GREEN SERVICE IN THE CONSUMER-PRODUCT INDUSTRY:

CONCEPTUALIZATION AND PERFORMANCE IMPLICATIONS

CHAN TING YAN

Ph.D

The Hong Kong

Polytechnic University

2015

THE HONG KONG POLYTECHNIC UNIVERSITY

INSTITUTE OF TEXTILES AND CLOTHING

Green service in the consumer-product industry: Conceptualization and performance implications

CHAN Ting Yan

A thesis submitted in partial fulfillment of the requirements for

the degree of Doctor of Philosophy

November 2013

CERTIFICATE OF ORIGINIALITY

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.

____

CHAN Ting Yan

ABSTRACT

Green service (GS) is concerned with the provision of customer services to satisfy customer needs by taking environmental sustainability into account. Although the implementation of GS is imperative for consumer-product firms in responding to growing stakeholder pressure to be environmentally responsible, research on GS is confined to examining customer service practices such as product take-back and recycling activities, and has the tendency to focus on managing environmental damage caused by product development, usage, and disposal. Prior studies have neglected the environmental damages caused by hardware infrastructures (e.g., use of facilities and equipment), operations (e.g., logistics processes), and cross-function efforts (e.g., information sharing and learning) in customer service activities in the various stages of a supply chain. There is a lack of GS measurements that comprise activities which span from product development to disposal, and limited knowledge on how consumer-product firms can engage in different organizational practices and activities to satisfy customer needs with reduced costs and environmental impacts for sustainable development. Prior research on GS is mostly case examples or anecdotal evidence that demonstrates the economic and environmental impacts of GS implementation, thus neglecting their impacts on customers in terms of customer satisfaction and customer loyalty.

As an attempt to bridge the research gaps in the literature on GS, this study conceptualizes GS in the context of consumer-product firms, empirically validates a GS measurement scale, and examines the performance consequences of GS implementation. Based on the natural resource based view, this study conceptualizes GS with the important environmental traits of pollution prevention, product stewardship, and sustainable development, which are crucial for consumer-product firms to be environmentally responsible in their economic activities. This study examines the relationships of GS, revenue growth, cost savings, environmental performance, customer satisfaction, and customer loyalty. A multi-method research design is adopted. In this study, interviews, content analyses, and a mass survey research have been carried out to collect primary and secondary data to theoretically develop and empirically validate the measurement scale of GS, and test hypotheses in five research phases.

The empirical findings suggest that GS is a third-order construct with three theoretical dimensions, namely, pollution prevention-, product-, and long-term development-oriented practices, where each consists of three sub-dimensions, thus resulting in a total of 34 measurement items. The results show that the implementation of GS is positively related to environmental performance, revenue growth, cost savings, and customer satisfaction. The empirical findings also confirm the theorization on the positive relationships of GS implementation, customer satisfaction and loyalty, and revenue growth. In addition, the results show that customer satisfaction has a mediating effect on the relationship between GS and customer loyalty, and customer loyalty has a mediating effect on the relationship between customer satisfaction and revenue growth.

This study contributes to the literature and practices by identifying GS activities that can be useful in reducing environmental damage caused by customer service activities of consumer-product firms, which have been neglected as a source of pollution due to their distinctive characteristic of being intangible. This study provides a useful reference for consumer-product firms to understand the organizational practices and activities of GS, and the breadth and depth of their implementation, which will guide them on taking proper environmental management measures to mitigate environmental damage from their customer service activities, while improving business performance for sustainable development. In particular, the case examples collected from content analysis and the validated GS measurement scale provide examples of GS implementation. Consumer-product firms can consider the approaches adopted by the sample firms in the content analysis to implement their own GS activities. On the other hand, the validated GS measurement scale could serve as a diagnostic tool for consumer-product firms to assess their current GS implementation, and identify areas for GS implementation and improvement actions. The analysis results will be useful for managers of consumer-product firms to plan their assessment, reporting, and monitoring mechanisms for GS implementation.

PUBLICATIONS ARISING FROM THE THESIS

List of Journal Papers

1. Chan, T.Y. and Wong, C.W.Y. (2012), "The consumption side of sustainable fashion supply chain: understanding fashion consumer eco-fashion consumption decision", *Journal of Fashion Marketing and Management*, Vol. 16, No. 2, pp. 193 – 215.

2. Chan T.Y., Wong, C.W.Y., Lai, K.H., Lun, V.Y.H., Ng, C.T. and Ngai, E.W.T., "Measures of green service: empirical tests and theoretical analysis", submitted to the Special Issue "Multi-methodological Research in Production and Operations Management" of Production and Operations Management, is presently being given full consideration for publication in Production and Operations Management.

