollinearity. The presence of high correlation is not enough to justify deletion of an index/item as they are primarily elaborated based on theory. In case of high correlations between items, they can be grouped in larger construct or split in higher order constructs based on applied concepts. In case of high correlation and not significant between an item and a construct, it can be dropped.
Measure validation	1. Internal consistency reliability (individual indicator Cronbach Alpha Reliability ($\alpha \geq 0.7$), composite reliability $0.7 \leq CR \leq 0.9$) 2. Convergent validity (outer loadings (indicator reliability$\geq$0.7), AVE$\geq$0.5) 3. Discriminant validity (Fornell-Larcker criterion, cross-loadings, heterotrait-monotrair (HTMT) ratio of correlations): AVE of each construct is higher than squared correlation with other constructs)	- Internal consistency with factor analysis in not applicable. - Convergent validity is assessed through redundancy analysis identifying the construct relationship with the same, but reflectively measured variable ($\beta > 0.7$, $R^2 > 0.6$) or with at least two endogenous reflective constructs. - Indicator multicollinearity (VFI<5) - Significance and relevance of indicator contribution to the construct (indicators weights *$w < 1/\sqrt{n}$, indicator significance $p < 0.05$)*
Measurement Error	Caused by inability to fully explain measures of observed variable	Caused by inability of the set of observed variables together to fully explain the latent construct Error term depends not only on selected observed variables, but also on the additional measures or constructs, used for model identification

Adapted from: (Bollen & Ting, 1993; Diamantopoulos et al., 2008; Diamantopoulos & Siguaw, 2006; Hair Jr, 2010; Hair Jr et al., 2016; Hair Jr et al., 2017; Jarvis et al., 2003; Peterson, Gischlar, & Peterson, 2017; Wilcox et al., 2008)

Confirmatory tetrad analysis (CTA) serves as a tool to reconfirm theoretically and logically proposed latent constructs, in which the items are correlated, thereby providing empirical evidence to support either formative or reflective construct specification. Rather than looking at the strength of correlation, it explores differences between the pairs of covariances, i.e. tetrads, confirming or

disconfirming appropriateness of reflective measurement construct (Bollen & Ting, 1993). In reflective constructs each tetrad has value of 0 and to vanish (H_0: $\tau=0$). If one tetrad value is significantly different from 0 (H_1: $\tau\neq0$), the hypothesis that the items covary equally, i.e. that the construct represent reflective measure, can be rejected and the test provides evidence that the construct is formative (Hair Jr et al., 2017). The specific feature of CTA-PLS is that large number of tetrads leads to multiple testing problem, when alpha is inflated, thereby, increasing probability of Type 1 error. To minimise potential bias, 90% bias-corrected and Bonferroni-adjusted confidence intervals (CI) are usually considered to assess the significance of difference between tetrads. CTA, however, serves as an additional tool for determining the direction of relationships between items and the latent variable. Moreover, it does not allow to check content validity of the construct. Therefore, it can only serve as additional tool and the decision on the formative vs reflective measurement should be primarily determined by theory and logic and should not be changed only based on the result of CTA (Hair Jr et al., 2017).

3.4.3.3.3. Reflective Constructs

Internal consistency reliability

Internal consistency reliability concerns the relevance of latent construct measurement items and the extent to which they measure the latent variable. PLS-SEM allow to assess internal consistency reliability with two tests. First, Cronbach's alpha observes intercorrelations between the latent construct items assuming that all indicators are equally reliable. Higher values between items indicate higher reliability with the commonly acceptable ratio of 0.70 and the minimum acceptable threshold of 0.60, which indicates lack of internal consistency reliability (Field, 2018). Second, composite reliability ratio accounts for covariances and variances in the construct, overcoming the limitations of Cronbach's alpha of sensitivity to the number of indicators (Hair Jr et al., 2017).

Similar to Cronbach's alpha, the value of 0.60-0.70 are acceptable and 0.80 are desirable. However, values close to 1 indicate that all items measure exactly same phenomenon.

Convergent validity

Convergent validity is the extent to which an applied measure relates to other measures within the observed phenomenon (Hair Jr et al., 2016). In the context of reflective construct, it addresses the proportion of variance, shared with other indicators. The general requirement of convergent validity are indicator loadings being higher than 0.7, indicator reliability (i.e. the size of the outer loading) and average variance extracted (AVE) higher than 0.5.

Discriminant validity

Discriminant validity empirically checks whether the construct of an interest captures a unique phenomenon and is distinct enough from other constructs of the model. The first and the most common approach is examination of cross-loadings, which should be lower than an indicators outer loadings (Field, 2018). The main limitation of this approach is inability to test discriminant validity when the constructs of interest are perfectly correlated (Henseler et al., 2017). Therefore, is should not be used as a single test of validity. Second, Fornell-Larcker criterion compares latent constructs correlations with the square root of its AVE, where $\sqrt{AVE} > r^2$ indicated discriminant validity. Same as cross-loadings, Fornell-Larcker criterion should not be applied as a single validity test because it creates biased results when loadings within the construct differ only slightly (Hair Jr et al., 2016). Third, heterotrait-monotrait ratio (HTMT) represents compares the difference of the between-trait and within-trait correlations. The main requirement is the HTMT ratio being statistically significant from 1 (i.e. 95% bootstrap confidence interval should exclude 1) (Sarstedt,

Ringle, & Hair, 2017). However, high values of the ration (i.e. above 0.90 are not desirable as they already indicate potential lack of discriminant validity (Hair Jr et al., 2016).

Considering the possible limitations of each test and the recommendations of PLS-SEM developers to apply the set of criteria to assess reflective constructs, the study applied all of the abovementioned criteria with the commonly applied guidelines and thresholds being accepted to test reliability and validity of tourist expectations, satisfaction with the personalised information service and loyalty.

3.4.3.3.4. Formative Constructs

Assessment of formative constructs differs from the procedures, applied for reflective measures. While it is still necessary to establish validity and reliability, the applied techniques are conceptually distinct from those, used for reflective latent construct assessment (Chin, 1998). The specifics of the procedures are discussed below.

Content Validity

Content validity as an extent to with the selected measurement scale represent a given concept is addressed through content specification, which requires all possible sub-dimensions of the explored phenomenon to be included in the analysis. The measurement indexes, which represent conceptual sub-dimensions of the concept, should be identified theoretically with a help of literature review and qualitative analysis (Jarvis et al., 2003). The undergone procedures were previously described in Phase 1 and Phase 2 of the present study.

Convergent validity

Convergent validity is an extent to which each of the selected indicators contributes to the intended meaning of the latent construct. In the context of formative constructs convergent validity refers to statistical proof that hypothesised indicators adequately represent the variable of interest, which

complements theoretically-driven selection process (Hair Jr et al., 2016). Convergent validity is checked with a help of redundancy analysis (Chin, 1998). It tests the presence of correlation between the proposed formative indicators of the construct and an alternative reflective measure of the same phenomenon (Figure 3.9).

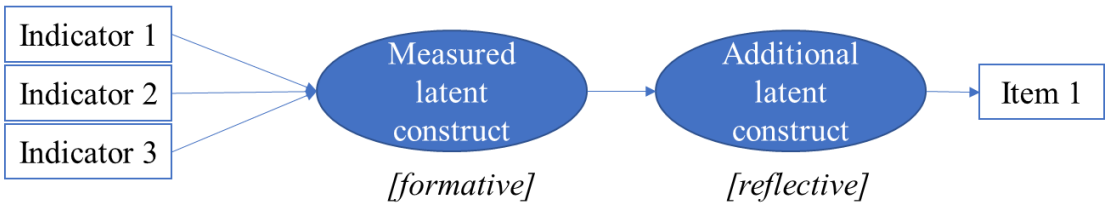


Figure 3-9 Redundancy analysis for Convergent Validity Assessment. Amended from: (Hair Jr et al., 2016)

The threshold for the strength of pass coefficient between two constructs is commonly accepted as 0.7 with the desired value of 0.8 or higher (e.g. Cheah et al., 2018; Chin, 1998). In this case R^2 reaches values of 0.50 - 0.64, which indicate that convergent validity is established, and redundant indicators should be deleted.

The bias in the measurement of indicator redundancy may arise from the sample size and measurement principle, i.e. reflective measure can be represented either by a single or by multi-item construct. First, small sample size (n=100) can produce high path coefficient in redundancy analysis, while with large sample sizes (n=400 and more) predictive validity drops lower than 0.7. However, considering the acquired sample size of n=244, this issue should not affect the validity of the test. Second, there is no commonly agreed opinion on the number of reflective items that should be applied for testing convergent validity. Overall, they can perform similarly (Cheah et al., 2018). From psychological perspective multiple items construct is more relevant as it is can better reflecting the meaning of the phenomenon and average out the random error in the items (Chin, 1998; Sarstedt & Wilczynski, 2009). However, the large number of indicators with the same

sample size increases path coefficient value (Cheah et al., 2018). Application of a global single-item measure does not affect the length of the questionnaire, reducing response bias (Chin, 1998; Hair Jr et al., 2017). Pragmatically, it offers benefits for a researcher, simplifying scale development for different contexts (Cheah et al., 2018). However, single item requires survey respondents to apply abstract thinking to express their perceptions on the phenomenon through the single response, potentially affecting content validity (Fuchs & Diamantopoulos, 2009). Moreover, selecting single appropriate item for an exact context can be problematic, creating the risk for redundancy analysis (Sarstedt, Diamantopoulos, Salzberger, & Baumgartner, 2016). Therefore, the study adjusted the questionnaire design to apply multiple reflective items to assess convergent validity.

Collinearity

Following the definition of formative measurement models, the selected indicators should demonstrate the absence of conceptual overlap among them. Therefore, high correlation between indicators or the presence of collinearity is not expected. Collinearity is assessed through the level of tolerance, which is the amount of variance of one formative indicator that is not explained by other selected indicators of the same variable, or through the variance inflation factor (VIF), which has a reciprocal value to tolerance (VIF= 1/Tolerance) (Ali, Mostafa, & Ringle, 2018; Hair Jr et al., 2017).

A threshold value of tolerance is commonly accepted as 0.2 and of the VIF is 5 (i.e. 1/0.2) (Field, 2018). Lower value of tolerance or higher value of VIF may cause biased results in structural model path coefficients. Depending on the significance and relevance outer weights, collinearity problems can be addressed either by removing the indicators that causes the problem, or reorganising the latent variable into higher-order construct (Hair Jr et al., 2016; Lowry & Gaskin,

2014). However, in case these procedures do not allow to solve collinearity issues, the whole measurement model will produce meaningless results, so that it should be operationalised differently.

Significance and Relevance of the Selected Indicators

The outer weights within a formatively measured variable represent the outcomes of a multiple regression, where the indicators serve as independent variables to measure the latent construct by producing its score. In other words, outer weights illustrate the relative contribution of each indicator to the entire latent construct. The analysis, therefore, includes the assessment of significance of their contribution to the this construct (Hair Jr, 2010).

The problem of indicator weight assessment is related to the fact that they are dependent on the whole system of relationships in the model and the number of indicators. In the first case, when a latent formative construct is used as an exogenous variable to explain the outcome of an endogenous variable, the later may change the meaning of the formative construct, affecting the values of indicator weight. For this reason, assessment of the p-value of the indicators weight is not enough and the analysis of bias-corrected and accelerated confidence intervals (BCa CI) is essential. Hair et al. (2016) also advices to avoid comparison between the weights of the same constructs, used within different models. In the second case, the number of indicators used to form a latent construct may decrease the value of weights. In formative constructs indicators, used to measure the latent variable, are assumed to explain its whole variance. Therefore, the maximum possible outer weight of each indicator should be not more than $1/\sqrt{n}$, where n is the number of indicators. In this case, the indicators with high weight should be examined (Hair Jr et al., 2017). Too high weight can mean that two or more indicators in the model measure same thing or that these indicators belong to different concepts, i.e. should be reorganised into different construct or

subconstructs. At the same time, when formative indicator's weight is high (i.e. w>0. 50), but nonsignificant, the absolute importance, i.e. the contribution of this indicator to the construct without considering other formative measure, should be additionally assessed. Specifically, when the loading is above 0.5, the indicator should be interpreted as important in general but not relatively important within the group of other indicators. Such indicators should be retained if it matches theoretical framework. However, if both the weight and the loadings are not significant and the loading has low value (l<0.1), such formative indicator should be deleted.

To assess the formative-formative hierarchical construct of personalised information service performance and the formative construct of co-created value, the study applied the discussed criteria and guidelines to test construct redundancy, collinearity issues and significance and relevance of the indicators, selected for each construct.

3.4.3.4. Structural (Inner) Model

The structural (inner) model assessment includes examination of predictive capabilities of the hypothesised model and exploration of the relationships between the variables. In comparison the CB-SEM, goodness-of-fit index is not applicable for the case pf PLS-SEM. Instead, the model assessment comprises a set of criteria, which include the test for collinearity, assessment of significance and relevance of hypothesised structural relationships, explained variance R^2 and effect size f^2, followed by the analysis of predictive relevance Q^2 and effect size q^2.

3.4.3.4.1. Model Fit and Predictive Capability

Prior to analysing the structural relationships, which are the focus of the study, it is important to assure that the algorithm produces relevant outcome. First, PLS-SEM can produce biased structural model estimates in case of high level of collinearity between the sets of predictor

variables. Therefore, the assessment of the level of collinearity is required, where the tolerance value of TO >0.20 or VIF <5 as acceptable (Hair Jr et al., 2016).

Second, the model predictive accuracy is determined by the explained variance in each of the endogenous constructs. The coefficients of determination R^2 is commonly used as an indicator of model in-sample predictive power as it reflects the squared correlation between an actual and predicted value of a selected endogenous variable. R^2 values of 0.25 demonstrate weak, 0.5 - moderate, 0.75 – substantial predictive accuracy (Hair Jr et al., 2011). However, in some contexts with high uncertainty of the outcomes, including consumer behaviour, the values of 0.2 or even 0.1 are considered as high. Therefore, the observed phenomenon and its context should also be considered when interpreting the results (Sarstedt et al., 2017). Moreover, the R^2 is dependable on the number of construct predictors. Therefore, when assessing the predictive accuracy and, especially, when comparing the predictive power of two different models, the R^2, adjusted to the number of antecedents, should also be considered (Hair Jr et al., 2016). However, an absolute value of R^2 gives few insights in model predictive accuracy. The effect size f^2 provides better understanding on the role of predictors in explaining model variance as it calculates the change in R^2 when a selected endogenous variable is excluded from the model. General rule of f^2=0.02 causing no effect, f^2 =0.15 having a moderate, and f^2 =0.35 having a large effect on R^2.

Third, the out-of-sample predictive accuracy Q^2 refers to the difference between the original and predicted values of the construct, i.e. the smaller is the difference, the larger is value of Q^2 (Sarstedt et al., 2017). Therefore, any value, which is higher than 0, indicates that the predictive power of the model is acceptable.

Fourth, both R^2 and Q^2 tend to outfit a given sample when generating the in-sample and out-of-sample predictions, accordingly. PLS-predict algorithm serves to identify potential overfitting of

the model by comparing the prediction errors of the estimated model against simple mean predictions (Shmueli, Ray, Estrada, & Chatla, 2016). The generated $Q^2_{predict}$ can be interpreted with the similar logic as Q^2, so that a positive value indicates that the prediction error, which is generated by PLS-SEM, is smaller than the one, applied using the mean value, confirming predictive validity of the model (Sarstedt et al., 2017).

Lastly, to enable theory testing, model fit parameters, such as the standardised root means square residual (SRMR), root means square covariance (RMS_{theta}) and exact fit criteria of squared Euclidean distance (d_ULS) and geodesic distance (d_G), as well as normed fit index (NFI) and multinormal distribution (Chi-square) have been recently introduced into PLS algorithm (Henseler et al., 2017). Specifically, SRMR and NFI can be applied in case a model, analysed with PLS-SEM, includes formative indicators (Gaskin, 2018). However, Hair et al. (2016) argue that application of the same logic as in CB-SEM is not fully applicable for PLS-SEM. Therefore, the established threshold of SRMR<0.08 and NFI>0.8 should be used with care.

3.4.3.4.2. Direct Causal Relationships

The analysis of hypothesised relationships of the structural model includes the assessment of the strength, significance and relevance of significant path coefficients β. The standardised value of the relationships between the variables may vary between [-1; 1] with the commonly used two-tail test of significance level of 5% (t-value >1.95, p<0.05). An additional check of path coefficients significance includes testing the stability of estimates by exploring bootstrap confidence interval. Zero, which falls within the bias-corrected confidence interval, indicated that path coefficient is not significant at a certain level. Additionally, q^2 effect size measures the predictive power of the path coefficient by calculating the change in out-of-sample predictive accuracy Q^2 when the target

exogenous construct is deleted. General rule of q^2 =0.02 causing no effect, q^2 =0.15 having a moderate, and q^2 =0.35 having a large effect on Q^2, pointing at relevance of path coefficients.

3.4.3.4.3. Indirect (Mediating) Causal Relationships

Mediation is the effect of the additional variable or several variables on the relationships between two constructs, so that the change in exogenous construct triggers the change in a mediator, which, in turn, affects the endogenous variable (Hair Jr et al., 2016). After assessing the direct relationships of a hypothesised model, additional analysis is required to identify potential suppressing or spurious effects (Henseler et al., 2009). Full mediation occurs when the effects between two variables is totally transmitted via mediator, making the direct path between them not significant. Partial mediation is the case when a mediator partially absorbs the direct causal effect between exogenous and endogenous variables, making both direct and indirect relationships significant. The possibility of both direct and indirect relationships and the capability of a mediator to change the direction of the effect, leads to the existence of several types of partial and full mediating effects (Table 3.11) and together accounting for total effects (Carrión, Nitzl, & Roldán, 2017).

Table 3-11 Types of Direct and Indirect Effects. Amended from (Hair Jr et al., 2016).

Type		Direct Relationship	Indirect Relationship	Direction of relationships
Non-Mediation	Non-mediation	Significant	Not Significant	Same/Opposite
	No-Effect non-mediation	Not Significant	Not Significant	Same/Opposite
Partial Mediation	Complementary	Significant	Significant	Same
	Competitive	Significant	Significant	Opposite
Full Mediation	Indirect-only	Not Significant	Significant	Same/Opposite

The analysis of mediation requires assessment of the strength, direction and significance of direct and indirect effects, which, in turn, enables comparison between them. Whether being competing or connected, multiple mediators can be correlated, affecting the total effect of exogenous variable on the endogenous one. Therefore, in the case of multiple mediation, the test of significance should

be held for each indirect effect, total indirect effect and direct effects between the constructs of interest (Hair Jr et al., 2016).

In the case of the hypothesised model (Figure 3.10), the total effect of Expectations on Satisfaction can be summarised as:

$$D = D' + (A_1 * B_1) + (A_2 * B_2) + (A_1 * A_3 * B_2)$$

Thus, to identify the presence of connected mediation, the significance of the direct effect D' was compared with each indirect effect $(A_1 * B_1)$, $(A_2 * B_2)$, as well as with the total indirect effect $(A_1 * B_1) + (A_2 * B_2) + (A_1 * A_3 * B_2)$.

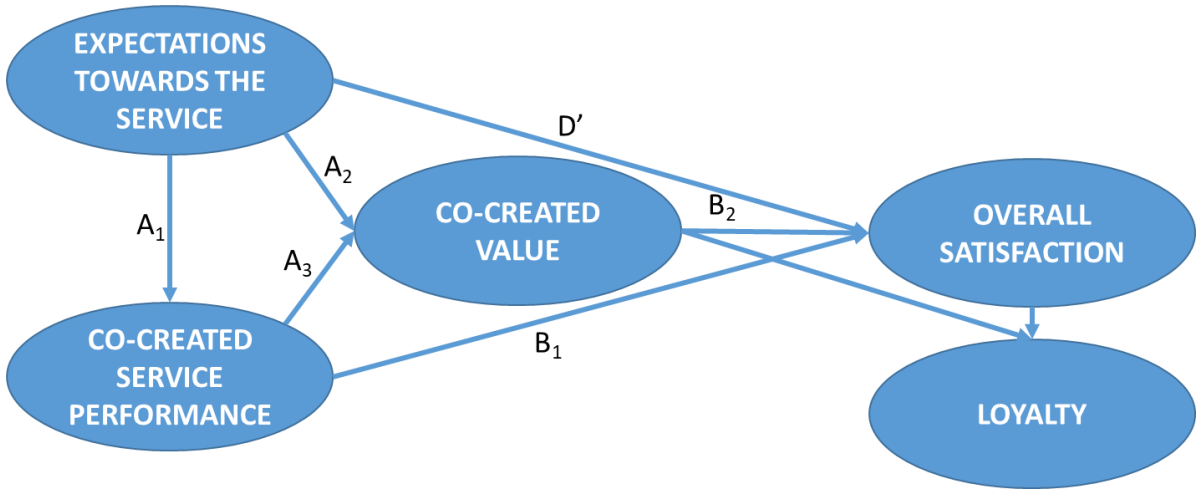


Figure 3-10 Hypothesised Mediation

3.4.3.4.4. Moderated Causal Relationships (Model Invariance)

Invariance in the strength of structural relationships between explored variables can be a result of human perceptions' heterogeneity. Failure to identify the cause of heterogeneity reduces the power of statistical tests and creates a threat for establishing model validity (Hair Jr et al., 2017). Therefore, the study additionally tested the possible effect of the factors of personal, social, travel and technological contexts.

Multigroup analysis and product term approach serve as tools to compare model parameters between the identified groups of respondents, so that the variables, that characterise tourist contexts, are tested as categorical moderators, which influence the magnitude of relationships within the model. Both methods lead to similar results (Henseler & Fassott, 2010). The advantage of the product term approach is its straightforward procedure and capability to handle both categorical and ordinal variables. However, it requires further adaptation and simplification of the model in the case, when formative constructs are used. Multi-group analysis creates bias in case moderating variable is ordinal and requires additional check for equality of measurement of the constructs (Hair Jr et al., 2017). However, it reveals more insights on the strength of relationships. Reinecke (1999) cited by (Henseler & Fassott, 2010) suggests using both methods to ensure the validity of results. More recent studies (e.g. Hair Jr et al., 2017) selecting one method based on the research objectives. As the study defines tourist needs, expectations and perceptions as context-dependent, it is important to acquire deeper insights in the effects of multiple factors of tourist internal and external context on the strength of structural model relationships, it applied multi-group two-step procedures.

First, the samples of each group are analysed and groupwise parameter estimates are assessed with a help of the measurement invariance of the composite models (MICOM) procedure to confirm the presence of variance and the equality of mean values and variances across groups (Henseler, 2012). If the measurement invariance is not established, it means that variations in the relationships between the variables are caused not by the real difference in the magnitude of these relationships, but by different meaning the representatives of different groups may attribute to the same notion. In other words, the models estimated for the groups under investigation cannot be compared.

Second, in case partial and full measurement invariance are established, the significance of the differences between the target groups are assessed (Hair Jr et al., 2017). Permutation tests, PLS-MGA and Welch-Satterthwait tests are among the procedures, developed to test the hypothesis of the second stage of analysis (Chin, Marcolin, & Newsted, 2003; Hair Jr et al., 2017). Overall, they may perform similarly (Henseler, 2012). Permutation test is named as more conservative one (Chin et al., 2003). However, PLS-MGA is a non-parametric test, which is free from the assumption of data normality and derives parameter estimates based on the observed distribution of bootstrap outcomes (Henseler, 2012). For this reason it is more suitable for PLS-SEM, which does not set the assumption of data normality (Henseler, 2012), and especially, for the cases, when the proportion between responses on the compared groups is not equal. As so, the study applied Permutation test for groups with the relatively equal proportion of responses in the groups, while PLS-MGA test was run for all other cases. To minimise bias, the estimation of pairwise differences was done with application of Path weighting scheme (max 300 iterations) and Complete Bias-Corrected and Accelerated (BCa) Bootstrap procedure with 1000 subsamples.

3.4.3.4.5. Importance-Performance Map Analysis

Importance-performance map analysis (IPMA) is a tool that extends model assessment by contrasting the importance of predecessor variables in predicting the target one towards its performance. The importance dimension is represented by direct and indirect effects of independent constructs on dependent ones, while performance is expressed by these latent variables' scores. The increase in performance of the predecessor construct by 1 point would lead to the increase the performance of the target construct by the size of the total effect (Hair Jr et al., 2017). IPMA provides important managerial implications, such as identification of the constructs with high importance but low performance, which require improvements, or low importance and

low performance, which are not worth investments (Hair Jr et al., 2017). Following the objectives of the study, it is applied to assess the importance of four subconstructs of personalised information service performance on the overall co-created service performance, and of the expectations, co-created performance and value on satisfaction.

3.4.4. Quantitative Research Quality and Limitations

Phase 3 of the study followed the procedures of the research design data collection and analysis, as well as the standards of reporting to ensure the validity and reliability of the findings. Table 3.12 summarises the most important strategies, applied by the quantitative stage.

Table 3-12 Quantitative Research Reliability and Validity

Stage of Research	Applied Strategy	
Research Design	Elaboration of the survey questions based on the theory-driven definitions of each concept, existing measurement scales and the results of the qualitative research	Content validity Construct validity Reliability
	Application of the data screening criteria	Content validity
	Application of the visual aids in the survey design	Reliability
	Pre-test of the survey questions	Content validity
	Pilot Test	Construct validity Content Validity
Data collection	Determination of the minimum sample size	Predictive validity
	Application of the filtering criteria to select target population	Content validity
	Application if the filtering criteria to select valid responses	Content validity Reliability
	Availability of the questionnaire in English and Chinese	Data Reliability
	Incorporation of the cover letter and the informed consent	Ethical validation
Data Analysis	Application of the methods of the measurement model validation, relevant for the case of the hypothesised model	Construct validity Reliability
	Application of the methods of the structural model validation, relevant for the case of the hypothesised model	Predictive validity. Reliability
Reporting the results	Avoiding plagiarism	Ethical validation
	Presentation of findings in written and graphical forms	Content validity

Research Design

In terms of the research design, it is possible to outline one limitation, which may affect the findings. Following the requirements of the redundancy analysis of the formative constructs, the formative indicators should be evaluated towards one or several reflective items, which describe

the concept. The questionnaire design adopted the additional reflective set of indicators for the Co-Created Service Performance higher-level construct and Co-Created Value latent construct. However, in the context of multidimensional nature of Co-Created Service Performance the convergent validity would have been better established if the reflective set of indicators for each of the dimensions of Co-Created Service Performance had been additionally adopted.

Data Collection Methods

In terms of data collection, the major limitation of the quantitative study is representation bias. On the one hand, the study explores satisfaction with personalised information service, which is delivered via computing devices. Customers with no access to the Internet do not belong to the target population. Moreover, the proportion of the Hong Kong residents, who are not the Internet users, constitute less than 8% (C&SD, 2017). Therefore, the problem of not equal access to online resources, which often creates limitations for online survey (Gideon, 2012), will not influence the present study. The fact that the respondents decide on participation themselves, improves data representativeness in comparison to convenience sampling (Saunders et al., 2012). Though, self-selection method produces a high probability of the sampling error, which is especially relevant for online surveys (Quinlan, 2011). Online panel, reached through the research agency, has a potential to increase coverage error by reaching smaller population of active users of online surveys platforms, rather than the whole target population.

Another limitation of the study is the self-report techniques, applied after service consumption. First, it led to impossibility to associate the formed perceptions with the exact interactions with the personalised information service at the exact context of consumption. On the contrary, the interview and, mainly, the survey questions, triggered specific memories about different tasks and

related personalised information service performance. This, in turn, could have created bias in data validity. It can also explain the observed heterogeneity of responses.

Second, respondents are motivated to give specific answers to survey questions because of several reasons (Curran, 2016). In addition to the willingness to contribute and to acquire a reward, people may give initially misleading or fake answers. This may be related to their attitude to the specific topic of the survey or the attempt to receive offered incentives while investing minimum time and cognitive efforts into survey completion. A set of techniques are applied to ensure comprehension of the questionnaire by respondents and the absence of spontaneous and random answers. However, potentially fake data, i.e. when users would give same reply to multiple questions but occasionally varying the answers to make the data look valid, may still exist in the sample. At the same time, introduction of an additional screening criteria to the questionnaire would have led either to the substantial increase in the cost of data collection, or to the small sample size. Due to the default high cost of the survey and the existing model requirement, the potential problem of individual validity remains among limitations of the study.

Third, customer expectations and perceptions dynamic are context-dependent and evolve during the process of co-production and after it. Pragmatism insists that the knowledge should be derived from the process. To establish better external and predictive validity the opinion on expectation should be collected before usage, perception on service performance should be accessed right after usage, and value and satisfaction data would be collected after service consumption. Recent technological advancements and constant connectivity provide technical opportunities to collect tourist opinion in real time and within the context of information service co-production and value co-creation. Such applications as MovisensXS (2017) provide respondents with the opportunity to submit replies on the go exactly during or right after interactions with a service. Though, the

requirement of a large sample and related financial and time requirement, associated with data collection, created restrictions for the present study, allowing only single interaction with the respondents. Therefore, the conceptual limitation of internal validity should be acknowledged in addition to the discussed technical issues. In future, combination of explanatory and confirmatory research with the elements of intervention in the process of personalised information service consumption, so that data is partially collected before and during service consumption, is suggested as more appropriate.

Additionally, certain limitations to data validity and reliability may exist due to the accepted strategy of data screening, initially implemented to ensure data validity. Human attention decreases after 10-15 minutes, thereby, potentially affecting the validity and reliability of the data. While single attention check question was purposely accepted with the purpose of causing minimum interruption to the respondents, its presence in the middle of the survey cannot ensure high tourist engagement with the last part of the questionnaire.

Data Analysis Methods

In terms of data analysis, the reliability of findings can potentially be affected by the selected metrics and settings of SmartPLS software. The study followed the recent recommendations of the scholars, who established themselves in PLS-SEM domain, including the developers of the method. However, the procedures of PLS-SEM are still under development. Due to the lack of empirical research, related to the performance of some of the existing procedures and metrics (e.g. metrics to assess model fit), there is no common agreement between the experts of the exact settings, which should be applied to assess measurement and structural models for the model of the hypothesised complexity.

Lastly, the study collected relatively wide range of parameters that may cause heterogeneous responses and, in turns, invariance in the measurement model. Relatively small target population of Hong Kong Google Trips users, psychological factors and the need to keep the respondents engaged with the survey, as well as technical limitations and ethical consideration, which restrict the researcher from tracking more types of personal data, does not allow to build the holistic picture of the respondents. Therefore, it is important to acknowledge that there can exist the unidentified heterogeneity, caused by the unobserved factors of tourist context, which, in turn, may create bias in measurements of the path coefficients magnitude.

3.4.5. Conclusion

Phase 3 proposes a set of methods, aimed at meeting the objectives 6 and 7 of validating the proposed measurement and structural models and identifying the potential invariance in the observed relationships. Guided by pragmatism and the need to target relatively homogeneous populations to identify behaviour patterns, the study targets the specific population of Hong Kong residents, who travelled abroad and used Google Trips mobile trip planner to support their tourist activities. The research proposes rigorous sampling strategy and validation procedures to ensure belonging of the respondents to the target population and the validity and reliability of the acquired data. The PLS SEM tests are explained as appropriate procedures for validating the reflective and formative types of latent constructs, for measuring the direct and indirect relationships between the constructs, for exploring the possible moderating factors of the observed relationships and for identifying the most important factors for improving the performance of the dependent latent constructs. The elaborated research design of the Phase 3 is believed the optimum to minimise possible bias in data collection and analysis and to ensure the validity and reliability of the findings.

However, several limitations are taken into consideration when integrating the research findings of all three phases.

Chapter 3 Conclusion

To sum up, the chapter has discussed the specifics of the research methodology, aimed answering the research questions and acquiring valid and reliable results. Being guided by pragmatic research paradigm, which is advantageous for interpretations of the research phenomenon of personalised information service and for elaboration of the complex research objectives, the study accepted three-phase sequential research design, which allows to accommodate the methods, which can generate the answers to the articulated research questions.

The first phase primarily operationalises the conceptual model under perspective of S-D logic and based on the previous research and elaborated scales. The second phase builds on the empirical qualitative study and, specifically, on the results of the qualitative content analysis, which triangulates the self-reported perceptions of tourists, the experience of the industry experts and the knowledge of academics. It allows to further specify and refine the measurement and structural models, which are tested during the 3rd phase with the PLS-SEM set of techniques based on the customer online survey data.

The proposed design aims at securing the continuity between methods, integrating the findings, delivering rigorous interpretations and transferable insights, thereby, creating useful findings. However, such factors as scarcity of time and financial resources, imperfection or the developing nature of several data collection and analysis methods, as well as drawbacks of planning may affect the desired research quality, potentially creating bias.

Chapter 4 Findings

The study followed two-phase sequential research design with the combination of qualitative and quantitative methods of data collection and analysis. This chapter consequentially provides a detailed report of the findings of each phase. It further interprets the findings in relation to the research objectives, articulated for each phase in order to crease the background for integration of the results and addressing the research aim, done in Chapter 5.

4.1. Phase 2: Empirical Exploratory and Explanatory Qualitative Inquiry

The qualitative findings represent the result of triangulated opinions of the three groups of participants on tourist expectations towards the personalised information service, their perceptions on the co-created service performance, co-created value, as well as satisfaction and loyalty. The findings primarily answer the Research Objectives No 3, No 4 and No 5 and serve for the verification and further clarification of the hypothesised model of tourist satisfaction with personalised information service. They also provide the details and in-depth explanation of the identified perceptions (for tourists) and related theories and practices, developed in response to them. To present the findings, this section follows the process of tourist satisfaction formation to specify each of the hypothesised variables, and then explain the relationships between them.

4.1.1. Tourist Expectations

4.1.1.1. The Nature of Tourist Expectations towards Personalised Information Service

Overall, tourist expectations towards personalised information service are confirmed to be a ***generalised judgement***, rather than a detailed conscious listing of the encounters with the service and its attributes. Specifically, all tourists shared the description of what desired information

service would satisfy their information needs by reflecting on the issues they faced in previous trips and on the benefits they may acquire. For example, one of the tourists, who recently got married, described her expectations toward information services in tourist as being able to dynamically adjust the presented information to the changes not only in her personal but also in social context:

'*Let's say I'm travelling with my family and with children, my preferences would change, and the selection of the relevant information should change according to the number of people, their salary. Or if I am travelling with a young couple or students, their preferences might be very different from ours'*.

Such reflections demonstrate that tourist expectations are related not to the capabilities of the service to deliver personalisation or IS functionality. Three of four academics agree that such expectations are rather superficial and are narrowed specifically to the potential service outcome:

'*Ordinary tourists would not think too much. Their judgement is very simple. They think on the level of 'this is right', 'this is wrong'. And the way they would adopt the technology, they would think that the information is useful, because it fits into their context, but they won't think that this is because of personalisation. They think this is the way information should be*'.

Another conclusion, which can be drawn by comparing tourist description of the anticipated information service to the present state of personalisation in tourism industry (e.g. Skift, 2018), is that tourist expectations include highly personalised service outcome. All industry experts are consistent in the opinion that tourists became very demanding towards the capabilities of personalised information services to implicitly and proactively meet their preferences and to assist them along the trip. Such expectations are influenced by tourists' understanding of contemporary capabilities of ICTs in general. A developer of the travel information website admits: '*Everyone*

is doing basic context-aware personalisation and users kind of got accustomed to it'. An expert in user experience (UX) and personalisation for tourism explains that:

'C*ustomer expectations have never been so high. We're talking about digital transformation as a requirement because businesses should become more personal and more relevant to stay on the market, to be more agile and to engage better with their customers. Or they have to close their doors'.*

Importantly, all three groups of respondents demonstrate that tourists are often not aware about personalisation technology being applied by the exact information service provider. Tourists neither recognise whether information is initially personalised or not, nor pay attention to the system information about the presence of personalisation process even when being preliminary warned that some of the information services use content personalisation. For example, when asked about their expectations on information services capabilities to support planning their trips, tourists discuss information services that apply implicit personalisation to the list of travel services (e.g. Google Trips, TripIt, TripAdvisor) and those that do not (e.g. Booking.com, Hotels.com), in one row. The industry experts also admit that users normally do not differentiate between personalised and not personalised information services. Moreover, often they are not aware about personalisation being applied and attribute their basic expectations to the travel websites and mobile applications:

'Now, with all this technology, with mobile websites, people would expect more personalized information to be delivered by technology. They expect the tailor-made information will be created for them to facilitate their decision making, whatever they are interested in… But I don't think they are really aware of the website being personalised, I don't think they can distinguish between personalised information and not personal information.'

'*On the one hand, they would not be aware about personalisation, so they would expect the website to perform its normal functions. On the other hand, we live in an interesting world, when user expectations towards the websites increased dramatically in general'.*

However, academic researchers explain that tourist awareness about the presence of personalisation technology may increase their expectations before interactions with an information service begin:

'*First of all, we have to look at their awareness about it. They cannot have high expectations because they don't know about it. So* [when speaking about high expectations]*, I was talking about the moment when they already learnt that there is personalisation, that information can be personalised for them, and then they expect a lot*.'

4.1.1.2. Attributed Meaning in Tourist Expectations towards Personalised Information Service

When assessing the specific meaning tourists attribute to personalised information services in their expectations, it can be summarised as ***anticipation on service reliability in being useful for satisfying their individual needs*** *(Figure 4.1)*. In particular, tourists' answers demonstrate that their expectations are the reflection on their individual, specific and immediate preferences and wants, derived from the exact context of consumption, and the possibility to satisfy them. In other words, tourists would like to receive highly ***personalised information:***

'*For example, if we're talking about the airline tickets search, they* [information service providers] *can know what type of seats I prefer, it will be good if they offer me that type of seat. Moreover, I expect them to know this, the airline should know these details*.'

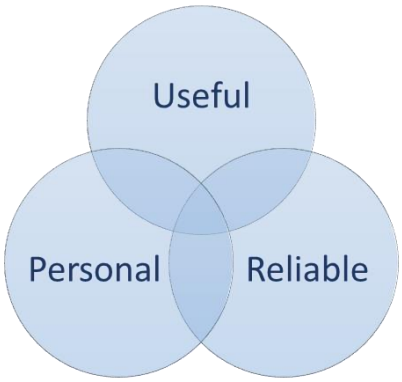


Figure 4-1 Specified Construct of Tourist Expectations towards Personalised Information Service.

One of the marketing experts, who observes consumer behaviour in time, supports the idea that the level of expectations towards information service capability to satisfy certain needs changes depending on these needs and the context of consumption by giving the following example:

'*… Business travellers plan by themselves, they don't really care, and we don't see any of the patterns. Normally they do not email us. But when bringing family to Hong Kong … suddenly same customers can become very demanding. No reason for them to do that before, because they're here only for work*'.

Expectedly, relevance of information to an individual context was associated by all three groups of participants with the ***usefulness of an information service for the need satisfaction***. For examples, a researcher in ICT for Tourism states that '*people no more willing to accept genetic information, they would like to see something that is useful for them … They expect that tailor-made information will be created for them to facilitate their decision making, whatever they are interested in*'.

The third theme that emerged from the interviewees' reflections is ***reliability of an information service provider in delivering relevant and useful information***. One of the tourists, who also mentioned that she finds the proposed information as not suitable for satisfying her needs,

explained that she does not trust Google in recommending hotels for her because '*in Google the top one and top two, and, sometimes top three* [selected options] ... *they're definitely not the most popular options, but those, who pay for these top positions*'. One of the tourism marketing experts explains that expectations towards reliability, personalisation and usefulness for a successful trip are interrelated:

'*If they* [tourists] *are told that their trip is custom made, they go there as they are recommended to do so. They will have higher expectations, because they will understand that it is not simply advertised but chosen for them. If something happens to their trip, if their experience is ruined, subconsciously they will blame the website*.'

Importantly, the awareness about personalisation may add new features that tourists attribute to information service. In particular, the findings demonstrate that understanding of the process of personalisation and the fact that an information system tracks their personal data may add expectations that this service will use tourist data reliably and securely. When specifically asked about their expectations towards the process of personalisation, which track user personal data to select relevant information for them, tourists state that they have concerns about their security threats, associated with unreliable data usage. Frequent travellers, who always use online information services to plan the trip, outline that they expect well-known websites to use be reliable and to provide appropriate protection to their data. Tourists, who did not travel a lot, or who used to be assisted by a travel agent, have lower expectations towards reliability of data application by information service providers. However, none of the tourists introduces the issue of data-related reliability among their expectations him/herself. On the contrary, their responses were provided as a feedback on a specific probe question. Therefore, information service reliability, related to secure application of user data, in not a stable parameter of tourist expectations at least in Hong Kong

context.

As a result, the findings prove that in the case of tourist interactions with personalised information service, their pre-consumption expectations constitute a simple judgement, which reflects their information need within a context of consumption. The anticipated service performance can be described by three major parameters of personalised, useful and reliable information service. The expectations on these parameters are interrelated and shaped by tourist previous experience with information services and by awareness about the capabilities of contemporary technologies to support decision making. Such view is consistent with the basic concept of customer expectations being defined as the wants and feeling of what benefit would service provide them (Chan et al., 2003; Song et al., 2011). It allows to specify tourist expectations latent construct as a first-order, reflective construct with the measurement items, which explain the meaning of the latent construct in the context of personalised information service and regardless of tourists' previous experience and awareness about personalisation being a part of information service processes. It is also consistent with the validated measurement scale from the above named studies (Chan et al., 2003; Song et al., 2011) and allows to borrow the survey questions from them.

4.1.2. Co-Created Personalised Information Service Performance

As it was discussed in the literature review, service performance summarises customer judgements on operating attributes of the service. When seen under perspective of S-D logic, the performance of a service can be redefined as being determined by the resources of the service provider, or the IS and of the customer himself. The next section discusses the specifics of personalised information service performance and resulting specification of the latent construct.

4.1.2.1. The nature of Co-Created Personalised Information Service Performance

Qualitative research demonstrated that co-created personalised information service performance can be defined from two perspectives. On the one hand, it is described as a ***summative judgement about the performance*** of the four distinct dimensions of service performance. On the other hand, it is also be defined as ***a generalised judgement about the overall service performance*** in the context of the need that triggered interactions with the service.

4.1.2.2. Attributed Meaning in Tourist Summative Perceptions on Co-Created Service Performance

In the case of the summative judgement, the dimensions of Co-Created Service Performance together with their attributes represent important composites of the concept, including the performance of the content itself, of interactional processes with the website or mobile app interface, of service provider personnel and the company as an entity, and of tourist participation and control over service performance (Figure 4.2). The first three dimensions conceptually match the classic dimensions of information system success model (Delone & McLean, 2016; Petter et al., 2013), while the fourth one is consistent with the proposed dimension of customer processes performance.

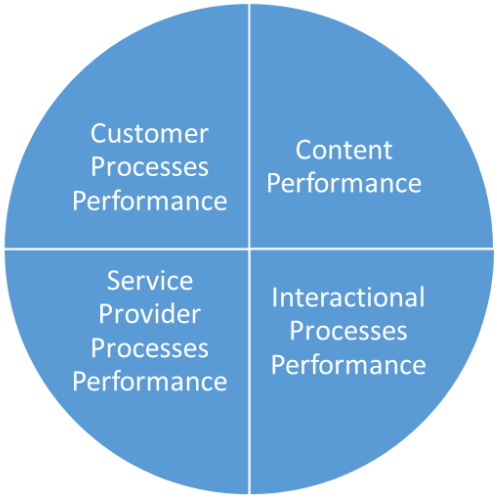


Figure 4-2 Specified Dimensions of Co-Created Personalised Information Service Performance

In order to achieve high level of personalised information service performance users need to perceive each of these dimensions as excellent. For example, the experts explain that personalised information service should provide relevant and dynamically adjusted information to decrease the time and the scope of interactions with the IS, which is required to satisfy the information need. The interactions with the IS interface should also be intuitive to an extent that they minimise the number of tasks, required to retrieve relevant information and to perform control over the system settings, as well as be smart enough to prevent the user from receiving the irrelevant or zero options as a result of manual customisation. However, to ensure that the customers can receive relevant information, the personalised information service should give users the perception of control over the scope and the type of information, which would require user to perform additional interactions with the IS. For example, one of the UX designers emphasises that personalised information service requires '*complicated or multistage strategy'* to ensure high performance, because implicit personalisation itself brings high perceptions of '*convenience because of its interactive and non-intrusive'* nature but leaves user with the perception of the *'taken control'*. On the contrary, manual '*customisation brings the control back, but interrupts users from need satisfaction'* and created

additional cognitive load. As a result, each dimension of Co-Created Service Performance has partial contribution to the overall judgement about it. While the operational dimensions can be partially interrelated, high performance of one dimension does not guarantee high performance of other parameters. Together, these features allow to reconfirm the formative nature of the construct in the way as it was initially hypothesised in Chapter 3.

4.1.2.2.1. Content Performance

Similar to the cases of static content (e.g. Chae et al., 2002; Gorla, Somers, & Wong, 2010) and personalised recommendation (Pu et al., 2011), the performance of the personalised content, delivered by an information service in the tourism context, is a complex concept with several partially interrelated dimensions ***of relevant solutions, relevant selection of solutions (sufficient, but not overloading)*** and ***relevant information about each of the solutions***. One of the UX designers summarised high performing content can be as *'the answer to the tourist question, which is the complete and exhaustive, presented is a way that is understandable and comprehensible for this tourist'.*

In other words, there are four criteria that together compose tourist perceptions on content performance (Figure 4.3). According to all three groups of participants, each dimension can either create or destroy the value of the personalised information service. High performance enables quick and easy selection of the optimum service that matches tourists needs. Not being satisfied with at least one of them leads to the intention to use additional sources of information or to leave the website at all. This supports theoretical specification of this construct as a formative one.

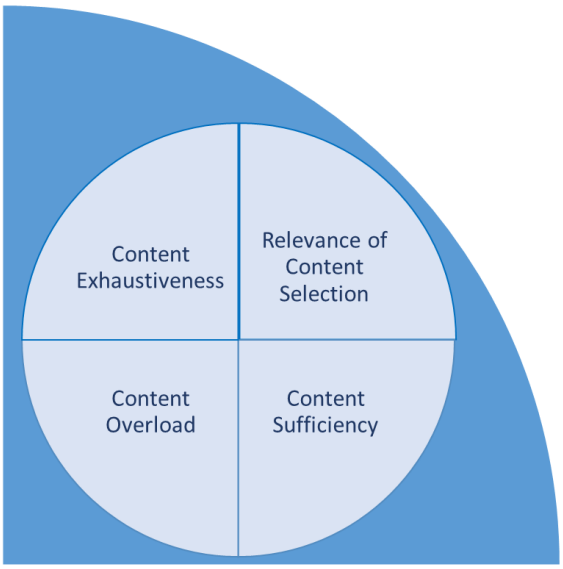


Figure 4-3 Specified Construct of Personalised Content Performance

4.1.2.2.1.1. Relevance of Content Selection

As expected, the relevance of the content is confirmed as one of the critical factors of the personalised information service performance and one of the major purposes of implementing personalisation. All of the research participants agree that personalisation technology should deliver the information that matches tourist needs, which exist in the exact context of use. Some tourists reported that they were highly satisfied with the recommended information, while some of them admitted that several tourists complained that their experience with the websites that use implicit personalisation is not positive as '*The choice they give to me is irrelevant'*. Among the specific factors, which were suggested for filtering the option, the interviewees outlined the preferences for the service characteristics (e.g. price, brand, location, rankings- and customer reviews-based quality), individual external context (e.g. social environment, familiarity with destination) and internal context (i.e. age, gender, cultural specifics, experience in travel, proficiency in web and the place of permanent residence, restrictions or disabilities). The examples

below illustrate the most often issues of tourist experience with personalised websites and mobile applications, identified by the interviewees.

Travel destinations are among the influential factors that personalisation is advised to account for. Interestingly, marketing experts mentioned that personalisation strategy should be adjusted for different types of destinations and the number of hotels or attractions there. According to them, tourist will perceive the content as high-performing if it is coherent with their usual requirements, but also accounts for local specifics:

'*Even if the tourist used to get very luxurious accommodation, he would like to do something differently … Depending on the place the demand changes a little bit. For example, in Italy they* [tourists] *would look for some culture. In India, in Thailand, which promote culture and nature, they might prefer some local palaces, local houses, to go for an elephant ride, whatever... local factors are those factors that are getting tourists out their comfort zone.'*

However, none of the interviewed tourists outlined that they would prefer personalisation to be improved for different types of travel destinations. On the contrary, three tourists explained that they would prefer personalisation principle to be changes following their experience with the destination. Specifically, they would prefer to have personalised information during the first-time visit because they feel '*insecure*' and the presence of the services that were selected for them according to their individual needs would make them feel better. During the second- or third-time visits they '*already know everything'* and feel flexible enough to have more exploratory activities themselves: '*In some destination like Japan... I am very familiar with them. I feel very comfortable to go there, and I have very many friends there. Honestly, I don't really need any kind of recommendations…'*. As a result, if tourists are offered personalisation during the repeating visits to a destination, they might reject it.

Geographic location of a point of interest (a hotel, an attraction, a restaurant) is one of the most popular factors, which, according to the interviewees, should be used for personalisation. One of the experts explains: '*People became extremely mobile. It is absolutely normal to have breakfast in Vilnius, lunch in Riga, and then dinner in Tallinn. So, the factor of permanent location might be absolutely irrelevant, especially within EU, and its importance would increase for tourism* '. However, there was no common agreement on the exact settings, such as the distance from tourists' exact place or inclusion of the specific zones, such as shopping or dining area at a city. Some people outline that 'the closer - the better' principle should dominate in the logic of personalisation: '*If I'm looking for hotel in Helsinki, I don't want to hear about any hotels near the Helsinki Airport. I want to find them exactly where I want them to be*'. Some tourists disagree and claim that it will be good to have a substantial choice of locations, such as the target one and the most popular one, pointing at the importance to differentiate location-based filtering.

Another distinctive topic, which appeared from tourists' reflections on their experience with the personalised website, is lack of focus on tourists' ***social environment*** and people they travel with. Several interviewees shared their negative experience with personalisation. The IS did not recognise the change in amount of people travelling together, the relationships between them, and the social roles, which they accept with or without people, thereby, providing them with irrelevant options:

'1 month I am a business traveller, next month I am a father who travels with his kids and looking for appropriate holidays for all of us, then I am a traveller who is looking for a cottage for myself and group of my friends. So, it's not just the novelty as we want to go to different places, but also the fact that our situation changes quite fast, my travel needs change quite fast…'

As a result, *loyalty* to a certain brand and the *preferences for a certain type of services* (e.g. luxury services), which consumer behaviour theory places among the determinants of purchase decision, also vary depending of the social role that tourists accept. For example, another tourist stated that her major requirement when selecting hotels for her vacations is the lowest price. At the same time, when recollecting her business trip planning routines, she mentioned definitively stated: '*I like InterContinental Hotel chain, and I like to stay in their rooms. But the system should offer me only those hotels of Intercontinental, that are good for my location*'.

Three tourists also reflected that the decision-making process with personalised recommendations becomes challenging and overwhelming when they travel *with the group of friends or relatives*. According to the definition, personalised application provides individually designed recommendations for each person. Considering that every tourist may have individual preferences, tourists outline that it is difficult for them to come up with the agreement on the activities:

'Let's say I'm travelling with family and with children, the preferences should change and the selection of the relevant information changes according to the number of people, their salary, or if you're talking about young couples, or students, their preferences might be very different from ours… It is also about the size of the group. Sometimes people travel in three, and one has child, and they travel all together.'

As a result, it can be seen that the way travel content is adjusted, is different for every context of use. This makes application of the specific factors for measuring tourist perceptions on content performance not possible. When referring to the above-named definition of relevant content, the most frequent wordings used by the interviewees to explain this state were 'to offer relevant information', 'to correspond to the request' and 'to match the preferences'. As it was discussed in the literature review, tourists behaviour is not always goal-oriented and driven by the clearly

articulated preferences, and they may not only search information (i.e. to submit a request), but browse the digital space to explore the opportunities or simply fill their free time an activity (Choe et al., 2017; Tan & Goh, 2015). Therefore, the study accepts the concept of **'*information relevance*'**, which is also consistent with the several questionnaires that assessed the delivered content (Delone & McLean, 2004; Yang et al., 2005) as the most appropriate to measure tourist perceptions on personalised content.

4.1.2.2.1.2. Relevant Selection of Solutions

As it was discussed in the literature review, content personalisation directly affects the amount of options that are presented to tourists. The findings confirm that the attributes of the list of personalised options determine how quickly and easily the user can find what he needs. All the participants are consistent with the idea that limiting the number of options, which tourists experience, creates the range of outcomes that vary from the decreased ***information overload*** to the ***restricted choice***. This, in turn, lead to different cognitive and emotional states and behavioural intentions.

One the one hand, too extensive range of options in not helpful because it leads to emotionally and physically tiring decision-making process, which, in turn, motivates users to stop exploring the options or to switch to a competing website or app.

'If I have five pages, I only read first 2-3 pages. ... I know, if I go to Slovenia, I have some particular point I want to stay in ... The rest of the choice is useless. So, I won't spend time reading pages 3 or page 4'.

The experts agree that '*If you give them* [tourists] *10 options or 20 options, they might be lost, they will be confused, so at the point you need to narrow it down, if you want to reach your outcome.'*

On the other hand, limited amount of options in the situation, when tourists expect to be offered a variety of services, may lead to frustration, loss of trust to the service provider and negation of personalisation usefulness:

'*I don't trust if there are only three options. I don't trust app if I see only limited options. For example, if I only see three options, I will not believe that in a big city like Tokyo or Osaka there are only three sushi or three restaurants with Chinese cuisine. So, I will think that the website doesn't collect enough information for its customers so far.* '

Another tourist first acknowledged that the website offered her the hotels that match her preferences. However, when specifically asked, what would her reaction be like if she is offered the list of 3 relevant, she emotionally responded:

'*No!!!! I will panic!!!! I mean… will you believe that in the place like Cuba there are only three hotels??*? *So, I will first of all check out the website to make sure that there are no other hotels [in addition to the three offered by personalised information service], and if there are no more, I will probably check their [the three options] quality. And I will try to search again to see if there are choices*'

Interestingly, the same tourist then continued: '*From 10 to 20 options is ok. If there are 5 pages, it is too much. I will never look more than one page.'*, - pointing at the fact, that the variety of travel services plays not only utilitarian function. All three groups of participants agree that reasonable range of relevant options is the most advantageous outcome of personalisation, because it not only allows to simplify and speed up decision-making process, but also stimulates interest and creates trust to the service provider, increasing tourist satisfaction with the service:

'If you provide tourists with too much choices, or options to modify them, you overload the interface and make interactions very complicated. But if you do not provide customers with the opportunity to find what they want, this will not only cause disappointment, your potential customers will leave your website'.

The need for sufficient amount of options is relevant for different types of services including accommodation, attractions, places to eat and flight tickets. However, there is no common agreement on the amount of options that should be provided neither between tourists, nor between experts and academics. Tourist opinions vary from 3 listings (i.e. of the low-price, of a superior quality and the acceptable one) to 1-2 pages of relatively relevant options. All of them agree that '*five [*options*] is not too much'* and usually would like to have wider variety of options to choose from.

Importantly, tourist perception on the sufficiency of selection can change for each person depending on his or her context (i.e. purpose of the trip, type of tourism, familiarity with the destination and available time). For example, one of the interviewees recollect her reasoning in the following way: '*When I travel to some unfamiliar destination, I need more hotels to choose from. When I travel to a place, which is very familiar to me, I might need only one or two options. I already know these hotels, so I would just like this hotel to be sorted by price, by availability'.*

'I would say that it depends on the circumstances. First, it depends on how much in a hurry I am. If I am in a hurry and I don't have much time to take a decision, then, if they can narrow down the choice for me, probably will be good. But if I'm not in a hurry, and I have enough time to make a decision, then I will probably feel that this is not enough choice. '

Same as in the case with content relevance, these examples outline context-dependent nature of tourist perceptions towards information sufficiency and overloading volume of offers, pointing on the need for an individualised solution.

The experts' opinions on content sufficiency are divided into two distinct ideas. One group of experts supports the idea of more extensive list of options being the starting point of tourist interactions with personalised content. They advise 10-20 services or 1-2 pages of the offers, emphasising that ideally the user should find everything he needs at the first page of the search results. Another group follows one of the marketing principles of providing customers with the three option to create the best choice-stimulating environment:

'The presence of choice is critical. This is a rule, and I wouldn't challenge it. In other worlds, there should be three options (i.e. cheap, very good, and ok), but the main principle that should be observed is the relevance to customer needs satisfaction. So, there could be options that are relevant, very relevant, but very expensive, that are less relevant and less expensive, that are less-less relevant, but very affordable. Together they would form the choice '

In order to avoid insufficiency of content, several experts suggest combining the list of highly-personalised services with the list of the most popular services: '*Minimisation of risks leads to standardisation. The more standardised is the solution the less risks it created in causing high dissatisfaction. But then we are losing the idea of personalisation and the necessity to adjust the service to each customer… The target is achieving the right balance between fully standardised options and highly personalised everything*.' This is expected to improve the sufficiency of information for decision-making. They also explain that users usually compare information about a destination, attractions, hotels or other services on several websites and form perceptions of these websites' dependability based on the seen options. Therefore, listing the most popular options

together with those, selected by personalisation, will not only secure information sufficiency, but also will contribute to the perception of service provider reliability and trust.

The tactic for avoiding content overload is related to providing tourists with an opportunity to access lacking information. However, the exact solution varies among marketing and UX experts. Specifically, marketing executives insist that the amount of content tourists receive should be limited, but tourists should receive the opportunity to access service provider, including customer support service, for human-to-human communication. Such strategy of giving *'the big picture first, and then the opportunity to learn everything'* aims at not just at ensuring that the relevant option has been identifies, but also at developing more trustful relationships between the tourist and the service provider.

On the contrary, UX experts insist that any additional interactions will minimise convenience and contribute to the cognitive load and time spend for need satisfaction. According to them, the common practice is to give users more control over the personalised content by providing them with the rest of the content via 'next page' or 'more options' buttons:

If you look at what Google does, they present first options in a different way to attract users to them, and then, probably one page of options should be enough. But this is also one of the reasons why pages or other presentation methods exist to divide options into groups. So, if you indeed have 1000 relevant options, the user would have access to all of them by clicking on the 'next' page.'

As a result, tourist perceptions of the relevance of selection can be expressed by two parameters of ***the extent of overload***, caused by the amount of information, and, simultaneously, by ***the sufficiency of this information for decision-making*** and making the right choice. Previous studies include questions about information sufficiency (i.e. 'enough options' (Chae et al., 2002) and 'sufficient information' (Pu et al., 2011) for task completion. To the best knowledge of the author,

previous studies, that explored personalised content, did not include the question about the content being too extensive. However, high-performance of the content depends on the balance between these two parameters, which can be achieved with a help of personalisation and customisation strategies, applied to the list of options, as well as by incorporating other types of communication between a customer and a service provider. Therefore, the study proposes two separate criteria of content sufficiency and the overload with the content as the constituents of the content performance construct.

4.1.2.2.1.3. Information Exhaustiveness for Need Satisfaction

Personalisation technology creates the opportunity to dynamically adapt the way each service option is selected to the tourist preferences and restriction within the exact context of use, which may become an extension of content selection strategy. All the participants agree that the presence of the information, required to assess the option, simplifies and speeds up the decision-making process, enabling quick comparison between the options. On the contrary, the absence of the expected information generates perceptions that information is '*artificially manipulated*' with the purpose of not exposing low-quality parameters: '*In case the content is relevant but not complete … the user feels lost or not cared about, and, sometimes, cheated'*. This, in turn, leads to the refusal to use the information service and to the intention to switch to another website or mobile application.

While UX design allows incorporation of multiple content units presented in different forms, all the participants agree that the most essential service parameters or '*bullet points*' are the name of the service, customer ranking and reviews, price (if applicable), a picture and a link to broader description: '*It's a big and brief picture first, and then the details*. Several tourists also express the preferences to see the service attribution to a certain brand, as well as several preview photos from

the service provider and from customer. Most of the experts agree that the above-named elements would constitute an exhaustive description of a service. Some of them also point on the danger of creating information overload within each option description:

'In tourism the less information – the better. We assume that tourists that access personalised website have intentions to find the relevant information. So, they would be ready to click one or even sometime 3 buttons to find solutions. It is not very good from usability perspective, but it is still ok. But if you display lots of irrelevant content for him, this might be a critical issue to stay at the website.'

As a result, the parameter of information exhaustiveness is among the constitutes of the overall perception on personalised content performance. Several studies applied the concepts of 'complete' and 'concise' (Gorla et al., 2010) content. However, they do not fully reflect the discussed meaning. Taking into consideration, that the interviewees applied a range of approaches to describe their experience with personalised content exhaustiveness, and that the research did not identified common opinion on the required parameters within each option, the study accepts the descriptive approach to articulate the survey question in relation to the ***presence of all the important information, required to make a decision***.

4.1.2.2.2. Interactional Processes Performance

As it was discussed in the literature review, IS performance can be defined from the broad perspective, which includes the whole scope of processes and the related requirements and standards (for example, ISO (2011)), relevant to all three levels of software architecture. Alternatively, it can focus only on the interactional level of the software architecture, which is exposed to users, and their perceptions on the experienced parameters of the interface. Service outcome and co-created value are affected by all the resource integration processes (Payne et al.,

2008; Vargo & Lusch, 2017), and the extensive research practice of using such parameters in academic research (e.g. Petter et al., 2008; Petter et al., 2013; Stacie et al., 2008; Wang & Liao, 2007). Therefore, the study originally presumed to assess user perceptions on IS performance with the general scale of system quality parameters, such as ease of use and leaning, system flexibility, system reliability, security, as well as system features of intuitiveness, sophistication, flexibility, and response times. However, the qualitative research demonstrated that the approach that focused solely on the parameters of system interface usability is more relevant for the context of this study.

First, the interviewed tourists demonstrated, that most of them do not pay attention to the technical parameters of the IS. For example, when speaking about the security of the IS, tourists were concerned about sharing certain types on data. However, none of them actually said that this might prevent them from forming positive perceptions towards the service and using the service:

'Yes, I think it [device battery draining by the app] *is a problem. I actually had this problem before. Actually, in my case I insisted on using this application. I continued to use it because it was the only good application for transportation I could rely on. … as soon as I don't need this application, for example, as soon as I leave the city, I just delete the application. And in future I may think about finding another one, which is better'.*

Speaking about the memory of the device, which might be taken by an app and may affect the use of other applications, another tourist outlined: '*It's totally fine, it is reasonable. And it's really not that much, because nowadays smartphones have huge capacity.*'

Second, the marketing and UX practitioners all agree that due to contemporary capabilities of personal devices and the final purpose of the application development, the assessment should focus of the perceptions of usefulness, which is mainly formed by the information system usability parameters, i.e. the parameters of user interactions with the interface:

'Honestly speaking, taking into consideration contemporary performance of devices and connection, personalisation can take longer, I mean, it may take longer for the user to receive the fully loaded page. Though, I believe we are talking about usefulness. If your user expects that personalisation will help him, he would be ready to wait a bit longer.'

'You are actually making personalised website to improve usability. You are aiming at improving these qualities. If we see these parameters as qualities, you can treat personalisation as one of them ...So we're talking about the quality of the design. ... All these ISO standards... They're changing within time, and they have changed a lot especially in the field of human-centred interactions. ... Earlier usability means only easy to use. Now it stands for lots of things, it might have the meaning of fun, and it depends on the definition'.

'As a user I don't' care. Users don't think about technical parameters. If they can't quickly and easily fulfil the task, they doubt the website. If something negative happens, they leave it and never come back.'

Third, this approach of interactional processes assessment is actually more consistent with the S-D logic (Vargo & Lusch, 2013). The developments in the field of customer value co-creation (e.g. Heinonen et al., 2010; Heinonen et al., 2013; Plé, 2016) emphasise that value is co-created or co-destructed during the process of only those resource integration processes, that are consciously experiences by users. By not being able to answer the question and expressing curiosity on what the question is about, most of the tourists revealed that they do not pay attention to and often are not aware about the issues, related to data sharing, security, IS settings. When asked about their awareness about personalisation being applied at TripAdvisor and Google Trips, she used, one of them responded: '*I don't think so. I believe it just a summary*.' In the next few questions, when asked about her awareness about her personal data being tracked by these websites, she replied: '*I*

don't care!'. On the other hand, all tourists actively engaged in the discussion about their experience with the personalised information services usability characteristics. Therefore, this study accepts the parameters of usability as relevant to describe tourist interactions with the IS (Figure 4.4).

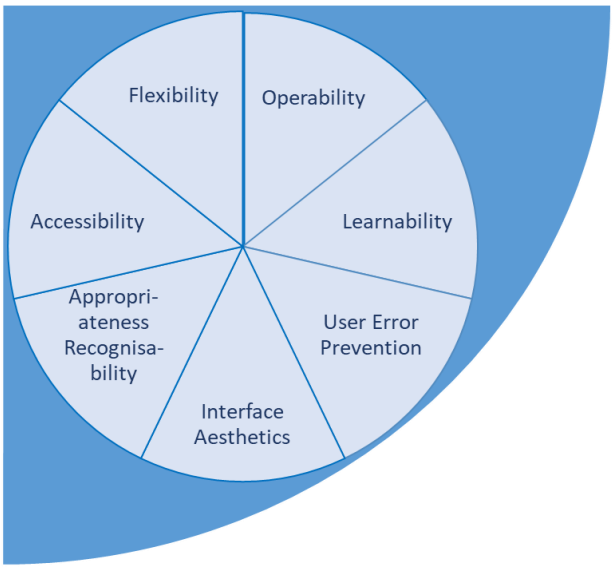


Figure 4-4 Specified Construct of Interactional Processes Performance

The findings reconfirm that the usability parameters are determined by technical features of the IS, including the strategy of personalisation, and together form tourist overall judgement on the performance of their interactions with the IS. Due to the strategy, usability parameters can be interrelated and aim at achieving similarly high scores on its performance:

'When we interact with any device to do something, for example to search for information, or it to complete the booking, or any other task you might have, personalised experience will mean that it is easier and quicker to complete this task and interactions become more intuitive'.

However, the change in the performance of one parameter do not necessary trigger the equivalent change in others. For example, more visual content presentation can make the interface easier to use:

'If the system finds out that this is not an experience user, they can modify this screen, so they simplify the interface, they simplify the interactions, and they can simplify the information. So, he doesn't need to read that much information, and in this case, you will not feel so overwhelmed. In this case personalisation will be very good for him.'

At the same time, in some situations it can have an opposite effect:

I think that the design of the website is important. And it should be easy to read and colourful. But, honestly, other things like sound effects and visual effects are not that important, because I don't have much time to see all these things. Fancy page just makes things more difficult to read. I probably belong to old generation and I prefer something that is written clearly instead of fancy.

As a result, the construct of Interactional Processes Performance can also be specified as a formative one, which is consistent with a large group of research in HCI and Service Management domains (e.g. Collier & Bienstock, 2006; Dickinger & Stangl, 2013; Hsu, 2008).

4.1.2.2.2.1. Operability and Learnability

Operability and learnability, or 'user-friendliness' are the well-defined and the core parameters of the IS usability. All interviewees with no exception support the idea that an application or a website should primarily exhibit the qualities of ***easiness to use*** and ***speed to learn*** in the context of the exact task. The tourists reflected their requirements towards the personalised website or app in the following way:

'*It can be very simple website and I don't know if it's personalised or not. This would be the website I can understand very easily, and I trust this website. I would say that the quality is good.*'

'It is also very easy to see the distance to this hotel, and you can see around your place, and what kind of travelling place you're in, and what are the famous tourist places to see there. … And I need to have an opportunity to find very quickly the right district for myself, when I stand in'.

From the point of view of marketing experts, '*it [the interface] should be user-friendly. If the user can find everything easily and without being tired, this is very important'.* From the point of the of the UX designers, these parameters are also among the most important for creating the perception of high-performing application:

'When you want to access information via Expedia, you need to go through these authentication codes. This can be very-very annoying. So, when you create applications that uses personalised data, they need to be easy, they need to be quick. They should have everything inside. '

Considering the common agreement among the research participants and the well-elaborated scale for user-friendliness, the study accept the definitions of operability and learnability as '***easy to use'*** and '***quick to learn***' in relation to each specific task the application supports.

4.1.2.2.2.2. User Error Prevention

User error prevention refers to designing the interface in such a way that helps to prevent user conscious and unconscious mistakes. The major topic that appeared from all three groups of interviewees is ***intuitiveness*** of the user interface as a capability to quickly, independently and correctly complete the task. Being not aware of the specific terms, tourists discussed this topic by recollecting their experience with a websites or app when they were had difficulties in

understanding how to use it. For example, one of the tourists described the situation, when the OTA confused her to the extent that she quitted booking and returned to the trusted travel agent:

'They [OTA websites] *hide some costs and fees. For example, some insurance fees for each ticket, and it's hard for you to know that. and sometimes you click on insurance, and you think that you have already cancelled it, because you don't want to pay for insurance, but it is still there. I just gave up because I cannot cancel this insurance. At least I heard* [from the friends] *that I cannot'.*

According to the marketing and UX design practitioners, the interface intuitiveness can be influenced by the amount of content of the webpage, by its presentation, making content personalisation an influential factor of tourist perceptions on intuitiveness:

'When we interact with any device to do something, for example to search for information, or it to complete the booking, or any other task you might have, personalised experience will mean that it is easier and quicker to complete this task. So, you are more effective and you're more efficient. Also, it might change the experience to the point that it becomes more fun. And interactions become more intuitive. The short answer is that personalisation can transform the whole experience from a device or from an application.

When speaking about content presentation, an intuitive interface can be supported by the interactive way to deliver relevant information: '*And give them what will be an intuitive solution for tourists. First 3 options, them 3 or 5 more, then, 3 or 5 more*.' Additionally, the type and the scope of user interactions with the system and its capability to interactively adjust to user context can increase or ruin information system intuitiveness:

'If the request comes from the global environment, you don't want your customers to input 16 digits or they are credit cards every time. You can give them another way to pay, for example the

fingerprint. In mobile, they may be different specifics of the interface. For example, you might want to allow them to order something with the voice.'

Taking into consideration that the notion of intuitiveness is the only that consistently appears within the identified theme of the user error prevention, and well as same parameter of intuitiveness, which are recommended by several studied, such as (Delone & McLean, 2004; Petter et al., 2013; Yang et al., 2005), this study articulated interface intuitiveness in relation to the task completion.

4.1.2.2.2.3. Interface Aesthetics

When discussing the interface aesthetics, the participants share the idea that the way the webpage looks like is not the main determinant of their perceptions on the Interactional Processes performance and the usefulness of the website. However, it should not be neglected as an attribute because the attractiveness of the interface determines trust to the website. For example, tourists reflect on the visual presentation of content as on an important component of generating attention and associating the information service with positive emotions:

'Pictures will be eye catching and I think it's very important. Every time I chose the hotel, I would definitely look at the pictures'

'You always want to have nice and happy colours starting from the beginning, from the booking stage. At booking.com they simply used blue colours and some dull colours. It just feels so much old-fashioned. In my perception, if Agoda and booking.com have similar prices, I will take Agoda, because they have colourful logo and they are cheerful... I just have this feeling of cheerfulness and I feel 'oh, that's a good start for my journey'. So, I will book at Agoda.com. Also, Agoda.com

has so much promotions and discount codes. They arise my interest in it and I think that they can give me good price again.

The experts agree with the importance of aesthetically attractive interface. They add that is also affects the perceptions of ease of use, speed of learning and intuitiveness, thereby, contributing to or decreasing user perceptions of the personalised information service. However, there is no common agreement between experts on the definition of 'aesthetics' for the context of tourism, which, in turn, points on the importance to personalise visual presentation and applied tools according to the individual perceptions. Specifically, one of the academic experts in tourism marketing insists on making tourism website content more diversified with different types of media to make it more emotional and realistically presented:

'In tourism, information should be emotional. We sometimes have lots of well-structured factual information, but it does not help in creating positive emotions. … And in the end, to decide, maybe it may be less factual and more emotional. Different types of media, multimedia, I think now we are moving towards different types of virtual and augmented reality. … we can have more sounds and visual information, which create much more realistic picture, rather than just relying on text and pictures.'

On the contrary, the marketing manager from one of the leading OTAs answers the question about the definitive features of high performing personalised interaction with the IS with a very straightforward view: '*No multimedia*!' and explains that different types of media content make the interface difficult to use and, sometimes, intrusive. However, he then elaborates on the idea of the interface attractiveness:

'*For me it is very important how information is presented in the website. The content should be nice, should look good, should attract your attention. So, we're talking about the way the text is*

written the way, the font, the way it is supported with photos, because photos are very-very important now. … These are differentiating factors, it is especially important in tourism, because tourism is holidays, it is relaxation, it is experience, it is more abstract. These websites they have to be delightful, they have to be enjoyable. It is nice colours, nice photos, nice text, this will be very catchy.'

The website developers believe that more concise and minimalistic interface design increases ease of use and usefulness in the context of large volumes of heterogeneous information, and, therefore, should be preferred over the mixture of presentation strategies in the case of information service:

'*For the users the interface should definitely be attractive…* [The preferred elements are] *pictures and photos + price. In tourism the less information – the better. We assume that tourists that access personalised website have intentions to find the relevant information. So, they would be ready to click one or sometimes 3 buttons to find the solutions*.'

In the case of the interface aesthetics, the most commonly used words to express the requirements, were 'colourful', 'nice' and 'attractive'. Usability, IS as well as general service performance assessment often applies the expression '***visually appealing***' (Jiang, Klein, & Carr, 2002; Parasuraman et al., 1985; Pitt et al., 1995), which is believed to be relevant to describe interface aesthetics considering the differences in tourists and experts requirements for it.

4.1.2.2.2.4. Appropriateness Recognisability:

The classic definition of 'appropriateness recognisability' is explained as customer perceptions on whether the service is appropriate to satisfy their needs (ISO, 2011). In addition to the relevancy of the content, discussed before, the analysis identified the topic of understanding the reasons why the personalised system selected certain options for the specific user and of the related trade-off

they make between the received personalised content and submitted personal data. This coincides with the parameter of 'Explanation', proposed by Pu et al. (2011). As it was mentioned at the beginning of this Section, tourists are not always aware about personalisation being applied. Most of them outlined that they have common knowledge that Internet resources track their personal data. However, only one of the tourists clearly expressed understanding that in some cases this data can be used to personalise content for him. At the same time, they might recognise that the content, which they see at the personalised website, differs from other websites by the type and amount of options, which, in turn, creates risks of tourist frustration and panic:

Let's imagine that I am going to book a trip to Jamaica. I opened booking.com, and they are saying me: 'Hi! We know that you're going to book a trip to Jamaica, and here are some suggestions for you'. But how do you know that I'm going to book a trip to Jamaica? And then it turns out that they are using my data from Alexa or from Google home. So, they have been listening to me to understand that I'm going to do this trip. So, I open the app, they already know this, and they will make my experience positive and easier, but I'm not ok with them using these data because I haven't allowed that. I think that from this point personalization can go wrong. It can be very-very wrong.

All of the experts, including academics, marketing and website design practitioners agree that tourists need to have a simplistic understanding of personalisation logic '*in the form of relationships between personal data and personalised service they get*', or to make personalisation more ***transparent*** for them. However, the ideas of much information about the process of personalisation tourists should be exposed to varied. Some experts suggest the information about the presence of personalisation being applied and about the value that is potentially created by personalised content in comparison to not personalised one should be enough:

'The first thing in personalisation is to make sure that the guest knows that we are communicating'.

'There is absolutely no need to explain how data works for personalisation, because this is intrusive, and they will not understand it anyway, but will be frightened by things they don't understand. What is critical is very clear explanation of the benefits they will acquire in comparison to not-personalised service, and how much this user has to 'pay' for it.'

'I strongly believe that the user will be highly satisfied with personalisation service if he has clear understanding of the benefit he gets, and, in particular, the result of personalisation algorithms provide this user this relevant answers to his problems, and the user know what he gives away for this, and he knows that his personal data is secured.'

Another group of experts suggest that more extensive information is required about the data and the applied policy to give tourists better understanding on the occurring interactions:

'*I would say that one of the primary factors or personalisation and its success is transparency. You need to be transparent; you have to explain what data you take and how you use it to create personalisation'.*

'Technically, you need to make the policy more transparent. I mean, how you use information, how much information you need, why you want to provide me with better product. For me it's always a matter. You want to give me something better, but I know I have to pay for that, so I want to understand what I can receive, and what I have to pay. There is no such thing as free lunch.'

Such difference is also relevant for tourists. One of them, who has limited digital experience and prefers to consult travel agents, reveals that:

'*I would also be happy to see more... let's call it methodologies. So, not only the result of personalisation, but I want to know how it is done. For example, if I'm given the top 10 must have places, it is very useful. But if I'm also told how and why they are selected, and how to get to them,*

and how to book them it will be much better.'

However, all of the tourists acknowledge that they never pay attention neither to the 'terms and conditions' of the service provider, nor to the permissions they give to the application or the website. The only exception that was identified is the process of payment as the attention to the data is triggered by the perception of security:

'Whenever I book online, I am very conscious about charging and payment information, because I'm really worried about someone, who can steal my card information by doing some sneaky things. So, for payment I pay particular attention. But, honestly, the rest of the things, even my passport number, or some other personal data like birth data, - they never bother me. Things like cookies, or location or anything else, they never bother me. I just click click click click click click click whatever they asked me to click.'

Taking into consideration that there is a common agreement that the interface should help tourists to recognise the general logic of personalisation and to make the possible benefits of it transparent in order to develop trustful relationships and minimise the risk of frustration, the study accepts the idea of personalisation process transparency as an indicator of appropriateness recognisability and borrows the validated measure of '***understanding of the reason why certain information is recommended***' (Pu et al., 2011) as relevant for the context of personalised information service.

4.1.2.2.2.5. Accessibility

The parameter of accessibility is defined by HCI and the usability standards as a degree to which an application can deliver the expected performance in the specified contexts and beyond them (ISO, 2011). In the context of personalised information service this can be interpreted in relation to the accuracy of the delivered information in the context of consumption. In addition to the

capabilities of the personalisation strategy in selecting relevant information, discussed above, the expected content delivery can be restricted due to the interference of the external factors. Despite technical capabilities of the IS are beyond the scope of this study, the study identified several issues, which raise the issue of the interface accessibility.

The first issue is related to the accuracy of the static content regardless of personalisation. For example, one of the tourists described the situation with the wrong hotel address: '*I received the confirmation letter with the address and the map of this hotel. But when I went to this place, this hotel didn't exist there*'. Another tourist was disappointed that the hotel, which the personalised information service selected for him, did not include complete information about the fees and charges tourists must pay on the site. He admitted that despite the sum of money was insufficient, the inaccuracy in hotel description, which led to the need to pay extra fees, brought a range of negative emotions and lack of trust to the personalised information service provider.

The second and the most discussed issue is the availability of the stable Internet connection. When describing their experience with the mobile applications, when their satiation has changed during the trip, several tourists outlined that the absence of roaming or high-speed connection in several locations did not allow them to receive up-to-date content, thereby, making personalised content outdated for their new situation.

The third issue, outlined by one tourist and one academic, is the accuracy of customer data. Specifically, the interviewees outlined that they experienced problems with identification of their location, which, in turn, restricted them from the selection of the relevant service. The academic expert suggested that the problem can be caused by GPS decreased accuracy in the specific destination, however, emphasised that tourists are not capable in assessing the reasons of disturbances.

'In case of GPS, I have the knowledge and understanding that this happens because of high building, that this is not the application or the website working incorrectly. I'm not sure if the tourists will understand this, because not many of them would have that kind of Hong Kong experience. So, they might think that this is the problem of the app, that this is the app that doesn't show very accurate location. This will be a great problem because they don't know where they are and they're tourists'

As a result, there are multiple issue, which can restrict tourist access to the personalised content, making interactions with the website or application irrelevant and potentially leading to the consequences of irrelevantly personalised information, discussed at the beginning of this chapter. Considering that tourists are not exposed to and are usually not aware about technical issues, the study accepts the idea of ***consistently accurate interactional processes*** as relevant to assess tourist perceptions on the IS accessibility.

4.1.2.2.2.6. Flexibility

The issue of flexibility as a capability of the IS to interactively update the content after the change in the tourist context has been widely discussed by all interviewees. While this parameter is not included in the standardised usability measurement scale (ISO, 2011), there is a common agreement that tourists' dynamically changing needs require a technology, which can proactively recognise tourist context and ***systematically update the selection of information***. For example, one of the tourists revealed that regardless of whether she has already planned the day or not, she is open to adjustments and is inspired by the capability of the personalised mobile application to automatically update her location and filter the points of interests for her based on that: *'Well, it's pretty good. I mean I trust application, because this is the purpose of this application.'*

However, everyone also agreed that current software has issues with accurate and up-to-date recognition of customer preferences. The major problem that was voiced by the interviewees is incapability of the websites to identify the moment of decision-making and the resulting continuous exposure of the tourist to the content that is already out of interest. When discussing digital environment in general, one of the marketing experts provides the following example:

'*Nowadays marketers do not focus that much on the previous behaviour, but they are looking on what is going on right now in tourism information search process. But of course, everyone encountered that situation when you Google for hotel in Helsinki, next month you have all your Facebook full of advertisements of this destination'.*

When asked about their opinion about the personalised list of tourism services being continuously updated, tourists indirectly confirm that they have experienced these situations: '*Receive offers? If I haven't paid yet for this service, then definitely, yes* '.

An expert in UX also stresses that '*as soon as the user booked the hotel, service provider should immediately stop sending him offers for the target destinations. Otherwise, user might not only be annoyed but also to get disappointed with the bought hotel in case better options pop up*.' Another travel website developer agrees with the idea but emphasises that proactiveness not just reactiveness, but proactiveness would have major effect on the perception of service performance and created value: '*tourist would be satisfied if he receives the solution before he ever asked the question and spent time and efforts to articulate it*.'

As a result, the parameter of flexibility as a reactive or even proactive personalisation of tourism content according to the changes in tourist internal or external context became a capability of the IS and also one of tourist expectations. The identified issue of the continuous content update without the full capacity to identify the changed tourist environment demonstrates that the

parameter of flexibility is interrelated with the previously discussed IS accessibility and relevancy of content selection, so that high performance is determined by relevant content delivered via flexible and accessible interactions. Taking into consideration the common agreement on the topic of interactivity and reactive implicit personalisation, the study accepts the question about the ***regularity of content updates*** from previous research in information service quality (Kuo et al., 2009; Yang et al., 2005).

4.1.2.2.3. Service Provider Processes Performance

Service Provider Performance is often defined as the overall support that customers receive from the service provider (Delone & McLean, 2016; Petter et al., 2013). Specifically, such support can be delivered by a service provider personnel via the face-to-face communication, via the IS or via the outsourced service. Previous studies propose a range of parameters that can be used to access customer perceptions on service provider processes performance, which may include empathy, responsiveness, assurance, follow-up service, reliability and competence (Delone & McLean, 2016; Gorla et al., 2010; Palmer, 2002; Parasuraman et al., 1991; Petter et al., 2013).

The study demonstrates that in the context of personalisation, the concept of Service Provider Co-Creation Processes performance goes in line with the classic definition. Specifically, high performance can be achieved through the ***information service capability to deliver relevant content in a non-intrusive way while ensuring reliable personal data management and being able to provide immediate support in case it is requested*** (Figure 4.5). In this case, the parameters of reliability, responsiveness and non-intrusiveness describe different types of interactions, which can be motivated by different tasks along customer journey, as well as different IS processes. For example, tourists mainly associate intrusiveness of interactions with information delivery by the service provider, responsiveness – with information request and subsequent response by the

service provider, and reliability – with the personal data exchange between a tourist and a service provider via the IS. Together, the abovenamed parameters contribute to tourist perceptions on the Service Provider Processes performance. As a result, the construct is specified as a formative latent variable.

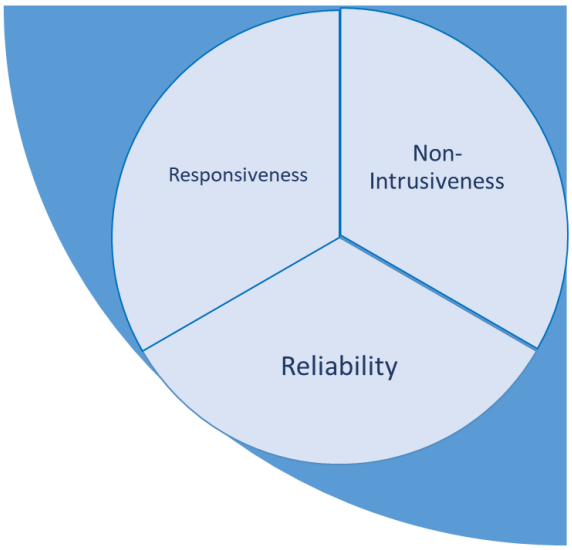


Figure 4-5 Specification of Service Provider Processes Performance

4.1.2.2.3.1. Non-intrusiveness

Non-intrusiveness is usually outlined among the requirement of the user interface. It defines whether the HCI can minimise the attention, required to complete the task, and can deliver the required information while keeping the user in the calm state (Case, 2016; Shen et al., 2016). The majority of the interviewees confirmed that the presence of non-intrusive personalised information service contributes to the perceptions on information service usefulness: '*The role of personalisation is therefore is to non-intrusively guide user towards to right choice*'. Moreover, there is an agreement that perceptions on the level of intrusiveness facilitate a range of hedonic

states from being calm to being '*annoyed*'. However, the perceptions of what causes intrusiveness varied between the experts and the tourists.

IT and marketing experts had a broader view on the issues and agree that a website' intrusive behaviour can be caused by inappropriate application of all forms of information input and output. Several experts give the examples of intrusive website behaviour in the case when it requires manual input of information (for example, location, phone number or personal preferences), instead of making the system to recognise them and to automatically place them in the required field: *'Any customisation of settings such as changing of colours or displaying more or less functions or on the left or on the right side of the screen are just toys, that in reality interrupt users from their major task.'* In the context of personalised list of options and the need of the service provider to sustain its business model by incorporating the prepaid options in this list, the presentation of the prepaid options would affect tourist perceptions of the webpage intrusiveness: *'Non-intrusive would mean splitting the whole bunch of adds you need to place into groups and showing the first three in the top, then three more in the middle of the page, and some more on the side bar or in to top-down position.*' Such description is consistent with the way IS architecture and the concept of user experience.

On the contrary, users associated the term 'intrusive' with a narrower scope of interactions. According to them, intrusiveness is caused only by the proactive forms of content distribution, such as push notifications with recommendations, reminders, automatic updates on the content, etc.: *'If you give me super option this evening, I will be happy, but if you start reminding me about something later or sending me offers later, I will block you.'* When ask about his perceptions on the personalised content being automatically updated, another tourist said that in general it is very

‘*useful*’, but can also be ‘*annoying*’ as he additionally associated system flexibility with the forms media, dynamically pushed to users:

‘*I think this is the drawback of personalisation. Especially when I read some newspapers online and companies are trying to reach me with special pop-up windows this like ‘how are you going to spend your vacation?’ and ‘where would you like to go?’, - this really annoyed me*. ‘

Following the same question, another tourist also described receiving frequent messages from the service provider, rather than implicitly and non-intrusively updated page: ‘*I actually think that this might be a problem because on the one hand... yeah …. it's useful. If I move to Hong Kong CityU, I also want to see some information, but not very often.* ‘

Such trend can be explained by high intangibility of information services on the one hand (Parasuraman et al., 2005) and the increasing information service standardisation and conformance to the technical standards on the other (Marcus, 2015). One of the experts explained it in the following way: ‘*For customer, it is not important because it should work without bringing any attention to it*.‘ Another expert added that the requirements and perceptions on the website intrusiveness may vary depending on the cultural context: *‘The second and the key issue, that would incorporate that difference between Eastern and Western consumers, is non-intrusiveness of a service.’* As a result, when service is non-intrusive, i.e. does not attracts tourists’ attention and does not disrupts their activities, it is not noticed and accepted by the interviewed tourists as ‘*normal*’. In the case, when a website or mobile application content distribution strategy catches tourist’s attention, it is recognised as intrusive.

In the context of this study this led to tourist associating dynamically distributed content, such as implicitly updated page or push notification, as a direct communication of the service providers. When talking about IS operability and learnability, tourists tend to describe the subject of

discussion with a help of the inanimate nouns, such as '*it*', '*information*', '*website*', '*system*'. On the contrary, when reflecting on the website intrusiveness, tourists consistently describe it as a type of service provider activities, for example, '*companies are trying to reach me'* or *'they would hide the information'*. As a result, the study adopted the common terms of information service capability ***to distract tourist from their activities*** (Nielsen & Budiu, 2013) as a relevant for assessing tourists perceptions on the website intrusiveness. However, the parameter was attributed to a group of Service Provider Processes.

4.1.2.2.3.2. Reliability

The parameter of reliability is a classic parameter of any service performance (Cronin Jr & Taylor, 1994; Parasuraman et al., 1985; Parasuraman et al., 2005; Petter et al., 2008). It is generally defined as the 'ability to perform the promised service dependably and accurately' (Parasuraman et al., 1985), and is usually specified depending on the context of consumption. The findings confirm that in the context of personalised information service, tourist perceptions on reliability can be shaped by multiple parameters. Specifically, the experts outline such issues as IS technical capabilities, system mistakes, security and, importantly, the strategy of content presentation:

'It can be anything that is perceived by users. There might be objective reasons like bugs. But it could be also perceived lack of merchant activity at the website. It can be the perception that some content is created artificially rather can represent true information. Say, few customer reviews. Secondly, when the content is relevant but not complete. '

'Of course, information should be trustworthy. Lying is probably one of the things that cannot be accepted anymore. Previously you would Photoshop your images, and some company still do that, they prepare perfect images, do fantastic videos - and someone still will buy it. But lying and

creating false attributes … this is what we cannot do anymore. You will get caught, and you will immediately get lots of negative recommendations. So, the information should be trustworthy'.

Interestingly, tourist perceptions on service provider reliability in the context of personalised information service consumption were mainly associated with their personal data security, rather than with the reliably delivered relevant content:

'... everyone is using online travel agencies, everyone is using booking.com, sometimes agoda.com, etc. It is ok, they don't rip out my money, they are real, and reliable, then I'm fine. I wouldn't worry that much about security. If this is not a well-known website, … then I probably won't use it. '

And vice versa, system security was assessed by tourist perceptions on a service provider brand reputation and associated reliability, while the parameter of IS security as an objective capability of the system to protect personal data was not recognised. Specifically, while tourists are aware about the potential threat itself, none of them mention any indicators of IS security. On the contrary, when replying to the specific question about their perceptions on their personal data security, tourists tend to indirectly associate the data security with the power of the brand:

'I most often use a popular website, I use is booking.com. And another one is Airbnb'.

'Yes, I feel quite comfortable about it. Actually, I used Expedia for the last six or seven years, and I'm absolutely fine with them collecting my data.'

'I know that they want to use as much my all my data as possible. I also have a good experience. When I use booking.com they are so good at finding good hotels for me. They are so nice. '

When discussing the issue in a more detailed way, several tourists also outlines the presence of cause-effect relationships between their perceptions on the brand reliability and personal data

security. For example, when asked if he thinks that famous tourism brands like booking.com also manage data reliably, the tourist relied: '*Yes, I have confidence in using them without any questions*.'

One of the academic experts explains the interrelation between the perceptions on company reliability and on security from the theoretical perspective:

'If I trust the company, I have to trust the concept. For example, the concept is Airbnb. The trust that I can find a good private owned. I need to trust this one, that they can provide me with reliable and safe place. I would infer the trust to the platform like Airbnb. It means that I need to show my trust to the operations first and then I will further assess distrust can be applied to the company'.

Two UX experts further explain that this principle and the fact that users associate data security with the brand rather than with the technical specifications of the system, is used in website content presentation strategy. Specifically, transactional environment, which is perceived as vulnerable because of financial data usage, is not only supported by a reliable intermediary, but their logo is purposely emphasised during the transaction: '*… if you ask for credit card details, it really creates lots of pressure. The solution here is to use intermediaries, who are well-known and trusted, e.g. PayPal.* '

Following the observed specifics on tourist reasoning, the concept of service provider reliability was specified as a capability of the service provider to ensure ***secure personal data management***.

4.1.2.2.2.3.3. Responsiveness

The ease of use of information service is associated with the minimum disturbance and load, and, therefore, with fully automated interactions. Human-to-human communication requires time and cognitive efforts from the customer side. However, most of the interviewees agree that the human

presence in the form of a customer support service is important to ensure service effectiveness and to support the establishment of trustful relationships between a tourist and a service provider.

Most of the tourists outline that they would prefer to have a customer support service, represented by human or human-like communication, such as a chatbot. Specifically, most of them reflected on the situation, when they experienced problems and the way customer support ***responded to the request***. The extent to which service provider contributed to resolving the problem formed tourist perceptions on the service provider performance and subsequent behaviour intentions. For example, one of the tourists remembered the occasion when the OTA provided him with the wrong hotel address:

'*I called to Expedia and explained them that they gave me the wrong piece of information, and they have it at their website. Expedia were very grateful for this information. They actually paid for the taxi as well as the hotel fee. If the trouble is really happening, I will not hesitate to contact customer support directly. I think it's very useful. Otherwise, I would not spend lots of time for communication. I will just skip the option and move to another one.*'

On the contrary, negative experience with the customer support response motivated tourists to reject the service:

'They just don't care about their customers. Their customer service is very unprofessional. And their attitude is unacceptable. If something happens, I need to call them, and it seems that they know nothing about that. For example, they don't know basic law and regulation overseas. So, I blocked Ctrip.'

Both industry and marketing experts agree that the presence of human or human-like communication is essential in case tourists needs any assistance:

'*When they interact with the screen, it is good if they can have a reflection, if they can ask someone. For example, if they have a live chat and ask for assistance. Ok, it is good if you plan everything yourself, but sometimes you need to speak to someone, who will help. I mean to speak to someone totally personal. … If you have a kind of support, people would feel more secure with the website*.'

At the same time, both marketing and UX experts agree that there is a need for a balance between the implicitness of interactions on the one hand and the capability of the service provider to react immediately and take control over the situation in the case, when the customer is not able to solve problem himself. When asked about the role of human-to-human communication in the case of personalised information service, one of the marketing experts emphasised that the benefit would be achieved in case this communication is non-intrusive: *'We don't want to intrude into their life too much, we want to stay professional, and help them as much as possible'*. The UX experts in general support this opinion. However, they warned that in order to have positive effect on tourist perceptions on personalised information service performance, any intrusion into their activities (i.e. whether do ne by human or by an human-like algorithm) should be capable in resolving the issue: *'On the one hand, a human can understand your problem, and even help you to express this problem when you are confused. Experienced expert can guess about your problem before you have articulated it. But not every customer support employee is capable in this'*. Another expert admits that current state of artificial intelligence also cannot ensure effective problem solving in the context of multiple possible issues occurring along the customer journey: *'In tourism, if we take booking.com* [as an example], *customer support would be dealing not only with the website issues, but with the problems of accommodation booking. So, I'm afraid that currently computer cannot manage all the possible scenarios and tasks that may pop up… the presence of human communication and the support or advice of the expert is very important.'*

To sum up, there is a common agreement that despite its intrusiveness in comparison to implicitly developed solutions, the responsiveness of customer support is an important factor that affects tourist perceptions on personalised information service usefulness and intention to use it. The higher is the capability of the service provider to adequately respond to tourists' problems, the higher is tourist perceptions on the overall personalised information service performance. Therefore, the criteria of service responsiveness has been suggested for application in multiple studies (Delone & McLean, 2003a; Delone & McLean, 2016; Huang, Lin, et al., 2015; Parasuraman et al., 1988; Pitt et al., 1995). However, the survey questions were adapted to the exact context of the study. Taking this into consideration, the study follows tourist feedback and specifies service provider responsiveness in relation to the service provider ***capability to immediately respond to the reported issues***.

4.1.2.2.4. Customer Processes Performance

Following S-D logic, customer co-creation processes were defined by this study as tourist participation and control over the resource integration (Heinonen et al., 2013). The findings allow to explain participation as a conscious investment of individual resources including time, cognitive and emotional efforts and personal data in order to achieve higher personal value. Such investment is done in the form of ***perceived control*** over the observed scope of interactions and resource integrational processes: ***over personalisation settings (i.e. customisation), over the amount of content, over the process of interactions with the website, and over personal data, submitted in order to enable personalisation:*** *'It is critical that your user has full control over the settings and over the mode of interactions with the service provider… Otherwise, the easiest way for the user to get rid of annoying and irrelevant personalised messages is to block the website'*.

Customer participation aims at improving the performance of the above-named resource integration processes performance, including to increase of the utilitarian and sign value, and to minimise the destruction of hedonic and relational value. Specifically, tourists are primarily driven by the desire to achieve the most relevant result with the minimum time investments: *'They* [tourists] *are willing to communicate. And they're becoming practical … and they think 'I want to make sure that I really have a good stay'.* Additionally, tourists may execute control to ensure satisfaction of the sign and relational needs. The trust to the service provider can be affected by the concerns that service providers are '*cheating on them*' by recommending the most expensive or least popular service, which, in turn, results in the loss of confidence: *'So, if it does not involve my input, I do not feel 100% comfortable'*. The perception of having control empowers people to take decisions and makes them feel more confident: '*It is not about how you sell me; it is about my decisions. Information is available and I don't really need someone to tell me what I need or tell me what I need to choose. It is something I do not like.*'

However, all the interviewees agree that customer satisfaction from the executed control over the personalised information service always comes as a trade-off between the ease of use of implicitly personalised and the acquired assurance of receiving better service with no threat to privacy:

'We need to take a step back and remember why we are doing personalisation. And one of the things for me is that you speed up the interaction you make things easier… To give me options on how I can co-create this experience, it might make things more complicated for me. …If we give people the opportunity to correct stuff and to say 'no-no, you got it wrong', and adjust things accordingly, then, I think, the service would become more flexible.'

The identified themes of perceived control over the customisation settings, over amount of content and over the process of interactions with the website and over the personal data, submitted in order

to enable personalisation, are coherent with the discussed dimensions of IS success (Delone & McLean, 2016). They characterise the distinctive, partially interrelated types of resource integration processes, which together form the overall tourist perception on the degree of available control over the personalised information service. Therefore, Customer Processes Performance is specified by this study as a formative latent construct with four variables (Figure 4.6).

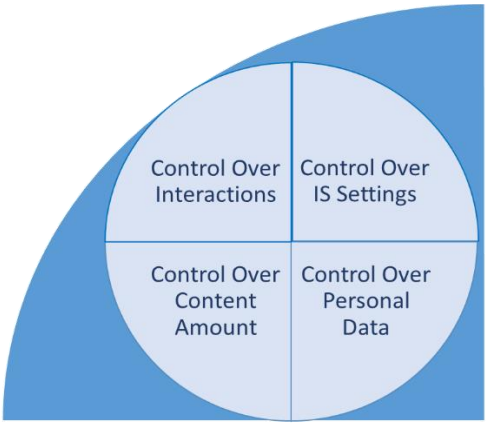


Figure 4-6 Specification of Customer Processes Performance

4.1.2.2.4.1. Perceived Control over IS Settings (Customisation):

The control over the IS personalisation settings refers to the tourist capability to manually adapt the results of implicit personalisation with the aim to revise the filtering criteria and improve the performance of personalised content. Most of the tourists express the willingness to customise content filtering settings, explained by the concerns that the list of the personalised options might not represent the best solution for their context:

'I always stay in B&B. If I go to Eastern Europe, I want to stay in some very special accommodation, which only Eastern Europe has. But if the system personalised has everything according to my previous preferences, it only shows me B&Bs, I might not be very interested in that information'.

Another reason for interfering in the result of personalisation is the perceptions of potentially lost opportunities of novel experiences and the lack of choice. For example, several tourists were worries that personalised selection of hotels would restrict her from acquiring novel experiences:

'*I often travel to the UK … and I look for similar hotels. But sometimes I want to go somewhere else to explore. I want to learn something new, something I haven't experienced before. If the system is personalising information, I can think that the information doesn't really fit what I want. If it's to personalised* [incorrectly] *it will limit my choice* '.

The interference into the result of implicit personalisation leads to additional time and cognitive overload, however, there is a range of opinions on the desirable customisation options, varying from having full control to the formal presence of control option. Specifically, one of the tourists expressed the opinion that he would like to have a total control over content selection including the opportunity to switch personalisation off and explore the whole range of available options:

'I think personalisation can be an option how we can turn it on and off. If I want the system to filter some information for me to save my time, I turn on this function. But if I want to do everything myself, if I'm interested in a kind of experiment, I can explore everything manually. Then don't interfere, just show me all the information you have. And I will be by myself. Personally, for me this will be better option rather than personalizing everything for me without asking my permission.'

Several tourists acknowledge that the presence of customisation is important for them. However, they agree that they would only put efforts into changing the criteria for content selection in case they are not satisfied with the results of the implicitly delivered information: '*I would say it like this: if I just don't like the things that you recommend, then I will*.'

Lastly, one tourist identified no intention to modify the settings and to start search once again. However, she repeatedly expressed the idea that the absence of visible customisation option and transparent explanation of the personalisation principle makes her feel uncomfortable because she is does not trust the implicit selection. For example, she brought the example of the optimum flight route with the minimum time of the trip:

'... But what if I want to go shopping in Dubai? What if I am scared about the airport in Moscow? I don't want the system to choose everything for me because of this reason. So, I don't want just to know the result. I want to know more how it is created.'

The experts agree that users should have ***perception of control over the content filtering settings*** that form the list of personalised options, i.e. to have customisation options. However, the industry and academic experts do not have a common solution in terms of the necessary degree of control. Same as in the case of tourist perceptions, the opinions vary from providing the extensive opportunities for customisation to creating a perception of the influence on content selection.

For example, one of the marketing executives admitted: '*I think, in the end, the last word should be left for the traveller. So, in the end he has to decide himself*.' An expert in UX design supports this idea and admits that personalisation is not always accurate. Therefore, tourists should be given the opportunity to improve it: '*From my experience as consumer, 20% of the content I receive is somehow relevant, but 50% is absolutely irrelevant, absurd content, and I would like to have control over it.*'

Several interviewees agree that customers should be given certain freedom to modify the parameters of content selection. One of the UX experts defines the degree of user participation as '*at least some superficial or small-degree control, but it should exist*'. Another one specifies that there should be limited number of available settings: '*I would say that for the regular user 3-5*

parameters for customisation is more than enough.' On the contrary, one of the academic experts proposes to provide tourists with the total control over personalisation: *'... to provide customers with control over personalisation to turn it on and off, so that they can see on the screen whether information is personalised or not'.*

Lastly, the experts additionally admit that full control may nullify the utilitarian value of personalisation of providing relevant information, received as a result of easy and quick process of selection.

'No real control is required. Here I would agree with Microsoft strategy, who tend to minimise user control over Windows. At the beginning no one is happy, but in the end the majority admits that everything works and interactions with Windows became much easier and pleasurable. A company that takes its business strategy and personalisation in particular seriously would have much more competence in creation high-quality personalisation and its presentation to user, than a user can imagine.'

The academic experts advise that the solution, acceptable for all tourists, may be reached through the balance between the implicit personalisation and manual customisation of content: *'Even though we generalize something, which would be interesting for you, you still have the right to customise these things again according to your individual needs and individual expectations. That's why I believe that personalisation and customisation should not be separated'.*

The range of opinions, described above, allows to define the performance of customer perceived control over IS settings as a tourist ***perceived capability to modify the result of implicitly personalised content***, which has been done by the IS based on the tracked personal data. Such definitions is consistent with the concept and measurer of user control on the context of

recommender system (Pu et al., 2011). High performance, in turn, is achieved when the tourist perceives the amount of the given control over content selection as relevant.

4.1.2.2.4.2. Perceived Control Over the Amount of Content

Perceived control over the amount of content referrers to the perceived ***capability of the tourists to access the whole scope of available options*** rather than only those, which are selected for them. As it was discussed in relation to the performance of personalised content, tourists have concerns about the potentially foregone options and, therefore, would like to have a relevant selection of options to arrive at a decision. If aware that an information service applies personalisation technology, tourists express the want to have excess to the full amount of available content and to the opportunity to regulate the presentation of this content:

'If they are offering me the opportunity to sort hotels by price, or by ranking, by customer evaluations, I would think that it is fairer. If there only sorting things by price, I would say that it's also fine, because most of us are price sensitive.'

Most of the experts support the idea of providing tourists with the opportunity to engage with the large among of available options in addition to the personalised one. Moreover, they stress that tourists should make a decision on whether to explore all the selection or to stay within the list of personalised options depending on the time they are willing to invest in each individual case.

'... you should provide them with the opportunity to search more and let them know that you have much more options for them, but these five are the most relevant. Everyone knows that we are living in information era, so there is plenty of information everywhere and about everything, and of course customers are aware that they can search for this information. The personalisation is

providing them with the top one, top 5, top 10 options, selected for them, and then not restricting them from searching more options if they have time for that.'

'You should always give them control; you should give them the way to control their experience. You're giving them there 10 attractions, and there is a big principle in context-aware computing. You give that all this suggestion. But it also always gives them the way to see all other attractions by saying: 'These are the other attractions for you to have a look'. So, they are not restricted to that 10 attractions. They can go and find anything themselves If they have time.'

Similar to the case of the perceived control over content, the experts agree that the given control over the amount of content would cause additional cognitive load to explore them. Therefore, several experts insist that the large variety of option should still retain relatively relevance to minimise the negative effects of tourist interactions with it: '*If you indeed have 1000 relevant options, the user would have access to all of them by clicking on the 'next' page'*. Moreover, they are consistent with the idea that the balance between user control on the one hand, and IS ease of use and intuitiveness, on the other, should be created:

'I would suggest showing them [tourists] the most relevant and supplementing the page with the button 'more options'. And give them what will be an intuitive solution for tourists. First 3 options, them 3 or 5 more, then, 3 or 5 more… The presence of the long list might be convenient in certain cases. For example, in Airbnb the whole amount of offers allow to see all of them at the map and proceed to their description and photos. Usually, users can overview and comprehend about 10 options.'.

Taking into consideration the multiplicity of meanings, this study defines the perceived control over personalised content as ***the access to and the management capabilities of the available scope content***. Such capabilities may include navigating between the options and sorting them in a way

that is relevant for the tourist in the exact context of use, it should be elaborated in a way that does not contradict the implicit content selection and customisation strategies.

4.1.2.2.4.3. Perceived Control Over Interactions with the IS

The perceived control over interactions with the personalised website or mobile application is defined by this study as a tourist capability to manage IS flexibility. As it was discussed above, the IS flexibility as a capability of the system to proactively update the selection of options according to the changes in tourist context is among the parameters that determine the performance of Interactional Processes. High perception on flexibility contributes to the positive assessment of the information service in general. However, the participants additionally explain that tourists tend to continue customisation of their experience after the occurred interactions with the website. Specifically, they select, record or memorise the chosen points of interests and schedule their activities with consideration on the selected options to make the trip more convenient. Despite this concept was not originally hypothesised, the theme of control over the interactions with personalised content emerged in the interviews with some of participants.

Tourists explicitly outlined that while enjoying the personalised website flexibility they value the opportunity to make personal adjustments to the personalised content with the aim to recollect and use is later during the trip:

'*Ideally, I would like to have an opportunity to keep all the information because sometimes you see something, and you think that it's useful, but you can't save it. So, it will be good if I can save information directly on the website or directly in my account*.'

'Well, if I have already chosen something, I will go back so I would like the information to be available for me. So, the opportunity to recall the information I have seen is very advantageous.

At the same time, I'm quite spontaneous person, so I don't want to have to strict plan to travel. If I see that there some very good options are available, then I might not want to go back, and I would decide to experience something new. So, I will probably consider the information at the new location.'

The theme of control over the interactions with the personalised content is not identified among the experts, who focus mainly on content delivery. However, when asked about the tourist control over the interactions, several experts outline that the personalised information service should primarily serve tourists needs rather than business model: '*First of all, not so business oriented, but customer oriented, personalised. Don't make me feel like you're making big money from me'*.

Following tourist requirements, the parameter of perceived control over the interactions in the meaning of the ***capability to save, retrieve or delete the selected options*** is suggested as an additional parameter of Customer Processes Performance to be tested in the measurement model.

4.1.2.2.4.4. Perceived Control Over Data

The perceived control over the personal data as a capability to update, withdraw or modify it was identified as a distinctive theme in addition to the perceived control over IS settings. The findings reveal that the ***opportunity to execute control over the personal data*** can contribute to different types of value in the case of the achieved trade-off between the degree of control and cognitive and emotional load, associated with the need to perform additional interactions with the system interface.

'*If tourists would have some basic knowledge about the principles of customisation and personalisation, they would know that the system would help to learn people to know more about me. This may also elevate or increase cognitive pressure, because 'if you* [service provider] *have*

the data and you sell it to the third party, this would also help the parties to create something that plans to benefit for me [a tourist].''

First, tourists outline that the reasons for managing their personal data include the improvement of personalisation or prevention of forming of the wrong profile as the wrong data may affects the accuracy of personalisation in future interaction. The problem, outlined both by tourists and experts, is related to the way how the IS recognises the real or fake changes in tourist preferences. For example, one of the marketers reflects on the situation when business travellers, who have limited number of requirements, '*suddenly … become very demanding'* when travelling with the families. According to this expert, such tourists are '*trying to find the ways to communicate the non-standard preferences*' to the service provider. Relevant knowledge in data application and technical capabilities allow tourists to prevent the system to learn the change in the patterns and to regulate the degree of personalisation: '*As a person, related to IT, I know system functionality, so if I need to search something one, say, something my wife asked about, I used private mode for browsing, because my personal data cannot be tracked through it.'*

Second, despite tourists demonstrate that they have no interest in learning the specifics of their data application by reading 'Terms and Conditions' before giving their consent to share personal details, the awareness about personal data being tracked raises security concerns among tourists and makes them feel vulnerable:

'…if I have some concerns on how they use my data, if I have no guarantee that they will not steal my details, then I probably won't use it. In this case I will try to book through the agent rather than booking myself. So, if I never used this website, if I think that they can still my money, I will give it a second thought.'

However, the degree of security concerns varies among tourists. Some of them are rather flexible in terms of providing their personal data for the sake of the proposed benefit, while outlining that the presence of control would be appreciated:

'*Frankly speaking, I don't know how many people feel that…. I know when I use Chrome, it knows pretty much about me, because it is browser, it recognises my information about my location, etc., And for myself, I don't mind, because I know that it will not influence my privacy, but it will recommend me better things, something I want.* '

'In terms of travel, probably, I think it is ok… Also, I feel that I cannot change anything. I cannot control these things. … I mean if I don't want to share my data with them, what can I do? I cannot stop them from taking my data! They are just collecting my travel information, right?'

Tourists may also differentiate between different types of data. Specifically, they outline that they do not care about sharing those data that does not poses security threats, while would like to have control and restrict the system from tracking those data that is associated with financial and personal security:

'Yes, yes, …or I am… I'm ok with sharing some limited amount of personal data. Given that service provider does not ask me about my credit card number. I think it's important and I believe that they would not traumatise my privacy. But… I don't mind if they share my online behaviour or my previous experience with the third parties. Yes, for this I don't mind as long as they don't share my contact number and my credit card details.'

The third reason for gaining control over the personal data is the emotional pressure of being observed: '*I feel like 'why you know my preferences? Why do you spy on me? I really have such kind of feelings*.' The experts explain that this happens not only to lack of understanding the

concept of personalisation, but also to lack of familiarity with and the trust to the service provider with the consequent unwillingness to share too intimate information:

'I will see how much information you need to give in order to produce personalised service. To some extent I would stop, I would draw a line. I know that if I give you more information, you will give me more personalised service, but I don't want to know you so much about me, because I don't know who you are and how you can use this information.'

The last outlines reason for execution the control over shared personal data is outlines by the industry practitioners. It is related to ethical considerations of tracking personal data. Several experts warn that the benefits of personalisation may clash with the individual perceptions of privacy, pushing tourists out of their comfort zones:

'When someone knows all about you. What is the level of too much knowledge? For example, when your credit card provider knows that you are pregnant even before you know this, it is probably too much. This is kind of grey area: it is perfectly legal, but is it ethical? '

To address the discussed specifics, the marketing practitioners and academics suggest applying different personalisation strategies for the people with different perceptions of data security and control. Following the described concerns and the digital experience, such strategies may vary from inspiring the perception of security rather than extensively engaging people in data management, to granting a substantial degree of control over the data with the option to restrict personalisation function by default.

'I think one of the ways is to differentiate your users by perception of privacy control. What are they concerned about privacy a lot or not? If your user knows that you're providing this information to her, at the same time, she is concerned about for privacy, you may do something

like saying 'it's fine, your data is secured, you don't worry about privacy'. But for the people who don't care, maybe it's not necessary. '

'It is also about providing customers to opt out to the version of the website that is not personalized at all. I think it would be really excellent to have this opportunity of having no personalised information, of not providing any data, just to see how different it is. '

However, the experts also admit that tourist can control their data only if they are aware about personalisation being applied and have sufficient digital experience. Indeed, despite the theme of tourist control over personal data did appear as a result of analysis, only two tourists expressed awareness that personalisation builds assumptions about their needs based on the different combinations of data, and only one of them knew that the identified changes in the shared data would affect the performance of content personalisation. Therefore, the interviewed experts agree that tourists should be informed about personalisation and related risks: *'there should be absolute transparency about data privacy and security, which probably should be more transparent than data itself.* '

To sum up, the study identified a range of cases when tourist control over the personal data will contribute to the co-created value of different types. The multiplicity of opinions and the level of expertise, which shapes tourist perceptions on the possibility and the degree of control, indirectly point on the need to additionally consider personalisation of this aspect. It also allows to specify the concept in the general way of perception on the ***capability to manage sharing personal data with the personalised information serv***ice rather than to consider all possible scenarios for the questionnaire development.

4.1.2.3. Attributed Meaning in Tourist Reflection on Co-Created Service Performance

In the case of the generalised judgement, the concept of co-created service performance reflects tourist perceptions on the capability of the service to improve or deteriorate the performance of the specific tasks, completed during the interactions with the website or mobile application: *'Ordinary people don't really think about it* [technical parameters]. *They just search and then think whether it's usable or not. They can't think 'all this website gives me personalised experience'. They just can appreciate, they want to appreciate, so they would know 'this service provider always gives me what I want'. And if it does, they will use it continuously. That's it.*'

As it was discussed in the literature review, the overall performance of the service can be either assessed with a help of a general statement (e.g. Chan et al., 2003; Song, 2009), or to be specified for the exact context of use. The first option allows to make the assessment tool applicable for multiple contexts, while the second case allows to consider the specifics of the service and better reflect the capability of the service to meet the requirements. In the context of personalised information service, aimed at increasing the relevance of information and, thereby, decreasing the information overload, experienced by tourists, high service performance means its reliability in providing useful information, which also means that tourists experience convenient interactions with the service: '*These [personalised] applications are extremely helpful to save time and to make travel more convenient'*.

Such perspective is generally coherent with the previously defined service performance as being a customer overall judgement about service reliable and personalised performance (Chan et al., 2003; Song, 2009). However, the specifics of tourist experience with the websites require the concept of convenience to be split up into two characteristics of convenience for the individual (i.e. internal contextual factors) and convenience in the external environment (i.e. external

contextual factors). As a result, the Co-Created Performance of Personalised Information Service is specified as a reflective latent construct with four descriptive parameters of ***usefulness, convenience for the individual tourist and for the context of consumption, and dependability*** (Figure 4.7).

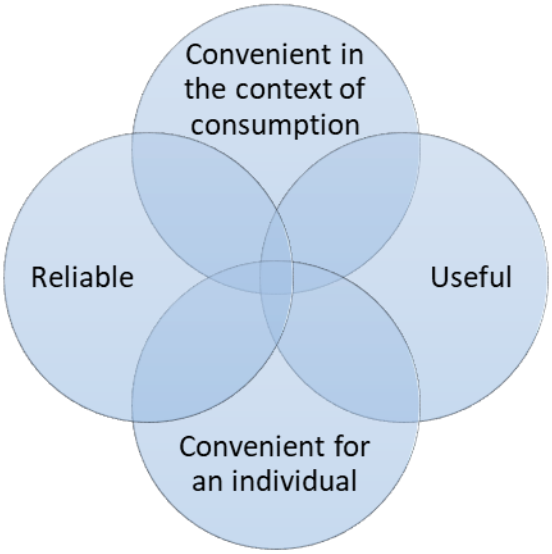


Figure 4-7 Co-Created Service Performance as a Reflective Latent Construct

4.1.2.3.1. Usefulness

One of the commonly applied indicators of the overall performance of the information service is its usefulness for task completion (Bagozzi, 2007; Davis, 1985; Lee, Lee, & Hwang, 2015; Nielsen & Budiu, 2013). All experts and most of the tourists agree that usefulness is also among the key performance parameters for the case of personalised information service: *'It* [personalised information service] *works' means that it performs all the functions, so it is useful'*.

Previous sections of Chapter 4 demonstrated that each of the four dimensions of personalised service performance have either positive or negative direct effect on tourist perceptions of the service usefulness, including the personalised content performance and interactional processes performance (e.g.*'…relevant information delivered in the right moment are very useful'),* service

provider processes performance *(e.g. 'I think if customer support is available immediately, that would be very useful')* and customer processes performance *(e.g. 'If the website can customise the information so that it is useful for customers, then customers will evaluate lease higher').* As a result, usefulness is considered one of the main purposes of the information service in general and of the personalised service in particular.

The concept of 'usefulness' is directly applied in the customer-centric questionnaires as a standalone variable and as one of the indicators of a latent variable. The findings of the present study reveal that 'useful' is also the most frequent term, used to characterise personalised information service performance. Therefore, the concept of '***usefulness for task completion***' was used to reflect the overall performance of the service.

4.1.2.3.2. Convenience

The second major theme, identified as a result of the qualitative content analysis, is personalised information service convenience for task completion. When explaining their perceptions towards the service, most of the interviewees emphasise convenience as one of most important service characteristics, resulting from the parameters of content, interactional processes, service provider processes and customer processes performance.

Specifically, when discussing content performance, one of the experts explained that *'there is a need to decrease the number of options on one page to guarantee convenient content presentation'.* When explaining the target performance of interactional processes, another expert outlined: *'The interface should be convenient. Do you remember the ad of Gillette brand? The razor should copy the lines on your face. Same idea is relevant for personalisation'.* Tourists share the idea of convenience being an important outcome of resource integration: '*I will stick to that website because it is very convenient'*. For instance, when describing the process of interactions with the

personalised information service interface, one of the tourists explained how low performance of certain processes led to the perceived inconvenience of the service: *'... I also had an experience when I was driving in Tasmania in some rural areas and the connection was not quite well. I didn't have map with me. So, I really needed to keep an eye on my previous screen captures to find the way. But this way is not really convenient'*. Another tourist reveals the combined effect of personalised content performance and their own performance on the perception on the service convenience: *'They will know my preferences; they know who I am. And I can easily and quickly download everything to my wallet. So, for me… I will stick to that website or app because it's very convenient.'* According to these tourists, incapability of any of the abovenamed dimensions to meet the requirement of convenience, for example, *'not showing information in a convenient way',* may lead to the decision to abandon the service.

Importantly, the theme of convenience included two codes of convenience for the individual and convenience in the context of use. As expected, the interviewees put the main emphasis on 'convenience for the individual tourist', which is the main target of personalisation. One of the UX designers explains that regardless of the business logic of the internal processes of resource integration the ultimate aim of the information service is the support of the interactions, that would be convenient for the exact tourist: *'User interactions with any website, and especially with personalised website should be convenient to this user, even despite the system administrator, or that auto mechanic believe that the logic is not right from the car point of view.'*

At the same time, tourists emphasise that their perceptions on the service convenience may change depending on the context of consumption. Two tourists outlined that the inconveniently organised customer interactional process of using voice conversations and, as a result, large amount of mobile Internet data. Despite admitting that in their everyday life mobile Internet usage is a norm,

the change of the country and appearance of roaming charges changes the perception of convenience: '*When I am travelling somewhere, I am using cell phone data, and it might not be very convenient to use lots of mobile data for calls'*.

Such division into two subthemes goes in line with the presence of several internal resource integration processes and resulting personalised information service characteristics, including the relevance of content selection and presentation, system accessibility and intrusiveness. As a result, the study includes both parameters of the service convenience in the measurement model, which should be either validated statistically or refined.

4.1.2.3.3. Dependability

Service reliability as an indicator that the service is free from drawbacks or deficiencies for a relatively long period of time (Chan et al., 2003). This indicator is proven to be relevant in the context of personalised information service as it was named among the reasons why tourists may leave the personalised websites alongside the usefulness and convenience. For instance, one of the UX designers reflected on his own experience:

'There are few reasons [for abandoning the website]. *The first one is when the website looks like unreliable… User may perceive that something might happen if he uses this website. I recently used the website-competitor of Airbnb. The website is not bad, and it works, but the quality of interface, the way information is presented is outdated. Airbnb uses modern, attractive interface with currently popular functionality. That website is like 10 years old. So, technically this website may meet all the requirement of usability, efficiency, etc. But the user might feel that it is unreliable, so that this doubt would be spread to accommodation it offers.'*

The specifics of tourist perceptions, that was identified during the content analysis, is association of service reliability with the professionalism of the service provider. As it was discussed in the

previous subsections, due to high intangibility of the information service and the fact that tourists are not exposed to the internal processes of the IS, they may not be aware of the technical specifications and resulting personalised information service performance. The study finds the evidence that they associate the capability of the service to perform without deficiencies with the level of expertise of the service provider. One of the tourists explains his reasoning in the following way:

'*When speaking about city tourism, I think it is very much ok for me to use information from the global websites like Expedia, and I am satisfied with the options… Sometimes, I prefer to go to some rural areas. In this case I would not use Expedia or Booking.com, because they are not experts in this, and they would not have good range of options for me … In this case I would go for search for some local applications or maybe sometimes to some magazine to choose the right application'.*

Another tourist described her reasoning towards poor information exhaustiveness performance: *'In my previous experience I have never seen any accommodation websites not providing complete information. They're doing good, but if in case they're not providing this information, I would also feel that they're not professional.* The third tourist expressed similar opinion when discussing the interface aesthetics: *'It tells me whether the website is professional, whether they spent time to organise the information in the right way'.*

In order to better reflect tourist perceptions, the study accepts the ***degree of service provider professionalism*** as an appropriate parameter to measure personalised information service reliability.

To sum up, qualitative content analysis allowed to reconfirm the result of conceptual development of the Co-Created Personalised Information Service Performance as a complex multidimensional concept, which can be defined from two distinctive perspective. As a summative judgement about the performance of the functional service attributes, the Co-Created Service Performance is defined as consisting of four exhaustive dimensions of content performance itself, and the performance of interactional, service provider and customer processes of resource integration. Each of these dimensions create direct contribution to the overall tourist perception of the service performance. This allows to specify Co-Created Service Performance as four-dimensional second-order formative-formative latent contract. Additionally, the attributes within these dimensions may have an indirect effect on the overall perception of service performance by strengthening or weakening the influence of other factors. Deeper exploration of these relationships is required to enable the balanced strategy, which, in turn, would enable the optimum service performance.