ACKNOWLEDGEMENTS

First, I am especially grateful for the gentle kindness, patience, guidance and inspiration offered by my chief supervisor: Dr C.W.Y. Wong. She always clarifies my thoughts. Her valuable input is vital to the completion of this research study. I also feel very fortune to be a postgraduate student of the Institute of Textiles and Clothing of the Hong Kong Polytechnic University, as it provides an excellent platform for exchanging fresh research ideas. Second, I would like to thank managers of the case companies in the exploratory research of this study. They spent time and effort to share their knowledge on real-life activities of GS and the performance consequences of GS implementation with me. Third, I would like to thank my family for their love and support during this long journey.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1 INTRODUCTION

1.1 Contextual background of the study

Customer service has been defined as a bundle of tangible goods and intangible services sold to the individual customer (Sasser et al., 1978; Roth and Menor, 2003), which aims to provide significant value-added benefits to satisfy the needs of individual customer (Grove et al., 1996; Innis and La Londe, 1994). Nowadays, individual customers are intensifying their quest for more refined customer services, such as customizing products based on individual customer needs, handling customer complaints and inquires, and handling the returns and exchanges of products (Oliva and Kallenberg, 2003; Ghosh et al., 2010; Lai et al., 2010; McMurrian and Matulich, 2011). The development of advanced technology, on the other hand, offers assistance to consumer-product firms to provide customer services that add value to their product offerings to better satisfy the end customers (Gummesson, 1994; Brezet et al., 2001).

Consumer-product firms are retail firms whose core business is to provide consumer goods and service offering to satisfy the needs of individual customer (Kotler and Armstrong, 2010). The business operations and organizational activities of consumer-product firms are business to customer oriented (Kotler and Armstrong, 2010). Customer service is vitally important in the operations management of consumer-product firms as it enables firms to differentiate from their competitors and adds value to better satisfy customer needs, which is crucial for business performance improvement (Roth and Menor, 2003; Lusch et al., 2010). Moreover, customer service, which is labor dependent and has less visibility (Cook et al., 2006), is difficult to be observed and imitated by firm's competitors, thus becoming a sustainable source of competitive advantage (Heskett et al., 1997; Cook et al., 2006). However, the dependency of customer service on a wide range of materials, physical equipment, and natural resources for its delivery poses threats to the natural environment (Grove et al., 1996; Elleger and Scheiner, 1997; Gatzweiler, 2002; Cook et al., 2006; Burja and Burja, 2009; Callaway and Dobrzykowski, 2009). For example, product packaging or gift wrapping services require materials such as ribbons, wrapping paper, and shopping bags. Likewise, product delivery services require vehicles, which consume fuel and energy, and emit carbon dioxide.

The concerns of stakeholders about environmental issues such as pollution, waste, and resource depletion caused by the provision of customer services are increasingly growing (Hume and Gallagher, 2010). Consumers are increasingly demanding not only environmentally friendly product offerings, but also environmentally friendly service offerings (e.g., the provision of eco-label on environmentally friendly product offerings), which add value to better satisfying their needs of environmental protection (Lai et al., 2010; Wong et al., 2013). Environmental organizations are increasingly condemning business decisions or service offerings that may cause damage to the environment (Price and Coy, 2001). The governments and regulatory bodies are increasingly devising and imposing more stringent environmental regulations and schemes to mitigate environmental degradation caused by the provision of customer services for sustainable development (Pun et al., 2002). For instance, an environmental levy scheme on plastic shopping bags in the consumer-product industry under the Product Eco-responsibility (Plastic Shopping Bags) Regulation has imposed by the Government of the Hong Kong Special Administrative Region (HKSAR) of the People's Republic of China on 7th July 2009 with the aim to reduce the indiscriminate use of plastic shopping bags which subsequently induce their disposal into landfills (Environmental Protection Department, 2012).

In view of these, consumer-product firms are encouraged by stakeholders to respond to the growing environmental concerns and to be environmentally responsible in their retail operations by adopting *green service (GS)*, which is concerned with the provision of customer services to satisfy the needs of individual customer by taking account of environmental performance and sustainability (Foster Jr et al., 2000; Wong et al., 2013). Environmental management practices that are central to satisfying the needs of individual customers (Foster Jr et al., 2000) by improving service quality, meeting customer expectation, or adding value (Fornell et al., 1996) with reduced environmental impacts (Wong et al., 2013) are considered as GS practices. For example, the provision of a 5-cent discount incentive to individual customers who use reusable bags and the installation of recycling kiosks in stores or servicing locations to collect plastic bags from individual customers for recycling are GS practices that are implemented by such consumer-product firm as Target Co.. Such GS practices enable Target Co. to improve its customer service quality by making it convenient for customers to recycle plastic bags, while saving on its own costs and eliminating 7000 tons of plastic bag disposal into landfills in 2011 (Target Corporation, 2012). Similar to Target Co., many consumer-product firms implement GS practices not only to reduce environmental impacts and hence operation costs, but also to better satisfy the needs of environmentally conscious customers by demonstrating efforts in environment protection for achieving organizational sustainable development (Poksinska et al., 2003; Lai et al., 2010).

1.2 Conceptual background of the study

1.2.1 Research motivation

Although the provision of GS is appealing to consumer-product firms in responding to the growing pressures of being environmentally responsible, prior studies on GS have shortcomings in their recommendations and results, which would hinder the implementation of GS by consumer-product firms for sustainable development.

First, prior studies provide only practical examples on how firms in a pure service context (e.g., medical and personal care, banking, and hospitality and tourism) engage in different practices as part of their environmental protection efforts (Grove et al., 1996; Foster Jr et al., 2000; Goodman, 2000; Manzini and Vezzoli, 2003;

Manaktola and Jauhari, 2007), thus providing little insights into how consumer-product firms may handle the environmental damages of tangible products in addition to intangible services, such as product maintenance and delivery (Nordås, 2008). There is limited knowledge about the organizational practices and activities involved in GS provision which comprises a combination of consumer products and services in the context of consumer-product industry (Roth and Menor, 2003).

Second, although prior studies offer insights into specific GS activities that may mitigate environmental damage, these are performed in isolation without coherence to relevant organizational functions and operations (Wong et al., 2013). Prior studies provide limited knowledge on how consumer-product firms can engage in different organizational practices and activities to mitigate environmental damages of their customer service activities (Kassinis and Soteriou, 2003).

Third, although it is asserted that customer service activities take place and pose environmental impacts in various stages of the supply chain (Hart, 1995), there is a lack of GS measurement which comprises customer service activities in the various stages of a supply chain (Kassinis and Soteriou, 2003).

Fourth, most prior studies fail to take into account the environmental damage induced by hardware infrastructures (e.g., use of facilities and equipment), operations (e.g., logistics processes), and cross-functional efforts (e.g., information sharing and learning) involved in customer service provision (Angell and Klassen, 1999; Roth and Menor, 2003). There is limited knowledge on how consumer-product firms can manage environmental damage induced by hardware infrastructures, operations, and cross-functional efforts in service provision (Angell and Klassen, 1999).

Fifth, prior studies pay little attention to GS practices as a competitive dimension of operations (Wong et al., 2013). They do not take into account the important environmental management traits of pollution prevention, product stewardship, and sustainable development (Hart, 1995). According to the natural resource-based view of the firm (NRBV), firms are dependent on natural resources. Organizational efforts to be environmentally sustainable in carrying out business activities are needed and essential to reduce costs, preempt competitors, and enhance organizational reputation (Hart, 1995). These organizational efforts include pollution prevention, product stewardship, and sustainable development (Hart, 1995). By taking account of environmental management traits of pollution prevention, product stewardship, and sustainable development, firms will be environmentally sustainable in their conducting of economic activities (Buysse and Verbeke, 2003).

Sixth, although prior studies have examined the impact of the implementation of GS practices on organizational performance, which comprises environmental and business performances, they are limited to case studies or anecdotal evidence (Roy, 2000; Bartolomeo et al., 2003; Halme et al., 2004; Cook et al., 2006). While the implementation of GS could be a cost burden in the efforts of firms to address environmental issues related to their tangible product and intangible service offerings (Waddock and Graves, 1997; Montabon et al., 2007), the limited empirical evidence on the environmental benefits and business value of GS provides scant justification for consumer-product firms to invest in or implement GS to improve their environmental and business performances.

Seventh, while GS is concerned with servicing customers, its role in affecting customer satisfaction and loyalty has become crucial to business performance improvement in terms of revenue growth. The literature is rich with evidence that customer satisfaction is crucial for business performance improvement (Sparks and McColl-Kennedy, 2001), and revenue growth of an organization is affected by the level of customer loyalty (Reichheld and Sasser, 1990; Kassinis and Soteriou, 2003). In other words, higher level of customer satisfaction suggests that customer loyalty is cultivated, and thereby firms will be able to sustain their profitability as well as to gain revenue that is above the normal rate of return on investment (Vickery et al., 2003; Yee et al., 2009). Yet there is an absence of research studies that empirically examine the relationships among GS, customer satisfaction, customer loyalty, and revenue growth. Research on GS is confined to the use of case examples or anecdotal evidence to demonstrate the impact of GS implementation on such organizational performance as cost savings, revenue growth, and environmental performance, but neglects the impact of GS implementation on customer satisfaction and customer loyalty (Halme et al., 2004).

1.2.2 Research questions and objectives

In order to advance the understanding of GS in consumer-product industry, this study seeks to answer three research questions: (1) What are the practices and activities involved in GS provision by firms in consumer-product industry? (2) How does GS implementation affect the business and environmental performances of consumer-product firms? (3) How does GS implementation affect customer satisfaction and customer loyalty, which are imperative to improving the business performance of consumer-product firms?