4.1.3. Co-Created Value

4.1.3.1. The Nature of Co-Created Value

Following S-D logic, customer co-created value is defined by this study as a sum of acquired or lots benefits from all experienced interactions with the service system (Akaka, 2007; Vargo & Lusch, 2017), which in the context of this study refers to the interactions with personalised content, with IS interface, with service provider and customer participation in them. The findings demonstrate that co-created customer value describes tourist perceptions on the way how application of personalised information service affects travel experience in general, rather than specific interactions with it. The content analysis also identified two major themes of value description principles, which correspond to the discussed concepts of co-created customer value.

The first group summarises tourist perceptions of the satisfied or not satisfied needs, that triggered interactions with the service: '*It will meet my needs according to the certain circumstances'.* Such view is consistent with the classic definition of value under S-D logic and in the case of the present study refers to tourist information needs (Choe et al., 2017; Vogt & Fesenmaier, 1998). The second group summarises perceptions of value as an overall judgement of the acquired relative to lost resources: *'Customers want to see effectiveness, customers want to find everything they need easily and in a minimum time'*, which goes in line with the approach, where value is defined as a single and unidimensional judgement, expressed through one or several equivalents (e.g. Chan et al., 2003; Song, 2009). This section provides further insights on both perspectives of co-created value.

4.1.3.2. Essential Attributes that Form Perceptions

While different human needs have different importance in achieving satisfaction, they are exhaustive and represent the essential components, that together form this state. By describing their perceptions on co-created benefits, tourists also reconfirm both the significant role of each component, as well as little or no direct interdependence between them. When asked about positive emotions and happiness, caused by high-performing personalised information service, one of the tourists explained that hedonic value plays minimum role in influencing satisfaction, while utilitarian value is the main factor of it: *'I'm not sure I'm very rational person, so for me the main thing is just quickly accessible information'*. Therefore, the benefits of personalised information service, which mirror tourist information needs, were initially hypothesised as the indicators of the latent formative construct of co-created value.

Importantly, the context of personalised information service affected some of the original interpretations of tourist information needs. First, each of the tourist information needs is described

by previous studies as a multidimensional concept itself (Choe et al., 2017; Vogt & Fesenmaier, 1998). The findings have identified the presence of certain heterogeneity in the way tourist experience and express each type of the co-created value. However, the interviewees were mainly consistent in using similar wording, which indirectly reconfirms the relevance of specifying each type of co-created value with a single indicator and, therefore, of the whole latent variable as a first-order construct.

Second, the findings are consistent with the S-D logic idea that value can be co-created or co-destructed (Smith, 2013). Tourists express a range of positive and negative states, including being '*excited*', '*interested*', '*bored*' and '*annoyed*'. This, in turn, confirms the benefit of using the semantic differential scale rather than Likert scale to better convey the meaning of the hypothesised types of co-created value.

Third, same as in the original framework, the study identified five major themes, that describe each type of the co-created benefits. However, the exact definitions of several benefits vary from the general perspective. Such difference can be explained both the specifics of tourist interactions with personalised information services and by the fact that the study initially narrowed the scope of value co-creational processes to the relations between a customer and a service provider, thereby, potentially omitting some of the factors. As a result, the co-created value is defined by this study as being formed by utilitarian, hedonic, experiential, aesthetic and sing benefits with the specifics, described below.

4.1.3.2.1. Utilitarian Value

Utilitarian value reflects the main functional purpose of interactions with the information service in general and personalised service in particular and dexplains the ***usefulness of information service application for planning the trip***. One of the experts conceptualises it in the following

way: '*Now we are coming to another major issue: personalisation should make service useful.'* When describing negative experience with the application, tourists outline that their final decision to use is determined by the service usefulness. For example, one of the tourists discoursed on her intention to use the app that drains the battery of the smartphone very quickly and admitted that she would delete the application '*unless it is very useful*'. The UX designer further explains that '*if the application is useful, then small inconsistencies are simply not noticed*'. In other words, utilitarian value is agreed to be the major determinants of the overall perceptions on co-created or co-destructs value, satisfaction and loyalty.

In order to describe co-created utilitarian value, the absolute majority of the interviewees apply the concept of 'usefulness', e.g. '*These applications can be useful for travel*'. In addition to 'useful', four interviewees make use of the term *'helpful'*, e.g. '*These applications are extremely helpful'*, and one tourist used the word '*worthy*': '*If the website can customise the information so that it is useful for customers, then customers will evaluate lease higher, and service will be much worthy.*' Taking into consideration the prevailing usage of the term 'useful', and lack of representation of other terms, the study accepts 'usefulness for trip planning' (i.e. a range of states from useless to useful) as a suitable for specifying the survey question.

4.1.3.2.2. Hedonic Value

The findings demonstrate that hedonic benefits in the form of experienced emotion is an important component of the overall co-created customer value. For example, one of the tourists discuss acquired emotions in the same row with the service efficiency:

'I think this application are pleasurable besides that they are efficient and besides they save time.'

The experts agree with this idea and stress that co-creation of hedonic value should be addressed alongside with improving functional benefits of the service to better satisfy tourism-specific needs:

'*In tourism information should be emotional. We sometimes have lots of well-structured factual information, but it does not help in creating positive emotions. And it is also a great challenge to match different kinds of information with the possible emotions it might trigger. And in the end to decide, maybe it may be less factual and more emotional*.'

As it was discussed in the literature review, hedonic value is commonly acknowledged as highly subjective (Choe et al., 2017) and multiple studies describe different states and emotions, which can be attributed to this type of customer value (Smith & Colgate, 2007; Vogt & Fesenmaier, 1998). The analysis confirms the multiplicity of expressions, which can be applied to explain the experiences emotion. The two major subthemes are related to 'excitement' and 'pleasure' of the trip planning, triggered by personalised information service. Additionally, such emotions as 'happiness', 'fun' and 'disappointment' were among one-time associations with hedonic value:

'*Probably, the success of communication with a human may bring much more positive emotions. On the other hand, the failure of a machine may be perceived as less disappointing than a failure of a human customer support'.*

'All tourists have different requirements because they have different needs. So, if you want your customers to have happy trip, you would like to use personalisation or customisation to understand what they like and to provide them with the service they want'.

While tourists were mainly focused on one type of emotion, the experts admit that they can experience the range of states, and the exact type of hedonic value depends not only on the tourist, but on the personalisation strategy and experienced co-creation processes: *'Actually, there is a*

potential to make any type of benefits you want with personalisation… It's not only pleasure, it is for fun, and excitement. You control this. You have control over how you deliver this experience.'

Regarding the two major emotions, there is a common opinion that the entire process of trip planning, which is admitted being a part of travel experience, can make tourists feel excited: '*I feel that in the process I can get really excited about the process of search and about planning the trip*'. One of the experts agrees that '[personalised information] *can make them* [tourists] *more excited and impatient about their future trips'*. When explaining the balance between the relevance of content and relevance of selection of options, another expert added that personalised information service can trigger excitement regardless of the co-creates utilitarian value:

'Another option is to fill user time, to entertain him, taking his attention away from long loading process. In this case, even if the notification you give him is not absolutely true, you still can make him very happy and excited about the search process'.

The topic of 'pleasurable' experience has been identified as the second largest one. However, this concept is mainly applied in the interview by the experts to describe potentially co-created value. Despite one of the interview questions about co-created value specifically focused on pleasurable experiences, only one tourist reflected on having this emotion*: 'Honestly, for now my experience with personalised website is quite pleasant'*. Several tourists were not sure about the importance of this emotion for the overall co-created value, e.g. '*Well… I'm not sure I'm very rational person, so for me the main thing is just quickly accessible information'*. Alternatively, tourists describe the state of 'pleasure' as an outcome of co-created value, and, specifically, as a result of efficient trip planning, which makes it more consistent with the concept of satisfaction: '*Typically, it [pleasurable emotions] will depend on what type of information you're talking about. I think, yes.*

If information service can give me useful information, it will create some pleasurable emotions because it saves me lots of time.'

As a result, it is suggested that tourist excitement with the trip planning, caused by the information service, is considered as appropriate measure of hedonic value in the context of personalisation. Such specification also goes in line with the emotional component of tourist information needs (Vogt & Fesenmaier, 1998).

4.1.3.2.3. Innovation (Experiential) Value

In terms of the capability of the personalised website or application to contribute to travel experience, all tourists with no exception agree that high-performing service contributes to creation of positive experience. Moreover, there is a common agreement that the main component of experiential value is the interest, triggered among the tourists by personalisation-enabled trip experience. For example, one of the tourists explained that for her co-created value arises from satisfying the purpose of interactions with the personalised content and the service, which can be purely utilitarian or include the experiential component:

'*I think it depends on the situation. When user wants to quickly book important service, e.g. flight tickets, any visual or playful details would interrupt him from the process. When a game is part of booking and user wants to engage – then it might be actually interesting*. '

Several tourists additionally reflect on the capability of the personalised information service to co-destruct novel tourist experience:

'*If I go to Eastern Europe, I want to stay in some very special accommodation, which only Eastern Europe has. But in the system personalised has everything according to my previous preferences, so it only shows me B&Bs, I might not be that very interested in that information.* '

‘*The problem is that travel time is very limited, so I can only travel for several weeks in here in total. So, the problem is that I need to choose very carefully, I need to plan in advance. I want to do something that will be really interesting for me, I want new places. Even if I have been to the city or the country before, I want to go there again, I would like to go to another district or another place I haven't been there before.*’

The experts agree that tourist interactions with personalised website or app contribute to experiential value. For example, one of them stressed that low performing personalisation co-destructs creativity and interest: ‘*If it doesn't allow a user to access information quickly and easily, the process of information search becomes boring and annoying’.* One of the academics supports this idea and reveals that personalisation may co-form the wide range of experiences: *‘This* [personalisation] *might feel very creepy or very cool depending on the person.’*

In terms of semantic representation, the term ‘*interest*’ and the stemmed terms, derived from it, has been the most common way for tourists and experts to express co-created experiential value. However, their application was not systematic, while the concept of interest as a co-created value is consistent with main tourist motives and their information needs.

4.1.3.2.4. Aesthetic Value (Empowerment)

As it was discussed in the literature review, the aesthetics value is distinctive from other types of benefits as it reflects the self-evoked need of self-expression and the stimuli for articulation of the real or fantasised elements of the trip (Choe et al., 2017; Vogt & Fesenmaier, 1998). The findings did not find the direct confirmation that personalised information service itself creates the aesthetic value of dreaming about a certain place. Specifically, the direct question about the importance of self-expression did not led to a univocal opinion:

'Ohh… Actually, I don't have that kind of feelings you have mentioned. I think this kind of application that can help you to choose and help you to get to some place to the hotel to the restaurant and to do some attractions during the stay….'.

When discussion their role in co-creation of value through the personalised information service, tourists reflected on the importance to feel that the proposed solution was developed by them: '… *I will just take what I need I don't need you to sell me something as there is enough information to choose. It is not about how you sell me; it is about my decisions'.*

However, several experts insist that aesthetic value in the form of perception of self-capability to contribute to utilitarian, hedonic and experiential benefits is crucial for the overall co-created value and satisfaction. When discussion the topic of customer co-creation processed and specifically, their outcome, one of the experts insisted that self-expression should be considered among other types of value:

'*This is empowerment. Yes. definitely, by all means, yes, it should be considered. It is the consequence of making things easier of making overall positive experience. Whether this is true personalisation - I think yes. Yes, it is being empowered, being autonomous, that is definitely a big thing*.

Another expert explain that tourists might not consciously form perceptions about self-expression and its role in co-created value: *'I must say that I always doubt if people really recognise these things. This is some kind of additional benefits. Most of the people would take it for granted, especially the millenniums*', which is consistent with the concept of self-empowerment and human motivations (Ryan, Deci, & Vansteenkiste, 2016). Moreover, tourists indirectly revealed the consequences of co-destructed self-expressive value, which are the feeling of insecurity and of incapability to take a decision (Deci & Ryan, 2008). For example, some tourists expressed that

personalised information service supported them with such a list of options, that they cannot take a decision. One of them expressed concerns that the personalised information service provider stripped her for the opportunity and right of choice by applying the implicit personalisation. Therefore, the component of aesthetic need in the form of ***individual perceptions on his or her capability to make the right choice*** is proposed to be tested as one of the factors that form overall co-created value of the personalised information service.

4.1.3.2.5. Sign Value

While establishing the relationships with the service provider are not among the needs that motivate tourists to use personalisation information service, a certain degree of trust to it is known to be an outcome of the experienced interactions and one of the determinants of satisfaction and behavioural intentions. The analysis of tourist perception fully reconfirms this and demonstrates that the performance of multiple attributes of the personalised information service, including the relevance of content, of content selection, operability and learnability, interface aesthetics, can contribute to co-creation and co-destruction of trust between a service provider and the tourist, e.g.:

'*I would prefer information that is presented in a very formal way and a professional way. This will be will bring the impression that this website can be trustful*'

'*…I will search only and one or two websites I like and I trust*'.

All experts' opinions, including tourism marketing and UX practitioners and academics, are also consistent with the abovenamed dependence between personalised information service performance through sign value and trust to loyalty and decision to use the service again:

‘*As we are talking about business, not just pure technical perspective, then yes, it is important. You can actually build trust by improving interactions with the website, the main issue is that you show adds in non-intrusive way*’,

‘*Personalisation creates this emotional attachment and shapes what you think about the business and how you treat them’*

Taking into consideration that there is a common agreement on sign value being represented by trust to the service and that this criterion has been confirmed as one of the determinants of user satisfaction with the information service (e.g. Pu et al., 2011), the study accepts ***trust to the information service provider in providing positive tourist experience*** as a relevant representation of sign co-created value.

To sum up, tourist co-created value has been confirmed to be a complex concept, formed by fine dimensions of utilitarian, hedonic, experiential, aesthetic and sign benefits (Figure 4.8). Each dimension may have different set of antecedents and different contribution to the overall perception of co-created value with no or limited interrelation between these dimensions. As a result, the findings reconfirm specification of the co-created value from the personalised information service as a first-order 5-dimensional formative latent construct.

Figure 4-8 Co-Created Value as a Formative Construct

4.1.3.3. Essential Attributes that Reflect Perception on Co-Created Value

According to the definition, efficiency is the ration between the inputs and output (Chaffey & Ellis-Chadwick, 2012; Strauss & Frost, 2012). According to the existing literature, the main advantage of personalisation is its capability to increase the relevance of the provided content, which also leads to the decrease in information overload. In other words, personalised information service is presumed to simultaneously increase effectiveness and speed of trip planning. So that service efficiency can be interpreted as the ration between the effectiveness and invested time.

The qualitative content analysis has identified three major and closely interdependent themes of ***service effectiveness, speed of problem solving*** and, additionally, ***efficiency (Figure 4.9)***.

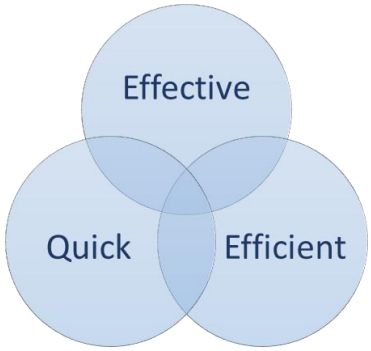


Figure 4-9 Co-Created Value as a Reflective Construct

Tourists sometimes outline one of the above named indicators of co-created value, e.g. '*They should be able to save lots of time for me*'. More often, they use two or three concepts together to better explain same idea, e.g. '*they* [personalised mobile applications] *are efficient and they save time*'. At the same time, most of the experts regardless of the domain, take more holistic approach and define co-created value through the parameters of effectiveness, efficiency and speed of decision-making simultaneously and interchangeably:

'They [personalised websites] *can effectively help people to complete their task of researching the relevant information in a short period of time'.*

'Personalised experience will mean that it is easier and quicker to complete this task. So, you are more effective and you're more efficient.'

'Customers want to see effectiveness; customers want to find everything they need easily and in a minimum time.'

As a result, the findings are consistent with the conceptual meaning of the value, which personalised information service is presumed to co-create. Taking into consideration the interrelated nature of effectiveness, efficiency and speed of need satisfaction in the context of the study and the fact that these concepts were confirmed to be the components of customer value and the determinants of information services satisfaction (Chae et al., 2002; Delone & McLean, 2016; Liang et al., 2006), the study accepts all three indicators as relevant to reflect the overall customer perception on co-created value.

4.1.4. Awareness about Personalisation

The complexity of consumer behaviour is determined by human motivation, which is continuously affected by multiple factors of internal and external environment, affecting tourist perceptions on

the experienced interactions. As it was mentioned above, the study observed that tourist awareness about personalisation being applied can change tourist judgements on the personalised information performance and co-created value, potentially shaping their satisfaction. For examples, one of the UX designers explains:

'*I strongly believe that the user will be highly satisfied with personalisation service if he has clear understanding of the benefit he gets, and, in particular, the result of personalisation algorithms provide this user this relevant answers to his problems, and the user know what he gives away for this, and he knows that his personal data is secured*.'

Importantly, the findings identified two themes that define awareness, which are the knowledge about personalisation as a technology that filters content and about personal data has been tracked for the purpose of personalisation.

Most of the tourists outline that they have common knowledge that Internet resources track their personal data. Half of them are not sure if they have given their consent for the service provider to track their personal data. Only one of them clearly expressed understanding that in some cases this data can be used to personalise content for him, while others had only suggestions. For example, when answering the question on the purpose of data collection, one of the digitally experiences tourists replied:

'I guess one reason is commercial setting, and they also have to protect themselves and in case they don't state something very clearly. In the end, a customer may fight them back'.

Another tourist had similar opinion. When asked about her awareness about personalisation being applied as Google trips and TripAdvisor, she demonstrated that she does not know the specifics of the strategy and, moreover, expressed concerns about the relevance of the provided information,

reconfirming the possibility of awareness to shape tourists perceptions on the personalised information performance: *'I'm not sure if they actually personalize it, or if the companies just give them money to make this a hotel stop choice'*. However, none of the tourists was able to say what kind of data about them the service provider gets.

The industry experts were mainly consistent with the belief that tourists have certain understanding on the strategy of personalisation, which is related both to tracked data and content filtering procedures:

'*I believe that most users do not read and do not understand the purpose of their data being collected. Maybe they don't read because they don't understand, or don't understand because they don't read, but I believe that they don't know about personalisation.'*

'I believe we will see more and more situations, when people don't know that their data is taken, and when they learn this, will they be ok with it. '

'... everyone heard that Google filters content based on personal data, and everyone is ok with this, and this is actually why people use Google. ... On the one hand, no, they would not be aware about personalisation, so they would expect the website to perform its normal functions. At the same time, we live in an interesting world, when user expectations towards the websites increased dramatically in general.'

At the same time, the academic experts acknowledged the lack of expertise in the present state of awareness about personalisation among tourists, e.g.: *'But I'm really not sure about ordinary people. I don't know if they realise that they're data is recorded.*'.

While all experts outlined that it is critical to increase the awareness about personalisation in order to ensure more effective management of tourist expectations and perceptions, the opinions on the degree of knowledge varied.

One of the experts who works in the intersection of tourism marketing and UX design, suggests that tourists should be explained the principle of personalisation to avoid misinterpretation of interactions with the service: *'If they know that I'm using their personal data to give them selected information about hotels, they will understand that this is not advertisement, this is not sponsored, it is not featured, my information shows that they were like it. If not, then there might be another hidden problem. And this is where being transparent comes in.'*

The UX designers support the idea of easy and non-intrusive interactions. Therefore, when asked about the importance to explain the specifics of personal data tracking, one of them explained that at the moment, when the application requests user consent for data application, the only thing tourist should be educated about is the value of personalisation:

'*The answer is very clear 'NO'. There is absolutely no need to explain how data works for personalisation, because this is intrusive, and they will not understand it anyway, but will be frightened by things they don't understand. What is critical is very clear explanation of the benefits they will acquire in comparison to not-personalised service, and how much this user has to 'pay' for it.*'

Interestingly, the academics saw a more global problem rather than single trip planning. Two of them expressed the idea that awareness about the capabilities of personalisation to co-created higher value and the threats of personal data misuse should be clearly explained to people not within the scope of interactions with a certain website or app, but as part of basic education:

'Yes, we should definitely educate them. But I think it is more reasonable to provide these kinds of education to the people when they are young … And, overall, this is a very tricky question on who should take the lead in educating people, how they should widely and appropriately share their data to optimise their experience. '

As a result, there is no common agreement neither in the degree of tourist awareness about personalisation strategy and their personal data application with this purpose, nor about the optimum way to share this awareness. However, it has been agreed that awareness does shape tourist expectations and perceptions on the experiences resource integration processes. Therefore, the study proposes it as a possible moderator of tourist satisfaction with the personalised information service.

4.1.5. Conclusion

To sum up, the qualitative content analysis explained the process of tourist interactions with personalised information service and the specifics of this service design, aimed at improving tourist satisfaction, which is confirmed to be a complex and multistage formation of the overall judgement of the service performance.

The findings reconfirm the presence on the direct the cause-effect relationships between pre-existing tourist expectations towards personalised information service, their perceptions on experiences co-created performance of this service, co-created value for the travel experience, satisfaction and behavioural intentions, which is consistent with the model of tourist satisfaction. Tourist awareness about the information service being personalised and, in particular, about the presence of content selection strategy and about their personal data being tracked for the purpose of content selection, can affect or even change the valence of tourist expectations and perceptions on the service, which goes in line with the consumer behaviour and, specifically, the idea that

customer knowledge determines customer expectations and subsequent perceptions.

Additionally, the in-depth explanation of tourist and expert reasoning allows to provide better contextualisation for the hypothesised variables of the process of satisfaction with the personalised information service. First, tourist expectations are observed as an anticipation on service reliability in being useful for satisfying tourist individual needs. It is therefore specified as the first-order latent construct with the three reflective indicators of the service usefulness, reliability in its contribution to the information need satisfaction and individual adaptation for this purpose.

Second, the study confirms that regardless of their awareness about personalisation, tourists form the overall perception on the service performance based on the assessment of the content, and the processes of service provider, IS and their own resource integration. With certain adjustments to the specifics of the research phenomenon, these dimensions go in line with the bunch of studies on information service performance. Similar to other studies in the field of information service, the perception on the personalised content performance is formed from the assessment of the relevance of the proposed options, the relevance of the selection of these options and the exhaustiveness of each option. The analysis also allows to associate the performance of interactional processes of resource integration with the attributes of the highest level of IS architecture or, in other words, with the IS usability parameters. The service provider resource integrational processes are consistent with the desired performance of the customer support system. The customer resource integrational processes represent the types of customer involvement in personalisation and the control over it. The abovenamed attributes and the relationships between them allow to specify co-created personalised information service performance as a second-order formative-formative latent construct.

Lastly, the study reconfirms that interactions with the personalised information service attributes

co-create different types of value, including utilitarian, hedonic, experiential, aesthetic and sign benefits, which reflects some of the information needs tourists are known to have. The independence of these benefits and the capability of different attributes of the service performance to contribute to different types of the benefits requires co-created value to be specified as a first-order formative construct.

Additionally, the findings reveal that both co-created service performance and co-created value can be expressed as a reflection of the service capability to improve or deteriorate the performance of the specific tasks, completed during the interactions with the website or mobile application, and to improve travel planning experience, accordingly. While these reflections are beyond the scope of the study, they provide valuable guidelines for assuring the validity of the model, which analysis will be presented in the next section.

4.2. Phase 3: Empirical Confirmatory Quantitative Inquiry

The quantitative findings present the result of the outer and inner structural equation model assessment. The analysis therefore serves to meet objectives No 6 and No 7 to validate the specified model and to provide valid and reliable explanation of the way how interactions with personalized information service affect tourist satisfaction. To present the findings, this section follows the logic of data assessment and of the PLS-SEM analytical techniques.

4.2.1. Data Validity Check

The study acquired 244 valid responses, which meet survey screening requirement of the sampling frame (Hong Kong residents who used Google Trips mobile application) and data validity (no missing values, correct answer to the attention check question and survey completing time linger within the interval of [7;60] minutes and standard deviation of the Likert scale and semantic differential scale equal or higher 0.3).

The study applied 57 variables including 55 survey questions and 2 parameters tracked online. Table 4.1 and Appendix 4.1. provide an overview of the descriptive statistics for the applied variables. The test for the data internal consistency reliability ($\alpha_{reflective}$=0.870) demonstrates that the applied scale describes one phenomenon.

All ordinal variables demonstrated skewness within the acceptable range of [-1; +1]. Most of them fall within the acceptable range of kurtosis of [-2; +2] with for value not exceeding [-3; +3] interval. This demonstrated that in general the data has symmetric distribution without heavy tails. One the one hand, this may indicate the real pattern and may decrease performance of the model. On the other hand, considering the central limit theorem and the fact that sample sizes smaller than 300 cases may result in high kurtosis (Field, 2018), the normality threshold can be accepted on the level of [-3; +3] (Gaskin, 2012). Moreover, while normal distribution is desirable, PLS-SEM

belongs to the group of nonparametric test and does not make preliminary assumptions of the observed residuals, and, therefore, of data normality (Hair Jr et al., 2016; Sarstedt et al., 2011). As so, the observed deviation from normality was considered as acceptable and both formative item and reflective indicators were retained in the dataset at this stage of analysis with the potential to delete the reflective items later.

Table 4-1 Case and Variable Summary

Cases	N	Variables	N
Total cases:	**244**	**Total variables:**	57
Responded to invitation	2808	*Missing*	0
Disqualified:	2565	Ordinal data	
Not Hong Kong residents	46	*Reflective Indicators*	17
Not applied Google Trips	1440	*Formative Indicators*	23
Dropped survey (missing data)	113	*Screening question*	1
Failed attention check	310	Nominal Data	
Outliers		*Survey questions*	14
Speed response (<7 min)	366	*Tracked data*	2
Long response (>60 min)	7		
Over quota (Gender, age)	277		
Straightliners (STDEV<0.3)	6		

The sampling adequacy of the applied ordinal variables is high (KMO = 0.930). The principal component analysis has identified 7 factors. This goes in line with the 5 latent constructs of the hypothesised model (Expectations, Co-Created Service Performance, Co-Created Value, Satisfaction, Loyalty) plus 2 additional reflective constructs of Co-Created Service Performance and Co-Created Value, which are necessary to test formative construct convergent validity.

4.2.2. User Demographic Characteristics

Table 4.2 summarises demographic characteristics of the sample. The male and female tourists are relatively equally represented. The respondents represent all age groups with the Generation X being the largest one, followed by Generation Y. Together, they are the most economically active age groups with high digital adoption, followed by Baby Boomers, who are less digitally active, and closed by Generation Z, who are digital native people but are may not be empowered to plan

the trip themselves. Importantly, more than 95% of the respondents have the income higher than 20 000 HKD per household, which would allow them to travel abroad.

4.2.3. Measurement (Outer) Model

The measurement model (Figure 4.10) was estimated with PLS-SEM algorithm with the application of factor weighting scheme with the default settings of Mode A set for reflective constructs and Mode B – for formative ones. The maximum number of iterations was set at 300 with the stop criterion of 10^{-7}. The algorithm converged in 9 iterations, which demonstrates that a stable solution has been found. To assess the significance of estimations, the complete bootstrapping algorithms was run with 5000 subsamples and bias-corrected and accelerated bootstrap method (two-tail, 0.05 significance level).

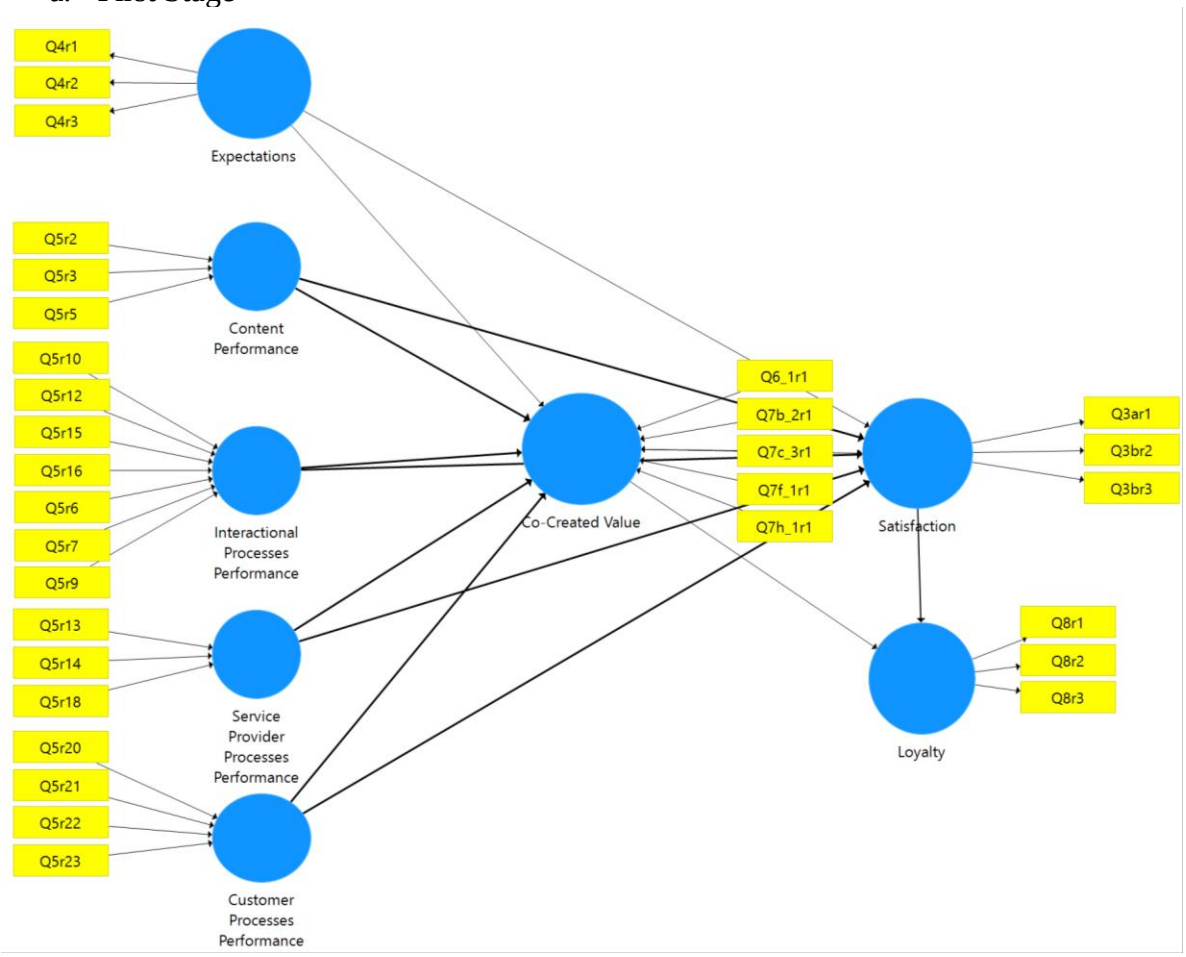
4.2.3.1. Confirmatory Tetrad Analysis

As is was discussed in the literature review, the applied latent variables can be measured both as reflective and formative constructs. Confirmatory tetrad analysis CTA was run with 5000 subsamples to test the 0.05 significance of the difference in the pairs of covariances within the constructs. The analysis demonstrated vanishing tetrads in customer expectations, satisfaction and loyalty. It indicates that there are no significant differences between the pairs of items covariances within each construct and reconfirms that the applied measurement scales of these constructs are reflective as if was initially hypothesised. In the case of co-created value, the bias-corrected Bonferroni-adjusted confidence interval of the second tetrad (2: Q6_1r1,Q7b_2r1,Q7f_1r1,Q7c_3r1) excludes 0 (Table 11 in Appendix 4.2). This means that the nonredundant tetrad is significantly different from 0, or the tetrad covary differently. Therefore, the analysis clearly indicated that the applied dimensions represent formative measurement scale.

Table 4-2 User Demographics Summary

Personal Context		**Technical Context**	
Place of birth	**Quant**	**Awareness about Personalisation**	**Quant**
Hong Kong	224	*Aware*	200
China	17	*Not aware*	44
Australia	1	**Awareness about Personal Data being tracked**	
Indonesia	1	*Aware*	142
India	1	*Not aware*	102
Gender		**Previous experience with travel planners**	
Male	114	*With Google Trips*	199
Female	130	*With Other Trip Planners*	85
Preferred not to say	0	*No Experience*	30
Age		**Operating System used for survey completion**	
18-24 (Gen Z)	30	*Windows (desktop/mobile)*	156
25-34 (Gen Y)	59	*Mac/iOS*	42
35-44 (Gen X)	60	*Other*	46
45-54 (Gen X)	40	**Device used for survey completion**	
55-64 (Baby Boomer)	51	*Desktop*	170
Older than 64 (Baby Boomer)	4	*Mobile (all types)*	74
Preferred not to say	0		
Completed Education			
Primary (No Degree)	0		
Secondary Primary (No Degree)	52		
Post-secondary Primary (No Degree)	54		
Undergraduate (Degree)	112		
Postgraduate (Masters degree or above)	26		
Preferred not to say	0		
Travel Context		**Social-Economic Context**	
Travel Experience		**Income**	**Quant**
Frequent traveller (>3 trips per year)	33	*Less than 9,999*	3
Regular Traveller (2-3 trips per year)	141	*10,000-19,999*	7
Not Frequent (once a year or rarer)	70	*20,000-29,999*	41
Destination		*30,000--59,999*	130
Short haul	190	*More than 60,000*	63
Long Haul	54	*Prefer not to say*	0
Social Environment		**Family Status**	
Alone	11	*Single*	81
With a spouse	105	*Married/live with partner*	160
With family members	37	*Separated/divorced*	3
With the group of friends	51	*Widowed*	0
Other	40	*Prefer not to say*	0
		Single	0

a. First Stage



b. Second Stage

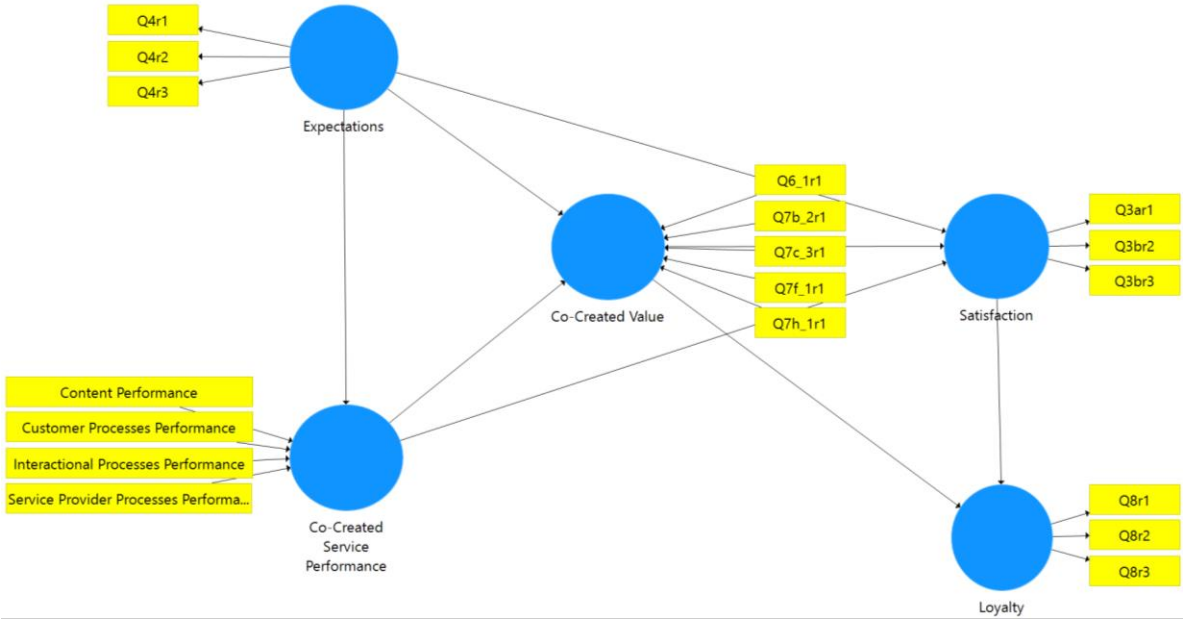


Figure 4-10 Outer Model Two-Stage Validation

In the case of the lower-order constructs of co-created service performance, the tetrads vanished in the 3-indicator constructs of Content Performance and Service Processes Performance. This can be either explained by the absence of significant differences in the pairs of covariances, or by the fact that CTA-PLS only performs well with latent variables being defined with at least 4 indicators (Hair Jr et al., 2017). In the case of Interactional Processes Performance and Customer Processes Performance the tetrads do not vanish but the bias-corrected Bonferroni-adjusted confidence intervals include 0 (Table 8, Appendix 4.2). Same result can be observed in the case of HOC of Co-Created Service Performance (Table 7, Appendix 4.2). In other words, the CTA-PLS does not provide an empirical evidence for formative measurements.

However, co-created service performance and value are defined by this study as being composed from a range of sub-dimensions with the measurement scale being selected for this. For examples, in the case of content quality, the increase in the relevance of selected information (Q5r2) may not affect or decrease the number of options tourists select from (Q5r3), which corresponds to the attributes of formative measures. Second, among the LOC only in the Content Performance the loadings within the construct are high (l>0.7), which potentially allows to use reflective measurement principle. In other sub-dimensions of Co-Created Service Performance some of the selected indicators load lower than 0.70 with the indicators of Interactional Processes Performance not exceeding 0.700 (Table 4.6), which, in turn, implies application of formative measurement principles. In the case of HOC, the loadings appeared to be high (l>0.70), which is not desirable. At the same time, VIF of each indicator does not exceeds the threshold value of 5, indicating that there is no multicollinearity and enabling formative measurement principle application (Bruhn, Georgi, & Hadwich, 2008; Hair Jr et al., 2017).

Moreover, in the case of HOC, formative-reflective hierarchical constructs are theoretically possible but empirically are extremely rare as they would have to represent common parts of several different measurement scales (Becker et al., 2012). Keeping in mind that conceptual considerations should be priorities over the results of the CTA-PLS (Hair Jr et al., 2017), the study retained the initially hypothesised measurement principle. As a result, three constructs' validity and reliability should be assessed according to reflective variables criteria, and two constructs – according to the formative ones.

4.2.3.2. Reflective Constructs Assessment

To assess and improve the measurement scales, each of the reflective constructs was tested for internal consistency reliability, convergent and discriminants validity. The initial scale (Appendix 4.1) included the constructs of Expectations (3 items), Satisfaction (3 items) and Loyalty (4 items). The analysis of the initial scale did not allow to establish discriminant validity as the latent variables Satisfaction and Loyalty were too close conceptually. To improve the scale, the item from the Loyalty construct with the highest cross-loading with Satisfaction (Q8r4) was removed from the analysis, so that only the items that describe personal intention to use the app were retained in the scale. This allowed to improve the composite reliability of the Loyalty construct by decreasing it from 0.930 to 0.908.

Table 4.4 summarises the main assessment criteria of internal consistency reliability and convergent and discriminant validity for the reflective latent constructs of Expectations, Customer Satisfaction and Loyalty, while a detailed overview of each test results is provided in Appendix 4.2.

Table 4-3 Reflective Constructs Assessment

	Convergent validity			Internal consistency Reliability		Discriminant validity	
Test	Outer loadings	Indicator Reliability	Explained Variance	Cronbach Alpha	Composite reliability	Forner-Larcker Criterion	HTMT Confidence interval
	l>0.70	*>0.5*	AVE *>0.50*	*α>0.60*	*0.60 <CR<0.90*	*√AVE>r²*	*If excludes 1*
Expectations							
Q4r1	0.808***	0.653	0.652	0.733	0.849	Yes	Yes
Q4r2	0.817***	0.667					
Q4r3	0.797***	0.635					
Satisfaction							
Q3ar1	0.864***	0.746	0.757	0.839	0.903	Yes	Yes
Q3br2	0.881***	0.776					
Q3br3	0.864***	0.745					
Loyalty							
Q8r1	0.892***	0.796	0.768	0.849	0.908	Yes	Yes
Q8r2	0.846***	0.716					
Q8r3	0.890***	0.792					
Q8r4	*deleted*						

*** $p<0.01$, ** $p<0.05$, *$p<0.1$

The outer loadings of all retained items along all reflective constructs are far beyond the threshold of 0.70 with the lowest value associated with tourist expectations on Google Trips reliability being close to 0.80 (lQ4r3=0.797***, indicator reliability 0.7972=0.635). Both Cronbach's alpha and composite reliability values exceed 0.70, with indicates acceptable level of internal consistency reliability. While no loadings exceed the value of 0.90, the composite reliability ration for Satisfaction (0.903) and Loyalty (0.908) slightly exceed the desirable value. This indicates that the applied reflective items may measure very similar phenomena. However, the observed values are far from the critical value of 1. Moreover, in the context of information service in tourism even higher values of composite reliability between Satisfaction and Loyalty were accepted as tolerable (Dickinger & Stangl, 2013). Therefore, it is possible to conclude that internal consistency reliability has been established.

The AVE values of all three latent variables are well above the minimum 0.50, which also indicates their convergent validity. In terms of discriminant validity, the loadings of the indicators that are

attributed to each of the analysed constructs, are higher than the all of the cross-loadings with other latent constructs. However, the items that reflect intention to use Google Trips in future (Q8r1) and, specifically, for the next trip (Q8r3) demonstrate high cross-loadings with Satisfaction construct. The square roots of each reflective constructs' AVE exceed these constructs' correlations with other variable (Appendix 4.2), which confirms Fornell-Larcker criterion of validity. In terms of HTMT ratio, the values between Expectations and Loyalty (0.515, bias corrected confidence interval [0.289, 0.716]) and Expectations and Satisfaction (0.462, bias corrected confidence interval [0.215, 0.691]) fully meet the requirements. The ration between Satisfaction and Loyalty exceeds the desirable threshold of 0.90. Same as high cross-loadings, such high value (0.938, bias corrected confidence interval [0.877, 0.983]) indicates that these constructs are conceptually similar. However, the scales of these latent constructs were validated in multiple previous studies for Satisfaction (e.g. Chan et al., 2003; Song, 2009; Song et al., 2011) and for Loyalty with the focus on individual intention to use the service (e.g. Dickinger & Stangl, 2013; Pu et al., 2011). Moreover, the critical threshold of HTMT ration, which is named as creating less bias in comparison to cross-loadings (Hair Jr et al., 2016), is 1 (Sarstedt et al., 2017). In the case of the present study, the bias corrected confidence interval [0.877, 0.983] excludes 1, making HTMT ratio acceptable.

As a result, despite several boarder values have been observed, it is possible to conclude that reflective latent constructs of Expectations, Satisfaction and Loyalty meet the requirements of validity and reliability. Therefore, they can be further used to estimate the structural model.

4.2.3.3. Formative Constructs Assessment

The formative nature of constructs and the complexity of relationships in of higher order constructs requires special tests to be applied to measure the construct. To assess and improve the

measurement scales, each of the formative constructs was tested for convergent validity, collinearity and the relevance and significance of the chosen indicators. The specific feature of formative constructs is that the deletion or replacement of an indicator affects the meaning of the latent construct. Co-Created Service Performance was initially hypothesised as second-order latent construct with four sub-dimensions of 4-item scale for content performance, 7-item scale for interactional processed performance, 3-item scale for service provider processes performance and 4-item scale for customer processes performance. The preliminary analysis demonstrated that one of the indicators of Content Performance, namely, the existing information overload (Q5r4) had low and not significant weight (w=0.091, p=0.284, bias-corrected confidence interval included 0), as well as low outer loading with other indicators (l=0.311 with the desirable threshold of 0.50 (Hair Jr et al., 2016)). Moreover, this attribute was proposed based on the empirical findings on personalised user experience studies, rather than borrowed from the existing scale. Therefore, one indicator was deleted from the initial Content Performance scale. The value construct was hypothesised as formed of 5 indicators, which initially met all the established criteria and did not require any modifications.

Tables 4.5 and 4.6 provide the summary of the results of the Co-Created Service Performance and Co-Created Value formative latent constructs with more details on confirmatory tetrad analysis (CTA) presented in Appendix 4.2.

Table 4-4 Convergent Validity of Formative Constructs

Redundancy analysis	*β>0.7*	*R^2>0.6*
Co-Created Service Performance	0.783***	0.613
Co-Created Value	0.844***	0.711

*** p<0.01, ** p<0.05, *p<0.1

Table 4-5 Validity and Reliability of Formative Constructs

Test		Weight (Loadings)	Significance and relevance of indicators				
Requirement	*VIF <5*	*w>0.02 (l<0.07)*	*w<1/√n*	*t >1.96*	*p<0.05*	*95% BCa CI*	*BCa CI Excludes 1*
Co-Created Service Performance			*w<0.500*				
HOC							
Content Performance	2.205	0.239 (0.832)	Yes	2.460	0.014	[0.266, 0.327]	Yes
Interaction Processes Performance	2.572	0.359 (0.897)	Yes	3.874	0.000	[0.326, 0.402]	Yes
Service Provider Processes Performance	1.749	0.214 (0.766)	Yes	2.956	0.003	[0.191, 0.246]	Yes
Customer Processes Performance	2.095	0.361 (0.872)	Yes	4.016	0.000	[0.267, 0.332]	Yes
LOC							
Content Performance			*w<0.577*				
Q5r2	1.285	0.490 (0.804)	Yes	5.305	0.000	[0.318; 0.684]	Yes
Q5r3	1.236	0.441 (0.758)	Yes	5.128	0.000	[0.243; 0.594]	Yes
Q5r4 *(Deleted)*	1.065	0.091 (0.311)	Yes	1.071	0.284	[-0.099; 0.234]	**No**
Q5r5	1.271	0.373 (0.729)	Yes	3.960	0.000	[0.171; 0.548]	Yes
Interaction Processes Performance			*w*<0.408				
Q5r12	1.408	0.059 (0.554)	Yes	0.672	0.502	[-0.120; 0.228]	**No**
Q5r10	1.191	0.200 (0.524)	Yes	2.589	0.001	[0.043; 0.359]	Yes
Q5r15	1.375	0.259 (0.641)	Yes	3.553	0.000	[0.121; 0.427]	Yes
Q5r16	1.367	0.306 (0.700)	Yes	3.553	0.000	[0.146; 0.478]	Yes
Q5r6	1.450	0.252 (0.691)	Yes	3.008	0.003	[0.148; 0.476]	Yes
Q5r7	1.381	0.310 (0.695)	Yes	3.581	0.000	[0.138; 0.399]	Yes
Q5r9	1.300	0.160 (0.583)	Yes	2.080	0.038	[0.012; 0.310]	Yes
Service Provider Processes Performance			*w*<0.577				
Q5r13	1.176	0.411 (0.696)	Yes	4.215	0.000	[0.211; 0.599]	Yes
Q5r14	1.268	0.347 (0.710)	Yes	4.242	0.002	[0.174; 0.491]	Yes
Q5r18	1.212	0.569 (0.821)	Yes	6.532	0.000	[0.402; 0.746]	Yes
Customer Processes Performance			*w*<0.500				
Q5r20	1.355	0.253 (0.664)	Yes	3.036	0.002	[0.092; 0.429]	Yes
Q5r21	1.372	0.190 (0.638)	Yes	2.019	0.044	[0.005; 0.377]	Yes
Q5r22	1.436	0.518 (0.856)	Yes	5.654	0.000	[0.351; 0.715]	Yes
Q5r23	1.301	0.363 (0.735)	Yes	4.421	0.000	[0.183; 0.513]	Yes
Co-Created Value			*w*<0.447				
Q6_1r1	1.769	0.361 (0.837)	Yes	7.761	0.000	[0.267, 0.452]	Yes
Q7b_2r1	1.950	0.223 (0.782)	Yes	5.174	0.000	[0.141, 0.305]	Yes
Q7c_3r1	1.874	0.246 (0.783)	Yes	5.685	0.000	[0.166, 0.334]	Yes
Q7f_1r1	1.944	0.209 (0.778)	Yes	3.464	0.001	[0.098, 0.330]	Yes
Q7h_1r1	1.777	0.221 (0.759)	Yes	4.613	0.000	[0.124, 0.311]	Yes

*** $p<0.01$, ** $p<0.05$, *$p<0.1$

Content validity of both latent constructs was established theoretically by redefining the existing concepts from the perspective of the S-D logic and specifying the measurement indicators with the results of the qualitative content analysis. The redundancy analysis (Table 4.5) yield estimates of the path coefficient β=0.783 and R^2 = 613 for Co-Created Service Performance and β=0.844 and R^2=0.711 for Co-Created Value. This overpasses the commonly applied thresholds of β=0.70 and R^2=0.60 and establishing convergent validity of the constructs. The measurement model is free from collinearity as the VIF values for the indicators of both LOC and HOC of Co-Created Service Performance, and of Co-Created Value do not exceed 2.6, which is far beyond the critical threshold of 5 (Table 4.6).

All retained indicators, including LOC and HOC level of Co-Created Service Performance and the indicators of Co-Created Value, relevantly contribute to the latent construct they are assigned to (Table 4.6). Specifically, they exceed the lower boarder of 0.02 and not surpassing the maximum possible relative contribution to the construct, determined by the number of indication within the latent construct ($w<1/\sqrt{n}$). All these indicators, except one, are significant at 5% level with t-values exceeding 1.96 and p-values remaining below α=0.05. The indicator Q5r12, associated with recognisability of personalised content relevance, demonstrated relatively law and not significant relative contribution to the construct (w=0.059, p=0.502, bias-corrected confidence interval includes 0). However, it belongs to the widely recognised group of usability parameters and its absence may affect the meaning of the construct. Moreover, the indicator outer loading exceeds 0.50 (l_{q5r12}=0.554), demonstrating that this indicator provides absolute contribution to the construct in the case, when other indicators are not taken into consideration. Therefore, it is retained in the measurement scale.

To sum up, the statistical tests themselves do not provide the unambiguous and absolute evidence of the relevance of the proposed measurement scale for the formative constructs of Co-Created Service Performance and Co-Created Value. However, with the triangulation of the theory-driven and empirically confirmed findings it is possible to conclude that the validity and reliability of the formative first-order and second-order constructs have been established after minor adjustment of the scale.

4.2.4. Structural (Inner) model

The inner model (Figure 4.11) estimated the hypothesised direct, as well as the identified indirect relationships between the latent constructs with PLS-SEM algorithm with the application of path weighting scheme with the default settings of Mode A set for reflective constructs and Mode B – for formative ones. The maximum number of iterations was set at 300 with the stop criterion of 10^{-7}. Appendix 4.3 provides the detailed analysis of the Inner model, while the main outcomes are summarised below.

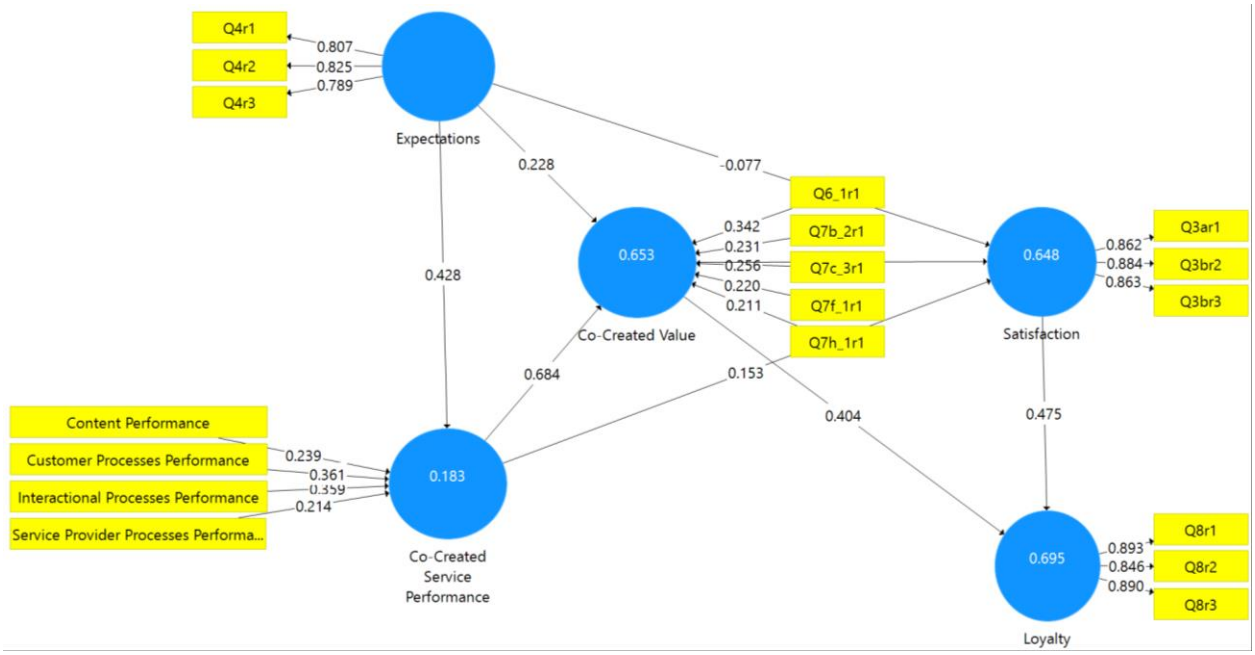


Figure 4-11 Estimated Structural Model

4.2.4.1. Collinearity, Explained Variance and Model Fit

The analysis of the predictor construct demonstrates that collinearity among them is not a critical issue as all VIF values are far below the critical threshold of 5 (Table 4.6). The explained variance of the endogenous latent constructs of Co-Created Value (R^2 = 0.653), Satisfaction (R^2 = 0.648) and Loyalty (R^2 = 0.695) by their predictors can be considered as moderate to substantial. In the case of Co-Created Service Performance (R^2 = 0.183) it is low (Table 4.7). However, R^2 is affected by the number of predictors. Expectations, being the single antecedent of Co-Created Service Performance, only creates small contribution to the construct. Moreover, this construct is defined as formative. As it was discussed in Chapter 3, whole variance in this case is assumed to be explained by formative indicators, which created bias in explaining the effect of a predictor of the change in the target construct. Moreover, the effect size f^2 of Expectations explaining Co-Created Service Performance fall in the middle between moderate and large (f^2=0.224). Therefore, such value can be considered as acceptable. In terms of other constructs, the largest effect (f^2=1.102) demonstrates Co-Created Service Performance on Co-Created Value, followed by the large effect (f^2=0.506) of Co-Created Value on Satisfaction. Expectations have moderate effect (f^2=0.122) on Co-Created Value, so have Co-Created Value (f^2=0.195) and Satisfaction (f^2=0.271) on Loyalty. At the same time, Co-Created Service Performance has small effect (f^2=0.026) on Satisfaction, while there is no effect (f^2=0.012) of Expectations on it.

Table 4-6 Collinearity and Significance of Path Relationships

	Collinearity	Path Coeff.	P Values	95% BCa Confidence Interval	Effect size f^2	Effect size q^2	H_0
	VIF < 5	*β≠0*	*P<0.05*	*Excludes 0*	*0.02/0.15/0.35*		
Expectations -> Co-Created Service Performance	1.000	0.428	0.000	[0.226, 0.607]	0.224	0.130	rejected
Expectations -> Co-Created Value	1.224	0.228	0.000	[0.118, 0.354]	0.122	0.033	rejected
Expectations -> Satisfaction	1.373	-0.077	*0.212*	*[-0.185, 0.041]*	*0.012*	*0.002*	*Not* rejected
Co-Created Service Performance -> Co-Created Value	1.224	0.684	0.000	[0.546, 0.799]	1.102	0.342	rejected
Co-Created Service Performance -> Satisfaction	2.572	0.153	0.006	[0.048, 0.265]	*0.026*	0.017	rejected
Co-Created Value -> Satisfaction	2.883	0.717	0.000	[0.576, 0.823]	0.506	*0.242*	rejected
Co-Created Value -> Loyalty	2.737	0.404	0.000	[0.271, 0.535]	0.195	0.081	rejected
Satisfaction -> Loyalty	2.737	0.475	0.000	[0.336, 0.605]	0.271	0.110	rejected

The model demonstrated the moderate fit. On the one hand, the classic indicators of the fit meet the requirement. The SRMR ration for both saturated and estimated models is much lower that the conservative threshold of 0.08 ($SRMR_{Sat}$=0.045, $SRMRE_{st}$=0.045) and NFI exceeds the threshold value of 0.8 (NFI_{Sat}=0.881 and NFI_{Est}=0.88). Both for the saturated and estimated models, d_ULS and d_G value falls in the 95% SRMR bootstrap confidence interval, reconfirming a good fit (Table 4 in Appendix 4.3). However, the predictive relevance Q^2predict is positive only for the Co-Created Value (Q^2predict=0.133). For the Co-Created Service Performance, Satisfaction and Loyalty is it below 0, which indicated that the prediction error of the PLS-SEM results is larger than the prediction error of using the mean values of the variables, indicating low predictive performance (Table 4.7). Such result can be an objective outcome of the model, which would mean that the model requires further improvement. Alternatively, low predictive performance can be a

result of the complexity relationships in the model. Therefore, more research with the larger sample size and other context is required.

Table 4-7 Predictive Power and Predictive Relevance of the Model

	Coefficient of Determinations	Adjusted Coefficient of Determinations	Cross validated Redundancy	Predictive Relevance
	R^2>0.2	R^2_{Adj} >0.2	Q^2_{incl}>0	Q^2predict>0
Co-Created Service Performance	*0.183*	0.179	0.115	-0.071
Co-Created Value	*0.653*	0.650	0.368	0.133
Satisfaction	0.648	0.643	0.455	-0.085
Loyalty	0.695	0.692	0.492	-0.194

4.2.4.2. Direct Total Effects of the Predictors on Satisfaction and Loyalty

Overall, the result of the models confirms the hypothesised relationships with the strongest path coefficients and the moderate to large effect sizes being observed for the step-by-step process of experiencing a service: Expectations -> Co-Created Service Performance (β=0.428***, q^2=0.130), Co-Created Service Performance -> Co-Created Value (β=0.677***, q^2=0.342) and Co-Created Value -> Satisfaction (β=0.715***, q^2=0.242). However, one of the hypothesised path coefficients (Expectations -> Satisfaction) appears to be not significant (β=-0.077).

When examining the relative importance of the antecedent variables on tourist Satisfaction with personalised information service, Co-Created Value appears to be the strongest predictor (β=0.715***). The effect size of this relationship is also from moderate to large q^2=0.242, indicating substantial predictive power of Co-Created Value for Satisfaction. The total effect of Co-Created Value on Satisfaction is almost the same (0.717***), which confirms that there is direct-only relationship between these variables, which is not interrupted by other factors (Table 4.8). The outer weights of this formative construct's indicators illustrate relative contribution of an index to the construct (Hair Jr et al., 2016). When referring to these outer weights, it is possible

to conclude that utilitarian value (w_{q6_1r1}=0.361***) is the most important factor managers should focus on. It is followed by hedonic benefits (w_{q7c_3r1}=0.246***), and then by experiential (w_{q7b_2r1}=0.361***) and relational value (w_{q7h_1r1}=0.361***). At the same time, while self-expressive value is still significant at 5% level, its relative contribution to the overall perception of Co-Created Value and, in turn, on Satisfaction, is the lowest among other value dimensions (w_{q7f_1r1}=0.208**).

Table 4-8 Relevance of Path Relationships

	Total Effects	T Statistics	P Values	95% BCa CI	Sig
Expectations -> Co-Created Service Performance	0.428	4.290	0.000	[0.226 0.607]	Yes
Expectations -> Co-Created Value	0.520	6.044	0.000	[0.324 0.665]	Yes
Expectations -> Loyalty	0.382	4.838	0.000	[0.224 0.531]	Yes
Expectations -> Satisfaction	0.362	3.781	0.000	[0.174 0.543]	Yes
Co-Created Service Performance -> Co-Created Value	0.684	10.233	0.000	[0.546 0.799]	Yes
Co-Created Service Performance -> Loyalty	0.582	8.937	0.000	[0.441 0.695]	Yes
Co-Created Service Performance -> Satisfaction	0.644	9.715	0.000	[0.494 0.752]	Yes
Co-Created Value -> Satisfaction	0.717	11.333	0.000	[0.576 0.823]	Yes
Co-Created Value -> Loyalty	0.745	17.088	0.000	[0.644 0.812]	Yes
Satisfaction -> Loyalty	0.475	7.06	0.000	[0.336 0.605]	Yes

The identified direct positive relationships between Co-Created Service Performance and Satisfaction is weak but statistically significant effect of (β=0.153**) with the small effect size of this relationship (q^2= 0.017). However, the total effect of Co-Created Service Performance on Satisfaction (0.644***) is substantial and second strongest after the effect of Co-Created Value (0.717***) (Table 2 Appendix 4.3). Statistically is points on other factors, that may mediate the relationships. Managerially, it confirms the importance for a company to focus on improvement of the dimensions of Co-Created Service Performance. Interestingly, the analysis of the relative importance of these dimensions, Content Performance or the relevance of information itself and

its amount, determined by personalisation algorithm, does not have the strongest path coefficient with the overall Co-Created Service Performance (β=0.239, p=0.014). On the contrary, the major relative contribution comes from Interactional Processes (β=0.359, p=0.000) and Customer Processes (β=0.361, p=0.000). At the same time, Service Provider Processes demonstrate the weakest relationships with the construct (β=0.214, p=0.003).

Lastly, negative relationship has been observed between Expectations and Satisfaction (β= -0.077). However, this path coefficient is not significant, and the effect size is absent (q2=0.002), which contradicts the expectations-perceptions gap theory (Parasuraman et al., 1985). At the same time, the total effect of Expectations on Satisfaction is substantial (0.362***). This demonstrates that it is still important to manage customer expectations, as well as points on the necessity to explore indirect effects of Expectations on Satisfaction.