Specifically, this study conceptualizes GS from a supply chain perspective to answer the call for GS measures that cover service supply chains (Kassinis and Soteriou, 2003), and empirically examines the performance consequences of GS implementation. Based on Kassinins and Soteriou (2003), GS is evaluated based on five performance measures: (1) environmental performance, which is related to the reduction of energy, water and resource consumption, emissions, and waste (Verfaillie and Bidwell, 2000), (2) cost savings, which is concerned with the improvement of productivity, and reduction of materials consumption and environmental fines and liabilities (Klassen and McLaughlin, 1996), (3) revenue growth, which is concerned with the improvement of market share and product pricing, and achievement of economies of scale (Klassen and McLaughlin, 1996), (4) customer satisfaction, which is concerned with the overall evaluation by customers of their total purchase and consumption experiences, expectancy disconfirmation, and firm performance against the ideal service provider of customers that pertains to a specific brand (Gustafsson et al., 2005), and (5) customer loyalty, which is concerned with attachment (repurchase), special preference, increased scale and scope of purchase, and engagement in positive word-of mouth advertising (Yi and La, 2004).

The NRBV advocates that firms are inevitably constrained by and dependent on the natural environment. It is therefore important for consumer-product firms to protect and reduce the consumption of natural resources in their customer service activities (Hart, 1995). While the notion of GS is to satisfy customer needs with reduced costs and environmental impacts for organizational sustainable development (Foster Jr et al., 2000), pollution prevention, product stewardship, and sustainable development are recognized as organizational efforts that are important for firms in carrying out economic activities so as to lower costs, preempt competitors, and enhance organizational reputation from the perspective of NRBV (Hart, 1995). Therefore, grounded in the NRBV, this study conceptualizes GS by taking account of the important environmental traits of pollution prevention, product stewardship, and sustainable development (Hart, 1995; Buysse and Verbeke, 2003). According to the NRBV, these environmental traits are built on a collection of resources that are tacit, rare, and/or socially complex, which are embedded in the knowledge of employees and organizational processes (Ray et al., 2004). GS, which involves organizational efforts such as pollution prevention, product stewardship and sustainable development, as well as resources that are tacit, socially complex, and/or rare, is valuable to firms in lowering expenses, preempting competitors, and enhancing their future position (Hart, 1995).

In addition, pursuing quality management is advocated by the NRBV to prevent pollution in organizational processes (Hart, 1995) with the focus of production quality and process improvement to eliminate waste through the achievement of zero-defect (Hart, 1995). Pursuing quality is also important to GS provision where customers are involved in the servicing process (Foster Jr et al., 2000), and customer satisfaction heavily determined by customer perception of the service quality (Cronin et al., 2000). Therefore, it is essential to embed the characteristics of service quality in a situation where both the physical product and intangible service offerings are provided, such as service reliability and interactions with customers (Dobholkar et al., 1996), in GS to balance productivity and environmental performance.

A multi-method research design that combines interviews, content analysis, and mass survey is used in this study to collect primary and secondary data to theoretically develop and empirically validate a GS measurement scale, and empirically examine GS implementation and performance relationships. Specifically, qualitative exploratory research is conducted to collect primary data from managers of 8 consumer-product firms through semi-structured interviews to identify organizational practices that constitute as GS. The case evidence is compared with the GS practices found from the environmental management, operations management, and service operations literature to identify the practices of GS for conceptualization of GS practices. A qualitative content analysis is used to collect and analyze secondary data from 30 corporate reports of Fortune 100 companies to identity real-life GS activities under the conceptualization of GS practices for the development of GS measurements. A large-scale quantitative survey research is conducted to collect primary data from 183 consumer-product firms to statistically validate the measurement scales of GS and performance outcomes by testing the properties of the measurement scales, as well as testing the hypotheses developed in this study. While a large-scale quantitative research provides a structural understanding of GS, the qualitative research offers interpretive reasoning of GS practices.

In summary, this study sets out to:

1. identify and specify the organizational practices and activities that constitute as GS in consumer-product industry;

2. theoretically develop and empirically validate the measurement of GS that cover service activities in the various supply chain stages based on the NRBV;

3. empirically examine the performance consequences of GS implementation in terms of environmental performance, revenue growth, cost savings, and customer satisfaction;

4. investigate the relationships among GS implementation, customer satisfaction, customer loyalty, and revenue growth;

5. provide the managerial implications of GS implementation for consumer-product firms in view of the increasing expectations of their stakeholders for environmental protection; and

6. suggest directions for future research on GS which are an emerging research area to address timely environmental issues that are related to the customer service provision of consumer-product firms.

1.3 Significance of the study

This study is timely and significant for two reasons. First, customer service has been a neglected source of pollution for a lengthy amount of time due to its distinctive characteristic of being intangible and simultaneous production and consumption nature (Kassinis and Soteriou, 2003; Callaway and Dobrzykowski, 2009). While consumer-product firms whose core business is to provide value-added services (e.g., product customization) to meet the unique needs of individual customer, they also play a significant role in economic development of a city by creating job opportunities and contributing to a significant portion of the GDP (Cook et al., 2006; Chase and Apte, 2007; Ehret and Wirtz, 2010). International cities, such as Hong Kong, Shanghai, and Singapore which have vibrant economies, are highly reliant on the prosperity of the consumer-product industry as a pillar of their economies. For instance, the HKSAR government not only encourages the development of product offerings through its departments (e.g., the Hong Kong Productivity Council), but also ensures superb product quality and customer service to support its economic growth through different schemes (e.g., the Quality Tourism Services Scheme) (Lee, 2013). A lack of understanding of the GS implementation in the consumer-product industry can adversely affect the competiveness of a city that relies on the prosperity of the consumer-product industry as a pillar of its economies, especially when the international community is increasing its demand for environmental protection (Barrett and Stavins, 2003).

Second, research on environmental practices to improve customer service provision is scant (Foster Jr et al., 2000; Goodman, 2000; Kassinis and Soteriou, 2003), despite that customer service is important to the business growth of consumer-product firms and environmental practices are crucial in the sustainable development of the consumer-product industry, which are widely recognized by governments and their regulatory bodies, as well as top global consumer-product firms, such as Target Co., Dell Inc., and Wal-Mart Stores Inc. The understanding on the organizational practices and activities of GS and the performance consequences of GS implementation will guide consumer-product firms on taking up proper environmental management measures, while improving organizational performance for sustainable development. In particular, the validated GS measurement developed in this study will provide consumer-product firms with an indicative measurement to evaluate their GS implementation and develop useful GS implementation benchmark references for their businesses.

1.4 Organization of the thesis

In the following chapters, the practical and theoretical bases for the study will be provided. In Chapter 2, the concept of customer service, the impact of customer service provision on natural environment, the concept of GS, and the relationships among stakeholders, GS, and consumer-product firms will be discussed. Moreover, the relationship between the implementation of GS and organizational performance, as well as the general role of customer satisfaction and customer loyalty in the relationship between the implementation of GS and organizational performance will be discussed, which aid to clarify the fundamental hypotheses of this study. In Chapter 3, the role of the NRBV in the conceptualization of GS practices in the consumer-product industry will be clarified, the conceptualization of GS practices, and the development of hypotheses based on the environmental management, operations management, and service operations literature will be discussed. In Chapter 4, the research design and phases, and methodological steps in scale development and data collection will be presented. The sample characteristics, data analysis method, and findings of the exploratory research will be discussed in Chapter 5. Likewise, the sample characteristics, data analysis method, and findings of the qualitative content analysis are discussed in Chapter 6. In Chapter 7, the sample characteristics, data analysis method, and findings of the quantitative survey research will be presented. Finally, the results along with a discussion of their implications and the limitations of this study will be provided in Chapter 8.

CHAPTER 2 LITERATURE REVIEW

2.1 Customer service of consumer-product firms

Customer service of consumer-product firms has been defined as a bundle of tangible goods and intangible services sold or offered to the individual customer" (Sasser et al., 1978), which aims to provide significant value-added benefits to satisfy the needs of individual customer (Grove et al., 1996; Innis and La Londe, 1994). Customer services of consumer-product firms are characterized by being intangible (i.e., lack of physical presence), diverse (i.e., heterogeneous), perishable (i.e., cannot be stored), and simultaneity of production and consumption (i.e., consumed as they are produced), (Grove et al., 1996; Hoffman et al., 2002; Roth and Menor, 2003).

Although customer service is intangible in its nature, prior studies provide evidence that customer service of consumer-product firms consists of tangible and intangible elements, which include products and processes (Roth and Menor, 2003). By reviewing the service operations management literature (e.g., Roth and Menor, 2003; Wong et al., 2013), customer service of consumer-product firms has been defined as a portfolio of core and peripheral service elements. Core service elements comprise facilitating goods, facilitating information, supporting facilities, explicit services, and implicit services. Specifically, supporting facilities such as facilities layout, decor, support technology and equipment are the physical and structural resources that are essential for the delivery of customer services. The facilitating goods comprise such physical items as products (i.e., merchandises), materials, and supplies (e.g., receipts and checkbook) that will be consumed in the process of customer service delivery. The facilitating information such as fee structures and medical records support and enhance the explicit services execution. The explicit services are referred to the experiential or sensual benefits of an individual customer (e.g., satisfy hunger, transportation and entertainment), whereas the implicit services are referred to the psychological benefits or more tacit aspects of the service (e.g., comfort, status and convenience), which may be sensed vaguely by the customer. Peripheral services are supplementary to the core service, which provide additional benefits offered to customers that enhance value and help to differentiate the core services (Roth and Menor, 2003). Valet parking for hospital services and shopping at terminals for air transportation services are examples of peripheral services. In other words, customer service contains a mix of tangible (e.g., products, facilities layout and support equipment) and intangible (e.g., status and convenience) core and peripheral elements to provide significant value-added benefits to satisfy the needs of individual customer (Roth and Menor, 2003).