In terms of the direct effects of predictor variables on tourist loyalty, which is expressed as their readiness to use the application again, both Co-Created Value and Satisfaction demonstrate strong positive relationships (β=0.404*** and β=0.475***, accordingly). However, the effect sizes can be characterised as being from small to moderate (q^2= 0.081 and q^2=0.110, accordingly). Additionally, Expectations and Co-Created Service Performance exhibit high total effects of Loyalty (0.382*** and 0.582***, accordingly), which indicates that these relationships require further exploration.

4.2.4.3. Mediation

Table 4.9 and Appendix 4.3 (Tables 1, 2 and 3) summarise the hypothesised directs, as well as indirect and total effects of the predictive latent constructs on the dependent ones. It can be seen that the hypothesised direct relationships are partially or fully mediated by the single or multiple variables. Moreover, some of the direct relationships were not accounted for in the initial model.

Table 4-9 Indirect Effects of the Predictors on Satisfaction

	Total Effects	Direct Effects	Indirect Effects
Expectations -> Co-Created Service Performance	0.428***	0.428***	
Expectations -> Co-Created Value	0.520***	0.228***	0.292***
Expectations -> Loyalty	0.382***		0.382***
Expectations -> Satisfaction	0.362***	- 0.077	0.439***
Co-Created Service Performance -> Co-Created Value	0.684***	0.684***	
Co-Created Service Performance -> Loyalty	0.582***		0.582***
Co-Created Service Performance -> Satisfaction	0.644***	0.153**	0.491***
Co-Created Value -> Satisfaction	0.717***	0.717***	
Co-Created Value -> Loyalty	0.745***	0.404***	0.341***
Satisfaction -> Loyalty	0.475***	0.475***	

When analysing the relationships between Expectations as a general statement about the expected service experience, and Satisfaction as overall post-consumption judgement about it, the observed direct relationship is negative. In general, it is consistent with the expectations-perceptions gap (Parasuraman et al., 1985). The indirect effects of Expectations on Satisfactions represent a case of multi-step multiple mediation (Carrión et al., 2017), where the total indirect effect Expectations -> Co-Created Service Performance -> Co-Created Value -> Satisfaction (Expectations -> Co-Created Service Performance*Co-Created Service Performance -> Satisfaction + Expectations -> Co-Created Value*Co-Created Value -> Satisfaction + Expectations -> Co-Created Service Performance* Co-Created Service Performance-> Co-Created Value* Co-Created Value -> Satisfaction) = 0.439*** (Table 4.8 and Tables 2 and 3 in Appendix 4.3). In other words, the process of experiencing Co-Created Service Performance attributes and assessing Co-Created Value the personalised information service contributes to the travel experience fully and jointly mediates the direct relationships between the pre-existing Expectations and resulting Satisfaction. Additionally, the analysis reveals the presence of indirect statistically significant relationships between Expectations and Loyalty (β=0.382, p=0.000) and well as Co-Created Service Performance (β=0.582, p=0.000), which can affect the direct relationships.

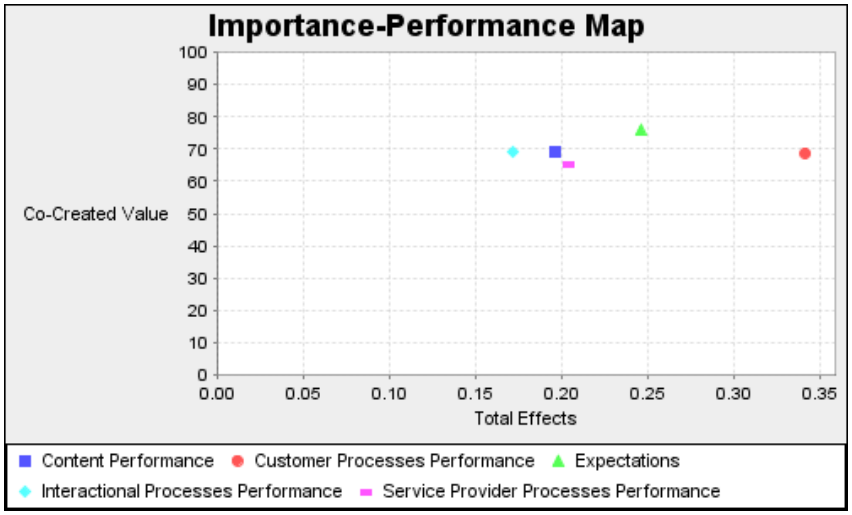
4.2.4.3. Importance Performance Map Analysis

All indicators, engages in the model, belong to an ordinal scale (Likert scale and semantic differential scale) and have same direction from low to high outcome. The acquired outer weights and total effects have positive signs. Therefore, the IPMA can be performed without interpretation bias.

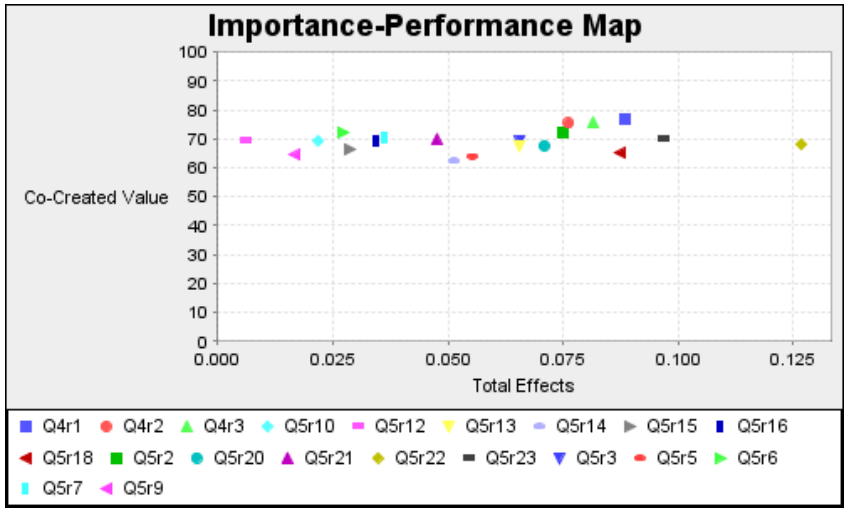
IPMA demonstrates that co-created value has particularly high importance and high performance in forming the overall satisfaction. The importance of co-created service performance components is higher than of expectations. The performance of expectations is the highest among satisfaction predecessors. However, its improvement by 1 point will only improve the performance of satisfaction to 0.1 (Figure 4.12 A).

Managerial efforts should be primarily invested in improving value co-creation as the increase in co-created value performance by one point will lead to increase in customer satisfaction performance by 0.762. Figure 4.12 B demonstrates that the main focus should be on utilitarian value co-creation (Q6_1r1). However, experiential (Q7c_3r1), hedonic (Q7b_2r1), expressive (Q7f_1r1) and relational (Q7h_1r1) benefits should also be addressed. Figure 4.12 C also demonstrates that to enable the improvement in tourist perceptions on co-created value, a company would primarily focus on managing customer co-creation processes performance, as well as tourist expectations.

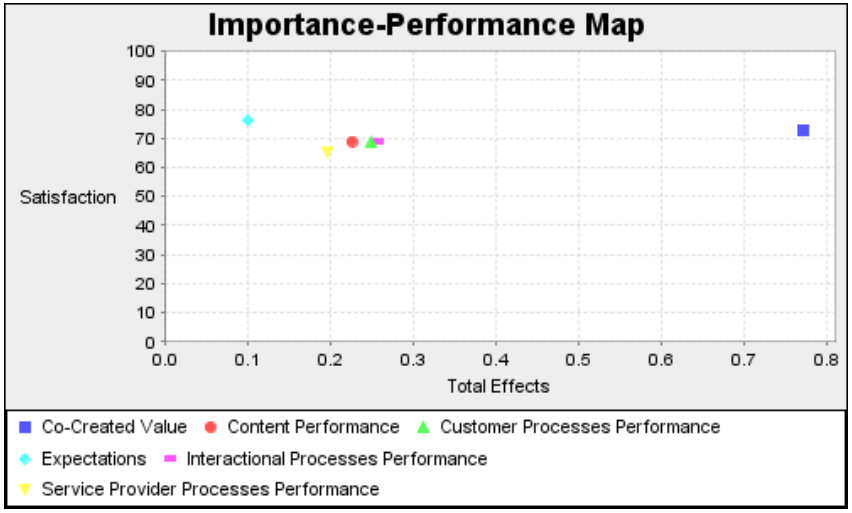
Co-created service performance demonstrates high importance, but low performance in forming satisfaction: the improvement in co-created service performance dimension by 1 point will only increase customer satisfaction by 0.2-0.6. However, the quality of content selection (Q5r2), the presence of immediate customer support (Q5r18) and the control over sharing personal data with the personalised information service provider (Q5r22) are worth managerial attention.


Importance-Performance Map
Co-Created Value
Total Effects
Content Performance
Customer Processes Performance
Expectations
Interactional Processes Performance
Service Provider Processes Performance

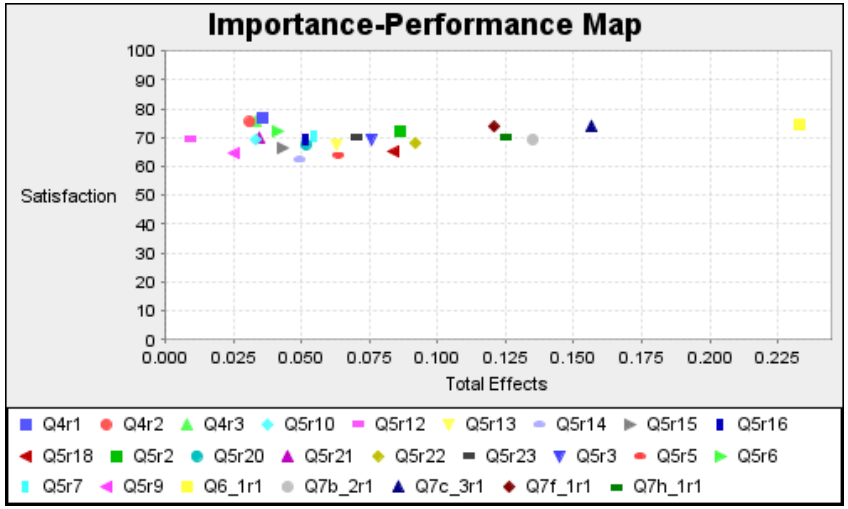
A.


Importance-Performance Map
Co-Created Value
Total Effects
Q4r1 Q4r2 Q4r3 Q5r10 Q5r12 Q5r13 Q5r14 Q5r15 Q5r16
Q5r18 Q5r2 Q5r20 Q5r21 Q5r22 Q5r23 Q5r3 Q5r5 Q5r6
Q5r7 Q5r9

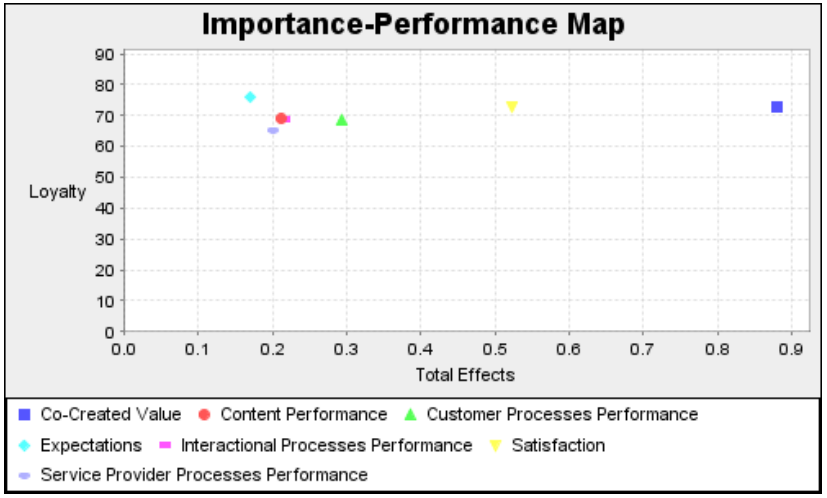
B.


Importance-Performance Map
Satisfaction
Total Effects
Co-Created Value
Content Performance
Customer Processes Performance
Expectations
Interactional Processes Performance
Service Provider Processes Performance

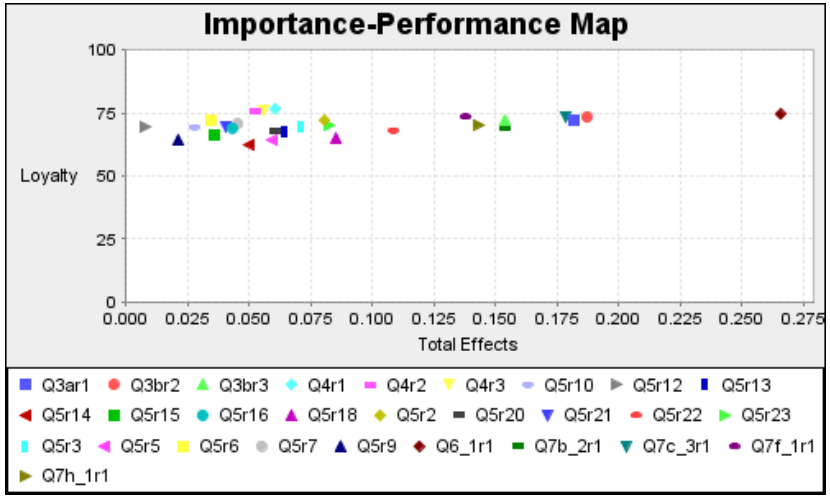
C


Importance-Performance Map
Satisfaction
Total Effects
Q4r1 Q4r2 Q4r3 Q5r10 Q5r12 Q5r13 Q5r14 Q5r15 Q5r16
Q5r18 Q5r2 Q5r20 Q5r21 Q5r22 Q5r23 Q5r3 Q5r5 Q5r6
Q5r7 Q5r9 Q6_1r1 Q7b_2r1 Q7c_3r1 Q7f_1r1 Q7h_1r1

D



E



D

Figure 4-12 Importance-Performance Map Analysis

In terms of the Loyalty, co-created value is identified as the most important factor that can be managed to efficiently increase loyalty as improvement in co-created value by one point will lead to increase in customer loyalty performance by 0.879 (Figure 4.12 D). Specifically, the attention should be paid to the utilitarian value, followed by the experiential and hedonic one (Figure 4.12 E). While managing customer satisfaction is also important as the improvement of its performance by 1 point, leads to the increase in loyalty by 0.523.

4.2.4.4. Model Invariance and Moderation

Tourist perceptions on service performance, co-created value and other service-related characteristics are idiosyncratic and vary depending on the factors of individual internal and external environment (i.e. personal, social, travel and technical contexts, including the awareness about personalisation as part of the technical context. Despite it is beyond the objectives of the present study, it applied PLS-MGA analysis to evaluate potential differences in the strength of the relationships between the constructs with the attempt to of further explanation of the relationships within the model.

Following the MICOM procedures, configural invariance is established for the explored model along all groups as the tested models of different groups have same indicators and scales and apply identical data treatment and estimation algorithms settings. The results of the test for compositional invariance and (when feasible) the assessment of the difference between the group is presented in Appendix 4.4 and discussed below.

4.2.4.4.1. Personal Context

4.2.4.4.1.1. Gender (Male/ Female)

In terms of gender, the significant difference is identified for the paths Expectations -> Co-Created Service Performance (β_{F-M} = 0.367, p=0.009) and Co-Created Service Performance -> Satisfaction (β_{F-M} = 0.260, p=0.011). Interestingly, male tourists have higher expectations, higher perceptions on co-created value, satisfaction and loyalty, than female tourists (Table 4.10). However, they assess co-created service performance lower that the opposite gender. In both cases male tourists have stronger association between the above named concepts. However, other structural relationships within a model are not significantly different for representatives of the major gender groups.

Table 4-10 MGA: Gender (Male/ Female)

Groups	MICOM 1			MICOM 2		MICOM 3
Gender (Male/ Female)	yes			yes		yes
MGA						
Male/ Female	**β (F)**	**β (M)**	**p-Values (F)**	**p-Values (M)**	**B difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.744	0.589	0.000	0.000	0.154	0.879
Co-Created Service Performance -> Satisfaction	0.021	0.282	0.793	0.000	0.260	0.011
Co-Created Value -> Loyalty/ Use Intentions	0.396	0.404	0.000	0.001	0.008	0.475
Co-Created Value -> Satisfaction	0.822	0.616	0.000	0.000	0.206	0.950
Expectations -> Co-Created Service Performance	0.240	0.607	0.081	0.000	0.367	0.009
Expectations -> Co-Created Value	0.201	0.308	0.009	0.002	0.107	0.199
Expectations -> Satisfaction	-0.136	-0.030	0.091	0.740	0.106	0.184
Satisfaction -> Loyalty/ Use Intentions	0.500	0.453	0.000	0.000	0.047	0.631

4.2.4.4.1.2. Age

The primary analysis of the selected 7 age groups did allow identify specific trends, which may be explained by incorrect segmentation and impossibility to outline the groups with distinctive perceptions. However, the number of cases in the group of over 64-year-old was not enough to enable statistical analysis.

In addition to age segmentation, marketing theory distinguishes more global groups of consumers: baby boomers (born approximately within 1930-1965), Generation X (born in 1966-1980), Generation Y (1981- 1995) and Generation Z (1995 - mid 2000). More specifically, the meaning behind 'age difference' is the difference in customer perceptions and behavoiur due to a certain age, i.e. biological age, maturity and accumulated life experience. The meaning of behind 'generations differences' is the difference in customer perceptions and behaviour due to the experiencing specific economic, social, cultural, technical and other factors. Therefore, it is not possible to equate the meanings of two concepts.

However, human core values and perceptions of reality are formed along time in the specific contexts. People experience reality through information . Information can be delivered in the form of a standalone resource, i.e. a book, a news article, a conversation, or to be embedded in the interactions with the objects of external environment, e.g. learned experience from interactions with a new gadget. Therefore, it is possible to generalise that people of a certain age, who used to live in a specific environment, where exposed to a similar major conditions and, therefore, accumulated similar information and experience. This, in turn, is expected to make their core values and behaviour patterns similar. Importantly, individual behaviour patterns are formed by a combination of multiple factors and, therefore, the distinction by a specific year of birth or age (e.g. baby boomers are people, born between 1946-1964) remain conditional. Therefore, marketing

and service management often attributes people to a specific generation cohort based on their age or year of birth.

When matching the age groups and generations by the year of birth, at the moment of analysis, the generation cohorts (Generations X, Y, Z and BB) overlapped with the acquired division by age with BB including two identified age groups (e.g. Dimock 2019). This allowed to include the group of over 64-year-old in the analysis as this group is still digitally active. Taking into consideration that the distinction between generation groups remains conditional, the applied strategy is believed to be effective and not causing major limitations to the validity of findings.

After associating the existing age categories with the abovementioned groups and running MICOM procedures either partial or full invariance was not established for all pairs but one for the construct of Loyalty (Table 4.11). As this study defines loyal behaviour as intention to use personalised information service, the presence of the significantly difference mean value or the construct's variances ratio means that representatives of different generations attribute distinct meaning to the concept of loyalty. This generally goes in line with the observed specifics of consumer and user behaviour. Younger generations, especially, Generation Z, are more technology-savvy. While the Internet became a primary source of travel information for all tourists, younger generations, including Gen Y, use multiple channels and types of information for travel planning (Xiang, Wang, et al., 2015). Also, Baby Boomers form satisfaction and loyalty to mobile services mainly under the influence of acquired economic value, while younger generations, including Gen Y, additionally require emotional composites to supplement utilitarian benefits to return to the product (Kumar & Lim, 2008). In other words, repeat usage of an app is determined by different motives. As so, the comparison between the strength of path coefficients for these pairs is not possible and the models can only be analysed separately.

Table 4-11 MGA: Age Groups

Groups	MICOM 1	MICOM 2	MICOM 3
Age			
Gen Y vs Gen X	Yes	yes	no
Gen X vs Gen Baby Boomers	Yes	yes	yes
Gen Y vs Gen Baby Boomers	Yes	yes	no
Gen Z vs Y	Yes	yes	no
Gen Z vs Gen X	Yes	no	n/a
Gen Z vs Gen Baby Boomers	Yes	no	n/a

MGA						
Gen X vs Gen Baby Boomers	**β (Gen X)**	**β (Gen BB)**	**p-Values (Gen X)**	**p-Values (Gen BB)**	**β difference (Gen X-Gen BB)**	**p-Value (Gen X-Gen BB / PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.542	0.720	0.000	0.000	0.185	0.902
Co-Created Service Performance -> Satisfaction	0.067	0.431	0.401	0.000	0.372	0.996
Co-Created Value -> Loyalty/ Use Intentions	0.513	0.482	0.000	0.000	0.05	0.382
Co-Created Value -> Satisfaction	0.683	0.520	0.000	0.000	0.174	0.123
Expectations -> Co-Created Service Performance	0.516	0.530	0.000	0.000	0.015	0.454
Expectations -> Co-Created Value	0.364	0.187	0.000	0.114	0.186	0.098
Expectations -> Satisfaction	0.127	-0.148	0.124	0.121	0.272	0.014
Satisfaction -> Loyalty/ Use Intentions	0.333	0.423	0.004	0.000	0.113	0.770

Full invariance was only established for the pair Generation X and Baby Boomers (Appendix 4.4). The PLS-MGA analysis demonstrates that there is a significant difference between the magnitude of Expectations -> Satisfaction ($\beta_{GenX-GenBB}$ = 0.272, p=0.014) and Co-Created Service Performance -> Satisfaction ($\beta_{GenBB-GenX}$ = 0.372, p=0.04) path coefficients. Interestingly, the path coefficients for Expectations -> Satisfaction is positive (β_{GenX}=0.127) for Gen X and negative (β_{GenBB}=-0.148) for Baby Boomers, However, in both cases they are not significant for both groups.

4.2.4.4.1.3. Education

In the case of education, relatively small proportion of the respondents with completed post-graduate education did not allow to perform multi-group analysis (Table 4.12). The level of

education may shape tourist demand for services and the level of discretion when making a purchase. Highly-educated customers do not rely on advertisement, but question it and look for reliable information (Kotler & Keller, 2016). To enable multi-group analysis, the respondents were grouped by higher education criteria, i.e. those, who have formal degree and who do not have one. The compared groups demonstrate identical trends in expressing their expectations and perceptions on personalised information service, which are consistent with the whole model results. Specifically, all path coefficients except Expectations -> Satisfaction (β_{Deg} = -0.050, p=0.590; β_{NoD}=-0.127, p=0.123) have positive valence. The relationships between Co-Created Service Performance and Satisfaction are positive, but not significant for both groups (β_{Deg} =0.107, p=0.101; β_{NoD}=0.171, p=0.117). However, the analysis did not identify any significantly different path coefficients.

Table 4-12 MGA: Education (No Completed Degree vs with Degree)

Groups	MICOM 1	MICOM 2	MICOM 3			
No Completed Degree vs with Degree	Yes	yes	yes			
MGA						
No Completed Degree vs with Degree	**β (Deg)**	**β (NoD)**	**p-Values (Deg)**	**p-Values (NoD)**	**β difference**	**p-Value (Parametric)**
Co-Created Service Performance -> Co-Created Value	0.637	0.736	0.000	0.000	0.100	0.420
Co-Created Service Performance -> Satisfaction	0.107	0.171	0.101	0.117	0.064	0.596
Co-Created Value -> Loyalty/ Use Intentions	0.361	0.451	0.000	0.000	0.091	0.510
Co-Created Value -> Satisfaction	0.714	0.761	0.000	0.000	0.047	0.737
Expectations -> Co-Created Service Performance	0.434	0.456	0.000	0.013	0.021	0.905
Expectations -> Co-Created Value	0.249	0.200	0.002	0.038	0.049	0.694
Expectations -> Satisfaction	-0.050	-0.127	0.590	0.123	0.076	0.552
Satisfaction -> Loyalty/ Use Intentions	0.475	0.471	0.000	0.000	0.004	0.976

4.2.4.4.2. Social-Economic Context

More than 65% of respondent fall in the category of married people, while another 33% are single and few more respondents are divorced. To enable comparison, single and divorced tourists were grouped in one category assuming that their perceptions on the experienced personalised information service and resulting travel experience is unlikely to be influenced by 'significant others'. However, the full variability was not established (Table 4.13) as the mean difference between expectations of single and married tourists towards personalised information service is significant ($m_{Sngl\text{-}Married}$=0.370, p=0.008). As data and construct validity was established, it indicates that the respondents assign different meaning to the questions, that describe expectations.

Table 4-13 MGA: Marital Status

Groups	MICOM 1	MICOM 2	MICOM 3
Family Status (Single vs With Partner)	yes	yes	no

4.2.4.4.3. Technical Context

4.2.4.4.3.1. Awareness about Personalisation Being Applied and Personal Data Being Tracked

200 out of 244 respondents replied positively on the statement that Google Trips personalises information for them. 142 of them indicated that they are aware that the app tracks their personal data (Table 4.2). However, the full invariance has not been established for this group of variables as the test has identified the significant different in perceptions of loyalty, thereby, making the analysis not feasible (Table 4.14).

When testing a potential moderating effect of tourist awareness of personalisation algorithm being applied, partial invariance was not established, making multi-group analysis not feasible. The trend that is observed in the case of personalisation awareness is high mean differences for the observed

constructs, which, however, falls out of the 95% confidence interval. This means that tourist with different awareness may attribute different meanings to their expectations and perceptions on the service.

Table 4-14 MGA: Awareness

Groups	MICOM 1	MICOM 2	MICOM 3
Awareness about Personalisation Being Applied	Yes	yes	no
Awareness about Personal Data being Applied	yes	no	n/a

4.2.4.4.3.2. Previous Experience with Travel Planner Apps

The existing knowledge is known to shape customer expectations and perceptions on service. Most of the respondents (n=199) have repeatedly used Google Trips, while 30 tourists outlined that they didn't have any experience with online travel planners before the described interaction with Google Trips. The remaining respondents used a range of apps with the similar functionality for planning, but different capabilities for personalisation (e.g. TripIt, MakeMyTrip apps).

The MICOM procedures illustrated that tourists with no previous experience have very distinct perceptions on the personalised information service. The mean difference for co-created service performance, value, satisfaction and loyalty varied significantly for the pairs, where the respondent with no travel planners experience where engaged (Appendix 4.4). This can perhaps be explained by the specific functionality of the new generation of travel planners, which redefined capabilities of information service to support travel activities, and, therefore, its performance. Importantly, the mean difference between the repeated users of Google Trips and those with no previous experience is highly positive for the abovementioned constructs (m>0.7). In other words, repeated users rate Google Trips performance and the acquired experience significantly higher than those, who used

it for the first time. However, such difference did not allow to establish full invariance and made the results of multi-group analysis irrelevant (Table 4.15).

Table 4-15 Previous application of personalised travel planners

Groups	MICOM 1	MICOM 2	MICOM 3
Previous application of personalised travel planners			
Google Trips vs Other Planners	yes	yes	yes
Google Trips vs No Experience	yes	yes	no
Other Planners – No Experience	yes	no	n/a

MGA					
Google Trips VS Other Travel Planners	**β (GT)**	**β (Other)**	**p-Values (GT)**	**p-Values (Other)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.671	0.534	0.000	0.000	0.137	0.161
Co-Created Service Performance -> Satisfaction	0.190	0.145	0.005	0.125	0.045	0.346
Co-Created Value -> Loyalty/ Use Intentions	0.399	0.317	0.000	0.004	0.082	0.269
Co-Created Value -> Satisfaction	0.672	0.767	0.000	0.000	0.096	0.753
Expectations -> Co-Created Service Performance	0.445	0.505	0.000	0.000	0.060	0.652
Expectations -> Co-Created Value	0.228	0.328	0.006	0.005	0.100	0.755
Expectations -> Satisfaction	-0.083	-0.210	0.299	0.127	0.127	0.202
Satisfaction -> Loyalty/ Use Intentions	0.461	0.525	0.000	0.000	0.004	0.976

When comparing the groups of respondents who continuously used Google Trips and other travel planners prior to the explored situation, MICOM procedures did not identified significantly different perceptions on the explored constructs. Evaluation of the strength of path relationships between them revealed very similar patterns. Same as for the model in general, there is a negative, but not significant effect of expectation on the overall satisfaction (β_{GT}=-0.083, p=0.299 and β_{Other}=-0.210, p=0.127 for the users of Google Trips and other planners, accordingly. The difference does exist for Co-Created Service Performance -> Satisfaction path coefficients, which have similar magnitude, but in case of other travel planners is not significant (β_{GT}=0.190,

p=0.005** and β_{Other}=0.145, p=0.125, accordingly). However, the difference between the path coefficients is not significant ($\beta_{GT\text{-}Other}$ =0.045, p=0.346).

4.2.4.4.3.3. Operating System (Windows / Mac/ Linux and other OSs)

To explore potential moderating effect of the operating system (OS) of the strength of relationships within the structural model, the study attempted to assess the difference between the users of Windows (all versions of the OS for desktop and mobile devices), Mac (for all devices, including iOS for mobile) and other OS. Interestingly, the MICOM test (Table 4.16) identified significant differences in the meaning users of these three groups of OS attribute to the constructs of Expectations ($R_{Windows\ -Mac}$ = -0.766,p=0.016), Co-created value ($m_{Windows\text{-}Other\ OS}$=0.461, p=0.005, $m_{Mac\text{-}Other}$= 0.486, p=0.021), loyalty ($m_{Windows\text{-}Other\ OS}$ = 0.439, p=0.008) and satisfaction ($m_{Windows\ -Other\ OS}$ =0.479, p=0.007), which is consistent with the results of market research (Jones, 2018). Such differences can be triggered by the differences in interactional design and functionality of different OS platforms, so that the experience with a certain OS is projected on the expectations and perceptions towards personalised travel planner. Another trend, which was been relevant for several years, is the possibility to match preferences for a certain OS brand with a specific social-demographic profile. Specifically, iOS users have been observed to have higher education, higher education and higher dependence of technology innovations (Hixon, 2014), so that different perceptions on the explored phenomenon are caused by the factors of social-economic, rather than technical context. Regardless of the reasons, the impossibility to establish full invariance does not allow to test potential moderating effect of operating system on the strength of causal relationships within the model.

Table 4-16 MGA: Operating System

Groups	MICOM 1	MICOM 2	MICOM 3
Operating System			
Windows vs Mac	yes	yes	no
Windows vs other OS	yes	yes	no
Mac vs other OS	yes	yes	no

4.2.4.4.3.4. Device Used for the Survey (Mobile vs Desktop)

Full invariance was established for the groups, who used mobile device (i.e. smartphone, tablet, phablet) and desktop computer to complete the survey, which means that all users attribute similar meaning to the constructs of expectations, co-created service performance, value, satisfaction and loyalty. Apart from two trends, the strength of causal relationships is also very similar (Table 4.17). The two trends concern Co-Created Service Performance -> Satisfaction and Expectations -> Satisfaction path coefficients. Regarding the first case, the users of the desktop computers have stronger and significant association between perceptions on co-created service performance and satisfaction (β_D=0.217, p=0.001), while the users of mobile devices demonstrate weaker relationship, which is not significant (β_M=0.072, p=0.571). Regarding the second case, there is a direct negative relationship between tourist expectations towards Google Trips and the achieved level of satisfaction, which is stronger for mobile users. However, in both cases the path coefficients are not significant (β_D=-0.009, p=0.874, β_M=-0.194, p=0.132). When comparing the two groups, none of the observed path relationships are significantly different from each other. Therefore, user device used to complete the survey does not have a moderating effect on tourist perceptions on personalised information service.

Table 4-17 MGA: Personal Device

Groups	MICOM 1	MICOM 2	MICOM 3
Device Used to Complete the Survey (Desktop vs Mobile)	yes	Yes	yes
MGA			

Device Used to Complete the Survey (Desktop vs Mobile)	**β (D)**	**β (M)**	**p-Values (D)**	**p-Values (M)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.699	0.686	0.000	0.000	0.013	0.443
Co-Created Service Performance -> Satisfaction	0.217	0.072	0.001	0.571	0.146	0.153
Co-Created Value -> Loyalty/ Use Intentions	0.388	0.425	0.000	0.000	0.038	0.610
Co-Created Value -> Satisfaction	0.637	0.838	0.000	0.000	0.201	0.915
Expectations -> Co-Created Service Performance	0.401	0.471	0.001	0.016	0.070	0.644
Expectations -> Co-Created Value	0.212	0.250	0.009	0.012	0.038	0.622
Expectations -> Satisfaction	-0.009	-0.194	0.874	0.132	0.186	0.101
Satisfaction -> Loyalty/ Use Intentions	0.467	0.497	0.000	0.000	0.030	0.609

4.2.4.4.4. Travel Context

4.2.4.4.4.1. Travel Experience (Frequency of Travel)

The majority (n=141) tourists identified themselves as regular traveller, who make trip abroad 2-3 times per year. 33 respondent travel more often, while 70 only make 1 trip per year or even less. To test travel experience as potential moderator of structural relationships of the model, the MICOM procedures were run pairwise for Frequent vs Regular, Frequent vs Not Frequent and Regular vs Not Frequent groups (Table 4.18). The neither partial nor full invariance were not established as the mean differences for all pairs and variables wee high (Appendix 4.4) and in most cases fall out of the 95% confidence interval. In other words, people with different travel experience attribute different meanings to the explored constructs and, therefore, should be analysed separately.

Table 4-18 MGA: Travel Experience

Groups	MICOM 1	MICOM 2	MICOM 3
Travel Experience (Frequency)			
Frequent vs Regular	yes	yes	no
Frequent vs Not Frequent	yes	yes	no
Regular vs Not Frequent	yes	yes	no

4.2.4.4.4.2. Destination (Short-Haul/ Long Haul)

Travel distance and increased uncertainty, related to distinct cultural, economic and social features shapes tourist behaviour and decision-making process (McKercher, Chan, & Lam, 2008). Following the United Nations geographic regions classification (UN, 2018) and considering geographic location of Hong Kong, the countries of Asia were categorised as short haul destinations, while the countries of Africa, Americas, Europe and Oceania - as long haul destinations.

The test for invariance confirmed that constructs are measured and perceived in a similar. The only boarder case is found for the construct of Expectations (r=0.580, p=0.058). However, the process of permutation builds on the samples, randomly drawn from the main dataset, so that the test statistics may vary (Hair Jr et al., 2017). When running the test for the second time, the p value was lower than 0.05. Therefore, this value is assumed as acceptable to perform multi-group analysis (Table 4.19).

PLS-MGA analysis demonstrated that there is only one path coefficient, moderated by the type of destination: Expectations -> Co-Created Value (β_{LH-SH}=0.237, p=0.052). While in this case both groups of short-haul and long-haul destinations demonstrate positive relationships between expectations and co-created value, it is not significant in the case of long-haul and significant for short-haul locations (β_{LH}=0.010, p=0.937; β_{SH}=0.247, p=0.001). Another difference is the

relationships Co-Created Service Performance -> Satisfaction, which is not significant for the long-haul destinations, but significant for short-haul locations (β_{LH}=0.122, p=0.359; β_{SH}=0.161, p=0.015). In the context of personalised information service, it can be explained by the high value of the long-haul trip in comparison to the short-haul one.

Table 4-19 Short-Haul vs Long Haul Trips

Groups	MICOM 1		MICOM 2		MICOM 3	
Short Haul vs Long Haul	Yes		yes		yes	
MGA						
Short Haul vs Long Haul	**β (LH)**	**β (SH)**	**p-Values (LH)**	**p-Values (SH)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.765	0.690	0.000	0.000	0.076	0.740
Co-Created Service Performance -> Satisfaction	0.122	0.161	0.359	0.015	0.039	0.388
Co-Created Value -> Loyalty/ Use Intentions	0.503	0.373	0.001	0.000	0.130	0.786
Co-Created Value -> Satisfaction	0.748	0.705	0.000	0.000	0.043	0.621
Expectations -> Co-Created Service Performance	0.483	0.427	0.000	0.000	0.055	0.638
Expectations -> Co-Created Value	0.010	0.247	0.937	0.001	0.237	0.052
Expectations -> Satisfaction	-0.141	-0.051	0.227	0.487	0.090	0.260
Satisfaction -> Loyalty/ Use Intentions	0.349	0.511	0.034	0.000	0.162	0.178

4.2.4.4.3. Travel Social Environment

The provided information and value co-creation process should be personalised to the requirement either of a single user or to the group of people, who can take travel decisions together. To test the potential moderating effect of social environment the study attempted to compare the groups of tourists, who travelled alone, with a spouse, with the members of the family and with friends.

The acquired data did not allow to perform pairwise comparison between all group. The small number or respondents who travelled alone (n=11) did not allow to run the multi-group analysis to compare it with other contexts. Interestingly, full invariance of constructs was not established

for the pair of family and spouse, as people, who travelled solely with the spouse were less satisfied with the app than a whole family (m_{Fam-Sp}=0.192) with the variance ration being significantly different (r=-0.922, p=0.012). Therefore, comparison of these pairs was not possible (Table 4.20).

Table 4-20 MGA: Social Environment

Groups	MICOM 1	MICOM 2	MICOM 3
Social environment			
with Family Members vs with Friends	Yes	yes	yes
with family members vs with spouse	Yes	yes	no
with Friends vs with Spouse	Yes	yes	yes

MGA						
with Family Members vs with Friends	**β (Fam)**	**β (Fr)**	**p-Values (Fam)**	**p-Values (Fr)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.579	0.812	0.000	0.000	0.233	0.844
Co-Created Service Performance -> Satisfaction	0.375	0.25	0.02	0.157	0.124	0.296
Co-Created Value -> Loyalty/ Use Intentions	0.757	0.626	0.000	0.000	0.131	0.235
Co-Created Value -> Satisfaction	0.416	0.608	0.043	0.000	0.192	0.767
Expectations -> Co-Created Service Performance	0.489	0.052	0.000	0.829	0.437	0.044
Expectations -> Co-Created Value	0.403	0.256	0.003	0.040	0.146	0.211
Expectations -> Satisfaction	0.096	-0.014	0.537	0.898	0.109	0.279
Satisfaction -> Loyalty/ Use Intentions	0.065	0.3	0.696	0.016	0.234	0.874

MGA						
with Friends vs with Spouse	**β (Fr)**	**β (Sp)**	**p-Values (Fr)**	**p-Values (Sp)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.812	0.675	0.000	0.000	0.137	0.256
Co-Created Service Performance -> Satisfaction	0.25	0.081	0.162	0.313	0.170	0.187
Co-Created Value -> Loyalty/ Use Intentions	0.626	0.339	0.000	0.000	0.286	0.020
Co-Created Value -> Satisfaction	0.608	0.812	0.001	0.000	0.204	0.858
Expectations -> Co-Created Service Performance	0.052	0.570	0.829	0.000	0.519	0.983
Expectations -> Co-Created Value	0.256	0.177	0.034	0.075	0.079	0.312
Expectations -> Satisfaction	-0.014	-0.109	0.899	0.298	0.095	0.257
Satisfaction -> Loyalty/ Use Intentions	0.300	0.557	0.017	0.000	0.257	0.957

In terms of the pairs of Friends-Family and Friends-Spouse, the analysis identified significant moderating effect of the context on the strength of the relationships between the latent variables (β_{Fam-Fr}=0.437, p=0.044; β_{Sp-Fr}=0.519, p=0.017). First, in both cases the path Expectations -> Co-Created Service Performance was affected. Specifically, the relationship between these variables for the case of traveling with friends was weak and not significant (β_{Fr}=0.052, p=0.829), while for the travel with a spouse or family – very strong and significant (β_{Sp}=0.570, p=0.000; β_{Fam}=0.489, p=0.000). Second, for the pair Friends-Spouse the significant difference wan also observed for the path Co-Created Value -> Loyalty/ Use Intentions (β_{Fr-Sp}=0.286, p=0.020). The difference is caused by the path coefficients of the similar significance but different magnitude (β_{Fr}=0.626, p=0.000; β_{Sp}=0.339, p=0.000, accordingly).

4.2.5. Conclusion

Phase 3 has crosschecked the acquired data to ensure its validity, tested the validated the measurement and the structural models and further explained the formed tourist perceptions. First, the analysis allowed to further clarify the meanings, attributed by Hong Kong tourists to the concepts of Expectations, Co-Created Personalised Information Service Performance, Co-Created Value, Satisfaction and Loyalty. The findings demonstrate that after few adjustments, the proposed reflective and formative latent constructs are relevant to measure tourist perceptions on the abovenamed concepts. Some variation in the attributed meanings were identified between the representatives of different contextual factors, including demographics and well as travel and technology experience. However, such variation did not prevent the latent constructs validation.

Second, the analysis of the structural relationships confirmed that Expectations, Co-Created Service Performance and Co-Created Value are the influential factors, which form Satisfaction with the personalised information service and customer Loyalty. While having the direct effect of

the outcome of tourist interactions with the personalised information service, Co-Created Service Performance and Co-Created Value additionally mediate the effect of tourist expectations towards the service capabilities to satisfy their needs. The factors of the tourist internal and external context have moderating effect of the relationships between the groups of variables. However, none of them have full moderating effect on the model.

Chapter 4 Conclusion

To sum up, the qualitative and quantitative inquiries demonstrated that personalised information service can be defines as co-created by the tourist and the service provider, as the dimension of customer co-creation processes creates significant contribution to the overall perceptions on the service performance. The analysis mainly reconfirmed the relevance of the commonly applied meanings of the applied concepts to the context of the personalisation. The findings reconfirm that there are significant direct relationships between the constructs that describe the process of tourist cognition and satisfaction, which fully mediate the effect of pre-existing expectations of satisfaction. At the same time, the study has not identified any factors that would have full and significant moderating effect on the observed relationships.

Chapter 5 Results Integration and Discussion

This study explored the influence of tourist perceptions on personalised information service in tourism and the way, how the interactions with the service contribute to formation of the overall satisfaction and loyalty. Chapter 5 integrates the findings of two phases with the reference to the aim of the present study and to the existing research. It provides the discussion on the contribution that the findings of the present study make to the theory and to practice. Lastly, it assesses the quality of the research and summarises the major limitations, which may have the influence on the results validity and reliability.

5.1. Findings Integration with the Reflection on Research Objectives

This study explored the way how tourist interactions with personalised information service contribute to the overall satisfaction and loyalty. To enable integration of findings, the objectives of the study (Table 5.1) can be rearranged in two groups. The first one is related to refining the definitions of the applied concepts of expectations, co-created service performance, co-created value, satisfaction and loyalty for the context of personalised information service. The second one summarises the explanation of the effect of the defined concepts on tourist satisfaction and loyalty.

Table 5-1 Findings Integration Principle

Concept Level	Relationships Level
RO1: To conceptualise tourist interactions with personalised information service	RO2: To propose an integrative model of tourist satisfaction with personalised information service
RO3: To refine and further elaborate the proposed measurement scales for the model of tourist satisfaction with personalised information service	RO4: To explain the cause-effect relationships and hierarchy within the model
RO6: To validate the proposed measurement model	RO5: To explore possible mediating and moderating effect on the hypothesised cause-effect relationships within the model
	RO7: To assess the structural model of tourist satisfaction with the personalised information service

5.1.1. Concept Level

On the concept level the analysis provided the insights of tourist expectations and perceptions towards personalisation and personalised information service and the specifics of interrelationships between these perceptions in the process of satisfaction formation.

5.1.1.1. Perceptions on Co-Created Service Performance

The most important finding is the redefined concept of the service performance. The study explained that customers not just actively participate in the service creation as prosumers. On the contrary, they perceive their participation and executed control over the information service co-creation as an important component of the overall service performance. Therefore, the personalised information service performance can be defined as co-created. It can be better explained as formed by four standalone dimensions: the performance of the personalised content, of tourist interactional processes with the IS interface, of the service provider processes of managing and supporting resource integration and value co-creation, and of customer processes of controlling the process of resource integration and value co-creation. Together, the four dimensions provide more comprehensive view on the co-created personalised information service performance.

The resulting meaning of high performing personalised content from tourist perspective is the relevant content, which is sufficient for decision-making and contains all information, required for arriving at a decision. The initially hypothesised meaning of the personalised content performance as a composite contract was changed as the outer model validation did not confirm the belonging of one indicator to the latent variable. Specifically, the requirement for the absence of content overload, which can be caused by the extensive list of options, has been dropped from the scale. In other words, the idea that too much information is not helpful for decision-making is not confirmed for the context of this study. On the one hand, it seems to contradict the logic of vertical

differentiation, applied for information service in tourism (Candela & Figini, 2012), as well as the paradox of choice (Schwartz, 2004). On the other hand, information search and selection of travel activities by exploring the information about them becomes a part of travel experience (Choe et al., 2017; Xiang, Wang, et al., 2015). This fact is also indirectly confirmed in this study by the presence of the strong influence of the experiential value, resulting from interactions with the personalised information service, on the overall perception on co-created value, and its high importance for increasing tourist loyalty. As a result, high-performing personalised content should address satisfaction on different type of tourist information needs, rather than focusing on pure utilitarian component.

The interactional co-creation processes performance as a representation of the website or mobile application performance can be relevantly expressed with the usability parameters, interpreted for the exact context of use. This corresponds to one of the methods of user interface assessment, applied by the academia (Law, Qi, & Buhalis, 2010; Pee, Jiang, & Klein, 2018; Sun, Fong, Law, & He, 2017) and the industry (ISO, 2011; Nielsen & Budiu, 2013). It also in general aligns with the recommended parameters of the information service success model (Delone & McLean, 2016), which was used as the base model by this study.

The meaning of the resulting concept of high performing service provider co-creation processes as a representation of the online service personnel performance summarises reliability, responsiveness and non-intrusiveness of interactions. In this case, reliability reflects tourist perceptions on the capability of the service provider to generate value from their data in a reliable way. This meaning partially repeats the dimensions of SERQUAL, which are broadly used for the purpose of assessing service provider performance (Delone & McLean, 2016; Parasuraman et al., 1991). While omitting several parameters of customer support service, it additionally incorporates

the non-intrusiveness of interactions. Indeed, there is an evidence, that customers refer to the service provider in the case, when the performance of the service outcome, such as personalised content, of the performance of the interactional processes, is not satisfactory (McLean & Wilson, 2016). The frequency and the nature of customer requests for assistance depends on the co-created service performance at the exact context of consumption and the exact issue (Jerath, Kumar, & Netessine, 2015). Also, the capabilities of context recognition together with the acknowledged requirement to provide non-intrusive service, are transforming customer support from reactive to proactive. More specifically, the IS in becoming increasingly capable in recognising the problem and fixing this problem before customers become aware about it (Koverman, 2016). As a result, customer might or might not experience the direct interactions with the service provider, which indirectly explains the elaborated meaning of service provider co-creation processes.

Lastly, tourist co-creation processes are tourist participation in the process of personalisation by having an opportunity to execute control over the content selection, its presentation, as well as over personal data integration and interactional processes with the system interface. In other words, tourist perception on their performance constitutes from their perceived capability to control the personalised information service outcome and the processes of resource integration they are exposed to. This goes in line with the domain of S-D logic, which explains customer value co-creation (Heinonen et al., 2013; Ranjan & Read, 2016).

Importantly, the discussed dimensions of the personalised information service performance make different contribution to the overall judgement about the service. The findings demonstrated that rather than focusing solely on the performance of the personalised content, tourists attribute primary importance to the smooth interactions with the IS interface and the presence of control over the personalised content and interactions with the system, followed by the personalised

content and customer service. Together with the outlined absence of the degree of content overload among the personalised content attributes, this is consistent with the discussed idea of the experiential nature of information search and decision-making in tourism (Vogt & Fesenmaier, 1998; Zins et al., 2012). At the same time, such findings do not align with the widely accepted assumption, that the performance of the personalised information service is mainly determined by the accuracy of content personalisation.

Meanwhile, the thesis did not produce a reliable explanation of the observed trend. One of the possible explanations for this phenomenon is lack of trust and low expectations towards personalisation technology (Aguirre, Mahr, Grewal, de Ruyter, & Wetzels, 2015). Despite there is an ongoing academic and business research in the field, several business reports outlined that personalisation in tourism is still underdeveloped and fails to capture the complexity of tourist needs and decision-making processes in different contexts (Boudet et al., 2019 ; Skift, 2019). The qualitative findings indicate that tourists are not happy with the current state of personalised information services, explaining that such services fail to recognise the changes in contexts, e.g. business vs leisure trip, travel along vs with family vs with friends, etc. Tourists admit that regardless of the platform, they tend to explore information themselves rather than following the given recommendation. Therefore, the performance of personalised content might be perceived as less important quick and intuitive interactions with the system interface and the possibility to control the settings for personalisation.

Another or additional explanation might be related to the presence of repeating information along multiple platforms. Marketing studies report that customers use multiple information sources to arrive at a decision (Wang, 2016). Usually a standardised information, such as an exhaustive list of hotels or attractions, is available at multiple websites. In this situation, comparison of a

‘personalised’, i.e. shortened list of relevant options, with a ‘standardised’, i.e. full list combining both relevant and irrelevant travel options, might be complicated. So, the convenience for exploration and comparison of the content (i.e. IS performance) in order to ensure the relevance of the personal choice, made by tourists themselves, become more important, than receiving a shortened, personalised information. As a result, more explanatory insights are required to provide reliable conclusion on the observed phenomenon.

5.1.1.2. Customer Expectations

In terms of the expectations towards the personalised information service, the findings demonstrate, that the intangible, inseparable and perishable nature of the information service together with the complexity of the co-created service performance attributes assessment does not allow tourists to form specific expectations towards these attributes. This forces tourists to apply a generalised anticipation on service reliability in being useful for satisfying the individual needs, which is consistent with the customer-centric frameworks of service performance (Chan et al., 2003; Chen, 2012; Song, 2009). The findings also serve as an evidence that the disconfirmation approach, which is also commonly applied for service-centric assessment of the service quality (Khalifa & Liu, 2002; Parasuraman et al., 1985; Wirtz & Bateson, 1999), cannot provide meaningful result in the context of the personalised information service assessment. It is believed that the dynamic nature of service system and resource integration along the whole process of interactions between the actors (Akaka et al., 2017; Vargo & Lusch, 2017) can serve as a possible explanation of such phenomenon. In other words, customers can learn about the specifics of personalisation strategy before and during the interactions with the service. Such knowledge can shape their expectations in real time, affecting their ability to perceive the personalised information service attributes and the overall judgement about their performance. This assumption can be

indirectly supported by the findings of this thesis. They demonstrated that people of different age, with different family status, digital experience and awareness about data tracking by the personalised information service, as well as different travel context not only attribute different meanings to some of the discussed concepts.

5.1.1.3. Perceptions on Co-Created Customer Value

The findings provide clear indication that co-created customer value is formed by a set of five standalone components of utilitarian, hedonic, experiential, aesthetic and sign benefits, which can be co-created or co-destructed. This is consistent with the main propositions of the S-D logic (Vargo & Akaka, 2009; Vargo & Lusch, 2013) of the dynamic and idiosyncratic nature of the value, co-created in the exact context of use. Simultaneously, it is coherent with the simplified reflection of the conceptualised tourist information needs (Choe et al., 2017; Vogt & Fesenmaier, 1998). Utilitarian value is reconfirmed as the main determinants of co-created value and the main parameter, which should be improved to efficiently increase both tourist satisfaction and loyalty, reconfirming that information consumption (Cole, 2012) and related interactions with the information services (Tussyadiah, 2014) are mainly driven by the utilitarian needs. However, other co-created value components, and, especially, experiential benefits, are also among the significant contributors to the overall perception of co-created value, satisfaction and loyalty.

5.1.1.4. Customer Satisfaction and Loyalty

The study initially hypothesised customer satisfaction as a reflection of the overall experience from the service (Chan et al., 2003; Flint et al., 2011; Kuo et al., 2009; Um et al., 2006) and loyalty as the composite approach of both as a customer attitude and as an intention to use (Day, 1976; Song, 2009). While the conceptual meaning of tourist satisfaction is reconfirmed, the findings demonstrate the presence of conceptual overlap between satisfaction and loyalty. The overlap is

identified through the very high composite reliability of the Loyalty construct and high cross loadings between Loyalty and Satisfaction for the item, which describes tourist intension to recommend the personalised information service to others. Deletion of this item allowed to improve convergent validity and internal consistency reliability for Loyalty. However, this item was the only one that belonged to the attitudinal loyalty. As a result, the analysed Loyalty represents the behavioural intention to use the personalised information service.

Behavioural loyalty is commonly applied in research (Chuah et al., 2014). Moreover, in the context of information service, it is often applied as a single construct without attitudinal loyalty. For example, the family of technology acceptance models considers intention to use as the main outcomes of user interactions with the information service (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000) and in the information service success model as a direct consequence of interactions with the service alongside with satisfaction (Delone & McLean, 2016). Therefore, such perceptions on loyalty do not contradict the existing theory and empirical findings from other contexts.

At the same time, the difference in perceptions can potentially be explained with the specifics of information consumption in the digital society. On the one hand, interaction with the service are mainly motivated by utilitarian needs (Cole, 2012). This study reconfirmed that the acquired utilitarian and hedonic benefits, which constitute co-created value, directly influence behaviour intentions in tourism context (Alegre & Cladera, 2006). At the same time, tourists often share their recommendations via the review websites, such as TripAdvisor, as an expression of their satisfaction or dissatisfaction, rather than loyalty. This is also confirmed by Dickinger and Stangl (2013), who demonstrate the belonginess of the readiness to recommend the information service to others as a reflection of tourist satisfaction. In other words, the meaning of loyalty may be

shifting towards purely behavioural intention, while service recommendation behaviour is becoming a natural way to express satisfaction or frustration. However, more research in required to validate the pattern.

5.1.2. Relationships Level

When looking at the way how tourist satisfaction is formed under the influence of the personalised information service, the observed relationships mainly go in line with the tourism satisfaction model (Song, 2009). First, the study provides a strong evidence that tourist perceptions on the co-created personalised information service performance have major effect on the satisfaction directly and indirectly via co-created value for the trip. Second, co-created value is confirmed as the main determinant of tourist satisfaction and loyalty. While co-created service performance also has a direct influence on customer satisfaction, the management of all dimensions of the co-created value with the primary focus on the utilitarian and experiential components is identified as more efficient way to increase tourist satisfaction in comparison to managing the process of resource integration. Third, being in line with the equity approach to define the relationships between expectations and perceptions, the study reconfirmed that tourist expectations have consistent positive effect on the co-created service performance and value. Despite the findings demonstrate that the influence of tourist expectations, articulated prior to interactions with the service, on the overall satisfaction, are fully mediated by the process of perceiving co-created service performance and co-created value, management of tourist expectations is found to be an effective way to improve the perceptions on co-created value, thereby, enabling higher satisfaction.

The findings go in line with the idea of the S-D logic that service performance and value are co-created in the context (Chandler & Vargo, 2011), confirming that satisfaction is a context-

dependent phenomenon (Chan et al., 2003; del Bosque et al., 2006; Tribe & Snaith, 1998). The analysis demonstrated that such contextual as age, gender, education, family status, as well as different digital and travel experience affect the magnitude of relationships. To form high tourist satisfaction, it is important to manage tourist expectations and to enable appropriate mutual resource integration processes to co-create high performing service and high customer value. Finally, the confirmed high dependence of tourist perceptions on the factors of internal and external context (Buhalis & Foerste, 2015; Buhalis & Sinarta, 2019; Leiper, 1990; March & Woodside, 2005) proves the importance of individually-designed service and points on the need to further improve personalisation to ensure maximised value, satisfactions and loyalty for each individual customer.

5.2. Thesis Contribution

5.2.1. Contribution to Theory

This main research phenomenon of this study is personalisation. The concept of personalisation represents a paradigmatic shift in understanding of service design and movement from service-centric to customer-centric vision. It consolidates the ideas of experience economy (Pine & Gilmore, 1999), service differentiation (Porter, 1998), mass customisation (Sigala, 2012) and real-time context-dependent customer needs (Buhalis & Sinarta, 2019; Choe et al., 2017). Rather than planning a service with several modifications and pushing it to target market segments, data-driven personalisation redefines service as immediate reaction to individual needs and creating a solution for them in real time. This, in turn, points at the need for service providers to rethink service design principles and their role in it.

The key theoretical contribution of this thesis is, therefore, the interpretation of the role of a consumer in the contemporary market environment of smart, data-driven personalised services. By exploring tourist interactions with personalised information services, the thesis demonstrated that tourists are not simply 'forced' into value formation process. Instead, they are willing to take active roles as service designers and to participate in this process to enable high performance service performance. From a larger perspective, this becomes one of the indicator of a technology-driven shift in the market relationships and the need to further evolve definition of successful collaboration between actors. From a more focused perspective, the specifics of successful value formation process are related to service design, resulting performance and customer perceptions on it. Therefore, the contribution of this thesis is further discussed on the level of the constructs and then on the level of the relationships between them.

On the level of the construct, the main contribution of this study is a concept of co-created service performance of the personalised information service. The findings do not contradict the existing literature in consumer behaviour and HCI in terms of the definition of the main variables under investigation. A range of studies from Service Management (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013; Navarro, Llinares, & Garzon, 2016; Vega-Vazquez et al., 2013) and ICT (Polo Peña, Frías Jamilena, & Rodríguez Molina, 2014) domains accepted S-D logic as a framing theory to explain the influence of resource integrations on the co-created or co-destructed customer value and satisfaction. Several studies explored customer participation within the service performance on the post-service encounter in the form of feedback sharing in order to improve information service performance (Sigala, 2009). Some of them tested the moderating effect of customer perceptions on their co-creation processes (Grissemann & Stokburger-Sauer, 2012; Tseng & Hu, 2014) and, specifically, of control and customer participation in the context of service

personalisation (Germanakos & Belk, 2016; Morosan & Defranco, 2016; Piccoli et al., 2017). However, to the best knowledge of the author, this is the first study, which specifically redefines the whole concept of service performance by integrating customer co-creating processes within the concept alongside with the attributes, co-created by the service provider resources.

As a result, the study developed the theoretical contribution to the service management domain and, specifically, to S-D logic (Chandler & Vargo, 2011; Kuzgun & Asugman, 2015; Vargo & Lusch, 2013) by further explaining the meaning of value co-creation through resource integration to the concept of service performance. Specifically, it integrated customer co-creating processes within the concept alongside with the attributes, co-created by the service provider resources. According to the findings, customers acknowledge their role in enabling personalised information service functionality to deliver the desired value and perceive their participation as vital. The study further demonstrated the strongest and significant relationship of customer co-creation processes with the overall co-created performance among the four dimensions. It also revealed that customer co-creation processes is the most important factor to be managed to efficiently co-create customer value.

First, these two facts provide the empirical evidence to the idea of S-D logic that customer operant resources, including knowledge, skills and capabilities, are the integral part of the service system (Akaka, 2007; Akaka et al., 2017; Edvardsson, Ng, Min Choo, & Firth, 2013). The mutual dependence of several personalised information service attributes, observed in Phase 2, also supports the idea of S-D logic that not the presence of interaction, but the proper integration of these resources into the service allow to co-create value (Echeverri & Skålén, 2011; Smith, 2013). As a result, the concept of co-created personalised information service performance provides an

alternative and more comprehensive explanation of the way how tourist interactions with personalised services form customer value.

Second, the findings extend the list of the models, developed to explain customer perceptions on functional characteristics of the service in the domains of service quality management. The theory consolidates a range of concepts and models that describe customer perception on service performance, including but not limited to SERQUAL (Parasuraman et al., 1991; Parasuraman et al., 1985), SERVPERF (Cronin Jr & Taylor, 1992), e-SERVQUAL (Gummesson, 2008b; Parasuraman et al., 2005), etc.), information system success (Delone & McLean, 2016), customer value (Alves, Fernandes, & Raposo, 2016; Barrutia & Gilsanz, 2013; Heinonen et al., 2013). Each of them presents value for the theoretical knowledge by defining the same phenomena for the specifics of the exact domain, service, user, context of consumption, etc. The study clarified the specific meanings, which tourists attribute to the concepts of expectations towards the service, co-created service performance, co-created value, satisfaction and loyalty for the context of interactions with the personalised tourism information service. As a result, identification and validation of the attributes, which form tourist perceptions on information service performance in the case of personalised information service, provide a case-specific knowledge alongside the existing models.

On the relationships level, the study contributed to the Consumer Behaviour and Information Service Management domains. Overall, the findings reconfirmed the conceptual explanation of the process of customer value formation (Vargo & Lusch, 2017), satisfaction and loyalty (Chan et al., 2003; Song, 2009). They provided a detailed explanation of the relationships between these concepts, thereby, priding the evidence to the idea that innovative services require specific approach to its design and elaboration of interaction principles for the entire scope of interactions

between actors in a defined context (Akaka et al., 2017). As a result, the study provides more comprehensive way to explain the increase tourist satisfaction and customer loyalty as an indicator of retention for the context of personalised information services.

While producing methodological contribution was beyond the scope of the present study, the applied research design resulted is a twofold contribution. On the construct level, the findings reconfirm the idea that functionality-based service performance attributes together form an overall tourist perception of the service performance (Adil, Al Ghaswyneh, & Albkour, 2013). Previous studies acknowledged that the misspecification of the service quality constructs by assessing the dimensions of the SERVQUAL as reflective by some studies could have led to deletion of the relevant attributes from the scale (Carrillat, Jaramillo, & Mulki, 2007; Collier & Bienstock, 2006; Jarvis et al., 2003). The integration of qualitative and quantitative findings provides the evidence that each of those factors independently contributes to customer perception of the service performance. This is in line with a range of studies from service management and quantitative research methods (Dickinger & Stangl, 2013; MacKenzie, Podsakoff, & Jarvis, 2005; Sarstedt, Hair, Cheah, Becker, & Ringle, 2019). Those studies argue that multidimensional measurement scales, including SERQUAL and SERPERF, should be validated according to the formative latent construct's principles. As a result, this thesis can serve as one more methodological guideline for correct assessment of service performance based on customer perceptions of experienced interactions.