The customer service offerings of consumer-product firms are very diverse as they are tailored to firm's strategic context (Roth and Menor, 2003). Managers of consumer-product firms are required to make decision on a portfolio of structural, infrastructural and integration elements that compose the content of customer service offerings (Roth and Menor, 2003). Based on the service delivery system framework (Roth and Menor, 2003), structural choice decisions involve key decisions concerning the physical aspects of the customer service delivery system, which include facilities and layout, technology and equipment, and capacity. Infrastructural choice decisions comprise a set of complicated and long-term decisions, which are concerned with people, service process, corporate policies, and behavioral aspects of customer service strategy. Integration choice decisions resolve the issues of both the external and internal integrations as well as adaptive mechanisms, which cover coordination, operations organization, service supply chain, technologies that support integration, and leaning and adaptive mechanisms. The service delivery system framework (Roth and Menor, 2003) provides further evidence that customer service offerings are composed by tangible elements (e.g., facilities, layout, technology, and equipment) and intangible elements (e.g., logistics processes, learning and adaptive mechanism).

Given the fact that customer service offerings are very diverse (Grove et al., 1996; Hoffman et al., 2002; Roth and Menor, 2003), there is an absence of measurement scales that capture the customer service activities in the literature (Goldstein et al., 2002). In viewing of the framework of service quality in situation where product and service are offered to customers (i.e., retail firms), customer services are concerned with the physical aspects of the servicing location, service reliability , problem solving capacity, interaction with customers, corporate policies (Dabholkar et al.,

1996) to improve customer satisfaction and therefore business performance (Sparks and McColl-Kennedy, 2001). Specifically, the physical aspects of servicing location are concerned with the design of the servicing environment and the appearance of facilitates and equipment (Dabholkar et al., 1996). Consumer-product firms may improve this aspect of service quality by designing and providing clean and attractive servicing environment to facilitate interactions with customers (Ogle et al., 2004; Nordås, 2008). This customer service activity is taken place in in-store operations. Service reliability is concerned with products and services are appropriately provided and as promised (Dabholkar et al., 1996). Consumer-product firms may improve this aspect of service quality by making products available at the store when consumers are in needed (Dabholkar et al., 1996). Such customer service activity is related to and taken place in product distribution operations in the supply chain. Problem solving is concerned with provision of customer assistance to source suitable products based on their needs and handling of unwanted products (Dabholkar et al., 1996). Consumer-product firms improve this aspect of service quality by sourcing the products that customers are needed, customizing products, providing customers with information on products, and providing end-of-life product collection service (Dabholkar et al., 1996; Nordås, 2008). Such customer service activities are related to procurement, product development, promotion, information system development, and after-sale service functions in the supply chain. Interaction with customers is concerned with the ability of sales representatives to help customers to identify and access the products they needed with courteous manner (Dabholkar et al., 1996). Consumer-product firms may improve the courteousness and product knowledge of sale representatives through training programs to improve service quality (Dabholkar et al., 1996; Sarkis et al., 2010). This customer service activity is related to human resource management of consumer-product firms. Corporate policies are related to the extent to which corporate policies respond to customer needs. Consumer-product firms may improve this aspect of service quality by developing or revising corporate policy based on customer needs (Dabholkar et al., 1996). This customer service activity is related to corporate policy development of consumer-product firms. It is asserted that customer service activities take place in various stages of the supply chain (Mentzer et al., 2000; Kassinis and Soteriou, 2003; De Waart and Kemper, 2004 ; Ellram et al., 2004).

2.2 The impact of customer service provision on natural environment

Although the provision of customer services enables firms to add value to better satisfying the needs of individual customer (Roth and Menor, 2003), it can be a source of environmental damage, which is widely reported by prior studies (e.g., Salzman, 2000; Kassinis and Soteriou, 2003; Callaway and Dobrzykowski, 2009). The provision of customer services (e.g., product distribution and delivery) requires resources (e.g., fuel) and consumes materials (e.g., packing materials) that can pose threats to the natural environment (Grove et al., 1996; Elleger and Scheiner, 1997; Gatzweiler, 2002; Cook et al., 2006; Callaway and Dobrzykowski, 2009). The provision of customer services (e.g., product distribution and delivery) also requires tangible assets (i.e., operant resources), such as trucks and equipment (Callaway and

Dobrzykowski, 2009), which all create waste and pollution (Elleger and Scheiner, 1997; Schendler, 2001). Moreover, recent studies has indicated that consumer-product industry rely on a wide range of equipment, physical components, materials, and natural resources in the delivery of customer services (Grove et al., 1996), and thus cause environmental degradation (Elleger and Scheiner, 1997; Greenan et al., 1997).