5.2.2. Practical Implications

Despite the findings by default represent the context-dependent solution, they provide an important contribution to the Consumer Experience and User Experience practice. Specifically, the developed model represents the framework and tool, which can be used for the existing service

assessment and for further improvement of personalisation as a strategy and an element of the IS design.

While identifying specific ways to improve travel content, or the interactional, service-provider and customer processes performance was beyond the scope of this thesis, the findings provide the guidelines for tourism experience and user experience design. More specifically, the findings allow to reassess the relevance of the common assumption, which guides personalisation, for the context of tourism.

The concept of the need to minimise time, cognitive and emotional efforts by decreasing the scope of information, should be adjusted for tourist context rather than borrowed as a core assumption for personalisation. Service industry largely follows the idea of the paradox of choice (Schwartz, 2004) and presumes that highly personalised content increases the usefulness of the information service and decreases the information overload. Though, everyday life service consumption is often based on the stable behaviour patterns. Customers tend to minimise the 'routine' of decision-making process, thereby, saving time and cognitive efforts for another activities. On the contrary, one of the core motivations to travel is acquisition of novel, unique experiences (Cohen et al., 2013). In the situation case of personalised information service, exploration of travel content (i.e. attractions, hotels) can become an experience itself and contribute to hedonic value in addition to the pure utilitarian function of planning. Also, successful travel planning can be associated with achievement, contributing to self-expressive component of value (Andrades & Dimanche, 2018). As a result, tourists might prefer to interact with new information rather than avoid it. Moreover, due to the novelty of travel contexts and relatively high monetary investments in comparison to everyday purchases, travel decision-making is often perceived as risky (Garg, 2015). However, a range of studies in tourism personalisation domain consider only the assumption of that customers

need to minimise information overload and solely focus on the methods to improve context recognition and user and context modelling (Aoike, Ho, Hara, Ota, & Kurata, 2019; Dietz, Roy, & Wörndl, 2019; Grün et al., 2017; Kurata & Hara, 2013; Massimo & Ricci, 2019).

This thesis validates the definition of the high performing personalised content as being the relevant content, which is sufficient for decision-making and contains all information, required for decision-making. As a result, the findings primarily highlight the need to supplement the content selection strategy with the appropriate presentation strategy, applied for the information unit and for the list of units. Second, to minimise the risk of customer frustration, the strategy would focus on the balanced performance of the personalised content, of the website interface, of the customer control over them, and of the customer service and brand presentation. The relative contribution of each parameter to the overall perception of the co-created service performance can serve as an indicator to achieve the required balance. Third, such a strategy would focus on satisfaction of all customer needs that triggered the interactions with the service rather than just on utilitarian aspects of value in order to enable efficient decision-making. The interactions with the personalised information, with the application, with the service provider, as well as the management of these interactions, should create interesting and exciting experience, support customer appreciation of organising the trip themselves, as well as contribute to the establishment of the trustful relationships. Fourth, the strategy would pay attention to managing customer expectations about the personalised information service. Due to the fact, that customer awareness about personalisation being applied, and personal data being tracked, leads to the different understanding of the interactions, which tourist experience, the provider of the personalised information service is advised to create proper awareness about the applied strategy and explanation of the purpose of personalisation and the value it aims to create.

It is again important to highlight that the pragmatic research paradigm defines valid knowledge as common for a group of subjects in a specific context of use (Schiller, 2015) and the identified examples of positive and negative customer perceptions of the co-created service performance should not be generalized to the form of universal recommendations. The industry should define the performance parameters, such as 'interesting' and 'exciting' for each specific case. However, the findings can be used as reliable principles of developing a comprehensive and balanced strategy for personalisation.

Second, the study proposes a comprehensive measurement scale for the case of personalised information service in the tourism context. The importance of such a scale is related to the integrated service-centric and customer centric views, which allows to consider the effect of functional parameters of a technology on customer experience within the decision-making process. The concept of service performance, formed by the functional attributes of the service (e.g. SERQUAL and SERPERF), is service-centric in nature, which omits the process of customer value formation. The equity based-models of customer satisfaction (e.g. tourism satisfaction model) as a service performance assessment tool are customer centric, and do not allow to identify contribution of specific service attributes to the overall co-created value and satisfaction. This study integrates them info one joint framework. It is important to outline that the length of the elaborated scale might decrease participants' attention and, therefore, create limitations for data validity (Creswell, 2013b; Schrepp, Hinderks, & Thomaschewski, 2017). However, the acquired integrative model potentially allows to overcome the conceptual limitations of pure service-centric approaches and customer-centric approaches, thereby, creating more comprehensive approach to assess the performance of the personalised information services.

The finding also provide several insights for policy makers. The privacy and data protection legislation vary around the world. Considering the existing threats and evolving ways of data misuse by individuals, organisation and, sometimes, governments, privacy legislation requires continuous revision with the view on enforcing its effectiveness in specific contexts (Wu, Tao, & Chang, 2017). From service-centric perspective, this means that personalised information services should continuously and proactively adjust its functionality, including terms and conditions of sharing personal data, in accordance with the changes in local legislation. Alternatively, they should be required to avoid business activity in a specific legal area.

Importantly, customer experience with data regulations depend on their subjective understanding of experienced service attributes (McColl-Kennedy, Cheung, & Ferrier, 2015). There is a consistent evidence that users do not read actual privacy policies and remain largely unaware about the real threats, existing legislation and the quality of applied security measures. Instead, they construct their perceptions based on marketing messages they receive from service providers and other stakeholders (Mulder & Tudorica, 2019). Moreover, there is an evidence that data privacy and security policies themselves vary not only depending on the objectivity of threats in the exact context, but on the cultural differences and traditions of regions (Wu et al., 2017). When seeing the policy implications from customer perspective, it is suggested that the scope and the nature of customer interactions with data-related settings (e.g. the parameters of customer co-creation: control over the content, personal data and nature of interactions with the personalised information service) should be additionally adapted to the individual tourist context, rather than solely to the local legislation. As a result, the point on the need for a comprehensive strategy, developed for each specific context, will provide higher customer satisfaction with personalised information services, than a generalised one.

Lastly, the study has identified the differences in the attributed meanings of the explored phenomena among the tourists of different generation, family status and digital experience. Exploration of the differences in tourist perceptions on content performance was beyond the scope of the present study and did not have systematic approach to serve as a background for a personalisation strategy. However, it is evident, that deeper personalisation with the dynamic tracking of tourist preferences within each separate context of use, that will meet individual requirement and exceed the expectations about the personalised information service is required.

5.3. Conclusion

This thesis provided a comprehensive explanation of the way personalised information service forms customer value, satisfaction and loyalty. The findings explain that tourist perceptions on the performance of the personalised information service are dynamically formed along the process of customer interactions with the process and his active participation in the service co-creation. Real-time non-intrusive management of these interactions as well as customer expectations towards to capabilities of the service to satisfy the existing information needs is an effective instrument of managing tourist satisfaction and loyalty. The thesis creates the original theoretical contribution to the S-D Logic, Service Management and User Experience domains and provides a range of practical suggestions for the improvement of personalisation strategy.

Chapter 6 Evaluation, Reflection and Conclusion

6.1. Research Summary

This research explored the way how tourist interactions with personalised information service form customer value, satisfaction and intention to use the service again. The three-phase sequential research design, which engaged the well-articulated theories and both qualitative and quantitative methods of data collection and data analysis. The findings propose the model of tourist satisfaction with personalised information service.

6.2. Research Quality

6.2.1. Integration of Findings

In order to enable reliable findings, the study strictly followed the developed research design. It built on the interception two major frameworks, framed by the major theory, assessed and analysed the qualitative and quantitative data, subsequently integrating of findings of two phases and reflecting to the initially hypothesised model. The research systematically followed the same logic at each of the named steps by conducting the analysis on the level of the concepts, followed by the level of the relationships between them. Such approach allowed to ensure the logical development and integration of findings. Therefore, it is possible to claim that the research acquired valid and reliable findings within the articulated research questions and objectives.

The research also has identified several trends, which can provide more insights on tourist interactions with the personalised information service. However, they could not be fully explored within the scope of this study because of the limitations of the applied data and methods. First, in terms of the integration of the mixed methods research results, it is possible to outline one limitation. The qualitative stage additionally identified the potential presence of more fragmented

relationships between customer perceptions on the co-created service performance attributes and co-created value. Specifically, it was observed that high performance of the specific combination of the co-created service performance attribute can maximise co-created value for customers. At the same time, according the accepted research paradigm, valid knowledge is the outcome of the community of similar inquiries. To validate or reject the presence of the observed relationships, the research design would require modifications with the substantially larger sample size accepted for both empirical research phases. Unfortunately, the time and financial limitations did not allow to do that, thereby, creating limitations for the present study and the agenda for the future research.

Second, similar to the information system success model (Delone & McLean, 2016), the qualitative research directly associated some of the dimensions of the personalised service performance with customer behavioural loyalty. However, same as in the tourist satisfaction model, the analysis did not identify the significant direct relationships between the constructs. At the same time, the analysis confirms the presence of the strong, but indirect effects between co-created service performance and loyalty. Unfortunately, there is not enough evidence to conclude on whether there is no direct relationships in the context of personalised information service, or whether co-created and satisfaction fully and jointly mediate this relationship, which, in turn, reveals the limitation of this study and increases the importance of further exploration of the whole scope of tourist interactions with the personalised information service.

6.2.2. Results generalisability

Following the main assumptions of the applied research paradigm and S-D logic, the results of the study are predetermined to be context-dependent. Taking into consideration that the validity and reliability of the data and research procedures were established with minor considerations, the results of this study can be fully generalised to the exact population, which was investigated.

Specifically, the elaborated measurement scale and the exact contribution of each factor to tourist satisfaction and loyalty can be attributed to the population of Hong Kong residents. However, the fact that the results do not contradict the existing theories and taking into consideration the international nature of Hong Kong, the logic of the identified relationships can be further expanded to larger population. Despite the observed differences, Hong Kong populations belongs to the Chinese culture (Nunan & Choi, 2010) and has similar cultural background with other Asian Confucian societies, such as South Korea and Japan (Hofstede, 2017). Therefore, the results of the study can be generalised to the Asian countries with the similar cultural and religious context as Hong Kong. However, the findings should be reconfirmed in other contexts before application.

6.3. Suggestions for Future Research

While shedding the light on the scope and nature of tourist interactions with personalised information service, the study has additionally revealed the gaps, which require attention. Considering these gaps and the limitations of the study, it is possible to outline tree major direction, which will be beneficial for forming a holistic understanding of the role that personalisation of information service has on value formation.

Fist, future research will benefit from exploration of tourist interactions with personalised services in different contexts. The context-dependent nature of pragmatism (Schiller, 2015) and S-D logic (Vargo & Lusch, 2017), applied by this study as a research philosophy and a framing theory, accordingly, dictates that truth and valid knowledge vary depending on the factors of individual context (Biesta & Mälardalens högskola, 2010; Silcock, 2015; Vargo & Lusch, 2008b, 2016). Moreover, the findings demonstrated that it is not just the valence of the service evaluation that may vary between representatives of different internal and external contexts. Customer expectations are shaped by previous experience (Cohen et al., 2013). Despite tourists are largely

unaware about technical capabilities of digital platforms to produce personalised content, their previous experience with relevantly personalised content raises their expectations towards future encounters. This, in turn, is expected to shape their perceptions on a service performance and co-created value. Therefore, the meaning tourists attribute to the applied concepts, including co-created service performance and value, and their interpretation, may also vary among tourists. The proposed measurement scale is valid in the combination of socio-economic, technical, cultural and travel factors, equivalent to those, explored in this study.

Importantly, this specific does not limit the validity and reliability of the proposed model and its indicators under the pragmatic research paradigm. Moreover, the requirement of measurement model assessment prior to result interpretation belongs to the standard procedures of structural equation modelling group of techniques (Rigdon, Sarstedt, & Ringle, 2017; Sarstedt et al., 2019). However, deeper understanding of the phenomenon requires broader exploration of the effect of personalised information service on tourist value formation in various contexts. The application of the proposed scale for interpreting tourist experience and co-created value in other distinct contexts requires prior validation. Potential replication of the research among the representatives of different cultures, age groups, family statuses, travel preferences and technical experience will be advantageous. Such research will allow either to reconfirm the identified specifics of tourist interactions with personalisation, or to provide an alternative explanation, valid for different target customers. As a result, future research in different contexts will allow to broader generalisation of the elaborated scale or will point at the need to adjust it to other contexts. A development of a more uniform framework would be a next step to enable wider applicability of the proposed tool.

Second, it is suggested that both theoretical knowledge and, mainly, practical understanding, will benefit from the closer look at the effect the dimensions of co-created service performance value

on the process of value formation. This study focused on the relationships between the higher-order latent constructs under assumption that tourist perception is a linear sequential process of experiencing service attributes, aggregating them info the overall perception and forming value. However, the findings outline that the dimensions and, possibly, the attributes of each dimension of co-created service performance, may have different contribution to each dimension of value. Moreover, the research provides the evidence of potential interdependencies of personalised information service parameters along the dimensions and co-created value. The comparison between the contribution of each service attribute to the formed value and the collective effect of the groups of such performance attributes to it will be beneficial for further improvement of the personalised service design. More specifically, it will be beneficial to understand the capability of the groups of parameters of the experienced service performance to reinforce or debilitate value formation. Such knowledge would allow to balance the performance of personalised information service and to manipulate their effect on the target dimensions of customer value.

Third, in addition to personalised information service performance itself, further research is required in relation to the process of value and satisfaction formation. The study confirmed the important role of tourist expectations towards the capability of the personalised information service to satisfy their information needs in forming the overall satisfaction. Better understanding of the mediating effects tourist perceptions have on the process of value and satisfaction formation, as well as the ways to manage tourist expectations and perceptions in order to minimise the risk of value co-destruction, is required.

Lastly, customer expectations and perceptions are formed under the influence of information, which is received from external environment, including the interactions with services (Vargo & Lusch, 2017). Therefore, it is reasonable to assume that tourist expectations have changed along

their customer journeys. The findings indirectly reconfirm it, as measurement invariance was not established by the MICOM procedure for people with the previous experience with Google Trips and without it. This illustrates that tourists with no previous experience have very distinct perceptions on the personalised information service. However, the data of this study was acquired through a retrospective self-report technique, which is the limitation of the applied methodology. It is suggested that future studies would explore tourist perceptions with alternative methods, including real-time observation of emotions, and combine them with the retrospective techniques.

6.4. Personal Reflections

When reflecting on my PhD journey, I have to recognise that it was the most challenging, but also the most valuable experience of my life.

First of all, I believe that I have evolved as a researcher and an academic. Needless to say, the 3 years of the PhD work allowed me to expand and deepen my knowledge in research methodologies. As sometimes described (Wisker, 2007), the process of learning and development was not linear for me. The initial part of shaping the topic and defining the scope of research was, perhaps, the most challenging one. At that stage my understanding of research and the meaning of PhD was rather intuitive. At certain points, the process of studying research methods, doing research, teaching, exchanging ideas with the peers and senior academics, as well as reviewing the work of other academics, resulted in complete confusion. This motivated me to fully accept the idea, attributed to Socrates, that 'The more we learn, the less we know' as my individual perception of myself in an academic world and in life in general, which now works as assurance and a background for further learning.

When comparing my experience to my colleagues at the beginning of their PhD journey, I am happy to admit that I have gained much broader vision on research. My PhD process helped me to

build critical view on the capabilities of different research approaches in answering specific research question, in interpreting such concepts as research quality and the purpose of academic work in general. The contribution in the form of the insights of tourist interactions with personalised information services and the model being used as personalised information services assessment tool, is presented at a range of academic conferences and published in peer-review e-Review of Tourism Research in 2019 and 2020. The paper, which summarises the contribution of a holistic model of tourist satisfaction with personalised information service, is currently under review at a double-blind peer review journal. I am also very happy that my current level of expertise in the field of Tourism & ICT, and potential in establishing myself as an academic has been recognised by my current employer.

Second, I would like to highlight that I went through a transformation as a personality. Doing PhD allowed me to reassess myself and to better define my role in the society. During these 3 years I had a chance of collaborating with the academics from the Hong Kong Polytechnic University, Hong Kong SAR, from Bournemouth University, UK, from the University of Surrey, UK, and from Salzburg University of Applied Sciences, Austria. Such collaborations improved my skills in strategic planning, teamwork and independent work, as well as extended my professional network, which, in the end, let to the current employment.

Apart from that, such an intercultural collaboration allowed me to better understand my own values. By exploring cultures, traditions and norms along countries and organisation, I got a unique opportunity to better understand motivations behind certain people's behaviour, as well as to test my own abilities to change and adapt. In the end, it resulted in reassessment of my own norms, beliefs, principles and long-term objectives. PhD journey allowed me to set my own boundaries for allowing changes as one extreme and restricting their effect on my activities, as another.

6.5. Final Remarks

Both S-D logic (Vargo & Lusch, 2016, 2017) and the practice of implementation personalisation strategy (Boudet et al., 2019 ; Flavin & Heller, 2019) call for elaboration of practically applicable tools to manage the process of value formation, thereby, minimising the risks of value co-destruction and enabling market innovations. The study contributes to understanding of the role of personalisation as a service strategy and as a technology in customer value creation. Despite addressing the problem in the single context of application, the findings point at the potential reasons of customer value being co-created and co-destructed by personalisation.

According to the findings, tourists attribute primary importance to the smooth interactions with the IS interface and the presence of control over the personalised content and interactions with the system, rather than focusing solely on the performance of the personalised content. The perceptions on co-created personalised information service performance have major effect on satisfaction directly and indirectly via co-created value, so that poor experience from the interactions with the application or lack of control will co-destruct value and cause low satisfaction regardless of the relevance of personalised content. At the same time, managing the dimensions of co-created value with the primary focus on utilitarian and experiential components is identified as more efficient way to increase tourist satisfaction rather than managing the processes of the service provider's and tourist's resources integration. To minimise the risk of value co-destruction and customer frustration, it is important for a service provider to enable high performance of the information service functionality, while managing tourist expectations and perceptions about the service.

The three trends of the increased availability of Big Data and smart technologies for user context recognition for Computer Science, of the focus on memorable positive experiences in Consumer Behaviour Science and of the increasing platformisation and standardisation of UX design, increase specialisation of each domain of study on the perspective, which is inherent for them. The findings demonstrate that effective personalisation requires the strategy to addressed at all levels. This outlines the need for the joint expertise of the experts from all three domains and in the exact context of application. It is hoped that redefining personalisation from a holistic perspective will open the floor for a critical conversation and collaboration between academics and practitioners.

References

Aaker, D. A., Kumar, V., Leone, R. P., & Day, G. S. (2013). *Marketing research*: Singapore : Wiley, 2013. Eleventh edition, International student version. / David A. Aaker, V. Kumar, Robert P. Leone, George S. Day.

Adar, E., Gearig, C., Balasubramanian, A., & Hullman, J. (2017). *PersaLog: Personalization of News Article Content.* Paper presented at the Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems.

Adil, M., Al Ghaswyneh, O. F. M., & Albkour, A. M. (2013). SERVQUAL and SERVPERF: A review of measures in services marketing research. *Global Journal of Management and Business Research*.

Adomavicius, G., & Tuzhilin, A. (2015). Context-aware recommender systems. In *Recommender systems handbook* (pp. 191-226): Springer.

Aguado, J. M. (2016). Emerging perspectives on the mobile content evolution. In. Hershey, PA: Information Science Reference.

Aguirre, E., Mahr, D., Grewal, D., de Ruyter, K., & Wetzels, M. (2015). Unraveling the personalization paradox: The effect of information collection and trust-building strategies on online advertisement effectiveness. *Journal of Retailing, 91*(1), 34-49.

Akaka, M. A. (2007). *The value co-creation crossroad of service-dominant logic and network theory.* Thesis (M.B.A.)--University of Hawai'i at Manoa, 2007.,

Akaka, M. A., Vargo, S. L., & Wieland, H. (2017). Extending the context of innovation: the co-creation and institutionalization of technology and markets. In *Innovating in Practice* (pp. 43-57): Springer.

Al-Hassan, M., Lu, H., & Lu, J. (2015). A semantic enhanced hybrid recommendation approach: A case study of e-Government tourism service recommendation system. *Decision Support Systems, 72*, 97-109.

Al-Khanjari, Z. A. (2013). Developing a common personalization framework for the e-application software systems. *Journal of Emerging Technologies in Web Intelligence, 5*(2), 188-196.

Aldás-Manzano, J. (2013). *PARTIAL LEAST SQUARES PATH MODELLING IN MARKETING AND MANAGEMENT RESEARCH: AN ANNOTATED APPLICATION*: World Scientific Publishing Co. Pte. Ltd.

Alegre, J., & Cladera, M. (2006). Repeat visitation in mature sun and sand holiday destinations. *Journal of Travel Research, 44*(3), 288-297.

Alegre, J., & Garau, J. (2010). Tourist satisfaction and dissatisfaction. *Annals of tourism research, 37*(1), 52-73.

Ali, F., Kim, W. G., Li, J., & Cobanoglu, C. (2018). A comparative study of covariance and partial least squares based structural equation modelling in hospitality and tourism research. *International Journal of Contemporary Hospitality Management, 30*(1), 416-435. doi:10.1108/IJCHM-08-2016-0409

Ali, F., Mostafa, R., & Ringle, C. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management, 30*(1), 514-538. doi:10.1108/IJCHM-10-2016-0568

Alves, H., Fernandes, C., & Raposo, M. (2016). Value co-creation: Concept and contexts of application and study. *Journal of Business Research, 69*(5), 1626-1633. doi:https://doi.org/10.1016/j.jbusres.2015.10.029

Amadeus IT Group SA. (2019). *Future Traveller Tribes 2030: Understanding Tomorrow's Traveller*. Retrieved from

Ananthapadmanaban, K., & Srivatsa, S. (2011). Personalization of user profile: creating user profile ontology for Tamilnadu Tourism. *International Journal of Computer Applications (0975–8887), 23*(8).

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin, 103*(3), 411.

Andrades, L., & Dimanche, F. (2018). Co-creation of experience value: A tourist behavior approach. *Creating Experience Value in Tourism*(Ed. 2), 83-97.

Andrejevic, M., & Gates, K. (2014). Big data surveillance: Introduction. *Surveillance & Society, 12*(2), 185-196.

Aoike, T., Ho, B., Hara, T., Ota, J., & Kurata, Y. (2019). Utilising Crowd Information of Tourist Spots in an Interactive Tour Recommender System. In *Information and Communication Technologies in Tourism 2019* (pp. 27-39): Springer.

Arora, N., Dreze, X., Ghose, A., Hess, J. D., Iyengar, R., Jing, B., . . . Neslin, S. (2008). Putting one-to-one marketing to work: Personalization, customization, and choice. *Marketing Letters, 19*(3-4), 305.

Asif, M. (2014). *Personalization of Mobile Services.*

Asif, M., & Krogstie, J. (2012a). Research issues in personalization of mobile services. *International Journal of Information Engineering and Electronic Business, 4*(4), 1.

Asif, M., & Krogstie, J. (2012b). *Taxonomy of personalization in mobile services.* Paper presented at the Proceedings of the 10th IADIS International Conference e-Society.

Asif, M., & Krogstie, J. (2013). Mobile Services Personalization Evaluation Model. *International Journal of u- and e- Service, Science and Technology, 6*(2), 1-12.

Ayres, L. (2008). Semi-Structured Interview. In (pp. 811-813): Sage Publications.

Bacha, F., Oliveira, K., & Abed, M. (2013). Context-Aware MDA Approach for Content Personalization in User Interface Development. *Diaz VG, Lovelle JMC, Garcia-Bistelo BCP, Martinez OS, Progressions and Innovations in Model-Driven Software Engineering, IGI Global*, 88-105.

Bae, Y. H., Hough, M., Jun, J. W., & Ju, I. (2017). Cultural Differences among Young Adult Consumers in Hong Kong, Japan, and Korea. *Journal of Global Marketing*, 1-13.

Bagozzi, R. P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the association for information systems, 8*(4), 3.

Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science, 40*(1), 8-34.

Ball, D., Coelho, P. S., & Vilares, M. J. (2006). Service personalization and loyalty. *Journal of services marketing, 20*(6), 391-403.

Barragáns-Martínez, A. B., & Costa-Montenegro, E. (2014). *Adding personalization and social features to a context-aware application for mobile tourism* (Vol. 1): IGI Global.

Barroso, C., & Picón, A. (2012). Multi-dimensional analysis of perceived switching costs. *Industrial Marketing Management, 41*(3), 531-543.

Barrutia, J. M., & Gilsanz, A. (2013). Electronic Service Quality and Value: Do Consumer Knowledge-Related Resources Matter? *Journal of service research, 16*(2), 231-246. doi:10.1177/1094670512468294

Batet, M., Moreno, A., Sánchez, D., Isern, D., & Valls, A. (2012). Turist@: Agent-based personalised recommendation of tourist activities. *Expert Systems With Applications, 39*(8), 7319-7329.

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models. *Long Range Planning, 45*(5-6), 359-394.

Beerli, A., Meneses, G. D., & Gil, S. M. (2007). Self-congruity and destination choice. *Annals of Tourism Research, 34*(3), 571-587.

Benson, V., Saridakis, G., & Tennakoon, H. (2015). Information disclosure of social media users: does control over personal information, user awareness and security notices matter? *Information Technology & People, 28*(3), 426-441.

Benyon, D. (2014). *Designing interactive systems : a comprehensive guide to HCI, UX and interaction design* (Third edition. ed.). Harlow, England: Pearson.

Bernoff, J. (2014). Strategic Thinking for the Mobile Mind Shift. *Marketing News, 48*(7), 24-25. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=96935814&site=eds-live&scope=site

Bhargava, H. K., & Choudhary, V. (2001). Information goods and vertical differentiation. *Journal of Management Information Systems, 18*(2), 89-106.

Bhatnagar, V., & Ranjan, J. (2010). Principles for successful mobile CRM in organisations from data mining perspective. *International Journal of Electronic Customer Relationship Management, 4*(3), 280-301. doi:10.1504/ijecrm.2010.035967

Biemer, P. P. (2010). Total survey error: Design, implementation, and evaluation. *Public Opinion Quarterly, 74*(5), 817-848.

Biesta, G. A., & Mälardalens högskola, A. f. u. k. o. k. O. (2010). Pragmatism and the philosophical foundations of mixed methods research. In. Thousand Oaks, CA: Sage.

Blom, J. O., & Monk, A. F. (2003). Theory of personalization of appearance: why users personalize their pcs and mobile phones. *Human-Computer Interaction, 18*(3), 193-228.

Bodoff, D., & Ho, S. Y. (2015). Effectiveness of Website Personalization: Does the Presence of Personalized Recommendations Cannibalize Sampling of Other Items? *International Journal of Electronic Commerce, 20*(2), 208-235. doi:10.1080/10864415.2016.1087821

Boksberger, P., Dolnicar, S., Laesser, C., & Randle, M. (2011). Self-congruity theory: To what extent does it hold in tourism? *Journal of Travel Research, 50*(4), 454-464.

Bollen, K. A., & Ting, K.-F. (1993). Confirmatory Tetrad Analysis. *Sociological Methodology, 23*, 147-175. doi:10.2307/271009

Borras, J., Moreno, A., & Valls, A. (2014). Intelligent tourism recommender systems: A survey. *Expert Systems With Applications, 41*(16), 7370-7389. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edswsc&AN=000340689700035&site=eds-live&scope=site

Borsboom, D., Mellenbergh, G. J., & Van Heerden, J. (2003). The theoretical status of latent variables. *Psychological review, 110*(2), 203.

Boudet, J., Gregg, B., Rathje, K., Stein, E., & Vollhardt, K. (2019). The future of personalization—and how to get ready for it. Retrieved from

https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/the-future-of-personalization-and-how-to-get-ready-for-it?cid=other-eml-alt-mip-mck&hlkid=2fe314b41bba48238912d953a7ea8e07&hctky=1435440&hdpid=91f963e7-8acd-4c40-8dd9-4fa2299e4b06

Bouranta, N., Chitiris, L., & Paravantis, J. (2009). The relationship between internal and external service quality. *International Journal of Contemporary Hospitality Management, 21*(3), 275-293.

Bowen, D. (2001). Antecedents of consumer satisfaction and dis-satisfaction (CS/D) on long-haul inclusive tours — a reality check on theoretical considerations. *Tourism Management, 22*(1), 49-61. doi:10.1016/S0261-5177(00)00022-4

Bradley, N. A., & Dunlop, M. D. (2005). Toward a multidisciplinary model of context to support context-aware computing. *Human-Computer Interaction, 20*(4), 403-446.

Braunhofer, M., Elahi, M., Ricci, F., & Schievenin, T. (2013). Context-aware points of interest suggestion with dynamic weather data management. In *Information and communication technologies in tourism 2014* (pp. 87-100): Springer.

Bray, B., & McClaskey, K. (2012). Personalization vs differentiation vs individualization. *Dostopno na: http://education. ky. gov/school/innov/Documents/BB-KM-Personalizedlearningchart-2012. pdf (pridobljeno 12. 10. 2013).*

Brenkert, G. G., & Beauchamp, T. L. (2010). *The Oxford handbook of business ethics*. New York: New York : Oxford University Press.

Bruhn, M., Georgi, D., & Hadwich, K. (2008). Customer equity management as formative second-order construct. *Journal of Business Research, 61*(12), 1292-1301.

Brusilovsky, P. (2013). *Adaptive Navigation Support in Educational Hypermedia.* Paper presented at the Human-Computer Interaction: INTERACT'97.

Brusilovsky, P., Kobsa, A., & Nejdl, W. (2007). The adaptive web methods and strategies of web personalization. In. Berlin: Springer-Verlag.

Brusilovsky, P., & Maybury, M. T. (2002). From adaptive hypermedia to the adaptive web. *Communications of the ACM, 45*(5), 30-33.

Bryman, A., & Bell, E. (2015). *Business research methods*: Oxford University Press, USA.

Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalisation of services. In *Information and Communication Technologies in Tourism 2015* (pp. 377-389): Springer.

Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value. *Journal of Destination Marketing & Management, 4*(3), 151-161.

Buhalis, D., & Law, R. (2008). Progress in Tourism Management: Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management, 29*, 609-623. doi:10.1016/j.tourman.2008.01.005

Buhalis, D., & Sinarta, Y. (2019). Real-time co-creation and nowness service: lessons from tourism and hospitality. *Journal of Travel & Tourism Marketing, 36*(5), 563-582.

Bunt, A., Carenini, G., & Conati, C. (2007). Adaptive content presentation for the web. *The adaptive web*, 409-432.

Buttle, F. (1996). SERVQUAL: review, critique, research agenda. *European Journal of Marketing, 30*(1), 8-32.

C&SD. (2016). *2016 Population By-census – Summary Results*. Hong Kong Special Administrative Region Government

C&SD. (2017). *Usage of Information Technology and the Internet by Hong Kong Residents, 2000 to 2016*. Hong Kong SAR: Census and Statistics Department, The Givernment of Hong Kong SAR
Campbell, N., O'driscoll, A., & Saren, M. (2013). Reconceptualizing Resources: A Critique of Service-Dominant Logic. *Journal of Macromarketing, 33*(4), 306-321. doi:10.1177/0276146713497755
Candela, G., & Figini, P. (2012). The economics of tourism destinations. In (pp. 73-130). Berlin ; London: Springer.
Carmagnola, F., Cena, F., Console, L., Cortassa, O., Gena, C., Goy, A., . . . Vernero, F. (2008). Tag-based user modeling for social multi-device adaptive guides. *User Modeling & User-Adapted Interaction, 18*(5), 497-538. doi:10.1007/s11257-008-9052-2
Carmon, Z., Wertenbroch, K., & Zeelenberg, M. (2003). Option attachment: When deliberating makes choosing feel like losing. *Journal of consumer research, 30*(1), 15-29.
Carrillat, F. A., Jaramillo, F., & Mulki, J. P. (2007). The validity of the SERVQUAL and SERVPERF scales; A meta-analytic view of 17 years of research across five continents. *INTERNATIONAL JOURNAL OF SERVICE INDUSTRY MANAGEMENT, 18*(5), 472-490. doi:10.1108/09564230710826250
Carrión, G. C., Nitzl, C., & Roldán, J. L. (2017). Mediation analyses in partial least squares structural equation modeling: Guidelines and empirical examples. In *Partial Least Squares Path Modeling* (pp. 173-195): Springer.
Carver, C. S., & Scheier, M. F. (2008). Feedback processes in the simultaneous regulation of action and affect. *Handbook of motivation science*, 308-324.
Case, A. (2016). *Calm technology: principles and patterns for non-intrusive design*.
Case Donald, O., & Given, L. M. (2016). *Looking for information : a survey of research on information seeking, needs, and behavior* (Fourth edition / by Donald O. Case, Lisa M. Given. ed.). Bingley, UK: Emerald Group Publishing Limited.
Cattell, H. E., & Mead, A. D. (2008). The sixteen personality factor questionnaire (16PF). *The SAGE handbook of personality theory and assessment, 2*, 135-178.
Chadwick, R. (2012). *Encyclopedia of applied ethics* (2nd ed.. ed.). London: London : Elsevier.
Chae, M., Kim, J., Kim, H., & Ryu, H. (2002). Information quality for mobile internet services: A theoretical model with empirical validation. *Electronic Markets, 12*(1), 38-46.
Chaffey, D., & Ellis-Chadwick, F. (2012). *Digital marketing. [electronic resource] : strategy, implementation and practice*: Harlow : Pearson Education, 2012. 5th ed. / Dave Chaffey, Fiona Ellis-Chadwick.
Chan, L. K., Hui, Y. V., Lo, H. P., Tse, S. K., Tso, G. K., & Wu, M. L. (2003). Consumer satisfaction index: new practice and findings. *European Journal of Marketing, 37*(5/6), 872-909.
Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory, 11*(1), 35-49.
Chang, L. (1994). A psychometric evaluation of 4-point and 6-point Likert-type scales in relation to reliability and validity. *Applied psychological measurement, 18*(3), 205-215.
Chang, R. C., Kivela, J., & Mak, A. H. (2010). Food preferences of Chinese tourists. *Annals of Tourism Research, 37*(4), 989-1011.
Chang, Y.-W. (2016). Influence of the principle of least effort across disciplines. *An International Journal for all Quantitative Aspects of the Science of Science,*

Communication in Science and Science Policy, 106(3), 1117-1133. doi:10.1007/s11192-016-1838-0

Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. (2013). Co-production versus co-creation: A process based continuum in the hotel service context. *International Journal of Hospitality Management, 32*, 11-20.

Cheah, J. H., Sarstedt, M., Ringle, C. M., Ramayah, T., & Ting, H. (2018). Convergent validity assessment of formatively measured constructs in PLS-SEM: On using single-item versus multi-item measures in redundancy analyses. *International Journal of Contemporary Hospitality Management*. doi:10.1108/IJCHM-10-2017-0649

Chen, L. (2012). *Developing Hong Kong Tourist Satisfaction Index Using Bayesian Structural Equation Modeling Approach.* Thesis (Ph.D.)--Hong Kong Polytechnic University (Hong Kong), 2012.,

Chen, Y., Zhang, H., & Qiu, L. (2013). A review on tourist satisfaction of tourism destinations. In *LISS 2012* (pp. 593-604): Springer.

Chenet, P., Tracey, S. D., Don, O., & Sullivan. (2010). Service quality, trust, commitment and service differentiation in business relationships. *Journal of Services Marketing, 24*(5), 336-346. doi:10.1108/08876041011060440

Chiang, H.-S., & Huang, T.-C. (2013). User-adapted travel planning system for personalized schedule recommendation. *Information Fusion*. doi:10.1016/j.inffus.2013.05.011

Chihani, B., Bertin, E., & Crespi, N. (2014). Programmable context awareness framework. *Journal of Systems and Software, 92*, 59-70.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research, 295*(2), 295-336.

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information systems research, 14*(2), 189-217.

Choe, Y., Fesenmaier, D. R., & Vogt, C. (2017). Twenty-five years past Vogt: Assessing the changing information needs of american travellers. In *Information and Communication Technologies in Tourism 2017* (pp. 489-502): Springer.

Choi, I. Y., Ryu, Y. U., & Kim, J. K. (2019). A recommender system based on personal constraints for smart tourism city *. *Asia Pacific Journal of Tourism Research*. doi:10.1080/10941665.2019.1592765

Chuah, H. W., Marimuthu, M., & Ramayah, T. (2014). The effect of perceived value on the loyalty of Generation Y mobile internet subscribers: A proposed conceptual framework. *Procedia-Social and Behavioral Sciences, 130*, 532-541.

Chung, J. Y., & Buhalis, D. (2008). Information needs in online social networks. *Information Technology & Tourism, 10*(4), 267-281.

Churchill Jr, G. A., & Surprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research*, 491-504.

Cohen, E. (1979). A phenomenology of tourist experiences. *Sociology, 13*(2), 179-201.

Cohen, J. (1992). A power primer. *Psychological bulletin, 112*, 155-159.

Cohen, L. (2011). *Research methods in education* (7th ed.. ed.). London ; New York: London ; New York : Routledge.

Cohen, S., Prayag, G., & Moital, M. (2013). Consumer behaviour in tourism: Concepts, influences and opportunities. In (pp. 1-38): Routledge.

Cole, C. (2012). *Information need : a theory connecting information search to knowledge formation*. Medford, New Jersey: Published for the American Society for Information Science and Technology by Information Today, Inc.
Collier, J. E., & Bienstock, C. C. (2006). Measuring Service Quality in E-Retailing. *Journal of service research, 8*(3), 260-275. doi:10.1177/1094670505278867
Constantinides, P., Chiasson, M. W., & Introna, L. D. (2012). THE ENDS OF INFORMATION SYSTEMS RESEARCH: A PRAGMATIC FRAMEWORK. *Mis Quarterly, 36*(1), 1-20. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=71148504&site=ehost-live
Cooper, C. (2008). *Tourism: Principles and practice*: Pearson education.
Corbin, J., Strauss, A., & Strauss, A. L. (2014). *Basics of qualitative research*: Sage.
Corley, K. G., & Gioia, D. A. (2011). Building theory about theory building: what constitutes a theoretical contribution?(Report). *Academy of Management Review, 36*(1), 12.
Correia, A., Moital, M., Oliveira, N., & da Costa, C. F. (2009). Multidimensional segmentation of gastronomic tourists based on motivation and satisfaction. *International Journal of Tourism Policy, 2*(1-2), 37-57.
Crane, A., Henriques, I., Husted, B. W., & Matten, D. (2016). What Constitutes a Theoretical Contribution in the Business and Society Field? *Business & Society, 55*(6), 783-791. doi:10.1177/0007650316651343
Creswell, J. W. (2013a). *Qualitative inquiry and research design: Choosing among five approaches*: Sage.
Creswell, J. W. (2013b). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage publications.
Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, California: SAGE.
Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*: Sage publications.
Cronin Jr, J. J., & Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *the Journal of Marketing*, 55-68.
Cronin Jr, J. J., & Taylor, S. A. (1994). SERVPERF versus SERVQUAL: reconciling performance-based and perceptions-minus-expectations measurement of service quality. *the Journal of Marketing*, 125-131.
Cummins, R. A., & Gullone, E. (2000). *Why we should not use 5-point Likert scales: The case for subjective quality of life measurement.* Paper presented at the Proceedings, second international conference on quality of life in cities.
Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *Journal of Experimental Social Psychology, 66*, 4-19. doi:https://doi.org/10.1016/j.jesp.2015.07.006
Cyr, D. (2013). Website design, trust and culture an eight country investigation. *Electronic Commerce Research and Applications, 12*(6), 373-385.
D'Amico, G., Ercoli, S., & Del Bimbo, A. (2013). *A Framework for Itinerary Personalization in Cultural Tourism of Smart Cities.* Paper presented at the AI* HCI@ AI* IA.
Davis, D., Golicic, S., & Boerstler, C. (2011). Benefits and challenges of conducting multiple methods research in marketing. *Official Publication of the Academy of Marketing Science, 39*(3), 467-479. doi:10.1007/s11747-010-0204-7

Davis, F. D. (1985). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Massachusetts Institute of Technology,
Day, G. S. (1976). A two-dimensional concept of brand loyalty. In *Mathematical models in marketing* (pp. 89-89): Springer.
Day, G. S., & Montgomery, D. B. (1999). Charting new directions for marketing. *the Journal of Marketing*, 3-13.
De Waal, C. (2005). *On pragmatism*. Belmont, Calif.: Belmont, Calif. : Thomson Wadsworth.
Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology/Psychologie canadienne, 49*(3), 182.
del Bosque, I. A. R., San Martín, H., & Collado, J. (2006). The role of expectations in the consumer satisfaction formation process: Empirical evidence in the travel agency sector. *Tourism Management, 27*(3), 410-419.
Delone, W. H., & McLean, E. (2003a). The Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19*(4), 9-30. doi:10.1080/07421222.2003.11045748
Delone, W. H., & McLean, E. R. (2003b). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems, 19*(4), 9-30.
Delone, W. H., & McLean, E. R. (2004). Measuring e-Commerce Success: Applying the DeLone & McLean Information Systems Success Model. *International Journal of Electronic Commerce, 9*(1), 31-47. doi:10.1080/10864415.2004.11044317
Delone, W. H., & McLean, E. R. (2016). Information systems success measurement. *Foundations and Trends® in Information Systems, 2*(1), 1-116.
Deng, W., Yeh, M., & Sung, M. (2013). A customer satisfaction index model for international tourist hotels: Integrating consumption emotions into the American Customer Satisfaction Index. *International Journal of Hospitality Management, 35*, 133-140.
Desai, D. (2016). A Study of Personalization Effect on Users' Satisfaction With E-Commerce Websites. *Sankalpa, 6*(2), 51-62.
Dewan, R., Jing, B., & Seidmann, A. (2000). Adoption of Internet-Based Product Customization and Pricing Strategies. *Journal of Management Information Systems, 17*(2), 9-28.
Dey, A. K. (2001). Understanding and using context. *PERSONAL AND UBIQUITOUS COMPUTING, 5*(1), 4-7.
Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of Business Research, 61*(12), 1203-1218. doi:10.1016/j.jbusres.2008.01.009
Diamantopoulos, A., & Siguaw, J. A. (2006). Formative Versus Reflective Indicators in Organizational Measure Development: A Comparison and Empirical Illustration. *British Journal of Management, 17*(4), 263-282. doi:10.1111/j.1467-8551.2006.00500.x
Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research, 38*(2), 269-277.
Dickinger, A., & Stangl, B. (2013). Website performance and behavioral consequences: A formative measurement approach. *Journal of Business Research, 66*, 771-777. doi:10.1016/j.jbusres.2011.09.017
Dickson, P. R., & Ginter, J. L. (1987). Market segmentation, product differentiation, and marketing strategy. *The Journal of Marketing*, 1-10.

Dietz, L. W., Roy, R., & Wörndl, W. (2019). Characterisation of Traveller Types Using Check-In Data from Location-Based Social Networks. In *Information and Communication Technologies in Tourism 2019* (pp. 15-26): Springer.

Dourish, P. (2004). What we talk about when we talk about context. *PERSONAL AND UBIQUITOUS COMPUTING, 8*(1), 19-30.

Drew, M., Woodside, A., Huang, S., & Hsu, C. H. (2009). Travel motivation: linking theory to practice. *International journal of culture, tourism and hospitality research, 3*(4), 287-295.

Dwyer, L. (2012). *Handbook of Research Methods in Tourism Quantitative and Qualitative Approaches*. Cheltenham ; Northampton, Mass.: Cheltenham ; Northampton, Mass. : Edward Elgar Pub.

Echeverri, P., & Skålén, P. (2011). Co-creation and co-destruction: A practice-theory based study of interactive value formation. *Marketing Theory, 11*(3), 351-373.

Edvardsson, B., Ng, G., Min Choo, Z., & Firth, R. (2013). Why is service-dominant logic based service system better? *International Journal of Quality and Service Sciences, 5*(2), 171-190. doi:10.1108/IJQSS-07-2012-0007

Edwards, J. R., & Bagozzi, R. P. (2000). On the Nature and Direction of Relationships Between Constructs and Measures. *Psychological methods, 5*(2), 155-174. doi:10.1037/1082-989X.5.2.155

Ekinci, Y., Dawes, P. L., & Massey, G. R. (2008). An extended model of the antecedents and consequences of consumer satisfaction for hospitality services. *European Journal of Marketing, 42*(1/2), 35-68.

Epstein, A. D., & Kheimets, N. G. (2001). Looking for Pontius Pilate's footprints near the Western wall: Russian Jewish tourists in Jerusalem. *Tourism Culture & Communication, 3*(1), 37-56.

Fan, H., & Poole, M. S. (2006). What is personalization? Perspectives on the design and implementation of personalization in information systems. *Journal of Organizational Computing and Electronic Commerce, 16*(3-4), 179-202.

Fan, S., Lau, R. Y. K., & Zhao, J. L. (2015). Demystifying Big Data Analytics for Business Intelligence Through the Lens of Marketing Mix. *Big Data Research, 2*, 28-32. doi:10.1016/j.bdr.2015.02.006

Faullant, R., Matzler, K., & Mooradian, T. A. (2011). Personality, basic emotions, and satisfaction: Primary emotions in the mountaineering experience. *Tourism Management, 32*(6), 1423-1430.

Fesenmaier, D. R., Xiang, Z., Pan, B., & Law, R. (2011). A framework of search engine use for travel planning. *Journal of Travel Research, 50*(6), 587-601.

Field, A. P. (2018). *Discovering statistics using IBM SPSS statistics* (5th edition.. ed.). Los Angeles, California: Los Angeles, California : SAGE Publications.

Filimowicz, M., & Tzankova, V. (2018). *New directions in third wave human-computer interaction. Volume 1, Technologies*. Cham, Switzerland: Springer.

Flavin, S., & Heller, J. (2019). *A technology blueprint for personalization*

at scale. Retrieved from

Fletcher, J., Fyall, A., Gilbert, D., & Wanhill, S. (2013). *Tourism: principles and practice*: Pearson Higher Ed.

Flint, D. J., Blocker, C. P., & Boutin, P. J. (2011). Customer value anticipation, customer satisfaction and loyalty: An empirical examination. *Industrial Marketing Management, 40*(2), 219-230. doi:10.1016/j.indmarman.2010.06.034

Fornell, C. (1992). A national customer satisfaction barometer: The Swedish experience. *the Journal of Marketing*, 6-21.

Freeman, R. (2007). Epistemological bricolage: How practitioners make sense of learning. *Administration & Society, 39*(4), 476-496.

Frew, E. A., & Shaw, R. N. (1999). The relationship between personality, gender, and tourism behavior. *Tourism Management, 20*(2), 193-202. doi:10.1016/S0261-5177(98)00081-8

Friborg, O., Martinussen, M., & Rosenvinge, J. H. (2006). Likert-based vs. semantic differential-based scorings of positive psychological constructs: A psychometric comparison of two versions of a scale measuring resilience. *Personality and Individual Differences, 40*(5), 873-884. doi:https://doi.org/10.1016/j.paid.2005.08.015

Fuchs, C., & Diamantopoulos, A. (2009). Using single-item measures for construct measurement in management research: Conceptual issues and application guidelines. *Die Betriebswirtschaft, 69*(2), 195.

Fuchs, M., Abadzhiev, A., Svensson, B., Höpken, W., & Lexhagen, M. (2013). A knowledge destination framework for tourism sustainability: A business intelligence application from Sweden. *Tourism (13327461), 61*(2), 121-148. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=hjh&AN=89774350&site=eds-live&scope=site

Fuchs, M., Höpken, W., & Lexhagen, M. (2014). Research Paper: Big data analytics for knowledge generation in tourism destinations – A case from Sweden. *Journal of Destination Marketing & Management, 3*, 198-209. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edselp&AN=S2212571X14000353&site=eds-live&scope=site

Füller, J. (2010). Refining Virtual Co-Creation from a Consumer Perspective. *California Management Review, 52*(2), 98-122. doi:10.1525/cmr.2010.52.2.98

Gali, N., Istodor, R. M., & Fränti, P. (2017). *Functional Classification of Websites.* Paper presented at the Proceedings of the Eighth International Symposium on Information and Communication Technology.

Gallarza, M. G., Gallarza, M. G., Arteaga, F., Arteaga, F., Del Chiappa, G., Del Chiappa, G., . . . Holbrook, M. B. (2017). A multidimensional service-value scale based on Holbrook's typology of customer value: Bridging the gap between the concept and its measurement. *Journal of Service Management, 28*(4), 724-762.

Garcia, A., Torre, I., & Linaza, M. T. (2013). Mobile Social Travel Recommender System. *Information & Communication Technologies in Tourism 2014*, 3. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=94500289&site=eds-live&scope=site

Garg, A. (2015). Travel risks vs tourist decision making: A tourist perspective. *International Journal of Hospitality & Tourism Systems, 8*(1), 1-9.

Garson, D. (2012). Partial least squares: Regression and path modeling. *Asheboro, NC: Statistical Publishing Associates*.

Gaskin, J. (2012). Data screening. *Gaskination's StatWiki*.

(2018). *SEM Boot Camp 2018 SmartPLS Partial Least Squares* [Retrieved from https://www.youtube.com/watch?v=D5qNoKDvTWM

Gauch, S., Speretta, M., Chandramouli, A., & Micarelli, A. (2007). User profiles for personalized information access. *The adaptive web*, 54-89.
Gavalas, D., & Kenteris, M. (2011). A web-based pervasive recommendation system for mobile tourist guides. *PERSONAL AND UBIQUITOUS COMPUTING, 15*(7), 759-770.
Gavalas, D., Konstantopoulos, C., Mastakas, K., & Pantziou, G. (2014a). Mobile recommender systems in tourism. *Journal of Network and Computer Applications, 39*, 319-333.
Gavalas, D., Konstantopoulos, C., Mastakas, K., & Pantziou, G. (2014b). Mobile recommender systems in tourism. *Journal of Network & Computer Applications, 39*, 319-333. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=94366622&site=eds-live&scope=site
Ge, Y., Xiong, H., Tuzhilin, A., & Liu, Q. (2014). Cost-Aware Collaborative Filtering for Travel Tour Recommendations. *ACM Transactions on Information Systems, 32*(1), 1-31. doi:10.1145/2559169
Germanakos, P., & Belk, M. (2016). *Human-Centred Web Adaptation and Personalization*: Springer.
Ghanam, Y., Maurer, F., & Abrahamsson, P. (2012). Making the leap to a software platform strategy: Issues and challenges. *Information and Software Technology, 54*(9), 968-984. doi:https://doi.org/10.1016/j.infsof.2012.03.005
Gideon, L. (2012). *Handbook of Survey Methodology for the Social Sciences*. New York, NY: New York, NY : Springer New York : Imprint: Springer.
Gil, M., Giner, P., & Pelechano, V. (2012). Personalization for unobtrusive service interaction. *PERSONAL AND UBIQUITOUS COMPUTING, 16*(5), 543-561. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edswsc&AN=000304563900006&site=eds-live&scope=site
Gökçen, E., Furnham, A., Mavroveli, S., & Petrides, K. V. (2014). A cross-cultural investigation of trait emotional intelligence in Hong Kong and the UK. *Personality and Individual Differences, 65*, 30-35. doi:10.1016/j.paid.2014.01.053
Goldkuhl, G. (2012). Pragmatism vs interpretivism in qualitative information systems research. *European journal of information systems, 21*(2), 135-146. doi:10.1057/ejis.2011.54
Google. (2017). Google Trips - Travel Planner. Retrieved from https://play.google.com/store/apps/details?id=com.google.android.apps.travel.onthego&hl=en
Google Inc. (2017). Google Trends. Retrieved from https://trends.google.com/
Gorla, N., Somers, T. M., & Wong, B. (2010). Organizational impact of system quality, information quality, and service quality. *The Journal of Strategic Information Systems, 19*(3), 207-228.
Greer, C. R., Lusch, R. F., & Vargo, S. L. (2016). A service perspective. *Organizational Dynamics, 1*(45), 28-38.
Gretzel, U., Ham, J., & Koo, C. (2018). Creating the city destination of the future: The case of smart Seoul. In *Managing Asian Destinations* (pp. 199-214): Springer.
Gretzel, U., Kang, M., & Lee, W. (2008). Differences in Consumer-Generated Media Adoption and Use: A Cross-National Perspective. *Journal of Hospitality & Leisure Marketing, 17*(1-2), 99-120. doi:10.1080/10507050801978240
Grissemann, U. S., & Stokburger-Sauer, N. E. (2012). Customer co-creation of travel services: The role of company support and customer satisfaction with the co-creation performance.

Tourism Management, 33(6), 1483-1492. doi:https://doi.org/10.1016/j.tourman.2012.02.002
Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing, 18*(4), 36-44.
Gruender, D. (1982). Pragmatism, science, and metaphysics. *The Monist, 65*(2), 189-210.
Grün, C., Neidhardt, J., & Werthner, H. (2017). Ontology-Based Matchmaking to Provide Personalized Recommendations for Tourists. In *Information and Communication Technologies in Tourism 2017* (pp. 3-16): Springer.
Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods, 18*(1), 59-82.
Gummesson, E. (2008a). Extending the service-dominant logic: from customer centricity to balanced centricity. *Journal of the Academy of Marketing Science, 36*(1), 15-17.
Gummesson, E. (2008b). Quality, service-dominant logic and many-to-many marketing. *The TQM Journal, 20*(2), 143-153.
Gummesson, E., Lusch, R. F., & Vargo, S. L. (2010). Transitioning from service management to service-dominant logic. *International Journal of Quality and Service Sciences, 2*(1), 8-22. doi:10.1108/17566691011026577
Hair, J. F. J., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European business review, 26*(2), 106-121.
Hair Jr, J. F. (2010). *Multivariate data analysis* (7th ed.. ed.). Upper Saddle River, NJ: Upper Saddle River, NJ : Prentice Hall.
Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
Hair Jr, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152.
Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European business review, 26*(2), 106-121.
Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*: SAGE Publications.
Han, D.-I., Jung, T., & Gibson, A. (2013). Dublin AR: Implementing Augmented Reality in Tourism. *Information & Communication Technologies in Tourism 2014*, 511. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=94500325&site=eds-live&scope=site
Hardian, B. (2012). Context Awareness in Mobile Computing. In. University of Indonesia.
Harzing, A.-W. (2006). Response Styles in Cross-national Survey Research. *International Journal of Cross Cultural Management, 6*(2), 243-266. doi:10.1177/1470595806066332
Haselton, T. (2017). Google Trips is a must-have app for travelers -- here's how it works. Retrieved from https://www.cnbc.com/2017/04/28/google-trips-walkthrough.html
Heinonen, K., & Pura, M. (2006). Classifying mobile services. *Helsinki Mobility Roundtable*, 1-2.
Heinonen, K., Strandvik, T., Mickelsson, K.-J., Edvardsson, B., Sundström, E., & Andersson, P. (2010). A customer-dominant logic of service. *Journal of Service Management, 21*(4), 531-548.

Heinonen, K., Strandvik, T., & Voima, P. (2013). Customer dominant value formation in service. *European business review, 25*(2), 104-123.
Hennink, M. M. (2007). *International focus group research: A handbook for the health and social sciences*: Cambridge University Press.
Henseler, J. (2012). PLS-MGA: A non-parametric approach to partial least squares-based multi-group analysis. In *Challenges at the interface of data analysis, computer science, and optimization* (pp. 495-501): Springer.
Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. In *Handbook of partial least squares* (pp. 713-735): Springer.
Henseler, J., Hubona, G., Ray, P. A., Latan, H., & Noonan, R. (2017). *Partial least squares path modeling: Updated guidelines*.
Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In *New challenges to international marketing* (pp. 277-319): Emerald Group Publishing Limited.
Hiesel, P., Braunhofer, M., & Wörndl, W. (2016). Learning the Popularity of Items for Mobile Tourist Guides. *Proceedings of RecTour*.
Hixon, T. (2014). What Kind Of Person Prefers An iPhone? Retrieved from https://www.forbes.com/sites/toddhixon/2014/04/10/what-kind-of-person-prefers-an-iphone/#35f27fdfd1b0
Ho, S., Davern, M., & Tam, K. (2008). Personalization and Choice Behavior: The Role of Personality Traits. *Database for Advances in Information Systems, 39*(4), 31-47.
Ho, S. Y. (2009). *Opportunities and challenges of mobile personalization: An exploratory study.* Paper presented at the ECIS.
Hofstede, G. (2017). Compare countries. Retrieved from https://www.hofstede-insights.com/product/compare-countries/
Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments*: Psychological Assessment Resources.
Höpken, W., Fuchs, M., Zanker, M., & Beer, T. (2010). Context-based adaptation of mobile applications in tourism. *Information Technology and Tourism, 12*(2), 175-195. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lah&AN=20113053456&site=eds-live&scope=site

http://www.cognizantcommunication.com

email: wolfram.hoepken@hs-weingarten.de
Horner, S., & Swarbrooke, J. (2016). *Consumer behaviour in tourism*. Oxford, UK: Routledge.
Hoseini-Tabatabaei, S. A., Gluhak, A., & Tafazolli, R. (2013). A Survey on Smartphone-Based Systems for Opportunistic User Context Recognition. *ACM Computing Surveys, 45*(3), 27:21-27:51. doi:10.1145/2480741.2480744
Hsu, S. H. (2008). Developing an index for online customer satisfaction: Adaptation of American Customer Satisfaction Index. *Expert Systems With Applications, 34*(4), 3033-3042. doi:10.1016/j.eswa.2007.06.036
Huang, E. Y., Lin, S.-W., & Fan, Y.-C. (2015). M-S-QUAL: Mobile service quality measurement. *Electronic Commerce Research and Applications, 14*(2), 126-142. doi:10.1016/j.elerap.2015.01.003

Huang, J. L., Liu, M., & Bowling, N. A. (2015). Insufficient effort responding: Examining an insidious confound in survey data. *Journal of applied psychology, 100*(3), 828.
Huang, K.-T., Lee, Y. W., & Wang, R. Y. (1998). *Quality information and knowledge*: Prentice Hall PTR.
Hung, K., & Petrick, J. F. (2011). Why do you cruise? Exploring the motivations for taking cruise holidays, and the construction of a cruising motivation scale. *Tourism Management, 32*(2), 386-393.
Hunt, S. D., & Morgan, R. M. (1995). The comparative advantage theory of competition. *the Journal of Marketing*, 1-15.
Iso-Ahola, S. E. (1980). *Social psychological perspectives on leisure and recreation*: Charles C. Thomas Springfield, IL.
ISO/IEC 7498-1, Information Technology–Open Systems Interconnection–Basic Reference Model: The Basic Model, (1996).
ISO-IEC 25010: 2011 Systems and Software Engineering-Systems and Software Quality Requirements and Evaluation (SQuaRE)-System and Software Quality Models, (2011).
Open systems interconnection (OSI). (2017).
Jafari, J., & Brent Ritchie, J. R. (1981). Toward a framework for tourism education: Problems and prospects. *Annals of Tourism Research, 8*(1), 13-34. doi:10.1016/0160-7383(81)90065-7
Jarvis, Cheryl B., MacKenzie, Scott B., & Podsakoff, Philip M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of consumer research, 30*(2), 199-218. doi:10.1086/376806
Jerath, K., Kumar, A., & Netessine, S. (2015). An information stock model of customer behavior in multichannel customer support services. *Manufacturing & Service Operations Management, 17*(3), 368-383.
Jiang, J. J., Klein, G., & Carr, C. L. (2002). Measuring information system service quality: SERVQUAL from the other side. *Mis Quarterly*, 145-166.
Johnson, M. D., Gustafsson, A., Andreassen, T. W., Lervik, L., & Cha, J. (2001). The evolution and future of national customer satisfaction index models. *Journal of economic Psychology, 22*(2), 217-245.
Jones, C. (2018). Apple's iOS Loyalty Rate Is Lower Than Google's Android, But Apple May Steal More Users Each Year. Retrieved from https://www.forbes.com/sites/chuckjones/2018/03/10/apples-ios-loyalty-rate-is-lower-than-googles-android-but-apple-may-steal-more-users-each-year/#68cd457268a8
Jørstad, I., & Do Van Thanh, S. D. (2004). Personalisation of future mobile services.
Jumisko-Pyykkö, S., & Vainio, T. (2012). Framing the context of use for mobile HCI. *Social and Organizational Impacts of Emerging Mobile Devices: Evaluating Use: Evaluating Use*, 217.
Kabassi, K. (2010). Review: Personalizing recommendations for tourists. *Telematics and Informatics, 27*, 51-66. doi:10.1016/j.tele.2009.05.003
Kang, D. S., & Mastin, T. (2008). How cultural difference affects international tourism public relations websites: A comparative analysis using Hofstede's cultural dimensions. *Public Relations Review, 34*(1), 54-56. doi:10.1016/j.pubrev.2007.11.002
Kardaras, D. K., Karakostas, B., & Mamakou, X. J. (2013). Content presentation personalisation and media adaptation in tourism web sites using Fuzzy Delphi Method and Fuzzy Cognitive Maps. *Expert Systems With Applications, 40*(6), 2331-2342.

Karjaluoto, H., Jayawardhena, C., Leppäniemi, M., & Pihlström, M. (2012). How value and trust influence loyalty in wireless telecommunications industry. *Telecommunications Policy, 36*(8), 636-649.
Kasanoff, B., Rogers, M., & Peppers, D. (2001). *Making it Personal: how to profit from personalization without invading privacy*: Perseus Publishing.
Kastenholz, E. (2004). Assessment and role of destination-self-congruity. *Annals of Tourism Research, 31*(3), 719-723.
Kennedy-Eden, H., & Gretzel, U. (2012). A Taxonomy of Mobile Applications in Tourism. *E-review of Tourism Research, 10*(2), 47-50. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=hjh&AN=84339716&site=eds-live&scope=site
Kettinger, W. J., & Lee, C. C. (1997). Pragmatic perspectives on the measurement of information systems service quality. *Mis Quarterly*, 223-240.
Khalifa, M., & Liu, V. (2002). Satisfaction with Internet-Based Services: The Role of Expectations and Desires. *International Journal of Electronic Commerce, 7*(2), 31-49. doi:10.1080/10864415.2002.11044267
Kim, S., Cha, J., Knutson, B. J., & Beck, J. A. (2011). Development and testing of the Consumer Experience Index (CEI). *Managing Service Quality: An International Journal, 21*(2), 112-132.
Kim, Y. G., & Eves, A. (2012). Construction and validation of a scale to measure tourist motivation to consume local food. *Tourism Management, 33*(6), 1458-1467.
Kjeldskov, J., & Paay, J. (2012, 2012 / 01 / 01 /). *A longitudinal review of mobile HCI research methods*.
Kock, N. (2014). Advanced mediating effects tests, multi-group analyses, and measurement model assessments in PLS-based SEM. *International Journal of e-Collaboration (IJeC), 10*(1), 1-13.
Kotler, P., Bowen, J., & Makens, J. C. (2014). *Marketing for hospitality and tourism / Philip R. Kotler, John T. Bowen and James Makens*: Harlow, Essex : Pearson, [2014] Sixth edition.
Kotler, P., & Keller, K. L. (2016). Marketing management. In (15th edition ed.). Harlow: Pearson.
Koverman, C. (2016). Next-Generation Connected Support in the Age of IoT: It's time to get proactive about customer support. *IEEE Consumer Electronics Magazine, 5*(1), 69-73. doi:10.1109/MCE.2015.2484698
Kozak, M. (2000). A critical review of approaches to measure satisfaction with tourist destinations. *Tourism Analysis, 5*(2-3), 191-196.
Krippendorff, K. (2013). *Content analysis : an introduction to its methodology* (3rd ed.. ed.). Thousand Oaks, CA: SAGE.
Kristensen, K., & Eskildsen, J. K. (2005). PLS structural equation modelling for customer satisfaction measurement: some empirical and theoretical results. In *Handbuch Pls-pfadmodellierung* (pp. 5-24): Schäffer-Poeschel.
Kroenke, D. M., & Boyle, R. (2017). *Experiencing MIS* (Seventh edition. ed.). Boston: Pearson.
Kumar, A., & Lim, H. (2008). Age differences in mobile service perceptions: comparison of Generation Y and baby boomers. *Journal of Services Marketing, 22*(7), 568-577.
Kumar, S., & Desai, D. (2016). Web Personalization: A Perspective of Design and Implementation Strategies in Websites. *KHOJ: Journal of Indian Management Research and Practices*, 109-119.

Kung, F. Y. H., Kwok, N., & Brown, D. J. (2018). Are Attention Check Questions a Threat to Scale Validity? *Applied Psychology, 67*(2), 264-283. doi:doi:10.1111/apps.12108

Kuo, Y.-F., Wu, C.-M., & Deng, W.-J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior, 25*(4), 887-896. doi:10.1016/j.chb.2009.03.003

Kurata, Y., & Hara, T. (2013). CT-Planner4: Toward a More User-Friendly Interactive Day-Tour Planner. *Information & Communication Technologies in Tourism 2014*, 73. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=94500294&site=eds-live&scope=site

Kuzel, A. J. (1992). Sampling in qualitative inquiry.

Kuzgun, E., & Asugman, G. (2015). Value in Services – A Service Dominant Logic Perspective. *Procedia - Social and Behavioral Sciences, 207*, 242-251. doi:10.1016/j.sbspro.2015.10.093

Kwon, K., & Kim, C. (2012). How to design personalization in a context of customer retention: Who personalizes what and to what extent? *Electronic Commerce Research and Applications, 11*(2), 101-116.

Lamsfus, C., Wang, D., Alzua-Sorzabal, A., & Xiang, Z. (2015). Going mobile: Defining context for on-the-go travelers. *Journal of Travel Research, 54*(6), 691-701.

Lamsfus, C., Xiang, Z., Alzua-Sorzabal, A., & Martín, D. (2013). Conceptualizing context in an intelligent mobile environment in travel and tourism. In *Information and communication technologies in tourism 2013* (pp. 1-11): Springer.

Law, R., Buhalis, D., & Cobanoglu, C. (2014). Progress on information and communication technologies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 26*(5), 727-750.

Law, R., & Cheung, C. (2006). A study of the perceived importance of the overall website quality of different classes of hotels. In (pp. 525-531): Pergamon Press.

Law, R., Leung, R., & Buhalis, D. (2009). Information technology applications in hospitality and tourism: a review of publications from 2005 to 2007. *Journal of Travel & Tourism Marketing, 26*(5-6), 599-623.

Law, R., Qi, S., & Buhalis, D. (2010). Progress in tourism management: A review of website evaluation in tourism research. *Tourism Management, 31*(3), 297-313.

Lee, C. H., & Cranage, D. A. (2011). Personalisation–privacy paradox: The effects of personalisation and privacy assurance on customer responses to travel Web sites. *Tourism Management, 32*(5), 987-994.

Lee, M. K. (2013). Designing Personalization in Technology-Based Services. In.

Lee, S., Jeon, S., & Kim, D. (2011). The impact of tour quality and tourist satisfaction on tourist loyalty: The case of Chinese tourists in Korea. *Tourism Management, 32*(5), 1115-1124.

Lee, Y., Lee, J., & Hwang, Y. (2015). Relating motivation to information and communication technology acceptance: Self-determination theory perspective. *Computers in Human Behavior, 51*, 418-428. Retrieved from http://www.sciencedirect.com/science/article/pii/S0747563215003921

Leiper, N. (1990). Tourist attraction systems. *Annals of Tourism Research, 17*(3), 367-384.

Lemke, F., Clark, M., & Wilson, H. (2011). Customer experience quality: an exploration in business and consumer contexts using repertory grid technique. *Official Publication of the Academy of Marketing Science, 39*(6), 846-869. doi:10.1007/s11747-010-0219-0

Leonard, P. (2010). Work, Identity and Change? Post/Colonial Encounters in Hong Kong. *Journal of Ethnic and Migration Studies, 36*(8), 1247-1263. doi:10.1080/13691831003687691

Leung, D., Law, R., van Hoof, H., & Buhalis, D. (2013). Social Media in Tourism and Hospitality: A Literature Review. *Journal of Travel & Tourism Marketing, 30*(1/2), 3-22. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=85878993&site=eds-live&scope=site

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research.(Research and Audit)(Report). *Journal of Family Medicine and Primary Care, 4*(3), 324. doi:10.4103/2249-4863.161306

Leung, R., & Law, R. (2010). A review of personality research in the tourism and hospitality context. *Journal of Travel & Tourism Marketing, 27*(5), 439-459.

Leung, R., Rong, J., Li, G., & Law, R. (2011). *An analysis on human personality and hotel web design: A Kohonen Network approach*. Paper presented at the ENTER.

Leung, R., Rong, J., Li, G., & Law, R. (2013). Personality differences and hotel web design study using targeted positive and negative association rule mining. *Journal of Hospitality Marketing & Management, 22*(7), 701-727.

Leung, S.-O. (2011). A comparison of psychometric properties and normality in 4-, 5-, 6-, and 11-point Likert scales. *Journal of Social Service Research, 37*(4), 412-421.

Lewis, B. R. (1993). Service quality: recent developments in financial services. *International Journal of Bank Marketing, 11*(6), 19-25.

Li, M., & Cai, L. A. (2012). The effects of personal values on travel motivation and behavioral intention. *Journal of Travel Research, 51*(4), 473-487.

Liang, T.-P., Lai, H.-J., & Ku, Y.-C. (2006). Personalized content recommendation and user satisfaction: Theoretical synthesis and empirical findings. *Journal of Management Information Systems, 23*(3), 45-70.

Liao, S. S., Li, Q., & Xu, D. J. (2005). A Bayesian network-based framework for personalization in mobile commerce applications. *Communications of the Association for Information Systems, 15*(1), 28.

Lin, C.-P., Tsai, Y. H., & Chiu, C.-K. (2009). Modeling Customer Loyalty from an Integrative Perspective of Self-Determination Theory and Expectation–Confirmation Theory. *Journal of Business and Psychology, 24*(3), 315-326. doi:10.1007/s10869-009-9110-8

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75): Sage.

Litvin, S. W., & Goh, H. K. (2002). Self-image congruity: a valid tourism theory? *Tourism Management, 23*(1), 81-83.

Litvin, S. W., & Smith, W. W. (2016). A new perspective on the Plog psychographic system. *Journal of Vacation Marketing, 22*(2), 89-97.

Liu, Y., Yang, Q., & Pu, B. (2015). The Research of Internet Information Services on the Impact of Tourism Decision-Making. *TOCSJ, 9*(1), 1840-1845. doi:10.2174/1874110X01509011840

Lovelock, C. H. (1996). Adding value to core products with supplementary services. *Services Marketing, 3rd ed. Prentice-Hall, Inc., Englewood Cliffs, NJ*, 337-360.

Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE transactions on professional communication, 57*(2), 123-146.
Lu, J., Wu, D., Mao, M., Wang, W., & Zhang, G. (2015). Recommender system application developments: a survey. *Decision Support Systems, 74*, 12-32.
Lu, Y., Zhang, L., & Wang, B. (2009). A multidimensional and hierarchical model of mobile service quality. *Electronic Commerce Research and Applications, 8*(5), 228-240. doi:10.1016/j.elerap.2009.04.002
Lukowicz, P. (2014) *Wearable technology*. Warwick Business School, Computational Social Science Conference.
M. Smith, A. (2013). The value co-destruction process: a customer resource perspective. *European Journal of Marketing, 47*(11/12), 1889-1909.
MacCallum, R. C., & Austin, J. T. (2000). APPLICATIONS OF STRUCTURAL EQUATION MODELING IN PSYCHOLOGICAL RESEARCH. *Annual Review of Psychology*, 201.
MacCannell, D. (1976). *The tourist: A new theory of the leisure class*: Univ of California Press.
MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of applied psychology, 90*(4), 710.
Maddi, S. R. (1993). The continuing relevance of personality theory. In *Fifty years of personality psychology* (pp. 85-101): Springer.
Madrigal, R. (1995). Personal values, traveler personality type, and leisure travel style. *Journal of Leisure Research, 27*(2), 125.
Maglio, P. P., & Spohrer, J. (2008). Fundamentals of service science. *Journal of the Academy of Marketing Science, 36*(1), 18-20.
Malachowski, A. R. (2013). *The Cambridge companion to pragmatism*. Cambridge ; New York: Cambridge ; New York : Cambridge University Press.
March, R., & Woodside, A. G. (2005). *Tourism behaviour : travellers' decisions and actions*. Wallingford ; Cambridge, Mass: CABI Pub.
Marchesani, D., Piccoli, G., & Lui, T.-w. (2017). The Impact of IT-Enabled Customer Experience Management on Service Perceptions and Performance. In *Information and Communication Technologies in Tourism 2017* (pp. 377-386): Springer.
Marcus, A. (2015). HCI and user-experience design : fast-forward to the past, present, and future. In. London: Springer.
Massimo, D., & Ricci, F. (2019). Clustering Users' POIs Visit Trajectories for Next-POI Recommendation. In *Information and Communication Technologies in Tourism 2019* (pp. 3-14): Springer.
Master_Card. (2017). Hongkongers Show the Second Highest Propensity to Travel in Asia Pacific [Press release]. Retrieved from https://www.mastercard.com.hk/content/dam/mccom/en-hk/documents/newsroom/en/2017/HK-The_Future_of_Outbound_Travel_Press_Release_E_Final.pdf
Mathieson, A., & Wall, G. (1982). *Tourism, economic, physical and social impacts*: Longman.
Mazanec, J. A. (2009). Unravelling myths in tourism research. *Tourism Recreation Research, 34*(3), 319-323.
McColl-Kennedy, J. R., Cheung, L., & Ferrier, E. (2015). Co-creating service experience practices. *Journal of Service Management, 26*(2), 249-275.

McKercher, B., Chan, A., & Lam, C. (2008). The Impact of Distance on International Tourist Movements. *Journal of Travel Research, 47*(2), 208-224. doi:10.1177/0047287508321191
McKercher, B., Denizci-Guillet, B., & Ng, E. (2012). Rethinking loyalty. *Annals of Tourism Research, 39*(2), 708-734.
McLean, G., & Wilson, A. (2016). Evolving the online customer experience… is there a role for online customer support? *Computers in Human Behavior, 60*, 602-610.
Meehan, K., Lunney, T., Curran, K., & McCaughey, A. (2013). *Context-aware intelligent recommendation system for tourism.* Paper presented at the Pervasive Computing and Communications Workshops (PERCOM Workshops), 2013 IEEE International Conference on.
Mehra, P. (2012). Context-Aware Computing Beyond Search and Location-Based Services Introduction. *IEEE INTERNET COMPUTING, 16*(2), 12-16. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=edswsc&AN=000300859200003&site=eds-live&scope=site
Mele, C., & Polese, F. (2011). Key dimensions of service systems in value-creating networks. In *The science of service systems* (pp. 37-59): Springer.
Microsoft. (2017). Layered Application Guidelines. Retrieved from https://msdn.microsoft.com/en-us/library/ee658109.aspx
Mill, R. C., & Morrison, A. M. (2002). *The tourism system*: Kendall Hunt.
Mintzberg, H. (2005). Developing theory about the development of theory. *Great minds in management: The process of theory development*, 355-372.
Missaoui, S., Kassem, F., Viviani, M., Agostini, A., Faiz, R., & Pasi, G. (2019). LOOKER: a mobile, personalized recommender system in the tourism domain based on social media user-generated content. *PERSONAL AND UBIQUITOUS COMPUTING*. doi:10.1007/s00779-018-01194-w
Monk, A. F., & Blom, J. O. (2007). A theory of personalisation of appearance: quantitative evaluation of qualitatively derived data. *Behaviour & information technology, 26*(3), 237-246.
Morgan, D. L. (1998). *Planning focus groups*. London: London : SAGE.
Morosan, C., & Defranco, A. (2016). Modeling guests' intentions to use mobile apps in hotels: The roles of personalization, privacy, and involvement. *Int J Contemp Hospitality Mngt, 28*(9), 1968-1991.
Morse, J. M., & Cheek, J. (2014). Making Room for Qualitatively-Driven Mixed-Method Research. In (Vol. 24, pp. 3-5).
Moutinho, L. (1987). Consumer behaviour in tourism. *European Journal of Marketing, 21*(10), 5-44.
MovisensXS (Producer). (2017). Movisens GmbH. Retrieved from https://www.movisens.com/en/products/movisensxs/
Mulder, T., & Tudorica, M. (2019). Privacy policies, cross-border health data and the GDPR. *Information & Communications Technology Law, 28*(3), 261-274.
Müller, T., Schuberth, F., & Henseler, J. (2018). PLS path modeling – a confirmatory approach to study tourism technology and tourist behavior. *Journal of Hospitality and Tourism Technology, 9*(3), 249-266. doi:doi:10.1108/JHTT-09-2017-0106

Murphy, H. C., Chen, M.-M., & Cossutta, M. (2016). An investigation of multiple devices and information sources used in the hotel booking process. *Tourism Management, 52*, 44-51. doi:10.1016/j.tourman.2015.06.004
Murphy, L., Moscardo, G., & Benckendorff, P. (2007). Using brand personality to differentiate regional tourism destinations. *Journal of Travel Research, 46*(1), 5-14.
Murthi, B., & Sarkar, S. (2003). The role of the management sciences in research on personalization. *Management Science, 49*(10), 1344-1362.
Naudet, Y., Yilma, B. A., & Panetto, H. (2018). *Personalisation in Cyber Physical and Social Systems: The Case of Recommendations in Cultural Heritage Spaces.* Paper presented at the Proceedings - 13th International Workshop on Semantic and Social Media Adaptation and Personalization, SMAP 2018.
Navarro, S., Llinares, C., & Garzon, D. (2016). Exploring the relationship between co-creation and satisfaction using QCA. *Journal of Business Research, 69*(4), 1336-1339. doi:10.1016/j.jbusres.2015.10.103
Ned, K., & Pierre, H. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal, 28*(1), 227-261. doi:doi:10.1111/isj.12131
Neidhardt, J., Seyfang, L., Schuster, R., & Werthner, H. (2015). A picture-based approach to recommender systems. *Information Technology & Tourism, 15*(1), 49-69.
Neuhofer, B. (2014). *An Exploration of the technology enhanced tourist experience.* Bournemouth University,
Neuhofer, B., Buhalis, D., & Ladkin, A. (2012). Research Paper: Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing & Management, 1*, 36-46. doi:10.1016/j.jdmm.2012.08.001
Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Smart technologies for personalized experiences: a case study in the hospitality domain. *Electronic Markets, 25*(3), 243-254.
Nguyen, T. N., & Ricci, F. (2017). A Chat-Based Group Recommender System for Tourism. In *Information and Communication Technologies in Tourism 2017* (pp. 17-30): Springer.
Nguyen, T. N., & Ricci, F. (2018). A chat-based group recommender system for tourism. *Information Technology & Tourism, 18*(1-4), 5-28.
Nielsen Company. (2016). Millenials are Top Smartphone Users. Retrieved from https://www.nielsen.com/us/en/insights/news/2016/millennials-are-top-smartphone-users.html
Nielsen, J. (1998). Personalization is over-rated. *Jakob Nielsen's Alertbox for October, 4*, 1998.
Nielsen, J., & Budiu, R. (2013). *Mobile usability*: Berkeley, Calif. : New Riders, c2013.
Nikou, S., & Mezei, J. (2013). Evaluation of mobile services and substantial adoption factors with Analytic Hierarchy Process (AHP). *Telecommunications Policy, 37*(10), 915-929. doi:10.1016/j.telpol.2012.09.007
Normann, R. (2001). *Reframing business: When the map changes the landscape*: John Wiley & Sons.
Nunan, D., & Choi, J. (2010). *Language and culture: Reflective narratives and the emergence of identity*: Routledge.
O'Brien, T. V., Tapia, H. S., & Brown, T. L. (1977). The self-concept in buyer behavior. *Business Horizons, 20*(5), 65-71.
Odin, Y., Odin, N., & Valette-Florence, P. (2001). Conceptual and operational aspects of brand loyalty: an empirical investigation. *Journal of Business Research, 53*(2), 75-84.

Oh, H. (1999). Service quality, customer satisfaction, and customer value: A holistic perspective. *International Journal of Hospitality Management, 18*(1), 67-82.
Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 460-469.
Otebolaku, A. M., & Andrade, M. T. (2016). User context recognition using smartphone sensors and classification models. *Journal of Network and Computer Applications, 66*, 33-51. doi:10.1016/j.jnca.2016.03.013
Oulasvirta, A., & Blom, J. (2008). Motivations in personalisation behaviour. *Interacting with computers, 20*(1), 1-16.
Palmer, J. W. (2002). Web site usability, design, and performance metrics. *Information systems research, 13*(2), 151-167.
Parasuraman, A. (1997). Reflections on gaining competitive advantage through customer value. *Journal of the Academy of Marketing Science, 25*(2), 154.
Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing, 67*(4), 420.
Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *the Journal of Marketing*, 41-50.
Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). Servqual: A multiple-item scale for measuring consumer perc. *Journal of Retailing, 64*(1), 12.
Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ES-QUAL a multiple-item scale for assessing electronic service quality. *Journal of service research, 7*(3), 213-233.
Park, J., Yang, S., & Lehto, X. (2007). Adoption of mobile technologies for Chinese consumers. *Journal of Electronic Commerce Research, 8*(3), 196.
Park, S., Tussyadiah, I. P., Mazanec, J. A., & Fesenmaier, D. R. (2010). Travel personae of American pleasure travelers: a network analysis. *Journal of Travel & Tourism Marketing, 27*(8), 797-811.
Pascale, Q., & Simon, R. (1997). Service quality in the Australian advertising industry: a methodological study. *Journal of Services Marketing, 11*(3), 180-192. doi:10.1108/08876049710168672
Paswan, A. K., Spears, N., & Ganesh, G. (2007). The effects of obtaining one's preferred service brand on consumer satisfaction and brand loyalty. *Journal of Services Marketing, 21*(2), 75-87.
Payne, A., & Frow, P. (2005). A Strategic Framework for Customer Relationship Management. *Journal of Marketing, 69*(4), 167-176. doi:10.1509/jmkg.2005.69.4.167
Payne, A., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science, 36*(1), 83-96.
Pearce, P. L. (2011). *Tourist behaviour and the contemporary world*. Bristol [England: Channel View Publications.
Pearce, P. L., & Lee, U.-I. (2005). Developing the travel career approach to tourist motivation. *Journal of Travel Research, 43*(3), 226-237.
Pee, L. G., Jiang, J., & Klein, G. (2018). Signaling effect of website usability on repurchase intention. *International Journal of Information Management, 39*, 228-241.
Perera, C., Zaslavsky, A., Christen, P., & Georgakopoulos, D. (2014). Context Aware Computing for The Internet of Things: A Survey. *IEEE COMMUNICATIONS SURVEYS AND TUTORIALS, 16*(1), 414-454. Retrieved from

http://search.ebscohost.com/login.aspx?direct=true&db=edswsc&AN=000338700300020&site=eds-live&scope=site
Peterson, C. H., Gischlar, K. L., & Peterson, N. A. (2017). Item Construction Using Reflective, Formative, or Rasch Measurement Models: Implications for Group Work. *Journal for Specialists in Group Work, 42*(1), 17-32. doi:10.1080/01933922.2016.1264523
Petter, S. (2018). "Haters Gonna Hate": PLS and Information Systems Research. *SIGMIS Database, 49*(1), 10-13. doi:10.1145/3229335.3229337
Petter, S., DeLone, W. H., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems, 17*(3), 236-263.
Petter, S., DeLone, W. H., & McLean, E. R. (2013). Information Systems Success: The Quest for the Independent Variables. *Journal of Management Information Systems, 29*(4), 7-62. doi:10.2753/MIS0742-1222290401
Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *Mis Quarterly*, 623-656.
Piccoli, G., Lui, T.-W., & Grün, B. (2017). The impact of IT-enabled customer service systems on service personalization, customer service perceptions, and hotel performance. *Tourism Management, 59*, 349-362.
Pielot, M., de Oliveira, R., Kwak, H., & Oliver, N. (2014). *Didn't you see my message?: predicting attentiveness to mobile instant messages.* Paper presented at the Proceedings of the 32nd annual ACM conference on Human factors in computing systems.
Pine, B. J., & Gilmore, J. H. (1999). *The experience economy : work is theatre & every business a stage / B. Joseph Pine II, James H. Gilmore*: Boston, Mass. : Harvard Business School Press, 1999.
Pitt, L. F., Watson, R. T., & Kavan, C. B. (1995). Service Quality: A Measure of Information Systems Effectiveness. *Mis Quarterly, 19*(2), 173-187. doi:10.2307/249687
Plé, L. (2016). Studying customers' resource integration by service employees in interactional value co-creation. *Journal of services marketing., 30*(2), 152-164. doi:10.1108/JSM-02-2015-0065
Plé, L., & Chumpitaz Cáceres, R. (2010). Not always co-creation: introducing interactional co-destruction of value in service-dominant logic. *Journal of Services Marketing, 24*(6), 430-437. doi:10.1108/08876041011072546
Plog, S. C. (1987). Understanding psychographics in tourism research. *Understanding psychographics in tourism research.*, 203-213.
Plog, S. C. (2002). The power of psychographics and the concept of venturesomeness. *Journal of Travel Research, 40*(3), 244-251.
Polo Peña, A. I., Frías Jamilena, D. M., & Rodríguez Molina, M. Á. (2014). Value co-creation via information and communications technology. *The Service Industries Journal, 34*(13), 1043-1059.
Porter, M. E. (1980). Competitive strategy: Techniques for analyzing industries and competition. *New York, 300*.
Porter, M. E. (1998). *On competition / Michael E. Porter*: Boston, Mass. : Harvard Business School, 1998.
Poslad, S. (2011). *Ubiquitous computing: smart devices, environments and interactions*: John Wiley & Sons.

Prahalad, C. K., & Ramaswamy, V. (2004). Co‐creation experiences: The next practice in value creation. *Journal of Interactive Marketing, 18*(3), 5-14.
Prasad, B. D. (2008). Content analysis. *Research methods for social work, 5*, 1-20.
Pritchard, A., & Morgan, N. (2006). Hotel Babylon? Exploring hotels as liminal sites of transition and transgression. *Tourism Management, 27*(5), 762-772.
Pu, P., Chen, L., & Hu, R. (2011). *A user-centric evaluation framework for recommender systems*. Paper presented at the Proceedings of the fifth ACM conference on Recommender systems.
Quinlan, C. (2011). *Business research methods*. Hampshire: Hampshire : South-Western/Cengage Learning.
Ranjan, K., & Read, S. (2016). Value co-creation: concept and measurement. *Official Publication of the Academy of Marketing Science, 44*(3), 290-315. doi:10.1007/s11747-014-0397-2
Redmond, S., Lovell, N., Yang, G., Horsch, A., Lukowicz, P., Murrugarra, L., & Marschollek, M. (2014). What does big data mean for wearable sensor systems?: Contribution of the IMIA wearable sensors in healthcare WG. *Yearbook of medical informatics, 9*(1), 135.
Region, T. G. o. t. H. K. S. A. (2015). *Eligibility for the Right of Abode in the HKSAR*.
Reis, J. L. (2015). Conceptual model that contribute to the design, quality and performance of personalized systems. *Studies of Organisational Management & Sustainability, 3*(1), 14-28.
Resnik, D. B. (2018). *The Ethics of Research with Human Subjects: Protecting People, Advancing Science, Promoting Trust* (Vol. 74): Springer.
Ricci, F. (2011). *Recommender systems handbook. [electronic resource]*: New York : Springer, c2011.
Riemer, K., & Totz, C. (2001). The many faces of personalization–An integrative economic overview of mass customization and personalization. *Proceedings of the MCPC, 1*, 1-2.
Rigdon, E., Sarstedt, M., & Ringle, C. (2017). *On Comparing Results from CB-SEM and PLS-SEM: Five Perspectives and Five Recommendations* (Vol. 39).
Rigdon, E. E., Ringle, C. M., & Sarstedt, M. (2010). *Structural modeling of heterogeneous data with partial least squares* (Vol. 7): Emerald Group Publishing Limited.
Ringle, C. M., Sarstedt, M., & Straub, D. (2012). A critical look at the use of PLS-SEM in MIS Quarterly.
Roberts, N., & Thatcher, J. (2009). Conceptualizing and testing formative constructs: tutorial and annotated example. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 40*(3), 9-39. doi:10.1145/1592401.1592405
Roh, J.-H., & Jin, S. (2012). *Personalized advertisement recommendation system based on user profile in the smart phone*. Paper presented at the Advanced Communication Technology (ICACT), 2012 14th International Conference On.
Rong, J., Li, G., & Law, R. (2009). A contrast analysis of online hotel web service purchasers and browsers. *International Journal of Hospitality Management, 28*(3), 466-478. doi:10.1016/j.ijhm.2009.02.002
Rosenbaum, M. S., & Spears, D. L. (2005). Who buys that? Who does what? Analysis of cross-cultural consumption behaviours among tourists in Hawaii. *Journal of Vacation Marketing, 11*(3), 235-247.
Rossiter, J. R. (2002). The C-OAR-SE procedure for scale development in marketing. *International Journal of Research in Marketing, 19*(4), 305-335.

Rust, R. T., & Huang, M.-H. (2014). Handbook of service marketing research. In. Cheltenham: Edward Elgar Pub. Ltd.
Rust, R. T., & Lemon, K. N. (2001). E-service and the consumer. *International Journal of Electronic Commerce, 5*(3), 85-101.
Rust, R. T., & Thompson, D. V. (2006). How does marketing strategy change in a service-based world. *The service-dominant logic of marketing: Dialog, debate, and directions*, 381-392.
Ryan, C. (2004). Tourism is the Edge—An Essay in Margins and Liminalities. *Tourism Recreation Research, 29*(3), 61-67.
Ryan, C. (2015). Tourist experience and fulfillment: Insights from positive psychology. *Annals of Tourism Research*(52), 195-196.
Ryan, C., & Hall, C. M. (2001). *Sex tourism: Marginal people and liminalities*: Psychology Press.
Ryan, R. M., & Deci, E. L. (2017). Self-determination theory : basic psychological needs in motivation, development, and wellness. In. New York, NY: The Guilford Press.
Ryan, R. M., Deci, E. L., & Vansteenkiste, M. (2016). Autonomy and Autonomy Disturbances in Self‐Development and Psychopathology: Research on Motivation, Attachment, and Clinical Process. *Developmental psychopathology*.
Sacchetti, S., & Tortia, E. C. (2013). Satisfaction with Creativity: A Study of Organizational Characteristics and Individual Motivation. *Journal of Happiness Studies, 14*(6), 1789-1811. doi:10.1007/s10902-012-9410-y
Salmons, J. (2009). *Online interviews in real time*: Sage.
Salmons, J. (2014). *Qualitative online interviews : strategies, design, and skills / Janet Salmons*: Los Angeles : SAGE, 2014. Second edition.
Salonen, V., & Karjaluoto, H. (2016). Web personalization: The state of the art and future avenues for research and practice. *Telematics and Informatics, 33*(4), 1088-1104. doi:10.1016/j.tele.2016.03.004
Santos, J. (2003). E-service quality: a model of virtual service quality dimensions. *Managing Service Quality: An International Journal, 13*(3), 233-246.
Sarstedt, M., Diamantopoulos, A., Salzberger, T., & Baumgartner, P. (2016). Selecting single items to measure doubly concrete constructs: A cautionary tale. *Journal of Business Research, 69*(8), 3159-3167.
Sarstedt, M., Hair, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal (AMJ), 27*(3), 197-211. doi:https://doi.org/10.1016/j.ausmj.2019.05.003
Sarstedt, M., Henseler, J., & Ringle, C. M. (2011). Multigroup analysis in partial least squares (PLS) path modeling: Alternative methods and empirical results. In *Measurement and research methods in international marketing* (pp. 195-218): Emerald Group Publishing Limited.
Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial least squares structural equation modeling. In *Handbook of market research* (pp. 1-40): Springer.
Sarstedt, M., & Wilczynski, P. (2009). More for less? A comparison of single-item and multi-item measures. *Die Betriebswirtschaft, 69*(2), 211.
Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methods for business students. In (Sixth edition. ed.). Harlow, England ; New York: Pearson.
Schiffman Leon, G., & Wisenblit, J. (2015). Consumer behavior. In (Global ed., 11th ed.). Harlow: Pearson Education.

Schiller, M. (2015). Paradigmatic pragmatism and the politics of diversity. *Ethnic and Racial Studies, 38*(7), 1120-1136. doi:10.1080/01419870.2014.992925
Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017). Design and Evaluation of a Short Version of the User Experience Questionnaire (UEQ-S). *IJIMAI, 4*(6), 103-108.
Schultz, D. P., & Schultz, S. E. (2016). *Theories of personality*: Cengage Learning.
Schwartz, B. (2004). *The paradox of choice: Why more is less* (Vol. 6): HarperCollins New York.
Sedera, D., & Gable, G. G. (2004). *A factor and structural equation analysis of the enterprise systems success measurement model*.
Serio, L., Tedeschi, P., & Ursino, G. (2016). Making Sense of (Ultra) Low-Cost Flights Vertical Differentiation in Two-Sided Markets. *Management Science, 64*(1), 401-420.
Shen, A., & Ball, A. D. (2009). Is personalization of services always a good thing? Exploring the role of technology-mediated personalization (TMP) in service relationships. *Journal of Services Marketing, 23*(2), 79-91. doi:10.1108/08876040910946341
Shen, J., Deng, C., & Gao, X. (2016). Attraction recommendation: Towards personalized tourism via collective intelligence. *Neurocomputing, 173*(Part 3), 789-798. doi:10.1016/j.neucom.2015.08.030
Shmueli, G., Ray, S., Estrada, J. M. V., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research, 69*(10), 4552-4564.
Shostack, G. (1977). BREAKING FREE FROM PRODUCT MARKETING. *Journal of Marketing, 41*(2), 73. doi:10.2307/1250637
Sigala, M. (2009). E-service quality and Web 2.0: expanding quality models to include customer participation and inter-customer support. *The Service Industries Journal, 29*(10), 1341-1358. doi:10.1080/02642060903026239
Sigala, M. (2012). *Mass Customisation Models for Travel and Tourism Information e-Services*.
Silcock, D. (2015). Marketing Pragmatism: a Constructive Review of Pragmatic Philosophy and Implications For Consumer Research. *Advances in Consumer Research, 43*, 212.
Silverman, D. (2011). *Qualitative research : issues of theory, method and practice / edited by David Silverman*: Los Angeles, [Calif.] ; London : SAGE, 2011. 3rd ed.
Sirgy, M. J., Prebensen, N., Chen, J., & Uysal, M. (2014). Revisiting self-congruity theory in travel and tourism. *Creating Experience Value in Tourism, 63*.
Skålén, P., & Edvardsson, B. (2016). Transforming from the goods to the service-dominant logic. *Marketing Theory, 16*(1), 101-121. doi:10.1177/1470593115596061
Skift. (2018). The Personalization Dilemma in Travel. Retrieved from https://skift.com/stf-magazine/
Skift. (2019). *Megatrends Definig Travel in 2019*. Retrieved from
Skillen, K., Liming Chen, C. D., Nugent, M. P., Donnelly, I., & Solheim, I. (2012). A user profile ontology based approach for assisting people with dementia in mobile environments. In (pp. 6390-6393).
Smallman, C., & Moore, K. (2010). PROCESS STUDIES OF TOURISTS' DECISION-MAKING. *Annals of Tourism Research, 37*(2), 397-422. doi:10.1016/j.annals.2009.10.014
Smith, A. M. (2013). The value co-destruction process: a customer resource perspective. *European Journal of Marketing, 47*(11/12), 1889-1909.

Smith, J. B., & Colgate, M. (2007). Customer Value Creation: A Practical Framework. *The Journal of Marketing Theory and Practice, 15*(1), 7-23. doi:10.2753/MTP1069-6679150101
Smith, P. (2009). Survey research: two types of knowledge. *International Journal of Market Research, 51*(6), 719-721.
Söderlund, M. (2002). Customer familiarity and its effects on satisfaction and behavioral intentions. *Psychology & Marketing, 19*(10), 861-879.
Solomon, M. R. (2015). *Consumer behavior [electronic resource] : buying, having, and being / Michael R. Solomon*: Harlow, Essex, England : Pearson, [2015] Eleventh edition.
Song, H. (2009). *Tourism satisfaction index for Hong Kong*.
Song, H., Li, G., van der Veen, R., & Chen, J. L. (2011). Assessing mainland Chinese tourists' satisfaction with Hong Kong using tourist satisfaction index. *International Journal of Tourism Research, 13*(1), 82-96.
Spohrer, J., Vargo, S. L., Caswell, N., & Maglio, P. P. (2008). *The service system is the basic abstraction of service science*. Paper presented at the Hawaii international conference on system sciences, proceedings of the 41st annual.
Stacie, P., DeLone, W. H., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems, 17*(3), 236-263.
Stewart, D. (2009). The role of method: some parting thoughts from a departing editor. *Academy of Marketing Science. Journal, 37*(4), 381-383. doi:10.1007/s11747-009-0156-y
Stewart, D. W. (2017). Online focus groups. *Journal of advertising : official publication of the American Academy of Advertising, 46*(1), 48-60. doi:10.1080/00913367.2016.1252288
Stewart, D. W., & Shamdasani, P. N. (2014). *Focus groups: Theory and practice* (Vol. 20): Sage publications.
Stokburger-Sauer, N. E. (2011). The relevance of visitors' nation brand embeddedness and personality congruence for nation brand identification, visit intentions and advocacy. *Tourism Management, 32*(6), 1282-1289.
Strauss, J., & Frost, R. (2012). *E-marketing / Judy Strauss, Raymond Frost*: London : Pearson, c2012. 6th ed., International ed.
Sun, S., Fong, D. K. C., Law, R., & He, S. (2017). An updated comprehensive review of website evaluation studies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 29*(1), 355-373.
Sun, S., Law, R., Luk, C., & Fong, L. H. N. (2017). Channels for Searching Hotel and Travel Information. In *Information and Communication Technologies in Tourism 2017* (pp. 445-458): Springer.
Sun, X., May, A., & Wang, Q. (2016). The impact of user- and system-initiated personalization on the user experience at large sports events. *Applied Ergonomics, 54*, 1.
Sunikka, A., & Bragge, J. (2008). *What, who and where: insights into personalization.* Paper presented at the Hawaii International Conference on System Sciences, Proceedings of the 41st Annual.
Sutanto, J., Palme, E., Tan, C.-H., & Phang, C. W. (2013). Addressing the Personalization-Privacy Paradox: An Empirical Assessment from a Field Experiment on Smartphone Users. *Mis Quarterly, 37*(4), 1141-1164.
Sutton, J. (1986). Vertical product differentiation: some basic themes. *The American Economic Review, 76*(2), 393-398.

Swarbrooke, J., & Horner, S. (2007). *Consumer behaviour in tourism* (2nd ed.). Oxford: Butterworth-Heinemann.
Talisse, R. B. (2011). *Pragmatism Reader From Peirce through the Present*. New Jersey: New Jersey : Princeton University Press.
Tan, E. M. Y., & Goh, D. H. L. (2015). A study of social interaction during mobile information seeking. *Journal of the Association for Information Science and Technology, 66*(10), 2031-2044. doi:10.1002/asi.23310
Tan, G. W.-H., Voon Hsien, L., Binshan, L., & Keng-Boon, O. (2017). Mobile applications in tourism: the future of the tourism industry? *Industrial Management & Data Systems, 117*(3).
Tan, W.-K., & Tang, C.-Y. (2013). Does personality predict tourism information search and feedback behaviour? *Current issues in tourism, 16*(4), 388-406.
Teas, R. K. (1993). Consumer Expectations and the Measurement of Perceived Service Quality. *Journal of Professional Services Marketing, 8*(2), 33-54. doi:10.1300/J090v08n02_05
Teddlie, C. (2009). *Foundations of mixed methods research : integrating quantitative and qualitative approaches in the social and behavioral sciences*. Los Angeles: Los Angeles : SAGE.
Telang, R., Rajan, U., & Mukhopadhyay, T. (2004). The market structure for Internet search engines. *Journal of Management Information Systems, 21*(2), 137-160.
Toepoel, V. (2015). *Doing surveys online*: Sage.
Tossell, C. C., Kortum, P., Shepard, C., Rahmati, A., & Zhong, L. (2012). An empirical analysis of smartphone personalisation: measurement and user variability. *Behaviour & Information Technology, 31*(10), 995-1010.
Tribe, J., & Snaith, T. (1998). From SERVQUAL to HOLSAT: holiday satisfaction in Varadero, Cuba. *Tourism Management, 19*(1), 25-34.
Tronvoll, B. (2012). A dynamic model of customer complaining behaviour from the perspective of service-dominant logic. *European Journal of Marketing, 46*(1/2), 284-305.
Tseng, M. M., & Hu, S. J. (2014). Mass customization. In *CIRP encyclopedia of production engineering* (pp. 836-843): Springer.
Tsiotsou, R. H., & Wirtz, J. (2015). The three-stage model of service consumption. *Handbook of Service Business-Management, Marketing, Innovation and Internationalisation*, 464.
Tung, V. W. S., & Law, R. (2017). The potential for tourism and hospitality experience research in human-robot interactions. *International Journal of Contemporary Hospitality Management, 29*(10), 2498-2513.
Turner, V. (1974). Liminal to liminoid, in play, flow, and ritual: an essay in comparative symbology. *Rice Institute Pamphlet-Rice University Studies, 60*(3).
Tussyadiah, I. P. (2014). Toward a Theoretical Foundation for Experience Design in Tourism. *Journal of Travel Research, 53*(5), 543-564. doi:10.1177/0047287513513172
Tuttas, C. A. (2015). Lessons Learned Using Web Conference Technology for Online Focus Group Interviews. *Qualitative Health Research, 25*(1), 122-133. doi:10.1177/1049732314549602
Um, S., Chon, K., & Ro, Y. (2006). Antecedents of revisit intention. *Annals of Tourism Research, 33*(4), 1141-1158. doi:10.1016/j.annals.2006.06.003
UN. (2018). Geographic Regions. Retrieved from https://unstats.un.org/unsd/methodology/m49/

UNWTO. (2017). *Hong Kong, China: Country-specific: Outbound tourism 2012 - 2016 (09.2017)* Retrieved from https://www-e-unwto-org.ezproxy.lb.polyu.edu.hk/doi/abs/10.5555/unwtotfb03442501201220162017 09
Usakli, A., & Baloglu, S. (2011). Brand personality of tourist destinations: An application of self-congruity theory. *Tourism Management, 32*(1), 114-127.
Vallet Weadon, D. J., Mylonas, P., Corella, M. Á., Fuentes, J. M., Castells, P., & Avrithis, Y. (2005). A semantically-enhanced personalization framework for knowledge-driven media services.
Vankalo, M. (2004). Internet-enabled techniques for personalizing the marketing program. *Helsinki, Finland: Swedish School of Economics and Business Administration*.
Vargo, S. L., & Akaka, M. A. (2009). Service-dominant logic as a foundation for service science: clarifications. *Service Science, 1*(1), 32-41.
Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing, 68*(1), 1-17.
Vargo, S. L., & Lusch, R. F. (2008a). From goods to service (s): Divergences and convergences of logics. *Industrial Marketing Management, 37*(3), 254-259.
Vargo, S. L., & Lusch, R. F. (2008b). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science, 36*(1), 1-10.
Vargo, S. L., & Lusch, R. F. (2011). It's all B2B… and beyond: Toward a systems perspective of the market. *Industrial Marketing Management, 40*(2), 181-187.
Vargo, S. L., & Lusch, R. F. (2013). Service-Dominant Logic: Prologue And Prospects. *Die Betriebswirtschaft, 73*(2), 91-93.
Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science, 44*(1), 5-23.
Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing, 34*(1), 46-67. doi:10.1016/j.ijresmar.2016.11.001
Varian, H. R. (2004). Microeconomic analysis. 1992. *3rd. ed. ed. New York, London: WW Norton & Company*.
Vatovec. (2008). Modelling Personalization. In: LinkedIn Corporation.
Vega-Vazquez, M., Revilla-Camacho, M. Á., & Cossío-Silva, F., J. (2013). The value co-creation process as a determinant of customer satisfaction. *Management Decision, 51*(10), 1945-1953. doi:10.1108/MD-04-2013-0227
Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision sciences, 39*(2), 273-315.
Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.
Vesanen, J. (2007). What is personalization? A conceptual framework. *European Journal of Marketing, 41*(5/6), 409-418.
Vogt, C. A., & Fesenmaier, D. R. (1998). Expanding the functional information search model. *Annals of Tourism Research, 25*(3), 551-578.
Von Der Pütten, A., Krämer, N., & Gratch, J. (2010). Proceedings of the 10th international conference on intelligent virtual agents (IVA'10). In (pp. 208-221): Springer-Verlag Berlin, Heidelberg.
Voss, G. B., Parasuraman, A., & Grewal, D. (1998). The roles of price, performance, and expectations in determining satisfaction in service exchanges. *The Journal of Marketing*, 46-61.

Wacker, J. G. (2008). A CONCEPTUAL UNDERSTANDING OF REQUIREMENTS FOR THEORY‐BUILDING RESEARCH: GUIDELINES FOR SCIENTIFIC THEORY BUILDING *. *Journal of Supply Chain Management, 44*(3), 5-15. doi:10.1111/j.1745-493X.2008.00062.x

Wallin Andreassen, T., & Lindestad, B. (1998). Customer loyalty and complex services: The impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise. *INTERNATIONAL JOURNAL OF SERVICE INDUSTRY MANAGEMENT, 9*(1), 7-23.

Wang, D. (2016). Smartphone use in everyday life and travel. *JOURNAL OF TRAVEL RESEARCH, 55*(1), 52-63. doi:10.1177/0047287514535847

Wang, D., Fesenmaier, D. R., & Park, S. (2012). The Role of Smartphones in Mediating the Touristic Experience. *Journal of Travel Research, 51*(4), 371-387. doi:10.1177/0047287511426341

Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research, 48*, 11-26. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=97844431&site=eds-live&scope=site

Wang, H.-Y., & Wang, S.-H. (2010). Predicting mobile hotel reservation adoption: Insight from a perceived value standpoint. *International Journal of Hospitality Management, 29*(4), 598-608. doi:10.1016/j.ijhm.2009.11.001

Wang, R. Y., & Strong, D. M. (1996). Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems, 12*(4), 5-33.

Wang, Y.-S., & Liao, Y.-W. (2007). The conceptualization and measurement of m-commerce user satisfaction. *Computers in Human Behavior, 23*(1), 381-398. doi:10.1016/j.chb.2004.10.017

Watkins, D. (2015). *Mixed methods research*. New York: New York : Oxford University Press.

Wattal, S., Telang, R., & Mukhopadhyay, T. (2009). Information Personalization in a Two-Dimensional Product Differentiation Model. *Journal of Management Information Systems, 26*(2), 69-95.

Wauthy, X. (1996). Quality choice in models of vertical differentiation. *The Journal of Industrial Economics*, 345-353.

Wieland, H., Polese, F., Vargo, S. L., & Lusch, R. F. (2012). Toward a service (eco) systems perspective on value creation. *Wieland, H., Polese, F., Vargo, S., Lusch*, 12-24.

Wikipedia. (2017). Websites blocked in mainland China. Retrieved from https://en.wikipedia.org/wiki/Websites_blocked_in_mainland_China

Wilcox, J. B., Howell, R. D., & Breivik, E. (2008). Questions about formative measurement. *Journal of Business Research, 61*(12), 1219-1228. doi:10.1016/j.jbusres.2008.01.010

Wilson, B., & Henseler, J. (2007). Modeling reflective higher-order constructs using three approaches with PLS path modeling: a Monte Carlo comparison.

Wiredu, G. O. (2014). Mobile computer usability : an organizational personality perspective. In. Heidelberg: Springer.

Wirtz, J., & Bateson, J. E. (1999). Introducing uncertain performance expectations in satisfaction models for services. *INTERNATIONAL JOURNAL OF SERVICE INDUSTRY MANAGEMENT, 10*(1), 82-99.

Wisker, G. (2007). *The postgraduate research handbook: Succeed with your MA, MPhil, EdD and PhD*: Macmillan International Higher Education.

World Economic Forum. (2019). *Globalization 4.0Shaping a New Global Architecture in the Age of the Fourth Industrial Revolution*. Retrieved from www.weforum.org
WTO, U. (2017). Outbound Tourism: Departures 1995 - 2016. Retrieved from https://www.e-unwto.org/doi/suppl/10.5555/unwtotfb0000290019952016201709
Wu, D., Im, I., Tremaine, M., Instone, K., & Turoff, M. (2003). *A framework for classifying personalization scheme used on e-commerce websites.* Paper presented at the System Sciences, 2003. Proceedings of the 36th Annual Hawaii International Conference on.
Wu, Y.-L., Tao, Y.-H., & Chang, C.-J. (2017). A comparative review on privacy concerns and safety demands of closed-circuit television among Taiwan, Japan, and the United Kingdom. *Journal of Information and Optimization Sciences, 38*(1), 173-196.
Xia, W., & Zhang, A. (2016). High-speed rail and air transport competition and cooperation: A vertical differentiation approach. *Transportation Research Part B: Methodological, 94*, 456-481.
Xiang, Z., Magnini, V. P., & Fesenmaier, D. R. (2015). Information technology and consumer behavior in travel and tourism: Insights from travel planning using the internet. *Journal of Retailing and Consumer Services, 22*, 244-249.
Xiang, Z., Wang, D., O'Leary, J. T., & Fesenmaier, D. R. (2015). Adapting to the Internet: Trends in Travelers' Use of the Web for Trip Planning. *Journal of Travel Research, 54*(4), 511-527. doi:10.1177/0047287514522883
Xiong, Z., Dixit, V. V., & Waller, S. T. (2015). *Privacy in the Era of Mobile Sensors: A Case Study on the Data Collection in ADAS and Autonomous Vehicles.* Paper presented at the Australasian Transport Research Forum (ATRF), 37th, 2015, Sydney, New South Wales, Australia.
Yang, Z. (2001). *Consumer perceptions of service quality in Internet-based electronic commerce.* Paper presented at the Proceedings of the EMAC Conference.
Yang, Z., Cai, S., Zhou, Z., & Zhou, N. (2005). Development and validation of an instrument to measure user perceived service quality of information presenting Web portals. *Information & Management, 42*(4), 575-589.
Yen, H. R. (2005). An attribute-based model of quality satisfaction for internet self-service technology. *The Service Industries Journal, 25*(5), 641-659.
Yi, Y. (1993). The determinants of consumer satisfaction: the moderating role of ambiguity. *ACR North American Advances*.
Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research, 66*(9), 1279-1284. doi:10.1016/j.jbusres.2012.02.026
Yoon, G., & Vargas, P. T. (2014). Know thy avatar: The unintended effect of virtual-self representation on behavior. *Psychological science, 25*(4), 1043-1045.
Yovcheva, Z. (2015). User-centred design of smartphone augmented reality in urban tourism context. In: Bournemouth University.
Zarezadeh, Z., Benckendorff, P., & Gretzel, U. (2018). Lack of progress in tourist information search research: a critique of citation behaviour and knowledge development. *Current Issues in Tourism*, 1-15. doi:10.1080/13683500.2018.1459511
Zeithaml, V. A. (1981). HOW CDNSUPER EVALUATION PROCESSES DlFfER BETWEEN GOODS AND SERVECES.
Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*: Cengage Learning.

Zins, A. H., Gretzel, U., Hwang, Y., & Fesenmaier, D. R. (2012). Informing destination recommender systems design and evaluation through quantitative research. *International journal of culture, tourism and hospitality research, 6*(4), 297-315. doi:10.1108/17506181211265040

Appendixes

Appendix 3.1. Information Sheet and Informed Consent Form

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

INFORMATION SHEET

SATISFACTION WITH PERSONALISED INFORMATION SERVICE

Dear _____,

You are invited to participate in a study on satisfaction with personalised information service in tourism, conducted by the School of Hotel and Tourism Management in The Hong Kong Polytechnic University. The aim of this study is to explain how personalized information service influences tourist satisfaction. We believe that your expertise in the field of technology-enabled experience in tourism will help to fulfil the research objectives. We also hope that you might contribute from a conversation with other experts from the industry and academia.

The study will involve an individual interview that is expected to last 45-60 minutes. You will be invited to meet the co-investigator either personally or online to discuss the stated topic. The interview will include questions pertaining quality of personalized information services, such as personalized mobile guides, online travel agencies, etc., and tourists experience with them. This information will help to understand the optimum ways to evaluate personalized information services, and to increase user satisfaction with them.

The interview should not result in any undue discomfort. The interview will neither include personal questions, nor information about the business you work in. All information related to you and your employer will remain confidential at the publishing stage.
You have the right not to reply to any question, and to withdraw from the study before or during the interview without explaining the reason.

The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20180228003).

If you would like to obtain more information about this study, access and correct the supplied data, or receive the results of the study, please contact Ms Ekaterina Volchek: tel. no.: (852) 3400-2330/ email: Katerina.volchek@).

If you have any complaints about the conduct of this research study, please do not hesitate to contact Miss Cherrie Mok, Secretary of the Human Subjects Ethics Sub-Committee of the Hong Kong Polytechnic University in writing (c/o Research Office of the University) stating clearly the responsible person and department of this study as well as the HSESC Reference Number.

Thank you for your interest in participating in this study.

Professor Haiyan Song,
Principal Investigator

Ms Ekaterina Volchek,
Co-investigator

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374

Email 電郵 polyu@polyu.edu.hk

Website 網址 www.polyu.edu.hk

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

INFORMED CONSENT TO PARTICIPATE IN FOCUS GROUP INTERVIEW FOR THE RESEARCH

SATISFACTION WITH PERSONALISED INFORMATION SERVICE IN TOURISM

I _____ hereby consent to contribute to the captioned research, conducted by Ms Ekaterina Volchek, by participating in the focus group interview.

I understand that information obtained from this research will be used in academic research and published.

I agree to name myself and the area of my expertise. However, my right to privacy will be retained, i.e. my personal details, and the name of the employer will not be revealed in the results of study.

I acknowledge that the procedure as set out in the attached information sheet has been fully explained.

I am aware that the interview will be video- and audio-recorded.

I am aware that there are no personal, business, or other risks involved. I understand the benefit I may acquire.

My participation in the project is voluntary.

I am aware that I have the right to question any part of the procedure, to refuse to reply to any question, and can withdraw at any time without explanation and penalty of any kind.

Name of participant _____

Signature of participant _____

Name of researcher Ms Ekaterina Volchek

Signature of researcher _____

Approval Date _____

Expiration Date _____

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374

Email 電郵 polyu@polyu.edu.hk

Website 網址 www.polyu.edu.hk

THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

INFORMED CONSENT TO PARTICIPATE IN ONLINE SURVEY FOR THE RESEARCH

SATISFACTION WITH PERSONALISED INFORMATION SERVICE IN TOURISM

You are invited to participate in a study on tourist satisfaction with Google Trips travel planner application. The study is conducted by the School of Hotel and Tourism Management at The Hong Kong Polytechnic University. The information obtained from this research will be used in academic research and published.

The aim of this study is to access personalised tourism service by analysing tourist satisfaction.

The survey is expected to take 15-20 minutes.

The survey will not include any personal questions. Your answers will be used solely for the purpose of this study and will not be revealed to any third parties. There are no personal, business, or other risks involved.

Your participation in this study should be voluntary. You have the right to question any part of the procedure, to refuse to reply to any question, and can withdraw at any time without explanation and penalty of any kind

By pressing 'Continue>>' you acknowledge that the procedure as set out above is clear to you and you agree to participate in this study

Please press Continue >> if you would like to proceed. If not, please close the browser.

/Continue>>/

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374

Email 電郵 polyu@polyu.edu.hk

Website 網址 www.polyu.edu.hk

Appendix 3.2. Review of the Construct Specifications and Measurement Scales

INFORMATION PERFORMANCE

Construct	Definition	Attribute	Meaning	Survey question	Author
Content quality	'the inherent value and usefulness of the information provided by the mobile service'	Objectivity	Value of info (intrinsic quality)	The information this content provides is objective	(Chae et al., 2002): Model of Information Quality for the Mobile Internet
		Believability	Value of info (intrinsic quality)	The information this content provides is understandable	
		Amount	Relevancy to the task (amount of information and completeness) contextual quality	• The amount of information is enough The information is incomplete	
Information quality	Information quality represents measures of information systems output. output.	accuracy	agreement with an attribute about a real world entity, a value stored in another database, or the result of an arithmetic computation	n/a	(Pitt et al., 1995): Information Systems Effectiveness
		precision	An absence of conflict between two datasets	n/a	
		currency	up-to-date information	n/a	
		timeliness	n/a	n/a	
		reliability of information provided	n/a	n/a	
HOC: Information Quality					(Gorla et al., 2010): Information quality
Information content	measures the relevance of the information presented to the user in the report/ inquiry screens and the accuracy and completeness of the information. .	accuracy	agreement with an attribute about a real-world entity, a value stored in another database, or the result of an arithmetic computation	Our information outputs (including on-screen and printed outputs) are accurate	
		complete	some specific application, and it refers to whether all of the data relevant to that application are present	Our information outputs (including on-screen and printed outputs) are complete	
		Concise	No definition. Translation: giving a lot of information clearly and in a few words; brief but comprehensive.	Our information outputs (including on-screen and printed outputs) are concise	

		Useful in our daily jobs	Information usefulness	Our information outputs (including on-screen and printed outputs) are Useful in our daily jobs	
		Relevant for decision making	Information Relevance	Our information outputs (including on-screen and printed outputs) are Relevant for decision making	
Information format	measures the style of presentation of information and whether information is provided in an easy-to-understand format	Comparable to other outputs	absence of conflict between two datasets, currency refers to up-to-date information	Information is consistent	
		Easily to understand	Easily to understand	Information is easy to understand	
Format for information quality	n/a	accuracy		n/a	Nelson et al. (2005): Information Quality
	n/a	completeness		n/a	
	n/a	currency		n/a	
Presentation layout of information outputs	n/a	Layout		n/a	
Information quality (semantic level)	the desirable characteristics of the system outputs; i.e., management reports and Web pages.	Accuracy	agreement with an attribute about a real world entity, a value stored in another database, or the result of an arithmetic computation	n/a	DeLone and McLean (2003) (Delone & McLean, 2016) (Petter et al., 2013) Information Service Success Model
		Completeness	some specific application, and it refers to whether all of the data relevant to that application are present	n/a	
		Consistency	An absence of conflict between two datasets	n/a	
		Currency	up-to-date information	n/a	
		Conciseness	n/a	n/a	
		Understandability	n/a	n/a	
		Relevance	n/a	n/a	
		Completeness	n/a	n/a	
		Usability	n/a	n/a	
		Timelessness	n/a	n/a	
HOC: Service Quality					(Kuo et al., 2009) Mobile value-added services
Content quality	Quality of the website information	n/a	n/a	This value-added service provides complete content	

				This value-added service provides appropriate content This value-added service provides important content This value-added service provides fashionable content This value-added service provides regularly updated content I can fully understand the content provided	
HOC: Recommendation quality	The quality of the suggested items	Recommendation accuracy	the degree to which users feel the recommendations match their interests and preferences.	The items recommended to me matched my interests.	(Pu et al., 2011) Recommender Systems
		Recommendation Novelty	the extent to which users receive new and interesting recommendations.	The items recommended to me are novel The recommender system helped me discover new products	
		Attractiveness	whether or not the recommended items are capable of stimulating users' imagination and evoking a positive emotion of interest or desire	n/a	
		Recommendation Diversity	the diversity level of items in the recommendation list.	The items recommended to me are diverse	
		Context compatibility	whether or not the recommendations consider general or personal context requirements.	n/a	
HOC: Information quality					(Yang et al., 2005) Information presenting Web portals
Usefulness of content	users' perception of the quality of information presented on a Web site	value	information value is concerned with r**elevancy and clearness**	Relevant information to the customer	
		reliability	Information r**eliability** refers to its accuracy, dependability, and consistency	Up-to-date information	
		currency	Information **currency** is	Valuable tips on products/services	

			concerned with information timeliness and continuous update		
		accuracy of information	Information **accurac**y describes the degree to which the system information is free of error	Unique content	
Adequacy of information.	the extent of completeness of information	Comprehensiveness	information that facilitates user understanding of the products and system decision making	Information comprehensiveness relative to other portals	
		Completeness		Complete content	
		Sufficiency		Sufficiency of information	
		Exhaustiveness		Detailed contact information	
		Description		Complete product/service description	
HOC: Perceived Benefits			n/a	n/a	**(Wang & Wang, 2010)** Mobile hotel reservation system
Information quality	the quality of content that the system presents	Completeness Details Relevance Reliability Selection Comparison	n/a	I think MHR provides complete information. I think MHR provides detailed information. I think MHR provides timely information. I think MHR provides reliable information. I think MHR provides selective information for purchase. I think MHR provides comparative information between hotel accommodations.	
Personalised content recommendation	Recommendation accuracy	n/a	Find the wanted Filter out unwanted Capture the right category	whether the system finds the news that the user wants to view, whether the system filters out the news that the user does not want, whether the system captures the right category (the one that is of interest to the user).	(Liang et al., 2006) Personalized Content Recommendation

INTERACTIONAL PROCESSES PERFORMANCE

Construct	Definition	Attribute	Meaning	Survey question	Author
Interactions quality	Capability of mobile Internet services to provide easy and efficient methods of interaction	Structure	structure of information should be self-descriptive indicating where the specific information is located so that visitors may **easily find it**	The menus of this content site are clearly categorized I can easily recognize where the information I need is located	(Chae et al., 2002): Model of Information Quality for the Mobile Internet (Huang, Lee, & Wang, 1998)
		Navigation	Guide the customers through the information space without making them lose track of where they are relative to other locations	I can easily move back to the page I previously visited. While I was on the site, I was able to aware where I was	
		Presentation	should be presented on the screen so as to be clearly understandable to the users.	The information this content provides is consistently represented The screen design of the content is harmonious	
Contextual Quality	customers must be able to use the information anytime and anywhere with little effort in getting access to it	Timeliness	customers can gain unrestricted access to information regardless of time and place,	I can access to this content whenever I need I can access to this content wherever I need	
		Promptness	the process of accessing the information is straightforward	This content automatically recognizes me The input process is quite simple to use this content	
Connection Quality	customers can confidently access the mobile service without interruption of connection so that they can focus on their original tasks in a stable environment	Stability	perceived stability of mobile Internet services	This mobile internet content system is stable to use This mobile internet content system has few errors	
		Responsiveness	responsiveness of mobile Internet services	Downloading time is speedy enough This mobile internet content system quickly responses for my input or clicks	
Interface Adequacy		Information sufficiency	the system's ability to display price, quantity, the image, user reviews, or any other information of an item to help users with making a decision.	The information provided for the recommended items is sufficient for me to make a purchase/download decision.	(Pu et al., 2011)
		Interface label adequacy		The labels of the recommender interface are clear. The labels of the recommender interface are adequate.	
		Layout adequacy		The layout of the recommender interface is attractive.	