2.3 The concept of GS

Due to the provision of customer services consumes resources and uses support of tangible assets (Callaway and Dobrzykowski, 2009), the operations management, environmental management, and service operations literature are now geared towards GS (Kassinis and Soteriou, 2003; Hume and Gallagher, 2010; Wong et al., 2013). GS, also known as environmentally sustainable service, has been defined as the provision or delivery of customer services to satisfy the needs of individual customer that take into account environmental sustainability (Wolfson et al., 2010; Wong et al., 2013). Satisfying the needs of individual customers with reduced environmental damage is central to the notion of GS. While perceived value, quality, and customer expectations are recognized by prior studies as the determinants of customer satisfaction (Fornell et al., 1996), environmental management practices that are central to satisfying the needs of individual customers by improving service quality, meeting customer expectation, or adding value with reduced environmental impacts are considered as GS practices (Foster Jr et al., 2000). As illustrated by

Target Co., the provision of a 5-cent discount incentive to individual customers who use reusable bags and the installation of recycling kiosks in stores or servicing locations to collect plastic bags from individual customers for recycling are considered as GS practices as these environmental management practices enable firm to improve its customer service quality by making it convenient for customers or assisting customers to recycle plastic bags, while reducing operation waste and costs by reducing plastic bag consumption.

The notion of GS is oriented towards not only to better satisfy the needs of environmentally conscious customers by demonstrating efforts in environment protection, but also to reduce environmental impacts and hence operation costs for achieving organizational sustainable development (Poksinska et al., 2003; Lai et al., 2010). Sustainable development is referred to the development that meets the demands of current generation without compromising or hampering the future generation's ability to meet their demands (World Commission on Environment and Development, 1987), which is concerned with the improvement of environmental performance (e.g., reduced waste), economic performance (e.g., improved revenue), and social performance (e.g., improved community satisfaction through the supply of products that the community in needed) (Kleindorfer et al., 2005**.** Therefore, the implementation of GS requires an innovative way of thinking that allows the firm to benefit by improving organizational level environmental performance (Wong et al., 2013). For example, the packaging engineers of International Business Machines Co.

(IBM Co.) improve service quality by meeting customer demand on environmentally friendly products and products that are delivered with reduced waste and emission through the redesign of product size and its packaging to hold eight units of product instead of one unit of product to improve transportation capacity (International Business Machines Co., 2011). These GS practices enable IBM Co. to eliminate use of 300 metric tons of corrugated fiberboard and wood annually, saving US$450,000 in annual transportation costs in 2011 (International Business Machines Co., 2011).

GS has been defined as environmentally sustainable service (Wolfson et al., 2010; Wong et al., 2013). Based on the characteristics and concept of customer service (Roth and Menor, 2003), GS consists of tangible (e.g., products and equipment) and intangible (e.g., processes and learning mechanism) elements that are jointly adding value to better satisfying customer need with fewer resources and reduced environmental impact (Brezet et al., 2001; Manzini and Vezzoli, 2003; Cook et al., 2006; Yang et al., 2011). GS practices take place in various stage of the supply chain spanning from in-store operations, logistics, promotion, procurement, product design and development, after-sale product management, information system development, human resource management, to corporate policy development (Kassinis and Soteriou, 2003). GS practices are tailored to firm's strategic context (Wong et al., 2013). Therefore, the implementation of GS practices can be varied widely from firm to firm in consumer-product industry. Prior studies have provided practical examples on how firms engage in different environmental management practices as part of their GS provision efforts, which are presented in Table 2.1. Table 2.2 summarizes the practices of GS that were identified in the literature.

Table 2.1 Review of GS practices in the literature (Continued on next eleven pages)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Banerjee et al. (2003)	Channel, physical distribution, rental, and leasing	Proctor & Gamble Company uses a dual source reduction strategy which concentrates on the product and designs a refillable pouch when introducing Downy in order to make the product more environmentally friendly and cost effective.	• Design products and packaging with minimum environmental impacts
	Channel, physical distribution, rental, and leasing	3M Company has saved more than $1 billion and improved its competitive position with a corporate program, 3P Plus, which emphasizes source reduction with pollution control measures.	• Reuse/recycle/reduce resources used in servicing location(s)
	Channel, physical distribution, rental, and leasing	PDD2 PCUR 4 Coca-Cola and Hoechst Celanese form an alliance to develop a new bottle from postconsumer plastic. This innovation resulted in enhancing Coca-Cola's image and market share in the competitive soft drink market.	• Source products from environmentally responsible suppliers • Design products and packaging with minimum environmental impacts
Bartolomeo et al. (2003)	Personal and repair	M&D Shining Colors, a Dutch company, offers car and truck washing services at the customer's premises by utilizing a mobile cleansing station which traps water for later treatment at M&D's own site.	• Use water-saving technologies in our servicing location(s)
Burja and Burja (2009)	Hospitality, travel, and tourism	Asiana Airlines, a Korean company, cuts harmful carbon emissions of 220,000 tons by promoting unpolluted ways for technical equipment maintenance, improving flight procedures, and reducing fuel consumption.	• Repair and maintain equipment to prolong the usable life of equipment used in servicing location(s) • Optimize shipping routes • Maximize shipping capacity • Reuse/recycle/ reduce resources used in distribution
Callaway and Dobrzykowski (2009)	Channel, physical distribution, rental, and leasing	United Technologies Corporation, a company offers heating, ventilation and air-conditioning equipment to the market, provides customers with maintenance services for its heating, ventilation, and air-conditioning equipment to prolong their life-cycles.	• Provide maintenance services to prolong usable life of our products