				The layout of the recommender interface is adequate.	
		Clarity of explanation	system's ability to explain why items are suggested to the active user.	The recommender explains why the products are recommended to me.	
Customer Satisfaction	As a proxy for IS success				(Wang & Liao, 2007) m-commerce user satisfaction
Content quality	'content quality dimension is similar to information quality'	Usefulness Currency Conciseness Clearness Stability Speed Accuracy Validity Availability Meets the needs	n/a	The content of the mobile web site is useful The content of the mobile web site is current The content of the mobile web site is concise The content of the mobile web site is clear The operation of the mobile web site is stable Web pages load fast in the mobile web site The content of the mobile web site is accurate The mobile web site has valid links The mobile web site is always up and available The mobile web site provides information content that exactly fits your needs	
Appearance	'content quality dimension is similar to information quality'	Quality of: Colours Fonts Media type Layout Organisation User-friendliness	n/a	The mobile web site uses colors properly The mobile web site uses fonts properly The mobile web site uses multimedia features properly The layout of the mobile web site is appropriate The mobile web site looks organized The mobile web site is user-friendly	
HOC: Perceived Benefits				n/a	**(Wang & Wang, 2010)** Mobile hotel reservation system
System quality	degree to which using MHR appears to have met customers' needs	instant connection transactions	n/a	I think MHR could be connected instantly.	
		web fast response		I think MHR provides fast response and transaction processing	
		good functionality		I think MHR provides a good functionality relevant to hotel choices	
		error-free		I think MHR provides error-free transactions.	
		appropriate hypermedia presentation		I think MHR provides an appropriate video-audio presentation.	
HOC: Perceived Sacrifice					
Technological effort	the degree to which an individual believes that using MHR	n/a	n/a	I think finding what I want via MHR is difficult. I think becoming skilful at using MHR is difficult. It is difficult to use MHR.	

	would expend physical and mental effort				
Perceived Risk	certain types of financial, product performance, psychological, physical, security and privacy risks when customers make booking transactions over wireless Internet through MHR	n/a	n/a	27. PR2: I think using MHR could not instill confidence in users and reduce uncertainty. 28. PR3: I think using MHR could not keep personal sensitive information from exposure. 29. PR4: I think using MHR puts my privacy at risk. 30. PR5: Comparing with other methods, using MHR has more uncertainties.	
User Interface	Satisfaction with IS	Ease of use Friendliness Proper format Clear presentation	n/a	whether the system is easy to use, whether the system is friendly, whether the interface is properly formatted, and whether the presentation is clear.	(Liang et al., 2006) Personalized Content Recommendation
HOC: System quality	the quality of the information system processing itself, which includes software and data components, and it is a measure of the extent to which the system is technically sound				(Gorla et al., 2010) Organisational Impact
Flexibility	high maintainability and many useful system features	easy to learn	n/a	n/a	n/a
		Equipped only with useful features and functions	n/a	n/a	
		Flexible to make changes easily	n/a	n/a	
System sophistication	one that uses modern technology and	applied modern technology	n/a	n/a	
		Well integrated	n/a	n/a	

	provides user-friendly interfaces	User-friendly	n/a	n/a	
		Good documentation	n/a	n/a	
		Short response time for on-line enquiry	n/a	n/a	
		Short time lag between data input and output for batch Processing	n/a	n/a	
System quality	measures the desired characteristics of an e-commerce system.	Usability	n/a	n/a	(Delone & McLean, 2004) (DeLone and McLean, 2003) (Delone & McLean, 2016) (Petter et al., 2013)
		availability	n/a	n/a	
		reliability	n/a	n/a	
		adaptability	n/a	n/a	
		response time	n/a	n/a	
		data quality	n/a	n/a	
		integration	n/a	n/a	
HOC: System Quality					(Palmer, 2002) Web Site Usability, Design, and Performance Metrics
Download Delay	Speed of Response	Initial Access Speed	n/a	The speed in which the computer provided information was Fast Enough - Too slow	
		Speed of Display Between Pages	n/a	The rate at which the information was displayed was Fast Enough - Too slow	
Navigation/ Organization	Part of usability concept	Arrangement	n/a	I find it easy to get this Web site to do what I want it to do.	
		Sequence	n/a	The sequence of obtaining information was Confusing --Clear	
		Layout	n/a	The layout of pages made tasks easier Never – Always	
		Organization	n/a	The information on succeeding links from the initial page was Predictable – Unpredictable	
Interactivity	Part of usability concept	Customization	n/a	Offers customization	
		Interactivity	n/a	Provides significant user interaction	
System quality	Desirable characteristics of an IS	Ease of use	n/a	n/a	(Petter et al., 2008) (Sedera & Gable, 2004) (Petter et al., 2013) Information System Success
		Ease of learning	n/a	n/a	
		User requirements	n/a	n/a	
		System features	n/a	n/a	
		System accuracy	n/a	n/a	
		Flexibility	n/a	n/a	

		Sophisticatio n	n/a	n/a	
		Integration	n/a	n/a	
		Customizati on	n/a	n/a	
HOC: Service quality	difference between customers' expectation and their perceived performance of a service				(Kuo et al., 2009) Mobile value-added services
Navigation and visual design	n/a	n/a	n/a	I can easily use the value-added service This value-added service is displayed in a harmonious way I can clearly understand the position of the screen I am currently browsing in the navigation layout The homepage of this value-added service can clearly present the location of information	
System reliability and connection quality	n/a	n/a	n/a	This value-added service system is stable Error seldom occurs to this value-added service system) This value-added service provides effective links I can easily return to the screen previously browsed It does not take too much time to download the information I need It does not take too much time to load the links I click on This value-added service system can instantly react to the data I input	
HOC: Environmental quality			the extent to which tangible features of the service-place play a formative role in consumer perceptions of overall service quality	I would say that the service provider's physical environment is one of the best in its industry I would rate the service provider's physical environment highly	(Lu et al., 2009) mobile service quality
Equipment	Physical equipment	n/a	the wireless telecommunications network that the service provider uses + mobile device that the consumer owns	I believe that the mobile telecommunications network is stable When I conduct security trading, the mobile telecommunications network always provides stable connections The service provider understands the importance of the mobile telecommunications network to consumers I count on my mobile devices to successfully complete the entire security trading process The response speed of my mobile device is very quick	

				With different mobile devices, the service provider could supply the same service	
Design	interface design of the trading system	n/a	navigation, color, shapes, font type, and music	The interface design of the security trading system gives me a deep impression The interface design of the security trading system serves my purposes The service provider understands the interface design of the security trading system is important to me	
Situation	the anytime and anywhere access is dependent on technological and social conditions of the use environment	n/a	specific circumstantial conditions that users meet when they move around and use mobile services in different places at different times	In general, the mobile telecommunications network meets my needs When I was in confined environments such as basements and elevators, I still receive real-time information that the service provider provides The service provider understands my need to use mobile brokerage service in confined environments such as basements and elevators	
HOC: Outcome quality			experience during the course of security trading I feel good about what the service provider provides to its customers	I always have an excellent experience during the course of security trading I feel good about what the service provider provides to its customers	
Punctuality	waiting time,	n/a	n/a	I count on the feedbacks that the security trading system provides when the security trading completes When the security trading completes, the trading information was sent back in a timely fashion When the securities trading completes, the service provider can provide customized information	
Tangibles	n/a	n/a	n/a	During the course of security trading, the information processing time is predicable During the course of security trading, the service provider delivers the information quickly The service provider understands that punctuality is important to me	
Valence	attributes that control whether customers believe the service outcome is good or bad, regardless of their evaluation of any other aspect of the experience"	n/a	n/a	When the service completes, I usually feel that I had a good experience I believe the service provider tries to give me a good experience I believe the service provider knows the type of experience its customers want	

HOC: Qualities					(Pu et al., 2011)
Interaction Adequacy	the system's ability to elicit user preferences, allow for user feedback and to explain the reasons why recommendations facilitate purchasing decisions also weighs heavily on users' overall perception of a recommender	Initial preference elicitation	n/a	The recommender allows me to tell what I like/dislike	
		Preference revision	n/a	I found it easy to tell the system what I like/dislike	
		Explanation	n/a	I found it easy to inform the system if I dislike/like the recommended item.	
Interface Adequacy	Interface ability to maximise visibility of the recommendation	Clarity	n/a	The labels of the recommender interface are clear.	
		Sufficiency for decision-making	n/a	The layout of the recommender interface is attractive	
		Label	n/a	The layout of the recommender interface is adequate	
		Adequacy	n/a	The labels of the recommender interface are adequate.	
HOC: Beliefs					
Perceived Ease of Use	users' ability to quickly and correctly accomplish tasks with ease and without frustration	Easy to use		I became familiar with the recommender system very quickly	
		Easy to find		I easily found the recommended items.	
		Usefulness of a recommender		The recommender helped me find the ideal item.	
Usefulness	the extent to which a user finds that using a recommender system would improve his/her performance, compared with their experiences without the help of a recommender	Decision support		Using the recommender to find what I like is easy.	
		Decision quality		The recommender gave me good suggestions.	

HOC: System quality			customers' perception of a Website's performance in information retrieval and delivery		(Yang et al., 2005) Information presenting Web portals
Usability	user friendliness	content layout and classification	n/a	Clear and well-organized content	
		Web site structure	n/a	Well-organized hyperlinks	
		User interface	n/a	Customized search functions	
		Web site appearance and visual design	n/a	Appropriate proportion of advertising	
		Intuitiveness / readability/comprehension/clarity	n/a	Ease of finding desired information	
		search facilities	n/a	Search facilities	
		ease of navigation	n/a	Logical layout	
Accessibility.	The convenience benefit of using a Web site as an information center can not be achieved without accessibility	availability and	available at all times	Accessibility of the site	
		responsiveness	speedy log-on, access, search, and Web page download	High speed of page loading	
Privacy/security	n/a	Confidentiality for customer information	vendor guarantees of personal information protection, confidence resulting from promises on the site, and the reputation of the organization.	Confidentiality for customer information Adequacy of security features Reputation of the company Proper use of personal information	
Interaction	Interactive communication/ customization	n/a	operations between users and service providers' employees, users and the Web site, and among peer users of similar products.	Interactive feedback between customers and the company Follow-up services to customers Message board forum for customers-to-customer/company	
Ease of use	n/a	n/a	n/a	The mobile web site has many interactive features The mobile web site has adequate search facilities The mobile web site can be personalized or customized to meet one_s needs The mobile web site is easy to use	(Wang & Liao, 2007) m-commerce user satisfaction

Incubative dimension	Can be developed before a website is launched	Ease of use	Easy to conduct external search, internal navigations, and use	n/a	(Santos, 2003) e-service quality
		appearance	Proper use of colours, graphics, images, animations, etc.	n/a	
		Linkage	Number and the quality of links a website offers	n/a	
		Structure and layout	Organisation and presentation of a content (simple, clear, consistent(	n/a	
		content	Presentation and layout of info and functions	n/a	
Active dimensions	Must be achieved through the period of webpage usage	reliability	Ability ot perform the promised service accurately and consistency, including frequency of update, prompt reply to customers, accuracy of online purchasing and billing	n/a	
		efficiency	Speed of downloading, search and navigation	n/a	
		support	Technical help. User guidelines, personal advice	n/a	
		communication	Keeping customers properly informed and communicating with them in language they can understand	n/a	
		security	Freedom from danger, risk or doubt during the service process	n/a	
		incentive	Encouragement given by service providers to consumers to browse and use the web site, including rewards for doing so.	n/a	
HOC: Mobile service quality					(Huang, Lin, et al., 2015) Mobile service quality
Efficiency	Whether the site responds quickly and is easy to use	n/a	n/a	This site enables me to access it quickly It enables me to complete a transaction quickly It loads its pages quickly	
Fulfilment	The extent to which the site's promises about order delivery and item	n/a	n/a	It quickly delivers what I order It delivers orders when promised This site makes items available for delivery within a suitable timeframe	

	availability are fulfilled.				
Privacy	The degree to which customers perceive the site to be safe and the extent to which their personal information is protected	n/a	n/a	This site protects my credit card information It protects information about my web-shopping behavior It does not share my personal information with other sites	
Efficiency	the nature of ISST to save time and to solve users' needs better than other options	n/a	n/a	Using the Web, I am able to complete the purchase of airline tickets or other travel services efficiently Without spending too much time, I am able to purchase airline tickets or other travel services through the Internet	**(Yen, 2005)** Satisfaction with self-service technology
Ease of use	Easy to use	n/a	n/a	The operations involved in browsing, searching, and ordering tickets or travel services through the Internet option are rather easy I don't need to go through a complex process when I purchase tickets or travel services through this Internet travel agency	
Performance	the capability of ISST to perform the task accurately and reliably	n/a	n/a	Using the Web option to order airline ticket or travel services, I will get just what I ordered The Internet-based self-service is an ordering option that will not results in errors	
Perceived control	the amount of control a customer feels that she or he holds over the process or outcome of a service encounter	n/a	n/a	1. I feel more in control using the Internet-based self-service option to search and order travel services 2. Internet-based self-service gives me more control over the process of purchasing travel services	
Convenience	the nature of ISST to allow users access to services at the time and location convenient for them	n/a	n/a	1. I am able to purchase airline tickets at a convenient location when I order through the Net 2. Internet travel agency services offer the benefit of ordering travel services at a convenient time	
HOC: E-S-QUAL					**(Parasuraman et al., 2005)**
Efficiency	The ease and the speed of accessing and using the website	n/a	n/a	This site makes it easy to find what I need It makes it easy to get anywhere on the sire In enables me to complete a transaction quickly	

				Information at this site is well organised It loads its pages fast This site is simple to use This site enables me to get on to it quickly This site is well organised	
Fulfillment	The extent to which the site's promises about order delivery and item availability are fulfilled	n/a	n/a	It delivers orders when promised This site makes items available for delivery within a suitable time frame It quickly delivers what I order It sends out the items ordered It has in stock items the company claims to have It is truthful about its offerings It makes accurate promises about delivery of the products	
System Availability	The correct technical functioning of the website	n/a	n/a	This site is always available for business This site launches and run right away This site does not crash Pages at this sire do not freeze after I enter my order information	
Privacy	The degree to which the site is safe and protects customer information	n/a	n/a	It protects information about my web-shopping behaviour It does not share my personal information with other sites This site protects information about my credit card	

3.SERVICE PROVIDER PROCESSES PERFORMANCE

HOC: Perceived Benefits					
Service quality	availability of multiple mechanisms for processing customers' complaints, assisting customers in using a product, suggesting complementary product or services, and problem solving	n/a	n/a	I think MHR could anticipate and respond promptly to user request. I think MHR could be depended on to provide whatever is promised. I think MHR could understand and adapt to the user's specific needs. I think MHR could provide follow-up service to users. I think MHR could give a professional and competence image.	(Wang & Wang, 2010) Mobile hotel reservation system
Personalised Service Quality	Same as SERVQUAL	n/a	Attention to user needs Capture interests Adaptive service	whether the system pays attention to the user needs, whether the system captures the user's interests, whether the system provides adaptive services.	(Liang et al., 2006) Personalized Content Recommendation
HOC: Service Quality					(Parasuraman et al., 1985) (Jiang et al., 2002)
Tangibles	The appearance of **physical facilities**, equipment, and personnel	n/a	n/a	They will have up-to-date hardware and software Their physical facilities will be visually appealing Their employees will be well dressed and neat in appearance The appearance of the physical facilities of these IS units will be in keeping with the kind of services provided	
Reliability	The ability to perform the promised service **dependably and accurately**	n/a	n/a	When these IS units promise to do something by a certain time, they will do so When users have a problem, these IS units will show a sincere interest in solving it These IS units will be dependable They will provide their services at the times they promise to do so They will insist on error-free records They will tell users exactly when services will be performed	
Responsiveness:	The willingness to help customers and provide **prompt service**	n/a	n/a	Employees will give prompt service to users Employees will always be willing to help users Employees will never be too busy to respond to users' requests	
Assurance:	The **knowledge and courtesy** of employees and their ability to inspire **trust**	n/a	n/a	The behavior of employees will instill confidence in users [Users will feel safe in their transactions with these IS units' employees] Employees will be consistently courteous with users	

	and confidence			Employees will have the knowledge to do their job well	
Empathy:	Providing caring and individualized attention to customers	n/a	n/a	These IS units will give users individual attention These IS units will have operation hours convenient to all their users These IS units will have employees who give users personal attention These IS units will have the users' best interest at heart The employees of these IS units will understand the specific needs of	
HOC: Service Quality					(Pitt et al., 1995)
Tangibles	Based on SERQUAL (Parasuraman et al., 1985)	n/a	n/a	IS has up-to-date hardware and software IS's physical facilities are visually appealing IS's employees are well dressed and neat in appearance The appearance of the physical facilities of IS is in keeping with the kind of services provided	
Reliability	Based on SERQUAL (Parasuraman et al., 1985)	n/a	n/a	When IS promises to do something by a certain time, it does so When users have a problem, IS shows a sincere interest in solving it IS is dependable IS provides its services at the times it promises to do so IS insists on error-free records	
Responsiveness	Based on SERQUAL (Parasuraman et al., 1985)	n/a	n/a	IS tell users exactly when services will be performed IS employees give prompt service to users IS employees are always willing to help users IS employees are never be too busy to respond to users' requests	
Assurance	Based on SERQUAL (Parasuraman et al., 1985)	n/a	n/a	The behavior of IS employees instils confidence in users Users will feel safe in their transactions with IS's employees IS employees are consistently courteous with users IS employees have the knowledge to do their job well	
Empathy	Based on SERQUAL (Parasuraman et al., 1985)	n/a	n/a	IS gives users individual attention IS has operating hours convenient to all its users IS has employees who give users personal attention IS has the users' best interests at heart Employees of IS understand the specific needs of its users	
Service Quality	the quality of the support that system users receive from the information systems	responsiveness	n/a	n/a	(Delone & McLean, 2016) (Petter et al., 2013)
		accuracy	n/a	n/a	
		reliability	n/a	n/a	
		technical competence	n/a	n/a	

	organization and IT support personnel or outsourced service	empathy of the IT personnel staff	n/a	n/a	(Delone & McLean, 2004) Information System Success
		Following-up service	n/a	n/a	
HOC: Service quality	IS department service quality				(Gorla et al., 2010) ettinger and Lee (1997) Pitt et al. (1995) Carr (2002) Organisational Impact
reliability	the extent to which the IS department strives to improve the information services provided to users.	n/a	n/a	When IS promises to do something by a certain time, it does so When users have a problem, IS shows a sincere interest in solving it IS services are dependable IS provides its services at the time it promises to do so IS insists on error-free records	
responsiveness	the extent to which the IS staff are willing to help users and provide prompt service	n/a	n/a	IS tells users exactly when services will be performed IS employees give prompt service to users IS employees are always willing to help users IS employees are never too busy to respond to users' requests	
assurance	the ability of the IS staff to build users' confidence	n/a	n/a	Users will feel safe in their transactions with IS's employees IS employees are consistently courteous with users IS employees have the knowledge to do their job well	
empathy	the personal attention and caring provided by the IS staff	n/a	n/a	IS gives users individual attention IS has operating hours convenient to all its users IS has the users' best interests at heart Employees of IS understand the specific needs of its users	
Service quality	service quality dimension is the same as service quality			The mobile web site responds to your requests fast enough The mobile web site provides convenient payment procedures The mobile web site provides good after-sales services The mobile site provides adequate FAQ services	(Wang & Liao, 2007) Information quality
HOC: Service quality	difference between customers' expectation and their perceived performance of a service				(Kuo et al., 2009) Chae et al. (2002) Kim et al. (2004) (Chae et al., 2002)
Management and customer service	n/a	n/a	n/a	This telecom company provides diversified value-added services This telecom company provides multiple tariff options This telecom company provides good post-services	

				I can easily alter the contract of value-added services When I have my contract altered, the telecom company still holds a friendly attitude When any problem occurs, the telecom company can instantly cope with it This telecom company provides a FAQ for value-added services	
HOC: Interactional quality			quality of my interaction with this service provider	I can count on the service provider knowing its jobs The service provider is able to answer my questions quickly The mobile service provider understands that I rely on its knowledge to meet my needs	(Lu et al., 2009) mobile service quality
Attitude	employee attitude and skills influenced customers' perception of service quality	n/a	n/a	When I have a problem, the mobile service provider shows a sincere interest in solving it The service provider is able to handle my problems or complaints directly and immediately The service provider is conscious of how important that the resolution of the problems or complaints is for me	
Expertise	Employee expertise	n/a	n/a	I count on the information that the security trading system provides The **security** trading system tells me the accurate time on which it provides service The security trading system understands the information that the consumers need	
Problem Solving	Overcoming problems	n/a	n/a	When I have a problem, the mobile service provider shows a sincere interest in solving it The service provider is able to handle my problems or complaints directly and immediately The service provider is conscious of how important that the resolution of the problems or complaints is for me	
Informati on	sufficient and reliable information	n/a	including the K Line graph, time-sharing trend graph, detailed stock price changes or ranks, and stock market information.	I count on the information that the security trading system provides The security trading system tells me the accurate time on which it provides service The security trading system understands the information that the consumers need	
HOC: Contact					(Huang, Lin, et al., 2015) Mobile service quality
Contact	The availability of telephone assistance and online representatives	n/a	n/a	Friendliness when reporting a complaint Service agents provide consistent advice It offers the ability to speak to a live person if there is a problem This site provides a telephone number to reach the company	

Responsive	The effectiveness of the site's problem-handling process and return policy	n/a	n/a	It provides me with convenient options for returning items This site handles product returns well This site offers a meaningful guarantee	
HOC: E-service Recovery quality					(Parasuraman et al., 2005)
Responsiveness	Effective handling of problems and return through the site	n/a	n/a	It provides me with convenient options for returning items This site handles product return well The site offers a meaningful guarantee It tells me what to do if my transaction is not processed It takes care of problems promptly	
Compensation	The degree to which the site compensated customers for problems	n/a	n/a	This website compensated me the problems it creates It compensates me when what I ordered doesn't arrive on time It picks up items I want to return from my home or business	
Contact	The availability of assistance through telephone or online representatives	n/a	n/a	This website provides a telephone number to reach the company This website has customer service representative available online It offers the ability to speak to a live person if there is a problem	

CUSTOMER PROCESSES PERFORMANCE

HOC: Beliefs					(Pu et al., 2011) Recommender Systems
Control	system's ability to allow users to have control	n/a	to revise their preferences, to customize received recommendations to request a new set of recommendations.	I feel in control of modifying my taste profile. The recommender allows me to modify my taste profile. I found it easy to modify my taste profile in the recommender.	
Transparency	whether or not a system allows users to understand its inner logic, i.e.	n/a	Understanding why a particular item is recommended to them	I understood why the items were recommended to me.	
Explanation	system's ability to explain its results	n/a	Understanding of the reasons for filtering	The recommender explains why the products are recommended to me.	

Appendix 3.3. Measurement Model Specification

	Concept	Question	Code
Satisfaction (5-point Likers scale)			
1	In comparison to ideal service	Imagine the perfect mobile service, which you would use to get travel information and rate it as 5 on the scale from 1 to 5. Please, rate Google Trips app with the same scale	Q3ar1
2	Overall satisfaction	Overall, I am satisfied with Google Trips travel planning application	Q3br2
3	In comparison to expected	Google Trips application met my expectations	Q3br3
Expectations (5-point Likers scale)			
4	Overall performance (usefulness of the service)	I expected the application to be useful for travel planning	Q4r1
5	Personalisation (relevance of information)	I expected that provided information would be relevant to my preferences	Q4r2
6	Reliability	I expected Google Trips to be dependable	Q4r3
Co-Created Service Performance (5-point Likers scale)			
Content Performance towards tourist decision making (quality of recommendations and information in context (Pu et al., 2011; Wang & Strong, 1996)			
7	Quality of Content Selection	The information Google Trips provided was relevant to me	Q5r2
8	Information sufficiency for need satisfaction	When selecting travel activities, I had enough options to choose from	Q5r3
9	Content overload	When selecting travel activities, I was not overloaded with information	Q5r4
10	Exhaustiveness for need satisfaction	Each page (screen) contained all the important information I needed to make decision	Q5r5
Interactional Processes Performance (IS usability Parameters) (ISO, 2011)			
11	Operability	With Google Trips I was able to easily manage each task, such as selecting the place to visit	Q5r6
12	Learnability	With Google Trips I was able to quickly manage each task, such as selecting the place to visit	Q5r7
13	User Error Prevention	I was able to use Google Trips intuitively	Q5r9
14	Interface Aesthetics	Google Trips app was visually appealing	Q5r10
15	Appropriateness Recognisability	I understood why specific information (e.g. attractions) is recommended to me	Q5r12
16	Accessibility	Google Trips worked consistently accurate	Q5r15
17	Flexibility	Google Trips automatically updated information on the screen in accordance with the situation	Q5r16
Service Provider Processes Performance (based on Service Quality) (Parasuraman et al., 1991)			
18	Non-intrusive service	The interactions with the Google Trips app did not distract me from my activities	Q5r13
19	Reliability	Google Trips used my personal data confidentially	Q5r14
20	Responsiveness	I believe I would receive immediate support from Google in case it is required	Q5r18
Customer Processes Performance (Ranjan & Read, 2016)			
21	Possibility of control over IS functionality	I felt in control of modifying the settings, that Google uses to select information for me, according to my preferences	Q5r20
22	Possibility of control over the content	I felt in control of sorting recommended options (for example, attractions) according to my preferences	Q5r21
23	Possibility of control over personal data	I felt in control of sharing my data with Google Trips	Q5r22

24	Possibility of control over interactions with the system	I felt in control of saving and quickly retrieving travel information, such as attractions, when I need it	Q5r23
Co-Created Performance (Reflective items for redundancy analysis)			
25	Usefulness for individual task completion	Google Trips was useful for managing each task	Q5r8
26	Convenience for task completion in context	Google Trips was convenient to use in different situations	Q5r11
27	Dependability	I believe Google Trips is run by tourism professionals	Q5r17
28	Convenience for task completion for individual	I believe Google support works in the way, that is convenient for me	Q5r19
Co-Created Value (5-point Semantic Differential Scale): Reflection of multiple dimensions of information needs under SDL (Choe et al., 2017; Kuzgun & Asugman, 2015)			
29	Utilitarian/ Functional	Google Trips is Useless for planning a trip/ Useful for planning a trip	Q6_1r1
30	Hedonic/ Emotional	After using Google Trips for planning my trip I felt Dull / Excited	Q7b_2r1
31	Experiential	Google Trips helped to make my trip: Boring / Interesting	Q7c_3r1
32	Aesthetic	Restricts me from organising trip myself / Empowers me to organise the trip myself	Q7f_1r1
33	Sign/ Relational	I do not trust Google Trips in providing me with personalised travel planning experience / I trust Google in providing me with personalised travel planning experience	Q7h_1r1
Co-Created Value (5-point Semantic Differential Scale) (reflective items for Redundancy analysis)			
34	Effectiveness for trip planning	Google Trips is Ineffective for planning a trip / Effective for planning a trip	Q6_3r1
35	Efficiency for trip planning	Google Trips is Inefficient for planning a trip / Efficient for planning a trip	Q6_5r1
36	Decrease of time/ information overload	Google Trips makes planning of my trip Slow / Quick	Q7c_2r1
Loyalty (5-point Likert Scale)			
37	Loyalty	I will use the application in future	Q8r1
38		I will use the application when I need it	Q8r2
39		I will use Google Trips for organising my next trip	Q8r3
40		I will recommend my friends to use Google Trips	Q8r4
Personal, social, technical and travel context			

Appendix 3.4. Discussion Guide

	Discussion Question	Follow-up question/ probe	Keywords
0	**Tell me about your travel experience. Do you travel a lot?**	*Family/ business?* *Alone / with company?*	
1	**Have you ever used any personalised website to find information for a trip (hotels, attractions, restaurants)?**	*Why did you use it?* *Before/ after?* Did you like it?	*TripAdvisor, booking.com, google trips,*
2	**In general, what made you satisfied/ dissatisfied with personalised service?**		Expectations website/service performance Value
3	**Do you remember, did you have any specific expectations for this service before you started to use it?**	*What kind of expectations?* *+ Why?* *In your opinion, if you didn't know anything about the app before you started to use it, would it change your opinion about it?* *+ What exactly would change?*	
4	**Why did you need information service?** **Can you outline some <u>benefits</u> personalised service created for you in comparison to not personalised?** **In your opinion, what is high quality service?**	Have you found information you were looking for? There is a great amount of information. Do you think this service helped you to find information quicker than not personalised? Easier? + Do you think this can be considered as service advantage or drawback? + Variety? +How do you feel if personalised service only gives you, say, 3 options of stay? + Would you try to search again?/ try to change the result + Would you use another website?	Got information that was missing, decrease of time load/spent decrease of cognitive load Control Result Change modify
5	**When speaking about app or website, how would you define 'high quality information'?**	How would you feel if information would automatically change depending on the environment you are in? Say, weather has changed, evening coming, etc.	Relevant Convenient Complete Diverse
6	**When you use an app, what technical parameters are important for you?**	When you used personalised app, did you keep in mind that it uses your personal data? + How do you feel about that? Is it possible to sacrifice high and stable performance of your smartphone or PC to allow better personalisation? Would you rather share more personal data to receive more relevant information, or to spend more time for selecting the right option yourself?	Security/ Privacy Reliability Control over personalised outcome Usability, performance efficiency, functional suitability

7	**Benefits**	Was your experience with the app pleasurable? Can you say that personalised information service helped you to better express or understand your preferences? Would you rely on personalisation next time?	Useful Pleasurable Trust Value Organise trip yourself Better express yourself
8	**What can be improved in personalised app to give you more satisfaction?**		

Appendix 3.5. Sample Interview Transcript

Interview with Expert

Interviewer:

The whole idea of this study is to understand how satisfaction or the overall experience from personalisation is formed. So, my first question to you would be about your opinion on what are the main factors that would influence tourist satisfaction with personalisation?

Expert:

I believe that in general it will make things easier for tourists. Personalisation will also make things more pleasant and more satisfying. But when I say this, I mean tourist experience from information or from interactions with a website. When we interact with any device to do something, for example to search for information, or it to complete the booking, or any other task you might have, personalised experience will mean that it is easier and quicker to complete this task. So, you are more effective and you're more efficient. Also, it might change the experience to the point that it becomes more fun. And interactions become more intuitive. The short answer is that personalisation can transform the whole experience from a device or from an application.

Interviewer:

Is personalisation always a positive thing? Does it always improve tourist experience, or can it have negative effects on the overall experience?

Expert:

A-Ha this is a great question. Before this year I would say yes, it's great because we used to say that personalisation is great and absolutely positive. Personalization became a requirement for businesses to stand out because it allows to make services more useful, more relevant. And of course, I'm not going to question this, this is still very important thing. But in the light of what just recently happened, for example, in case of Cambridge Analytica… The key of personalisation is data. You take my data to use it to make my experience more personal. But it would be fine not ok that you're taking this data. I believe we will see more and more situations, when people don't know that their data is taken, and when they learn this, will they be ok with it.

So, I would say that one of the primary factors or personalisation and its success is transparency. You need to be transparent; you have to explain what date you take and how you use it to create personalisation.

Let's imagine that I am going to book a trip to Jamaica. I opened booking.com, and they are saying me: ‘Hi! We know that you're going to book a trip to Jamaica, and here are some suggestions for you’. But how do you know that I'm going to book a trip to Jamaica? And then it turns out that they are using my data from Alexa or from Google home. So, they have been listening to me to understand that I'm going to do this trip. So, I open the app, they already know this, and they will make my experience positive and easier, but I'm not ok with them using these data because I haven't allowed that. I think that from this point personalization can go wrong. It can be very-very wrong.

Interviewer:

You have mentioned transparency. I recently listen to Mark Zuckerberg speech in front of the congress. What amazed me is that people don't really understand how data is collected and analysed. From the question the Congress asked it looks like they think that there are people behind data collection, and this people collect some kind of notes, write them down, and then discuss what to do with this data. Do you think we are talking about a kind of objective transparency and objective understanding of what is going on? Or are we talking about manipulation with tourist perception on privacy and security, and simultaneously ensuring that the data is protected?

Expert:

It could be also the answer. The short answer I don't know. That is the area that should be researched much more. So maybe transparency will work, but maybe you're right maybe it's about perception of security. If I own the company that works with personalisation that is definitely the question that I will need to research with my customers. Ok, I'm using all these data to personalise your service, but how do I do that. Am I being transparent with what data I am using and for what purposes, or maybe it's really just a matter of perception that I'm using your data in a secure way. Have you don't have the answer for that, but this is very important issue. And this will be very relevant for ages 2 to now so I hope that this question will be further research. Now we are moving forward with the belief that personalisation will solve all our problems. But in the result, it's not and it can go wrong in situation like this. You cannot just take data from people and used for whatever purpose.

Interviewer:

Nowadays there a lot of things popping up about control and providing tourist was control over personalization. We used to call them co-creators. Do you think it's important to provide them with the opportunity to influence and to change the process of personalisation and the outcome? Or will it make things even more complicated for tourists than they are now.

Expert:

I think it can sort of negate the advantages of personalisation. We need to take step back and remember why we are doing personalisation. And one of the things for me is that you speed up the interaction you make things easier. For instance, if I go to Amazon to shop… Or if we take Netflix, they do it really well. They by default advise me the movies to watch today in the evening, so I don't need to spend additional cognitive and emotional efforts to find what I want to watch, right? So, the whole thing is faster. It is easier for me. To give me options on how I can co-create this experience, it might make things more complicated for me. And might get to the point why there do I need to personalise things. the whole idea of co-creation is great. but when we talk about personalisation... you know... No, I would say it depends… If we give people the opportunity to correct stuff and to say 'no-no, you got it wrong', and just things accordingly, then, I think, the service would become more flexible. There is always scope for error and you need to get feedback. Am I doing things right for you? Help me to co-create experience for you?

Interviewer:

Ok and my next question about very similar things but it is from a different perspective. if we're talking about personalisation in third context. One of the major theories in tourism is the need for the novelty of experiences. They are new places, new social relationships, new everything. If we provide tourist with the selection of the relevant option wouldn't mean that way destroy part of this travel unique experience of exploring new things?

Expert:

I think it goes back to the think what you consider as personalisation. There are so many different definitions of personalisation. I am looking at context -awareness and HCI perspective, ok? Or, from a design perspective and maybe a little bit from the perspective of my car into work. This means that I'm looking on personalisation from the point of view of how to make things easier to use. My last project was the Scotland Yard, and the idea was on how we create a website that everyone can use, absolutely everyone. It doesn't matter who they are. They just go in, report things, and how can we translate things to the police to save some money. In this context Imagine people of London. There are millions of people, they are from different indication, different background, different culture, they speak different languages. Some of them also have disability: some cannot see well; some cannot use small smartphones. In this case with design one option for the website. Then we need to understand how we change this website depending on a different people and their background. The whole thing is that it is easier for them.

Let me give you an example. If I'm in the UK and I want to report a crime, for example a murder. The website will tell you: 'look we see that you're in London, that you are in Kensington. What would you like to report?' Raising my location this website makes my experience easier because it knows where I am. If you open the same website from Hong Kong, it tells you 'look we see that you are not in the UK, so go to MI5'. We don't deal with this region. So, if you call this personalisation, there is a clear benefit for users. The personalisation is changes in the product or service they don't customer data so that this product or service becomes easier to use. Just be that interaction and make the way how they look for information easier. From this perspective there is a clear benefit of personalisation in case you're doing it right.

So, to answer your question, if you have truth and you offer them 10 attractions the plus side is ... imagine that we are in London and there are 1000 attractions. If your tourist has only one day how can he go through all of them? I mean if the task is to get physical experience rather than spending the whole day for looking for attractions via are there mobile devices, then by selecting the relevant instructions for them you're actually making the experience better. We have done the work for you, here are year 10 attractions, now go and explore.

your question is good from the perspective if... imagine that you haven't given them the right attractions. Then what happens? Maybe they are missing the opportunity. If you didn't use their data in a right way, then…

Ah! And here is your point. You should always give them control; you should give them the way to control their experience. You're giving them there 10 attractions, and there is a big principle in context-aware computing. You give that all this suggestion. But it also always gives them the way to see all other attractions by saying: 'These are the other attractions for you to have a look'. So, they are not restricted to that 10 attractions. They can go and find anything themselves If they have time.

And this is very good point. I think Paul Dorish was among the first one who explored this. And I think that was one of the first ways is that explain that you always give the control to go back or to get out of it.

Interviewer:

Is it right to say that we are talking now about the way content is selected and presented in a comfortable and easy way according to usability principles, and this is one of the criteria of high-quality personalisation?

Expert:

Yeap

Interviewer:

And this is the main point that should enable quick and easy interaction, isn't it?

Expert:

Definitely, yes

Interviewer:

If we are talking about personalisation, are there any additional system requirements… In in addition to his ability, reliability, functional suitability, efficiency, security, etc. Are there any specific parameters that should be added to this list?

Expert:

You are actually making personalised website to improve usability. You are raining at improving these qualities. If we see these parameters as qualities, you can treat personalisation as one of them. So, personalisation can be further requirement for the application when you are designing an app. So, we're talking about the quality of the design. And all these things, you can measure them to a certain extent, right? You can measure them objectively you can evaluate an application.

This is actually a very big question. All this ISO standards... They're Changing within time, and they have changed a lot especially in the field of human centred interactions. In the industry they have changed quite a lot, so what was defined as usability 10 years ago has different meaning now. Earlier usability means only easy to use. Now it stands for lots of things, it might have the meaning of fun, and it depends on the definition.

Potentially you can add personalisation to this list. But I'm not sure what is the full list of this qualities right now. The problem is that human computer interaction is not a stable field, it is constantly developing, everyone is talking about digital transformation, about innovation, and human centred design, all people apply these terms like usability, reliability, contextualisation, personalisation, functional suitability. So, I really don't know about the exact criteria that that is suitable here. So, you really have to see the language.

And also… when I was doing my PhD, I said that everyone knows about this ISO standard, because they are International standards, right? They are in general very-very widely used in the industry. No one really knows what that is, I mean everyone knows ISO, but no one considers the exact rules.

Interviewer:

No one really knows the detail, do they?

Expert:

No, no one actually reads that. So, keep that in mind during your research, not all the people will know what you're talking about. If you ask three different experts what the criteria are to design an app, they will tell you three different things. So, when talking to people in you probably need to provide a bit more information.

So, I think it's an important question, I'm sure you should be asking them, but probably avoid saying ISO, but provide them with definitions and descriptions of each quality.

Interviewer:

Thank you very much for the idea. I will definitely consider this.

If you don't mind can we go backwards a little bit. You have mentioned at the beginning of our conversation that personalisation is expected to make things easier and quicker, to make things more pleasurable, and that it can improve experience. So, if we're seeing this from the perspective of value or different dimensions of the overall experience, we're talking about utilitarian benefits, we're talking about hedonic benefits. Is there anything else that should be included to assess the influence of personalisation?

Expert:

I would say yes. Actually, there is a potential to make any type of benefits you want with personalisation… It's not only pleasure, it is for fun, and excitement. You control this. You have control over how you deliver this experience. The whole idea of user experience is that you control the outcome.

Interviewer:

What about self-expressive value? If serious are able to organise their stream better with the help of personalisation and to choose where to go and what to do without the help open travel agent? should it be considered?

Expert:

This is empowerment. Yes. definitely, by all means, yes, it should be considered. It is the consequence of making things easier of making overall positive experience. Whether this is true personalisation - I think yes. Yes, it is being empowered, being autonomous, that is definitely a big thing.

Interviewer:

What about relational value? is it relevant for the case of personalised interactions?

Expert:

Can you rephrase? What do you mean by relational value?

Interviewer:

If we are talking about relationships between a user and a service provider, can personalisation contribute to closer and more trustful relationships?

Expert:

That's a really good question. I would say it depends. In case you're using the right data and doing the right thing, then there is a whole bunch of… but… you know… Wait… we are not talking about big things. Let me try to think my way through your question. So, you want to see different dimensions or the whole user experience, right?

Interviewer:

Yes, right. and what is interesting is that even if tourists in the interview mentioned that they were provided with relevant information, which means that personalisation worked well, they do not trust the result, because they do not trust service provider. They believed that the information they have been provided is just paid ads despite they were not able to say that they are irrelevant for them. So, normally, I would say that good service create trust between service provider and the customer. But in case of personalisation it can be somehow different.

Expert:

This is personalisation in this case. serving adds is not personalisation.

Interviewer:

Exactly. This is how they perceive personalized information.

Expert:

Personalisation for me changes the design of what you deliver. it can be information it can be functionality, but they are not adds. But yes, this is actually an interesting point. I just now started to think, that people might confuse these things because big companies like Google and Facebook they deliver so many adds all the time. When I type something in Google, I received lots of ads together with information.

And I just remembered one example. Someone went to Amazon to buy an urn, because his mother has died. 6 months later Facebook is giving him an add saying 'If you like that urn maybe you would like also these things.'

So, here you have two things. First, it is companies using your data to personalise advertisement and to personalise the design of an application. But design is a very huge thing now. So, let me explain it a little bit.

So, what I do now is a go to businesses, and they say we want to engage with our customers. So, they want me to find the way to make their service more relevant in for the customer to like them more. So, what we're doing we're going to the target customers, we're talking to them, we're creating prototypes, sketching bass on paper, trying to identify what are these people needs, and how can we make their life better, how can we improve the experience with the application, How do we make this product better. Would you find the experience in this way, and when we talk about the design. We need to understand user experience; we need to understand how people experience the product? Then we are going back to business and saying 'look, we have identified that your customer service is crap. people need to wait too much, when they're trying to approach you, it is confusing, your branch is not like he did well, your office is dirty, etc. '. When we are talking about digital experience, we say that your app is outdated, or you have enough but it doesn't satisfy the needs that push customers to use it. It doesn't solve any problems for your customers. So, we give suggestion. For example, design an app or a website, it does not technology-led, it is customer-led. When we make the decision about the design, we need to decide on what the structure is going to be like, what navigation is going to be like, what is the information we are delivering, what is the functionality we need to provide customers with. Are we going to use camera, so people can take selfie and check in? Are we going to let them to use their smartphone to tap on the door and to say 30 minutes of check in procedure? All this thing will enhance the overall experience with the website or with the application.

And the company says: we also want to personalise that the experience. we say ok, what data I can be potentially use? I can have the name and greet them by name. Maybe we know where they're from, and we can translate the whole app and the keyboard to their native language without doing some major changes. But the business would say 'we need to make a additional revenue from that, so we want to run advertisement'. But despite they use customer data, the add is not part of the app. It will influence the whole experience with the app, but we cannot say that we have personalised the app. We have personalized the advertisement that is presented in the app. It is important to keep in mind that the

decision on the design I will make it, the decision on advertisement will be made by marketers. And they will be two different things. Do you see what I mean?

And this is another great topic to explore. Because maybe in future these two things should not be developed separately, they should become one single step in the strategy.

Interviewer:

Ok, but what about the case when we're talking about Tours and Travel service that offers information? Let's say we're talking about online travel agency that offers you the range of hotels. So, the purpose of this service is to provide tourist with information about hotels, or attractions, or restaurants, whatever. So, the problem was that just whom I interviewed sad that they really like that the choice of hotels they were provided with, but they are not aware that there is personalisation that chooses these hotels for them. They were sure that someone paid for these hotels to be exposed as top 10. So, they receive this information as advertisement.

Expert:

Aha, interesting, now I understand it better. Do you have any data on why they think it's like that?

Interviewer:

No, I don't have any data or surgical explanation there were just few interviews and I was surprised by such reaction. So, this is just the belief, this is just they are perception of reality, of their interactions with the app.

Expert:

Did you ask them why they think it like that?

Interviewer:

Yes, sure but there was all clear reply. They are only saying ’we think it's like that’ or ‘it should be like that’.

Expert:

What I would do if I were you… what people tell you actually does not mean anything. People can tell you ‘I like it’ or ‘I don't like’, it it doesn't mean anything. What do you need to see is whether they still use it, whether they would click on this add or not? Even if people don't have any opinion, they will tell you something. You can ask me ‘do you like this blue button?’. I never thought about it, I don't have any experience with it, and honestly speaking I don't care. But I need to tell you something because you're asking me about this. I want you to think that I'm a good person. In reality this might be a big problem, but it also maybe that it doesn't really matter. So, trying to dig deeper into that. If my work, I might start with the question ‘what do you think about it? Then you always ask why, why it happened like this.

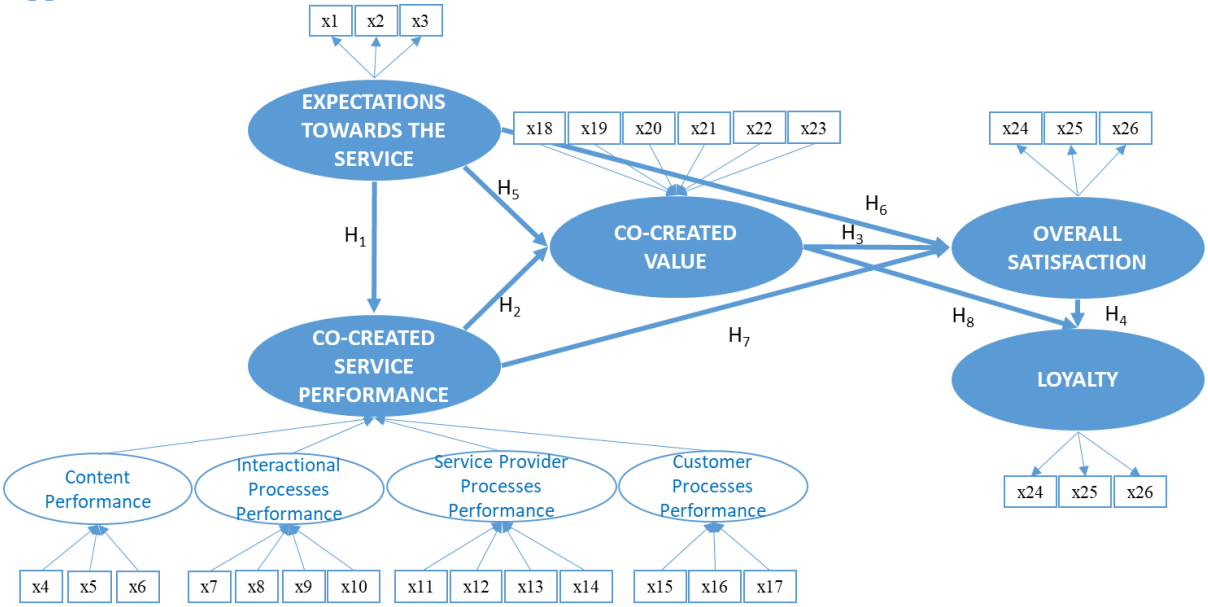
So, coming back to your first question. Personalisation can definitely contribute to relationships between users and businesses, we see that people start interacting and trusting business is more. That was the recent study of Google that said that 80% of customers with purchase again if they experience was personal. And I also observe it when I test the application. First of all, you need to satisfy the need. You need to solve the problem. So, if they're ready to book the trip with that personalised information, it will mean that you are solving their problems. If you're making information more personal, you're making the process of solving their problems easier. And this is exactly how you Create Trust. If it works well... I

would say that lack of technological development would hinder development of relationships. And this will become future requirement for business. Once tourist experience better, easier and more personalised service, they would expect that quality of service again. The expected everywhere. And this is why we have the whole bunch of new ideas in business, this is why we are talking about artificial intelligence, because customer expectations have never been so high. We're talking about digital transformation as a requirement because businesses should become more personal and more relevant to stay on the market, to be more agile and to engage better with the customers. Or they have to close their doors. Even the UK government is going through this now.

Expert (later):

I also started to think about this perception. It might be late today awareness of personalisation. If they know that an app uses their data, this might solve the perception problem. If they know that I'm using their personal data to give you selected information about hotels, they will understand that this is not advertisement, this is not sponsored, it is not featured, my information shows that they were like it. If not, then there might be another hidden problem. And this is where being transparent comes in.

Appendix 3.6. Codebook



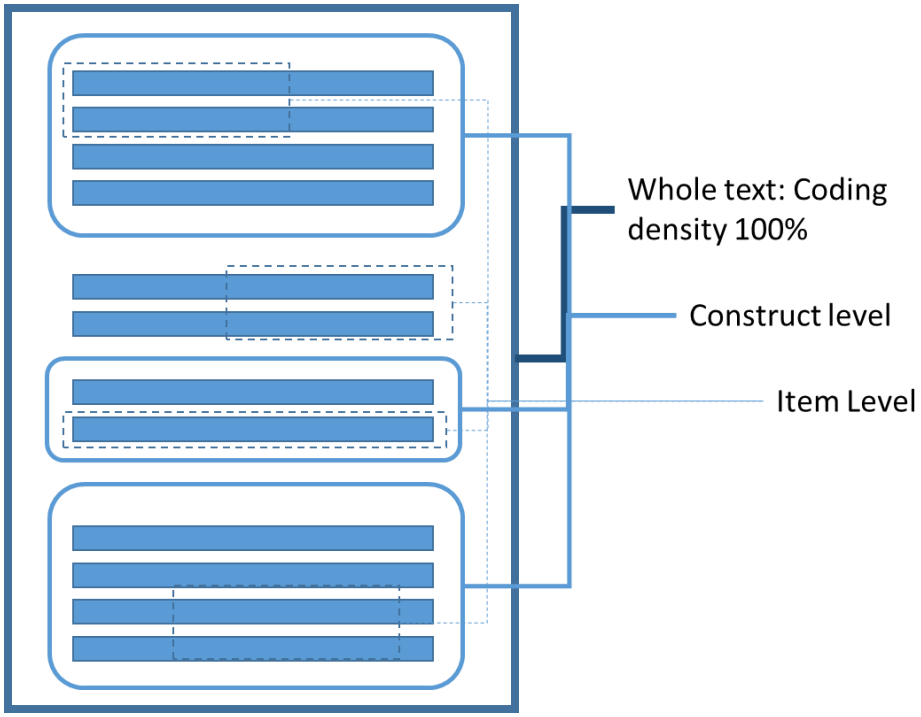
1 level codes	Definition
Expectations	Expectations describe customer wants and feeling of what the service would be like, and what benefit would service provide them. Feelings arise based on the previous experience, personal characteristics, existing motivations and attitudes, as well as interactions between customer on the one hand and supplier and brand on the other, help before service consumption
Perception on co-created information service performance	Characteristics or attributes of personalised information service, that are essential in evaluating the perceived performance of the website or mobile application. Such characteristics are used to describe user interactions with the system interface (all content and functionality, available at the screen), with the information, that user wants to acquire to satisfy his needs, and with the service provider, available through the system interface.
Perception on co-created value	Co-created value is defined as a set of the benefits, that can be acquired or lost for customer as a result of interactions with personalised information service. Value arises from service characteristics, and illustrated the improvement or decline in customer wellbeing, such as utilitarian, hedonic, relational and other long-term benefits, that were co-created during the interactions with the service, and together form overall satisfaction with the service.
Overall satisfaction	Overall satisfaction from customer perspective is a 'global' outcome assessment and a cumulative entity, which summarises consumer cognitive and emotional evaluation of the service
Loyalty	Tourists willingness to use him/herself and to advise the service to others
Awareness	Tourist knowledge of personalisation being applied by the application or website

2 level codes	Definition
Perceptions on co-created service performance	
Performance of personalised information	Information performance can be defined as desirable characteristics of content, exposed to tourists as an information system output.
Performance of company co-creation Processes	Business-to-customer interactions, relationships, practices, processes and resources, which service provider uses to manage its relationships with the customer. In the context of tourist interactions with personalised mobile app or website it is related to customer support and opportunity for tourists to solve the problems, that arise during the planned interactions with the self-service technology.
Performance of tourist co-creation processes	Customer-to-business interactions, relationships, practices, processes and resources, which customers use to manage and control their activities and the value they are co-creating through the service. In the context of tourist interactions with personalised mobile app or website it is related to tourist opportunity to control his or her involvement in personalisation, the process of personalisation, and its outcome.
Performance of tourist interactional processes with the information system	The Performance of encounter processes describes user interactions with the information system (IS) interface, i.e. with the delivered content, and its functionality. In the context of tourist interactions with personalised mobile app or website it is related to the attributes of the software tourists are exposed to, and their perceptions on them.
Co-created value	
Utilitarian value	Utilitarian value, which is often referred as functional or instrumental, is concerned with the extend, to which a service can be applied as an instrument to fulfil utilitarian needs.
Hedonic Value	Hedonic value assesses the extent to which a service created relevant feelings, emotions, and experiences for a customer, and empathises importance of affective and possibly short-term reactions, contributing to overall value
Experiential value	Experiential value arises in response to innovative service outcome, that enable novel, creative and diverse experience.
Relational Value	Relational value is a separate construct, which addresses the interactions personalised information service, its elements, and with the service provider.
Expressive value	By interacting with a service system, customers create value themselves and for themselves. Expressive value addresses self-identity, status, associations, esteem, and ethics, as well as fulfilment of altruistic motives.

Appendix 3.7. Intercoder Agreement: Reliability Test

Krippendorff's Alpha Reliability Estimate

	Data	**Alpha**	**Units**	**Observers**	**Pairs**	Coding Density
Whole code matrix	Nominal	**.8837**	786.0000	2.0000	786.0000	**100%**
Construct level	Nominal	.8693	376.0000	2.0000	376.0000	
Items level	Nominal	**.8878**	410.0000	2.0000	410.0000	



Appendix 3.8. Customer Survey of Tourist Satisfaction with Personalised Information Service

TOURIST SATISFACTION WITH PERSONALISED INFORMATION SERVICE

S3. Please, select language of the survey	1. English 2. Chinese

Screening questions	
Before proceeding to the survey, please, answer the following questions:	
S1. Do you live in Hong Kong?	1. Yes 2. No (Screenout)
S2. Did you use Google Trips app to organise any of your trips abroad?	1. Yes 2. No (Screenout)

You are invited to participate in a study on tourist satisfaction with Google Trips travel planner application. The study is conducted by the School of Hotel and Tourism Management at The Hong Kong Polytechnic University. The information obtained from this research will be used in academic research and published.

The aim of this study is to access personalised tourism service by analysing tourist satisfaction.

The survey is expected to take 15-20 minutes.

The survey will not include any personal questions. Your answers will be used solely for the purpose of this study and will not be revealed to any third parties. There are no personal, business, or other risks involved.

Your participation in this study should be voluntary. You have the right to question any part of the procedure, to refuse to reply to any question, and can withdraw at any time without explanation and penalty of any kind

By pressing 'Continue>>' you acknowledge that the procedure as set out above is clear to you and you agree to participate in this study

***

I promise to answer all questions carefully and to the best of my knowledge

Please press Continue >> if you would like to proceed. If not, please close the browser.

S4. Please, tell us your gender	1. Male 2. Female 3. Prefer not to say (Screenout)
S5. How old are you?	1. 18-24 2. 25-34 3. 35-44 4. 45-54 5. 55-64 6. Older than 64 7. Prefer not to say

Please remember your most recent trip, in which you used Google Trips planner	
Q0. Where did you travel?	[drop down list of countries]

Q1. Who accompanied you during the trip?	1. My spouse/ partner 2. My Family/ relatives 3. My friends 4. Other 5. I travelled alone
Q2. Did you use any of the listed application before the described trip?	1. Google Trips 2. TripIt 3. MakeMyTrip 4. Yes, but I don't remember which one 5. No, I didn't use any application before the trip

	Q4. Please tell us some details about your expectations when you have downloaded Google Trips	
1	I expected the application to be useful for travel planning	Strongly disagree - - - strongly agree
2	I expected that provided information would be relevant to my preferences	Strongly disagree - - - strongly agree
3	I expected Google Trips to be dependable	Strongly disagree - - - strongly agree

	Q5. Please tell us what you think about Google Trips capability to support each task you had, for example, selecting the place to visit and things to do, adding them to your itinerary, editing travel plans, and checking reservations	
1	Overall, Google Trips provides high-quality service	Strongly disagree - - - strongly agree
6	With Google Trips I was able to easily manage each task, such as selecting the place to visit	Strongly disagree - - - strongly agree
7	With Google Trips I was able to quickly manage each task, such as selecting the place to visit	Strongly disagree - - - strongly agree
8	Google Trips was useful for managing each task	Strongly disagree - - - strongly agree
9	I was able to use Google Trips intuitively	Strongly disagree - - - strongly agree
10	Google Trips app was visually appealing	Strongly disagree - - - strongly agree
11	Google Trips was convenient to use in different situations	Strongly disagree - - - strongly agree
2	The information Google Trips provided was relevant to me	Strongly disagree - - - strongly agree
3	When selecting travel activities, I had enough options to choose from	Strongly disagree - - - strongly agree
4	When selecting travel activities, I was not overloaded with information	Strongly disagree - - - strongly agree
S 7	For this question, please select 'disagree' to demonstrate your attention	Strongly disagree - - - strongly agree
5	Each page (screen) contained all the important information I needed to make decision	Strongly disagree - - - strongly agree
12	I understood why specific information (e.g. attractions) is recommended to me	Strongly disagree - - - strongly agree
13	The interactions with the Google Trips app did not distract me from my activities	Strongly disagree - - - strongly agree
14	Google Trips used my personal data confidentially	Strongly disagree - - - strongly agree
15	Google Trips worked consistently accurate	Strongly disagree - - - strongly agree

16	Google Trips automatically updated information on the screen in accordance with the situation	Strongly disagree - - - strongly agree
17	I believe Google Trips is run by tourism professionals	Strongly disagree - - - strongly agree
18	I believe I would receive immediate support from Google in case it is required	Strongly disagree - - - strongly agree
19	I believe I would receive support in the manner, that is convenient for me	Strongly disagree - - - strongly agree
20	I felt in control of modifying the settings, that Google uses to select information for me, according to my preferences	Strongly disagree - - - strongly agree
21	I felt in control of sorting recommended options (for example, attractions) according to my preferences	Strongly disagree - - - strongly agree
22	I felt in control of sharing my data with Google Trips	Strongly disagree - - - strongly agree
23	I felt in control of saving and quickly retrieving travel information, such as attractions, when I need it	Strongly disagree - - - strongly agree

Please think about your travel activities and experiences, and the way Google Trips app affected them. Select the answers, that better describe you experience. In each question, the left option indicates the worst experience you had, the right one – the best experience, the middle point – the experience that was neither bad nor good

Q6. Please tell us your opinion about the usefulness of Google Trips for travel planning 1….5 Google Trips is…	
	Useless for planning a trip - - - Useful for planning a trip
	Ineffective for planning a trip - - - Effective for planning a trip
	Inefficient for planning a trip - - - Efficient for planning a trip

Q7. Please tell us about your travel experience after using Google Trips 1…..5	
	Q7a. Google Trips makes planning of my trip…
	Slow - - - Quick

	Q7b. After using Google Trips for planning my trip I felt…
	Dull - - - Excited

	Q7c. Google Trips helped to make my trip…
	Boring - - - Interesting

	Q7f. Application of Google trips…
	Restricts me from organising trip myself - - - Empowers me to organise the trip myself

Q7h. After using Google Trips…

	I do not trust Google Trips in providing me with personalised travel planning experience - - - I trust Google in providing me with personalised travel planning experience

	Q3. Please tell us about your satisfaction with Google Trips application last time when you used it	
1	Imagine the perfect mobile service, which you would use to get travel information and rate it as 5 on the scale from 1 to 5. Please, rate Google Trips app with the same scale	1 - - - 5
2	Overall, I am satisfied with Google Trips travel planning application	Strongly disagree - - - strongly agree
3	Google Trips application met my expectations	Strongly disagree - - - strongly agree

	Q8. Please share with us your intention to use Google Trips in future 1…..5	
1	I will use the application in future	Strongly disagree - - - strongly agree
2	I will use the application when I need it	Strongly disagree - - - strongly agree
3	I will use Google Trips for organising my next trip	Strongly disagree - - - strongly agree
4	I will recommend my friends to use Google Trips	Strongly disagree - - - strongly agree

	Q9. Please tell us about your knowledge about Google Trips	
1	Google Trips app used 'my personal data' [*use this text to add pop up message over it]* 'Personal data is any information that is related to you. It may include your name, e-mail address, location, previous trips and reservations, etc.'	1. Yes / 2. No / 3. Not sure
2	Google Trips app 'personalised my travel experience' *[use this text to add pop up message over it]* 'When an app personalises your experience it means that it learns your interests and adapts information that is presented for you'	2. Yes / 2. No / 3. Not sure

Please tell us more about yourself Your answers will be used solely for the purpose of this study and will not be revealed to any third parties.	
Q10. How often do you travel abroad?	1. Once in few years 2. Once a year 3. Two-three times per year 4. More often
Q11. Please tell us what education you have completed	1. Primary 2. Secondary 3. Post-secondary 4. Undergraduate 5. Post-graduate (Masters degree or above) 6. Prefer not to say
Q12. What is your marital status?	1. Single 2. Married/live with partner 3. Separated/divorced 4. Widowed 5. Prefer not to say

Q13. What country you were born in?	_____ (drop down list)
S6. Please tell us your household monthly income in HKD	1. Less than 9,999 2. 10,000-19,999 3. 20,000-29,999 4. 30,000--59,999 5. More than 60,000 6. Prefer not to say

Thank you for your interest in participating in this study

The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20180228003).

If you would like to obtain more information about this study, access and correct the supplied data, or receive the results of the study, please contact:

Ms Ekaterina Volchek
PhD Candidate,

tel. no.: (852) 3400-2330
email: katerina.volchek@

旅客對 Google Trips 個人化資訊服務的滿意度

S3. 請選擇問卷的語言	· 英文 · 中文

資格篩選問題	
在參加此問卷調查之前，請您先回答以下這些問題：	
S1. 您住在香港嗎？	· 是 · 否
S2. 您**有使**用過流動應用程式 Google Trips 去計劃您的出國旅行嗎？	· 是 · 否

您獲邀參加一項有關使用流動應用程式 Google Trips 之滿意度的問卷調查。

這項研究是由香港理工大學酒店旅遊管理學院所主辦。該研究由香港理工大學酒店及旅遊管理學院進行。從這項研究中獲得的信息將用於學術研究並發表。

本研究的目的是通過分析遊客滿意度來獲得個性化的旅遊服務。

該調查預計需要 15-20 分鐘。

調查不包括任何個人問題。您的答案僅用於本研究的目的，不會透露給任何第三方。不涉及個人，商業或其他風險。

您參與本研究應該是自願的。您有權質疑程序的任何部分，拒絕回答任何問題，並且可以隨時撤回，無需任何解釋和處罰

按“繼續>>”即表示您確認您已明確上述程序，並且您同意參加本研究

S4. 您的性別	· 男性 · 女性 · 不想回答
S5. 您的年齡	· 18-24 **歲** · 25-34 **歲** · 35-44 **歲** · 45-54 **歲** · 55-64 **歲** · 64 **歲以上** · 不想回答

請回憶您最近曾使用過 Google Trips 去計劃的旅程	
Q0. 你在哪里旅行？	

Q1. 在旅程中有誰人與您同行？	· 我獨自旅行 · 我的配偶/伴侶 · 我的家人/親戚 · 我的友人 · 其他人
Q2. 在前述的旅程之前，您有用過下列的流動應用程式嗎？	· Google Trips · TripIt · MakeMyTrip · 有，但我記不起用過哪一種 · 沒有，我在啟程之前沒有使用過任何流動應用程式

Q4. 請告訴我們，當您下載 Google Trips 之時，您是有何期望的	
1. 我當時期望此應用**程式**能夠幫助我規劃行程	很不同意 - - - 很同意
2. 我當時期望它所提供的資訊是符合我的喜好的	很不同意 - - - 很同意
3. 我當時期望 Google Trips 值得信賴	很不同意 - - - 很同意

Q5. 請告訴我們，您認為 Google Trips 在支援每項任務的能力如何，例如，選擇要遊覽的地方和活動、把它們加入您的行程之中、修改旅遊計劃，以及核查預訂情況等	
1. **整體來說**，Google Trips 提供高質量的服務	很不同意 - - - 很同意
6. 用 Google Trips，我能夠輕易處理好每個事項，例如選擇要遊覽的地方等	很不同意 - - - 很同意
7. 用 Google Trips，我能夠很快處理好每個事項，例如選擇要遊覽的地方等	很不同意 - - - 很同意
8. Google Trips 對於處理好每個事項都很**有**用	很不同意 - - - 很同意
9. 我能夠倚靠直覺使用 Google Trips	很不同意 - - - 很同意
10. Google Trips 的版面很美觀	很不同意 - - - 很同意
11. Google Trips 在各種不同的情況下都方便使用	很不同意 - - - 很同意
2. Google Trips 所提供的資訊是與我相關的	很不同意 - - - 很同意
3. 當選擇旅遊活動時，我有足夠的選項可選擇	很不同意 - - - 很同意
4. 在選擇旅行活動時，我沒有過多的信息	很不同意 - - - 很同意
S7. 对于这个问题，请选择“不同意”来表达您的注意力	很不同意 - - - 很同意
5. 每**個**頁**面**都包含我做決定所需的一切重要資訊	很不同意 - - - 很同意
12. 我明白它為何向我推薦某些資訊(例如某些景點或節目)	很不同意 - - - 很同意
13. 與 Google Trips 所進行的互動並沒有擾亂我的**其他**活動	很不同意 - - - 很同意
14. Google Trips 保密地使用我的個人資訊	很不同意 - - - 很同意
15. Google Trips 一貫準確	很不同意 - - - 很同意
16. Google Trips 能按情況自動更新屏幕的資訊	很不同意 - - - 很同意
17. 我相信 Google Trips 是由旅遊業專業人員主理的	很不同意 - - - 很同意

18. 我相信，有需要時，我會獲得 Google 即時的支援	很不同意 - - - 很同意
19. 我相信，我會在方便我的情況下獲得支援	很不同意 - - - 很同意
20. Google 按我的喜好設定來選擇資訊發送給我，而我自覺能夠掌控這些設定	很不同意 - - - 很同意
21. Google 按我的喜好而把一些選項(例如景點或節目等)推薦給我，**而**我**自**覺能夠把最心儀的推薦挑選出來	很不同意 - - - 很同意
22. 我**自**覺能夠與人分享從 Google Trips 獲得的資訊	很不同意 - - - 很同意
23. 我**自**覺能夠掌握儲存旅遊資訊，例如景點或節目等，而當有需要時，我又能夠快速地檢索到這些資訊	很不同意 - - - 很同意

請思考一下您的旅遊活動和經歷，以及流動應用程式 Google Trips 的影響。請選擇那些能夠更恰當描述您的答案。在每條問題之中，左邊的選項表示您所遇到過最糟的經歷，而右邊的答案則是最好的經歷，至於中間的就既不是好也不是差的經歷。

Q6. 請告訴我們，您認為 Google Trips 對於計劃旅遊有何用處	
Google Trips 是	1. 對於計劃行程沒有用處的- - - 對於計劃行程有用處的
	2. 對於計劃行程沒有作用 - - - 對於計劃行程有作用
	3. 對於計劃行程沒有效益- - - 對於計劃行程有效益

Q7. 請告訴我們，在使用 Google Trips 之後，您有何旅遊體驗	
Google Trips 使我計劃行程變得	緩慢- - - **快捷**

Q7b. 在使用 Google Trips 來計劃我的行程之後，我感到	沉悶- - - 興奮

Q7c. Google Trips 令到我的行程變得	苦悶- - - 饒有趣味

Q7f. **使用** Google Trips	約束了我的行程規劃- - - 使我更有能力去計劃行程

Q7h. 在使用 Google Trips 之後	我不信任 Google Trips 能提供給我個人化的劃旅遊體驗 - - -我信任 Google Trips 能提供給我個人化的劃旅遊體驗

Q3. 請告訴我們，上次您使用 Google Trips 之時，您的滿意程度是甚麼	
1. **如**最完美**的旅遊**流動應用程式您會給 5 分**的話**，**請**按同一尺度來對 Google Trips 評分。	1 - - - 5
2. 總體上，我是滿意 Google Trips 這個**旅遊**流動程式的	很不同意 - - - 很同意
3. Google Trips 達到了我的期望	很不同意 - - - 很同意

8. 請與我們分享您將來使用 Google Trips 的意願	
1. 我願意將來**繼續**使用此應用**程式**	很不同意 - - - 很同意
2. 我願意**繼續**在有需要時使用此應用**程式**	很不同意 - - - 很同意
3. 我願意**繼續**使用 Google Trips 來計劃我下次**的**行程	很不同意 - - - 很同意
4. 我願意推薦**友人使**用 Google Trips	很不同意 - - - 很同意

9. 請告訴我們您對 Google Trips 有何認識	
1. Google Trips 應用**程式**使用了我的個人資料 [pop up text: 個人數據是與您相關的任何信息。 它可能包括您的姓名，電子郵件地址，位置，以前的旅行和預訂等。]	· 是 / 否 / 不肯定
2. Google Trips 應用**程式給予了我**個人化的旅遊體驗 [pop up text: 當應用程序個性化您的體驗時，這意味著它可以了解您的興趣並調整為您呈現的信息]	· 是 / 否 / 不肯定

請告訴我們更多有關您的資料	
Q10. 您出國旅行有多頻密？	· 幾年一次 · 一年一次 · 一年兩三次 · 更頻密
Q11. 您的教育程度	· 小學 · 中學 · 大專 · 大學 · 大學以上(碩士或更高) · 不想回答
Q12. 您的婚姻狀況如	· 單身 · 已婚/與伴侶同居 · 分居/離婚 · 寡居或鰥居 · 不想回答
Q13. 您在哪個國家或地區出生	_____

S6. 請告 訴我 們您 的家 庭月 收 入, 以港 元計 算	· 低於 9,999 · 10,000-19,999 · 20,000-29,999 · 30,000--59,999 · 高於 60,000 · 不想回答

多謝您參加這項研究

這個項目獲得了香港理工大學人類主題倫理小組委員會(HSESC)批准 (HSESC 參考編號: HSEARS20180228003)。

如果您想獲得更多有關這項研究的資料，獲得及更正所提供的資料，又或是獲取這項研究的結果, 請您聯繫：

Ms Ekaterina Volchek
PhD Candidate,

電話號碼： (852) 3400-2330
電郵： katerina.volchek@

Appendix 3.9. Pilot Test Reliability Check.

Pilot Test with min time=7 minutes

Table 2. Cases Summary

Opened Survey	**346**
Retained target population	181
Completed	169
Completed in 7 or more minutes	48
Valid cases after string answers treatment	27

Table 3. Time of survey Completion

N	Mean	95% Conf. Interval		Median	Variance	Std. Dev	Min	Max	Skewness
		Lower	Upper						
27	12.48	10.56	14.4	10.31	34.164	5.85	6.44	29.13	1.36

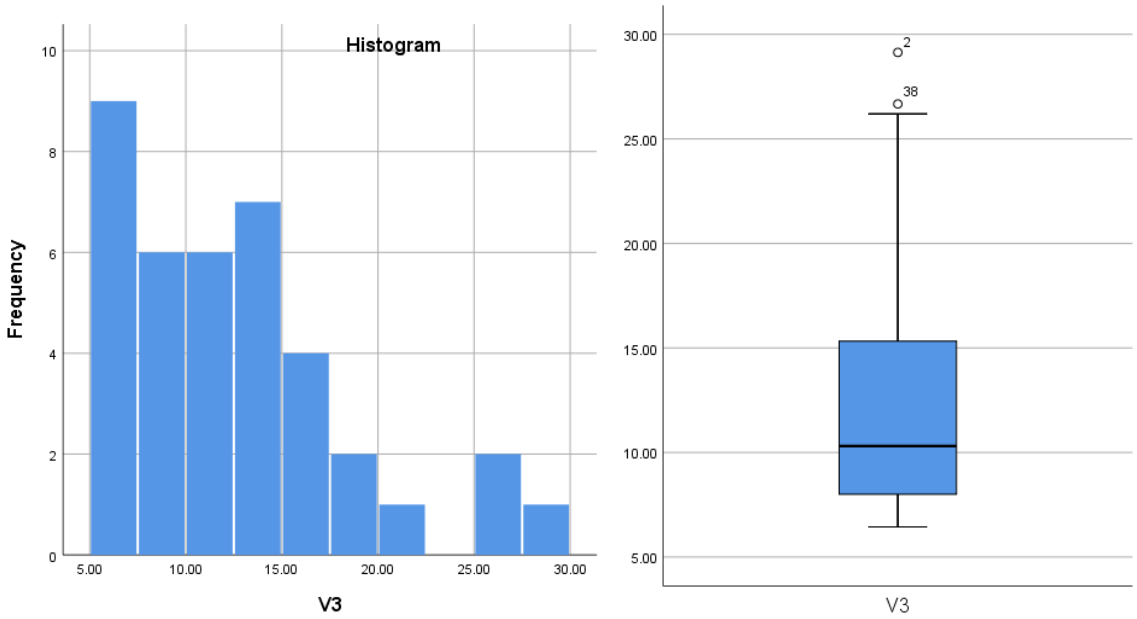


Table 4. Reliability of the Scale

	No of Factors	Cronbach's Alpha	PCA
Expectations, Satisfaction, Loyalty	3	0.884	
Expectations, Satisfaction, Loyalty, Co-Created Service Performance [Content Performance, Interactional Processes Performance, Service Provider Processes Performance, Customer Processes Performance], Co-Created Value	8		7

Appendix 4.1. Data Screening (Variable view)

	Missing	Mean	Median	Min	Max	Standard Deviation	Excess Kurtosis	Skewness
Tourist Perceptions (5-point Likers scale)								
Q3ar1	0	3.881	4	1	5	0.676	2.155	-0.731
Q3br2	0	3.934	4	1	5	0.692	2.433	-0.881
Q3br3	0	3.893	4	1	5	0.782	0.775	-0.586
Q4r1	0	4.07	4	1	5	0.677	1.297	-0.564
Q4r2	0	4.016	4	1	5	0.746	0.622	-0.562
Q4r3	0	4.037	4	1	5	0.697	1.081	-0.561
Q5r2	0	3.885	4	1	5	0.686	1.954	-0.692
Q5r3	0	3.783	4	1	5	0.706	1.566	-0.72
Q5r4	0	3.451	3	1	5	0.811	0.56	-0.443
Q5r5	0	3.561	4	1	5	0.707	0.376	-0.604
Q5r6	0	3.889	4	1	5	0.707	1.127	-0.608
Q5r7	0	3.828	4	1	5	0.662	0.806	-0.308
Q5r8	0	3.721	4	1	5	0.669	0.939	-0.518
Q5r9	0	3.578	4	1	5	0.734	0.567	-0.397
Q5r10	0	3.775	4	1	5	0.703	1.229	-0.506
Q5r11	0	3.775	4	1	5	0.709	1.353	-0.617
Q5r12	0	3.779	4	1	5	0.741	1.136	-0.652
Q5r13	0	3.705	4	1	5	0.698	0.942	-0.687
Q5r14	0	3.5	4	1	5	0.755	0.601	-0.316
Q5r15	0	3.656	4	1	5	0.693	0.396	-0.237
Q5r16	0	3.762	4	1	5	0.684	1.497	-0.583
Q5r17	0	3.684	4	1	5	0.748	1.138	-0.589
Q5r18	0	3.602	4	1	5	0.726	0.375	-0.524
Q5r19	0	3.672	4	1	5	0.665	0.659	-0.357
Q5r20	0	3.705	4	1	5	0.63	1.281	-0.662
Q5r21	0	3.791	4	1	5	0.708	1.565	-0.721
Q5r22	0	3.721	4	1	5	0.722	0.627	-0.51
Q5r23	0	3.799	4	1	5	0.663	1.157	-0.517
Q8r1	0	4.074	4	1	5	0.791	1.876	-0.982
Q8r2	0	4.127	4	1	5	0.716	1.261	-0.732
Q8r3	0	4.016	4	1	5	0.835	0.867	-0.755
Q8r4	0	3.836	4	1	5	0.848	1.124	-0.735
Tourist Perceptions (5-point Semantic Differential scale)								
Q6_1r1	0	3.975	4	1	5	0.695	2.597	-0.925
Q6_3r1	0	3.984	4	1	5	0.773	1.955	-0.935
Q6_5r1	0	3.877	4	1	5	0.736	1.217	-0.607
Q7b_2r1	0	3.779	4	1	5	0.741	0.765	-0.409
Q7c_2r1	0	3.807	4	1	5	0.718	1.461	-0.695

Q7c_3r1	0	3.947	4	1	5	0.708	1.405	-0.551
Q7f_1r1	0	3.947	4	1	5	0.774	0.072	-0.387
Q7h_1r1	0	3.811	4	1	5	0.793	0.602	-0.543
Created Construct Scores during the Two-Stage Approach								
Content Performance	0	0	-0.078	-5.151	2.316	1	3.311	-0.966
Customer Processes Performance	0	0	0.084	-5.325	2.421	1	3.166	-0.816
Interactional Processes Performance	0	0	0.002	-5.335	2.401	1	3.807	-0.911
Service Provider Processes Performance	0	0	0.127	-4.786	2.09	1	2.003	-0.794

Appendix 4.2. Measurement Model Assessment

Reflective Constructs

Table 1. Expectations

		Convergent validity			Internal consistency Reliability		Discriminant validity	
	Test	Outer loadings	Indicator Reliability	Explained Variance	Cronbach Alpha	Composite reliability	Forner-Larcker Criterion	HTMT Confidence interval
	Requirement	*l>0.70*	*>0.5*	AVE *>0.50*	*α>0.60*	*0.60 <CR<0.90*	$\sqrt{AVE}>r^2$	*If excludes 1*
Expectations	Q4r1	0.808***	0.653	0.652	0.733	0.849	Yes	Yes
	Q4r2	0.817***	0.667					
	Q4r3	0.797***	0.635					

Table 2. Satisfaction

		Convergent validity			Internal consistency Reliability		Discriminant validity	
	Test	Outer loadings	Indicator Reliability	Explained Variance	Cronbach Alpha	Composite reliability	Forner-Larcker Criterion	HTMT Confidence interval
	Requirement	*l>0.70*	*>0.5*	AVE *>0.50*	*α>0.60*	*0.60 <CR<0.90*	$\sqrt{AVE}>r^2$	*If excludes 1*
Satisfaction	Q3ar1	0.864***	0.746	0.757	0.839	0.903	Yes	Yes
	Q3br2	0.881***	0.776					
	Q3br3	0.863***	0.745					

Table 3. Loyalty

		Convergent validity			Internal consistency Reliability		Discriminant validity	
	Test	Outer loadings	Indicator Reliability	Explained Variance	Cronbach Alpha	Composite reliability	Forner-Larcker Criterion	HTMT Confidence interval
	Requirement	*l>0.70*	*>0.5*	AVE *>0.50*	*α>0.60*	*0.60 <CR<0.90*	$\sqrt{AVE}>r^2$	*If excludes 1*
Loyalty	Q8r1	0.892***	0.796	0.768	0.849	0.908	Yes	Yes
	Q8r2	0.846***	0.716					
	Q8r3	0.890***	0.792					

Table 4. Cross-loadings

	Co-Created Value	Content Performance	Customer Processes Performance	Expectations (Reflective)	Interactional Processes Performance	Loyalty (Reflective)	Satisfaction (Reflective)	Service Provider Processes Performance
Q3ar1	0.689	0.46	0.512	0.314	0.522	0.654	**0.864**	0.526
Q3br2	0.717	0.563	0.52	0.325	0.534	0.752	**0.881**	0.429
Q3br3	0.669	0.482	0.491	0.305	0.522	0.669	**0.863**	0.439
Q4r1	0.453	0.306	0.285	**0.808**	0.323	0.344	0.277	0.276
Q4r2	0.413	0.286	0.337	**0.817**	0.405	0.321	0.289	0.228
Q4r3	0.397	0.236	0.238	**0.797**	0.314	0.317	0.311	0.194
Q5r10	0.389	0.372	0.376	0.317	0.524	0.319	0.28	0.36
Q5r12	0.397	0.482	0.538	0.226	0.554	0.317	0.311	0.393
Q5r13	0.446	0.426	0.369	0.311	0.439	0.338	0.346	0.696
Q5r14	0.436	0.341	0.402	0.159	0.46	0.329	0.376	0.71
Q5r15	0.435	0.488	0.453	0.21	0.641	0.352	0.388	0.457
Q5r16	0.486	0.411	0.517	0.301	0.7	0.33	0.411	0.464
Q5r18	0.483	0.406	0.496	0.187	0.474	0.376	0.458	0.821
Q5r2	0.544	0.804	0.544	0.33	0.578	0.477	0.438	0.376
Q5r20	0.439	0.425	0.665	0.191	0.476	0.417	0.419	0.411
Q5r21	0.45	0.409	0.638	0.273	0.474	0.36	0.367	0.41
Q5r22	0.595	0.501	0.856	0.289	0.509	0.476	0.505	0.481
Q5r23	0.534	0.508	0.735	0.288	0.516	0.492	0.404	0.393
Q5r3	0.451	0.758	0.442	0.194	0.508	0.482	0.481	0.408
Q5r5	0.486	0.729	0.451	0.256	0.526	0.376	0.405	0.431
Q5r6	0.451	0.514	0.429	0.276	0.691	0.462	0.438	0.379
Q5r7	0.463	0.5	0.357	0.315	0.695	0.447	0.43	0.309
Q5r9	0.373	0.401	0.378	0.245	0.583	0.344	0.378	0.398
Q6_1r1	0.837	0.56	0.556	0.503	0.569	0.654	0.635	0.51
Q7b_2r1	0.782	0.483	0.559	0.387	0.564	0.597	0.656	0.443
Q7c_3r1	0.784	0.493	0.53	0.378	0.586	0.617	0.638	0.457
Q7f_1r1	0.777	0.486	0.548	0.403	0.48	0.628	0.62	0.514

Q7h_1r1	0.759	0.515	0.58	0.347	0.468	0.589	0.604	0.483
Q8r1	0.712	0.514	0.543	0.361	0.556	**0.892**	*0.762*	0.436
Q8r2	0.631	0.51	0.488	0.357	0.457	**0.846**	*0.616*	0.394
Q8r3	0.708	0.52	0.542	0.35	0.517	**0.89**	*0.706*	0.398

Table 5. Forner-Larcker Criterion

	Expectations	**Loyalty/ Use Intentions**	**Satisfaction**
Expectations	0.807		
Interactional Processes Performance	0.429		
Loyalty/ Use Intentions	0.406	0.876	
Satisfaction	0.362	0.796	0.870
Service Provider Processes Performance	0.289	0.468	0.533

Table 6. Heterotrait-Monotrait Ratio (HTMT)

HTMT<0.85	**Expectations**	**Loyalty**	**Satisfaction**
Expectations			
Loyalty/ Use Intentions	0.515 [0.289, 0.716]		
Satisfaction	0.462 [0.215, 0.691]	0.938 [0.877, 0.983]	

Formative Constructs

Co-Created Service Performance

Table 7. CTA Co-Created Service Performance HOC

Co-Created Service Performance	Original Sample (O)	Sample Mean	Standard Deviation	T Statistics (|O/STDEV|)	P Values	Bias	CI Low	CI Up	Alpha adj.	z(1-alpha)	CI Low adj.	CI Up adj.
1: Content Performance, Customer Processes Performance, Interactional Processes Performance, Service Provider Processes Performance	-0.02	-0.02	0.033	0.599	0.549	0	-0.084	0.045	0.025	2.242	-0.093	0.054
2: Content Performance, Customer Processes Performance, Service Provider Processes Performance, Interactional Processes Performance	0.037	0.036	0.03	1.212	0.225	-0.001	-0.022	0.097	0.025	2.242	-0.030	0.106

Table 8. CTA Co-Created Service Performance LOC

Interactional Processes (IS) Performance	Original Sample (O)	Sample Mean	Standard Deviation	T Statistics (|O/STDEV|)	P Values	Bias	CI Low	CI Up	Alpha adj.	z(1-alpha)	CI Low adj.	CI Up adj.
1: Q5r10,Q5r15,Q5r16,Q5r6	0.002	0.002	0.007	0.325	0.745	0.000	-0.011	0.015	0.006	2.774	-0.016	0.021
2: Q5r10,Q5r15,Q5r6,Q5r16	-0.006	-0.006	0.008	0.761	0.447	0.000	-0.020	0.009	0.006	2.774	-0.027	0.015
4: Q5r10,Q5r15,Q5r16,Q5r7	-0.004	-0.004	0.006	0.660	0.509	0.000	-0.015	0.007	0.006	2.774	-0.019	0.012
6: Q5r10,Q5r16,Q5r7,Q5r15	-0.002	-0.002	0.007	0.319	0.750	0.000	-0.016	0.012	0.006	2.774	-0.022	0.018
7: Q5r10,Q5r15,Q5r16,Q5r9	-0.002	-0.002	0.006	0.384	0.701	0.000	-0.015	0.010	0.006	2.774	-0.020	0.015
10: Q5r10,Q5r15,Q5r6,Q5r7	0.004	0.003	0.008	0.442	0.658	0.000	-0.012	0.020	0.006	2.774	-0.019	0.027
16: Q5r10,Q5r15,Q5r7,Q5r9	-0.006	-0.006	0.006	0.918	0.359	0.000	-0.018	0.006	0.006	2.774	-0.023	0.011
22: Q5r10,Q5r16,Q5r6,Q5r9	-0.003	-0.003	0.008	0.334	0.738	0.000	-0.017	0.012	0.006	2.774	-0.023	0.019

26: Q5r10,Q5r16,Q5r9,Q5r7	-0.006	-0.006	0.006	1.045	0.296	0.000	-0.019	0.006	0.006	2.774	-0.024	0.011
Customer Processes Performance	**Original Sample (O)**	**Sample Mean**	**Standard Deviation**	**T Statistics (|O/STDEV|)**	**P Values**	**Bias**	**CI Low**	**CI Up**	**Alpha adj.**	**z(1-alpha)**	**CI Low adj.**	**CI Up adj.**
1:Q5r20,Q5r21,Q5r22,Q5r23	0.010	0.010	0.011	0.975	0.330	0.000	-0.010	0.032	0.025	2.242	-0.013	0.035
2:Q5r20,Q5r21,Q5r23,Q5r22	0.011	0.010	0.010	1.029	0.303	0.000	-0.009	0.031	0.025	2.242	-0.012	0.033

Content Performance and **Service Performance** - Tetrads vanished

Table 9. Co-Created Service Performance Construct Validity

Convergent Validity		
Test	*Redundancy analysis*	
Requirement	*P>0.7*	*R^2>0.6*
Co-Created Service Performance	0.783***	0.613

*** p<0.01, ** p<0.05, *p<0.1

Table 10. Co-Created Service Performance Construct Validity

			(Significance and relevance of indicators)				
Test	**Collinearity**	**Weight (Loadings)**	**Weight**	**Significance**		**95% BCa CI**	**Sig**
Requirement	*VIF <5*	*w>0.02 (l<0.07)*	*w<1/√n*	*t >1.96*	*p<0.05*		*BCa CI Excludes 1*
HOC							
Co-Created Service Performance			*w<0.500*				
Content Performance	2.205	0.239 (0.832)	Yes	2.460	0.014	[0.266, 0.327]	Yes
Interaction Processes Performance	2.572	0.359 (0.897)	Yes	3.874	0.000	[0.326, 0.402]	Yes
Service Provider Processes Performance	1.749	0.214 (0.766)	Yes	2.956	0.003	[0.191, 0.246]	Yes
Customer Processes Performance	2.095	0.361 (0.872)	Yes	4.016	0.000	[0.267, 0.332]	Yes
LOC							
Content Performance			*w<0.577*				
Q5r2	1.285	0.490 (0.804)	Yes	5.540	0.000	[0.318; 0.684]	Yes
Q5r3	1.236	0.441 (0.758)	Yes	5.128	0.000	[0.243; 0.594]	Yes
Q5r5	1.271	0.373 (0.729)	Yes	3.960	0.000	[0.171; 0.548]	Yes
Interaction Processes Performance			*w*<0.408				
Q5r12	1.408	0.059 (0.554)	Yes	0.672	0.502	[-0.120; 0.228]	No
Q5r10	1.191	0.200 (0.524)	Yes	2.589	0.001	[0.043; 0.359]	Yes
Q5r15	1.375	0.259 (0.641)	Yes	3.553	0.000	[0.121; 0.427]	Yes
Q5r16	1.367	0.306 (0.700)	Yes	3.553	0.000	[0.146; 0.478]	Yes
Q5r6	1.450	0.252 (0.691)	Yes	3.008	0.003	[0.148; 0.476]	Yes
Q5r7	1.381	0.310 (0.695)	Yes	3.581	0.000	[0.138; 0.399]	Yes
Q5r9	1.300	0.160 (0.583)	Yes	2.080	0.038	[0.012; 0.310]	Yes
Service Provider Processes Performance			*w*<0.577				
Q5r13	1.176	0.411 (0.696)	Yes	4.215	0.000	[0.211; 0.599]	Yes
Q5r14	1.268	0.347 (0.710)	Yes	4.242	0.002	[0.174; 0.491]	Yes
Q5r18	1.212	0.569 (0.821)	Yes	6.532	0.000	[0.402; 0.746]	Yes
Customer Processes Performance			*w*<0.500				
Q5r20	1.355	0.253 (0.664)	Yes	3.036	0.002	[0.092; 0.429]	Yes
Q5r21	1.372	0.190 (0.638)	Yes	2.019	0.044	[0.005; 0.377]	Yes

Q5r22	1.436	0.518 (0.856)	Yes	5.654	0.000	[0.351; 0.715]	Yes
Q5r23	1.301	0.363 (0.735)	Yes	4.421	0.000	[0.183; 0.513]	Yes

Co-Created Value

Table 11. Co-Created Value CTA

Co-Created Value	Original Sample	Sample Mean	Std. dev.	T Statistics	P Values	Bias	CI Low	CI Up	Alpha adj.	Z (1-alpha)	CI Low adj.	CI Up adj.
1: Q6_1r1,Q7b_2r1,Q7c_3r1,Q7f_1r1	-0.017	-0.017	0.01	1.713	0.087	0.000	-0.037	0.002	0.01	2.577	-0.043	0.008
2: Q6_1r1,Q7b_2r1,Q7f_1r1,Q7c_3r1	-0.028	-0.027	0.01	2.734	**0.006**	**0.001**	**-0.048**	**-0.008**	**0.01**	**2.577**	**-0.054**	**-0.002**
4: Q6_1r1,Q7b_2r1,Q7c_3r1,Q7h_1r1	-0.001	-0.001	0.008	0.165	0.869	0.000	-0.018	0.015	0.01	2.577	-0.023	0.02
6: Q6_1r1,Q7c_3r1,Q7h_1r1,Q7b_2r1	-0.019	-0.019	0.013	1.421	0.155	0.000	-0.046	0.007	0.01	2.577	-0.054	0.015
10: Q6_1r1,Q7c_3r1,Q7f_1r1,Q7h_1r1	0.017	0.017	0.013	1.275	0.203	-0.001	-0.009	0.044	0.01	2.577	-0.017	0.052

Table 12. Co-Created Value Convergent Validity

Convergent Validity		
Test	*Redundancy analysis*	
Requirement	*P>0.7*	*R^2>0.6*
Co-Created Value	0.844***	0.711

*** p<0.01, ** p<0.05, *p<0.1

Table 13. Co-Created Value Construct Validity

			Significance and relevance of indicators					
	Test	**Collinearity**	**Weight (Loadings)**	**Weights**	**Significance**		**95% BCa CI**	**Sig**
	Requirement	VIF *<5*	*w>0.02 (l<0.07)*	*w*<0.447	*t* >1.96	*p<0.05*		BCa CI excludes 1
Co-Created Value	Q6_1r1	1.769	0.361 (0.837)	Yes	7.761	0.000	[0.267, 0.452]	Yes
	Q7b_2r1	1.950	0.223 (0.782)	Yes	5.174	0.000	[0.141, 0.305]	Yes
	Q7c_3r1	1.874	0.246 (0.783)	Yes	5.685	0.000	[0.166, 0.334]	Yes
	Q7f_1r1	1.944	0.209 (0.778)	Yes	3.464	0.001	[0.098, 0.330]	Yes
	Q7h_1r1	1.777	0.221 (0.759)	Yes	4.613	0.000	[0.124, 0.311]	Yes

*** p<0.01, ** p<0.05, *p<0.1

Appendix 4.3. Structural Model Assessment

Table 1. Collinearity, Strength and Significance of Path Relationships

	Collinearity	Path Coefficient	T Statistics	P Values	95% BCa Confidence Interval	Sig	Effect size F^2	Effect Size q^2
	VIF < 5	*B≠0*	*t>1.96*	*P<0.05*		*Sig if excludes 1*	*0.02 no effect, 0.15 moderate, 0.35 large effect*	
Expectations -> Co-Created Service Performance	1.000	0.428	4.290	0.000	[0.226, 0.607]	Yes	0.224	**0.130**
Expectations -> Co-Created Value	1.224	0.228	3.673	0.000	[0.118, 0.354]	Yes	0.122	0.033
Expectations -> Satisfaction	1.373	-0.077	*1.249*	*0.212*	*[-0.185, 0.041]*	*No*	*0.012*	0.002
Co-Created Service Performance -> Co-Created Value	1.224	**0.684**	9.907	0.000	[0.546, 0.799]	Yes	1.102	**0.342**
Co-Created Service Performance -> Satisfaction	2.572	0.153	2.733	0.006	[0.048, 0.265]	Yes	0.026	0.017
Co-Created Value -> Satisfaction	2.883	**0.717**	11.333	0.000	[0.576, 0.823]	Yes	0.506	**0.242**
Co-Created Value -> Loyalty	2.737	0.404	6.137	0.000	[0.271, 0.535]	Yes	0.195	0.081
Satisfaction -> Loyalty	2.737	0.475	7.198	0.000	[0.336, 0.605]	Yes	0.271	0.110

Table 2. Relevance of Path Relationships

	Total Effects	T Statistics	P Values	95% BCa CI		Sig
Expectations -> Co-Created Service Performance	0.428	4.290	0.000	[0.226	0.607]	Yes
Expectations -> Co-Created Value	0.520	6.044	0.000	[0.324	0.665]	Yes
Expectations -> Loyalty	0.382	4.838	0.000	[0.224	0.531]	Yes
Expectations -> Satisfaction	0.362	3.781	0.000	[0.174	0.543]	Yes
Co-Created Service Performance -> Co-Created Value	**0.684**	10.233	0.000	[0.546	0.799]	Yes
Co-Created Service Performance -> Loyalty	**0.582**	8.937	0.000	[0.441	0.695]	Yes
Co-Created Service Performance -> Satisfaction	**0.644**	9.715	0.000	[0.494	0.752]	Yes
Co-Created Value -> Satisfaction	**0.717**	11.333	0.000	[0.576	0.823]	Yes
Co-Created Value -> Loyalty	**0.745**	17.088	0.000	[0.644	0.812]	Yes
Satisfaction -> Loyalty	0.475	7.06	0.000	[0.336	0.605]	Yes

Table 3. Total Indirect Effects (Mediation)

	Indirect Effects	T Statistics	P Values	95% BCa CI	Sig
Expectations -> Co-Created Service Performance					
Expectations -> Co-Created Value	0.292	5.029	0.000	[0.185 0.409]	Yes
Expectations -> Loyalty	0.382	4.838	0.000	[0.224 0.531]	Yes
Expectations -> Satisfaction	0.439	5.637	0.000	[0.275 0.580]	Yes
Co-Created Service Performance -> Co-Created Value					
Co-Created Service Performance -> Loyalty	0.582	8.937	0.000	[0.441 0.695]	Yes
Co-Created Service Performance -> Satisfaction	**0.491**	7.232	0.000	[0.356 0.619]	Yes
Co-Created Value -> Loyalty	0.341	5.768	0.000	[0.232 0.460]	Yes
Co-Created Value -> Satisfaction					
Satisfaction -> Loyalty					

Table 4. Model Fit

	Criterion	Saturated Model	Estimated Model	SRMR 95% BCa CI $_{Sat}$	SRMR 95% BCa CI $_{Est}$
SRMR	*SRMR<0.08, SRMR value falls in the 95% BCa CI*	0.045	0.045	[0.043, 0.047]	[0.044, 0.048]
d_ULS	*d_ULS value falls in the 95% BCa CI*	0.34	0.347	[0.315, 0.374]	[0.332, 0.390]
d_G	*d_G value falls in the 95% BCa CI*	0.235	0.236	[0.230, 0.249]	[0.234, 0.252]
Chi-Square		324.005	325.614		
NFI	*NFI>0.8*	0.881	0.88		

SRMR theta is not applicable for formative constructs

Table 5. Predictive Power and Predictive Relevance of the Model

	Coefficient of Determinations	Adjusted Coefficient of Determinations	Cross validated Redundancy	Predictive Relevance
	R^2>0.2	**R^2 $_{Adj}$ >0.2**	**Q^2_{incl}>0**	**Q^2predict>0**
Co-Created Service Performance	*0.183*	0.179	0.115	-0.071
Co-Created Value	*0.653*	0.650	0.368	0.133
Satisfaction	0.648	0.643	0.455	-0.085
Loyalty	0.695	0.692	0.492	-0.194

Appendix 4.4. MGA and Moderation

Gender (Male/ Female)

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.996	0.944	0.922	yes
Co-Created Value	0.997	0.974	0.919	yes
Expectations	0.998	0.991	0.472	yes
Loyalty/ Use Intentions	1.000	0.999	0.713	yes
Satisfaction	1.000	0.999	0.310	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.0230	[-0.256 0.246]	0.863	yes
Co-Created Value	-0.139	[-0.271 0.230]	0.271	yes
Expectations	-0.126	[-0.249 0.239]	0.308	yes
Loyalty/ Use Intentions	-0.087	[-0.258 0.248]	0.506	yes
Satisfaction	-0.088	[-0.269 0.239]	0.494	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	R=0	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.060	[-0.655 0.642]	0.866	yes
Co-Created Value	-0.032	[-0.545 0.557]	0.907	yes
Expectations	0.415	[-0.481 0.476]	0.110	yes
Loyalty/ Use Intentions	-0.106	[-0.554 0.502]	0.679	yes
Satisfaction	-0.184	[-0.627 0.564]	0.566	yes

MGA						
	β (F)	**β (M)**	**p-Values (F)**	**p-Values (M)**	**B difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.744	0.589	0.000	0.000	0.154	0.879
Co-Created Service Performance -> Satisfaction	0.021	0.282	0.793	0.000	0.260	**0.011**
Co-Created Value -> Loyalty/ Use Intentions	0.396	0.404	0.000	0.001	0.008	0.475
Co-Created Value -> Satisfaction	0.822	0.616	0.000	0.000	0.206	0.950

Expectations -> Co-Created Service Performance	0.240	0.607	0.081	0.000	0.367	**0.009**
Expectations -> Co-Created Value	0.201	0.308	0.009	0.002	0.107	0.199
Expectations -> Satisfaction	-0.136	-0.030	0.091	0.740	0.106	0.184
Satisfaction -> Loyalty/ Use Intentions	0.500	0.453	0.000	0.000	0.047	0.631

Age (Generation Y, X, Z and Baby Boomers)

Gen Y vs Gen X

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.999	0.897	0.996	yes
Co-Created Value	0.987	0.953	0.660	yes
Expectations	0.998	0.985	0.650	yes
Loyalty/ Use Intentions	1	0.999	0.523	yes
Satisfaction	0.999	0.998	0.237	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.258	[-0.333 0.314]	0.117	yes
Co-Created Value	-0.114	[-0.318 0.319]	0.483	yes
Expectations	-0.195	[-0.311 0.307]	0.241	yes
Loyalty/ Use Intentions	-0.439	[-0.298 0.320]	**0.001**	No
Satisfaction	-0.103	[-0.313 0.302]	0.527	yes

Gen X vs Gen Baby Boomers

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.934	0.876	0.237	yes
Co-Created Value	0.989	0.958	0.628	yes
Expectations	0.995	0.983	0.381	yes
Loyalty/ Use Intentions	1	0.999	0.366	yes
Satisfaction	1	0.999	0.944	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*

Co-Created Service Performance	-0.322	[-0.358 0.323]	0.047	yes
Co-Created Value	-0.302	[-0.359 0.342]	0.076	yes
Expectations	-0.236	[-0.343 0.359]	0.177	yes
Loyalty/ Use Intentions	-0.057	[-0.377 0.341]	0.747	yes
Satisfaction	-0.262	[-0.361 0.324]	0.128	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	R=0	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.065	[-0.396 0.493]	0.792	yes
Co-Created Value	-0.303	[-0.416 0.489]	0.204	yes
Expectations	-0.028	[-0.444 0.500]	0.917	yes
Loyalty/ Use Intentions	-0.113	[-0.430 0.530]	0.679	yes
Satisfaction	0.031	[-0.493 0.559]	0.917	yes

MGA						
	β (Gen X)	**β (Gen BB)**	**p-Values (Gen X)**	**p-Values (Gen BB)**	**β difference (Gen X-Gen BB)**	**p-Value (Gen X-Gen BB / PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.542	0.720	0.000	0.000	0.185	0.902
Co-Created Service Performance -> Satisfaction	0.067	0.431	**0.401**	0.000	0.372	**0.996**
Co-Created Value -> Loyalty/ Use Intentions	0.513	0.482	0.000	0.000	0.05	0.382
Co-Created Value -> Satisfaction	0.683	0.520	0.000	0.000	0.174	0.123
Expectations -> Co-Created Service Performance	0.516	0.530	0.000	0.000	0.015	0.454
Expectations -> Co-Created Value	0.364	0.187	0.000	0.114	0.186	0.098
Expectations -> Satisfaction	0.127	-0.148	**0.124**	**0.121**	0.272	**0.014**
Satisfaction -> Loyalty/ Use Intentions	0.333	0.423	0.004	0.000	0.113	0.770

Gen Y vs Gen Baby Boomers

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.951	0.907	0.285	Yes
Co-Created Value	0.981	0.938	0.631	Yes
Expectations	0.999	0.964	0.802	Yes

Loyalty/ Use Intentions	0.999	0.998	0.233	Yes
Satisfaction	0.999	0.998	0.339	Yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.490	[-0.390 0.369]	**0.009**	No
Co-Created Value	-0.369	[-0.380 0.345]	**0.045**	No
Expectations	-0.363	[-0.386 0.370]	0.055	Yes
Loyalty/ Use Intentions	-0.454	[-0.332 0.365]	**0.016**	No
Satisfaction	-0.317	[-0.346 0.365]	0.075	yes

Gen Z vs Gen Y

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.965	0.755	0.769	yes
Co-Created Value	0.949	0.882	0.429	yes
Expectations	0.998	0.864	0.894	yes
Loyalty/ Use Intentions	0.998	0.995	0.314	yes
Satisfaction	1	0.996	0.806	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.298	[-0.453 0.420]	0.191	yes
Co-Created Value	0.310	[-0.492 0.421]	0.204	yes
Expectations	-0.083	[-0.501 0.440]	0.727	yes
Loyalty/ Use Intentions	0.505	[-0.468 0.460]	**0.036**	No
Satisfaction	0.426	[-0.461 0.449]	0.063	yes

Gen Z vs Gen X

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.967	0.712	0.838	yes
Co-Created Value	0.954	0.933	0.173	yes
Expectations	0.992	0.962	0.43	yes
Loyalty/ Use Intentions	0.996	0.997	**0.014**	No
Satisfaction	1	0.997	0.702	yes

Gen Z vs Gen Baby Boomers

MICOM Step 2:				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.881	0.804	0.216	yes
Co-Created Value	0.942	0.882	0.308	yes
Expectations	0.999	0.877	0.940	yes
Loyalty/ Use Intentions	0.993	0.994	**0.036**	**No**
Satisfaction	1	0.997	0.832	yes

Education

No Completed Degree vs with Degree

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.977	0.937	0.414	yes
Co-Created Value	0.985	0.975	0.265	yes
Expectations	0.999	0.991	0.581	yes
Loyalty/ Use Intentions	1	0.999	0.700	yes
Satisfaction	1	0.999	0.211	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.009	[-0.246 0.269]	0.949	yes
Co-Created Value	0.131	[-0.269 0.275]	0.311	yes
Expectations	-0.115	[-0.248 0.257]	0.424	yes
Loyalty/ Use Intentions	0.088	[-0.253 0.229]	0.494	yes
Satisfaction	0.099	[-0.263 0.263]	0.422	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.502	[-0.672 0.642]	0.208	yes
Co-Created Value	-0.297	[-0.546 0.517]	0.338	yes
Expectations	-0.181	[-0.496 0.477]	0.616	yes
Loyalty/ Use Intentions	-0.218	[-0.496 0.510]	0.418	yes
Satisfaction	-0.142	[-0.577 0.520]	0.631	yes

MGA						
	β (Deg)	**β (NoD)**	**p-Values (Deg)**	**p-Values (NoD)**	**β difference**	**p-Value (Parametric)**
Co-Created Service Performance -> Co-Created Value	0.637	0.736	0.000	0.000	0.100	0.420
Co-Created Service Performance -> Satisfaction	0.107	0.171	0.101	0.117	0.064	0.596
Co-Created Value -> Loyalty/ Use Intentions	0.361	0.451	0.000	0.000	0.091	0.510
Co-Created Value -> Satisfaction	0.714	0.761	0.000	0.000	0.047	0.737

Expectations -> Co-Created Service Performance	0.434	0.456	0.000	0.013	0.021	0.905
Expectations -> Co-Created Value	0.249	0.200	0.002	0.038	0.049	0.694
Expectations -> Satisfaction	-0.050	-0.127	0.590	0.123	0.076	0.552
Satisfaction -> Loyalty/ Use Intentions	0.475	0.471	0.000	0.000	0.004	0.976

Family Status (Single vs With Partner)

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.968	0.931	0.296	yes
Co-Created Value	0.993	0.971	0.752	yes
Expectations	0.998	0.988	0.493	yes
Loyalty/ Use Intentions	1	0.999	0.955	yes
Satisfaction	1	0.999	0.355	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.257	[-0.241 0.279]	0.053	yes
Co-Created Value	0.130	[-0.264 0.267]	0.357	yes
Expectations	0.370	[-0.261 0.264]	**0.008**	**No**
Loyalty/ Use Intentions	0.232	[-0.254 0.257]	0.083	yes
Satisfaction	0.069	[-0.262 0.259]	0.628	yes

Awareness about Personalisation Being Applied

MICOM Step 1				
Indicators	**Scales**	**Data treatment**	**Model estimation settings**	**Configural variance**
Same	*Same*	*Identical*	*Identical*	Established/ not
Yes	Yes	Yes	yes	yes
MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.988	0.873	0.889	yes
Co-Created Value	0.992	0.945	0.840	yes
Expectations	0.992	0.961	0.308	yes
Loyalty/ Use Intentions	0.999	0.998	0.175	yes
Satisfaction	1	0.998	0.880	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	**0.989**	[-0.312 0.352]		No
Co-Created Value	**0.964**	[-0.310 0.359]		No
Expectations	**0.886**	[-0.334 0.334]		No
Loyalty/ Use Intentions	**0.816**	[-0.330 0.333]		No
Satisfaction	**0.791**	[-0.334 0.354]		No

Awareness about Personal Data being Applied

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.972	0.933	0.360	yes
Co-Created Value	0.983	0.971	0.291	yes
Expectations	0.997	0.990	0.411	yes
Loyalty/ Use Intentions	0.999	0.999	**0.024**	no
Satisfaction	1	0.999	0.800	yes

Previous application of personalised travel planners (Google Trips/ Other Planners/ No)

MICOM Step 2 (Google Trips vs Other Planners)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.985	0.922	0.681	yes
Co-Created Value	0.992	0.966	0.706	yes
Expectations	0.997	0.987	0.382	yes
Loyalty/ Use Intentions	0.999	0.998	0.282	yes
Satisfaction	1	0.998	0.649	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.080	[-0.250 0.258]	0.557	yes
Co-Created Value	-0.121	[-0.254 0.251]	0.372	yes
Expectations	-0.090	[-0.256 0.257]	0.483	yes
Loyalty/ Use Intentions	0.001	[-0.231 0.263]	0.996	yes
Satisfaction	0.009	[-0.234 0.257]	0.947	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	R=0	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.396	[-0.735 0.623]	0.352	yes
Co-Created Value	0.177	[-0.619 0.540]	0.605	yes
Expectations	-0.056	[-0.515 0.480]	0.854	yes
Loyalty/ Use Intentions	0.109	[-0.566 0.568]	0.677	yes
Satisfaction	-0.126	[-0.659 0.707]	0.726	yes

MGA						
	β (GT)	**β (Other)**	**p-Values (GT)**	**p-Values (Other)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.671	0.534	0.000	0.000	0.137	0.161
Co-Created Service Performance -> Satisfaction	0.190	0.145	**0.005**	**0.125**	0.045	0.346
Co-Created Value -> Loyalty/ Use Intentions	0.399	0.317	0.000	0.004	0.082	0.269

Co-Created Value -> Satisfaction	0.672	0.767	0.000	0.000	0.096	0.753
Expectations -> Co-Created Service Performance	0.445	0.505	0.000	0.000	0.060	0.652
Expectations -> Co-Created Value	0.228	0.328	0.006	0.005	0.100	0.755
Expectations -> Satisfaction	-0.083	-0.210	0.299	0.127	0.127	0.202
Satisfaction -> Loyalty/ Use Intentions	0.461	0.525	0.000	0.000	0.004	0.976

MICOM Step 2 (Google Trips vs No Experience)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.978	0.842	0.789	yes
Co-Created Value	0.977	0.918	0.567	yes
Expectations	0.982	0.891	0.247	yes
Loyalty/ Use Intentions	0.998	0.998	0.101	yes
Satisfaction	1	0.996	0.588	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.715	[-0.356 0.409]		no
Co-Created Value	0.806	[-0.346 0.406]		no
Expectations	0.285	[-0.370 0.389]	0.122	yes
Loyalty/ Use Intentions	0.829	[-0.352 0.395]		no
Satisfaction	0.955	[-0.355 0.386]		no

MICOM Step 2 (Other Planners – No Experience)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.971	0.81	0.809	yes
Co-Created Value	0.983	0.907	0.807	yes
Expectations	0.991	0.953	0.493	yes
Loyalty/ Use Intentions	0.996	0.997	**0.030**	**no**
Satisfaction	1	0.997	0.911	yes

Operating System (Windows/ Mac /Others) Used to Complete the Survey

MICOM Step 2 (Windows vs Mac)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.999	0.911	0.997	yes
Co-Created Value	0.994	0.945	0.9	yes
Expectations	0.994	0.966	0.329	yes
Loyalty/ Use Intentions	1	0.999	0.972	yes
Satisfaction	0.999	0.998	0.258	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.030	[-0.333 0.370]	0.848	yes
Co-Created Value	-0.038	[-0.347 0.355]	0.821	yes
Expectations	0.168	[-0.316 0.354]	0.335	yes
Loyalty/ Use Intentions	0.099	[-0.337 0.340]	0.581	yes
Satisfaction	0.021	[-0.339 0.340]	0.904	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	R=0	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.389	[-0.892 0.826]	0.508	yes
Co-Created Value	-0.374	[-0.748 0.820]	0.415	yes
Expectations	**-0.766**	[-0.690 0.613]	**0.016**	no
Loyalty/ Use Intentions	-0.334	[-0.663 0.750]	0.410	yes
Satisfaction	-0.476	[-0.716 0.845]	0.308	yes

MICOM Step 2 (Windows vs Other OS)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.956	0.876	0.478	yes
Co-Created Value	0.947	0.945	0.057	yes
Expectations	0.985	0.957	0.241	yes

Loyalty/ Use Intentions	0.999	0.998	0.143	yes
Satisfaction	0.999	0.998	0.352	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.008	[-0.320 0.328]	0.947	yes
Co-Created Value	**0.461**	[-0.344 0.319]	**0.005**	no
Expectations	0.244	[-0.327 0.320]	0.146	yes
Loyalty/ Use Intentions	**0.439**	[-0.324 0.338]	**0.008**	No
Satisfaction	**0.479**	[-0.347 0.350]	**0.007**	No

MICOM Step 2 (Mac vs Other OS)				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.954	0.814	0.669	Yes
Co-Created Value	0.931	0.908	0.172	Yes
Expectations	0.999	0.969	0.928	Yes
Loyalty/ Use Intentions	0.999	0.996	0.353	Yes
Satisfaction	1	0.997	0.790	Yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.050	[-0.433 0.407]	0.840	Yes
Co-Created Value	**0.486**	**[-0.429 0.396]**	**0.021**	No
Expectations	0.015	[--0.435 0.410]	0.953	Yes
Loyalty/ Use Intentions	0.329	[-0.424 0.414]	0.120	Yes
Satisfaction	0.413	[-0.439 0.391]	0.053	Yes

Device Used to Complete the Survey

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.995	0.932	0.917	Yes
Co-Created Value	0.998	0.968	0.956	Yes
Expectations	0.997	0.984	0.506	Yes
Loyalty/ Use Intentions	1	0.999	0.961	Yes
Satisfaction	0.999	0.999	0.071	Yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.001	[-0.281 0.281]	0.996	yes
Co-Created Value	0.269	[-0.269 0.280]	0.056	yes
Expectations	0.115	[-0.265 0.281]	0.401	yes
Loyalty/ Use Intentions	0.263	[-0.274 0.284]	0.064	yes
Satisfaction	0.270	[-0.279 0.283]	0.062	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.050	[-0.732 0.669]	0.923	yes
Co-Created Value	-0.133	[-0.568 0.592]	0.701	yes
Expectations	-0.443	[-0.530 0.494]	0.100	yes
Loyalty/ Use Intentions	-0.174	[-0.526 0.531]	0.563	yes
Satisfaction	-0.295	[-0.588 0.675]	0.366	yes
MGA				

	β (D)	**β (M)**	**p-Values (D)**	**p-Values (M)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.699	0.686	0.000	0.000	0.013	0.443
Co-Created Service Performance -> Satisfaction	**0.217**	**0.072**	**0.001**	**0.571**	0.146	0.153
Co-Created Value -> Loyalty/ Use Intentions	0.388	0.425	0.000	0.000	0.038	0.610
Co-Created Value -> Satisfaction	0.637	0.838	0.000	0.000	0.201	0.915
Expectations -> Co-Created Service Performance	0.401	0.471	0.001	0.016	0.070	0.644
Expectations -> Co-Created Value	0.212	0.250	0.009	0.012	0.038	0.622

Expectations -> Satisfaction	**-0.009**	**-0.194**	0.874	0.132	0.186	0.101
Satisfaction -> Loyalty/ Use Intentions	0.467	0.497	0.000	0.000	0.030	0.609

Travel Experience (Frequency)

MICOM Step 2 Frequent vs Regular				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.845	0.727	0.204	yes
Co-Created Value	0.961	0.902	0.415	yes
Expectations	0.993	0.965	0.407	yes
Loyalty/ Use Intentions	0.999	0.995	0.399	yes
Satisfaction	1	0.993	0.810	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	**0.407**	**[-0.393 0.383]**	**0.041**	no
Co-Created Value	**0.383**	**[-0.386 0.356]**	**0.045**	no
Expectations	0.280	[-0.356 0.360]	0.131	yes
Loyalty/ Use Intentions	**0.484**	**[-0.386 0.357]**	**0.007**	no
Satisfaction	0.307	[-0.401 0.372]	0.115	yes

MICOM Step 2 Frequent vs Not Frequent				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.924	0.917	0.072	yes
Co-Created Value	0.937	0.927	0.089	yes
Expectations	0.997	0.921	0.601	yes
Loyalty/ Use Intentions	1	0.999	0.326	yes
Satisfaction	1	0.999	0.689	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	**0.717**	**[-0.385 0.383]**		no
Co-Created Value	**0.695**	**[-0.403 0.404]**		no

Expectations	**0.545**	**[-0.455 0.414]**	0.009	no
Loyalty/ Use Intentions	**0.764**	**[-0.426 0.401]**	0.001	no
Satisfaction	**0.703**	**[-0.405 0.378]**		no

MICOM Step 2 Regular vs Not Frequent				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.990	0.909	0.852	yes
Co-Created Value	0.979	0.960	0.307	yes
Expectations	1.000	0.979	0.958	yes
Loyalty/ Use Intentions	0.999	0.999	0.132	yes
Satisfaction	1.000	0.999	0.948	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.544	[-0.277 0.270]		no
Co-Created Value	0.541	[-0.301 0.274]	0.001	no
Expectations	0.355	[-0.277 0.294]	0.018	no
Loyalty/ Use Intentions	0.450	[-0.300 0.272]	0.001	no
Satisfaction	0.507	[-0.316 0.285]		no

Short haul vs Long Haul Travel

MICOM Step 2				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.978	0.913	0.596	yes
Co-Created Value	0.982	0.958	0.372	yes
Expectations	0.999	0.977	0.773	yes
Loyalty/ Use Intentions	1	0.999	0.931	yes
Satisfaction	1	0.999	0.839	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.215	[-0.299 0.293]	0.156	yes
Co-Created Value	0.047	[-0.304 0.282]	0.752	yes
Expectations	-0.028	[-0.307 0.299]	0.865	yes
Loyalty/ Use Intentions	0.008	[-0.292 0.287]	0.957	yes
Satisfaction	-0.035	[-0.282 0.293]	0.833	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.240	[-0.859 0.728]	0.712	yes
Co-Created Value	0.407	[-0.645 0.640]	0.264	yes
Expectations	**0.580**	**[-0.623 0.574]**	**0.058**	yes
Loyalty/ Use Intentions	0.202	[-0.582 0.592]	0.558	yes
Satisfaction	-0.050	[-0.642 0.738]	0.909	yes

MGA						
	β (LH)	**β (SH)**	**p-Values (LH)**	**p-Values (SH)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.765	0.690	0.000	0.000	0.076	0.740
Co-Created Service Performance -> Satisfaction	0.122	0.161	**0.359**	**0.015**	0.039	0.388
Co-Created Value -> Loyalty/ Use Intentions	0.503	0.373	0.001	0.000	0.130	0.786
Co-Created Value -> Satisfaction	0.748	0.705	0.000	0.000	0.043	0.621

Expectations -> Co-Created Service Performance	0.483	0.427	0.000	0.000	0.055	0.638
Expectations -> Co-Created Value	0.010	0.247	**0.937**	**0.001**	0.237	**0.052**
Expectations -> Satisfaction	-0.141	-0.051	0.227	0.487	0.090	0.260
Satisfaction -> Loyalty/ Use Intentions	0.349	0.511	**0.034**	**0.000**	0.162	0.178

Social environment

MICOM Step 2: with family members vs with Friends				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.982	0.869	0.818	yes
Co-Created Value	0.958	0.939	0.166	yes
Expectations	0.993	0.874	0.688	yes
Loyalty/ Use Intentions	0.999	0.996	0.344	yes
Satisfaction	1	0.995	0.737	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.070	[-0.414 0.392]	0.761	yes
Co-Created Value	-0.125	[-0.414 0.418]	0.587	yes
Expectations	-0.168	[-0.424 0.433]	0.450	yes
Loyalty/ Use Intentions	-0.177	[-0.422 0.438]	0.429	yes
Satisfaction	-0.023	[-0.391 0.407]	0.907	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.387	[-1.117 1.109]	0.961	yes
Co-Created Value	-0.496	[-0.953 0.996]	0.604	yes
Expectations	-0.488	**[-0.532 0.515]**	0.072	yes
Loyalty/ Use Intentions	-0.417	[-0.842 0.872]	0.593	yes
Satisfaction	-0.778	[-1.096 1.102]	0.252	yes
MGA				

	β (Fam)	**β (Fr)**	**p-Values (Fam)**	**p-Values (Fr)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.579	0.812	0.000	0.000	0.233	0.844
Co-Created Service Performance -> Satisfaction	0.375	0.25	0.02	0.157	0.124	0.296
Co-Created Value -> Loyalty/ Use Intentions	0.757	0.626	0.000	0.000	0.131	0.235
Co-Created Value -> Satisfaction	0.416	0.608	0.043	0.000	0.192	0.767
Expectations -> Co-Created Service Performance	0.489	0.052	0.000	0.829	0.437	0.044

Expectations -> Co-Created Value	0.403	0.256	0.003	0.040	0.146	0.211
Expectations -> Satisfaction	0.096	-0.014	0.537	0.898	0.109	0.279
Satisfaction -> Loyalty/ Use Intentions	0.065	0.3	0.696	0.016	0.234	0.874

MICOM Step 2: with family members vs with spouse				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not
Co-Created Service Performance	0.872	0.849	0.082	Yes
Co-Created Value	0.981	0.936	0.578	Yes
Expectations	0.996	0.957	0.57	Yes
Loyalty/ Use Intentions	1	0.998	0.528	Yes
Satisfaction	1	0.998	0.842	Yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.087	[-0.390 0.369]	0.656	yes
Co-Created Value	0.15	[-0.387 0.362]	0.432	yes
Expectations	-0.096	[-0.394 0.366]	0.610	yes
Loyalty/ Use Intentions	0.162	[-0.386 0.368]	0.397	yes
Satisfaction	0.192	[-0.392 0.359]	0.308	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	-0.406	[-0.756 0.764]	0.395	yes
Co-Created Value	-0.328	[-0.697 0.642]	0.388	yes
Expectations	-0.231	[-0.804 0.852**]**	0.732	yes
Loyalty/ Use Intentions	-0.435	[-0.668 0.578]	0.2	yes
Satisfaction	**-0.922**	**[-0.791 0.662]**	**0.012**	no

MICOM Step 2: with Friends vs with Spouse				
Composite	**Correlation c**	**5% quantile of the empirical distribution of c**	**p value**	**Compositional variance**
	C>5% quantile		p>0.05	Established/ not

Co-Created Service Performance	0.946	0.897	0.27	yes
Co-Created Value	0.984	0.958	0.479	yes
Expectations	0.993	0.952	0.384	yes
Loyalty/ Use Intentions	1	0.999	0.512	yes
Satisfaction	1	0.999	0.673	yes
MICOM Step 3				
Composite	**Mean value difference**	**95% CI**	**p value**	**Mean value**
	(m=0)	*m falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.097	[-0.346 0.327]	0.573	yes
Co-Created Value	0.257	[-0.333 0.334]	0.136	yes
Expectations	0.055	[-0.344 0.341]	0.752	yes
Loyalty/ Use Intentions	0.315	[-0.334 0.319]	0.061	yes
Satisfaction	0.204	[-0.332 0.34]	0.224	yes
Composite	**Log of the composite's variances ration**	**95% CI**	**p value**	**Variance**
	(R=0)	*R falls within CI*	*p>0.05*	*Equal/ not*
Co-Created Service Performance	0.138	[-0.913 0.977]	0.861	yes
Co-Created Value	0.141	[-0.732 0.747]	0.775	yes
Expectations	0.246	**[-0.673 0.686]**	0.622	yes
Loyalty/ Use Intentions	-0.012	[-0.651 0.627]	0.974	yes
Satisfaction	-0.141	[-0.73 0.675]	0.714	yes
MGA				

	β (Fr)	**β (Sp)**	**p-Values (Fr)**	**p-Values (Sp)**	**β difference**	**p-Value (PLS-MGA)**
Co-Created Service Performance -> Co-Created Value	0.812	0.675	0.000	0.000	0.137	0.256
Co-Created Service Performance -> Satisfaction	0.25	0.081	0.162	0.313	0.170	0.187
Co-Created Value -> Loyalty/ Use Intentions	0.626	0.339	0.000	0.000	0.286	**0.020**
Co-Created Value -> Satisfaction	0.608	0.812	0.001	0.000	0.204	0.858
Expectations -> Co-Created Service Performance	**0.052**	**0.570**	**0.829**	**0.000**	0.519	**0.983**
Expectations -> Co-Created Value	0.256	0.177	0.034	0.075	0.079	0.312
Expectations -> Satisfaction	-0.014	-0.109	0.899	0.298	0.095	0.257
Satisfaction -> Loyalty/ Use Intentions	0.300	0.557	0.017	0.000	0.257	0.957