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Callaway and Dobrzykowski (2009)	Channel, physical distribution, rental, and leasing	IKEA provides consumers with education about green products, such as compact fluorescent light (CFL) bulbs. CFL bulbs have a 10 times longer lifespan than traditional bulbs, while using 80% less energy. However, CFL bulbs house a small amount of mercury. Given this, IKEA also offers its customers the opportunity to return their CFL bulbs for proper disposal. IKEA also gives incentive to its customers to return their used Christmas trees for recycling in exchange for a store gift certificate.	• Educate customers on environmental protection and sustainable consumption practices • Motivate customers to engage in our environmental protection programs • Design products and packaging with minimum environmental impacts • Collect end-of-life products from customers • Recycle end-of-life products
Enz and Siguaw (1999)	Hospitality, travel, and tourism	The Colony Hotel places a rattan bin with four compartments to collect and recycle containers, towels, and sheets in guest rooms. It also provides educational programs for guests and employs a recycling engineer to implement environmental programs.	• Educate customers on environmental protection and sustainable consumption practices • We collect end-of-life products from customers • We recycle end-of-life products
	Hospitality, travel, and tourism	Hotel Bel Air purchases recycling machines, recycled paper, plastic, cans and glasses, reduced energy use, and employs a special committee to guide and monitor their environmental programs.	• Use energy-saving technologies in our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s) • Recycle end-of-life products • Implement information systems to monitor and manage our environmental management practices and performances • Develop a green team committee that comprises employees who represent each department to implement environmental management initiatives

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Enz and Siguaw (1999)	Hospitality, travel, and tourism	Hyatt Regency Scottsdale operates a comprehensive recycling program. It also implements a host of environmental efficiency initiatives, creates an environmental-program manager position, and develops a "Green Team" committee that comprises employees who represent each department.	• Recycle end-of-life products • Develop a green team committee that comprises employees who represent each department to implement environmental management initiatives • Create an environmental-program manager position to implement and monitor environmental management initiatives and performance • Design service delivery processes with maximized efficiency to avoid resources used in work duplication
	Hospitality, travel, and tourism	Hyatt Regency Chicago operates a comprehensive waste-reduction and recycling program. It creates a recycling department, and purchases requisite equipment that can be recycled, including cardboard bailers, an aluminum crusher, and transportation vehicles .	• Reuse/recycle/ reduce resources used in servicing location(s) • Deploy transportation vehicles with environmental technologies or designs • Create a recycling department
Foster Jr et al. (2000)	Sports, arts, and entertainment	Bogus Basin Ski Area preserves the environment by implementing environmental management measures that include the relocation of wetland, avoid erosion in the construction of new parking lot, adoption of recycling practices, and the application of controlled burns to remove brush.	• Take sustainable design features into consideration when designing our servicing location(s)

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Foster Jr et al. (2000)	Sports, arts, and entertainment	Grand Targhee Ski Area upgrades its waste treatment systems, puts forth re-vegetation efforts, plants grass around tennis courts, motivates the reuse of towels, and eliminates paper consumption from paper skill passes.	• Take sustainable design features into consideration when designing our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s) • Install waste treatment system to reduce waste in our servicing location(s)
	Hospitality, travel, and tourism	Diego's Restaurant traps grease, removes grease from the sewers, and recycles used cardboard and used oil.	• Reuse/recycle/ reduce resources used in servicing location(s) • Install waste treatment system to reduce waste in our servicing location(s)
	Hospitality, travel, and tourism	Los Hermanos Restaurant traps grease and draws out grease from the sewers.	• Install waste treatment system to reduce waste in our servicing location(s)
	Health care	Bannock Regional Medical Center, a medium-sized county hospital in Southern Idaho in the United States, develops a safety committee to take charge of environmental issues, requests its employees to take on environmental responsibilities, trains employees about environmental aspects, conducts risk environmental audits quarterly, holds annual employee exams on environmental issues, has equipment for the treatment of waste in its facilities, and celebrates Earth Day.	• Provide training programs to educate employees about our environmental management practices • establish measureable environmental performance targets for our employees • evaluate the environmental performance of our employees • motivate employees to participate in our environmental management practices • Develop a green team committee that comprises employees who represent each department to implement environmental management initiatives • Implement activities that raise customer awareness on environmental issues • Install waste treatment system to reduce waste in our servicing location(s)

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Foster Jr et al. (2000)	Health care	Pocatello Regional Medical Center, a healthcare service provider in Idaho, carries out recycling programs, uses surgical linens that are reusable, uses energy-saving light bulb, and closes down its waste incinerator.	• Reuse/recycle/ reduce resources used in servicing location(s) • Take sustainable design features into consideration when designing our servicing location(s) • Use energy-saving technologies in our servicing location(s)
Goodman (2000)	Hospitality, travel, and tourism	Scandic Hotels rolls out a new environmental training course to employees and develops a corporate environmental policy which encourages its staff to take on more environmental responsibilities. It also establishes environmental education programs to increase employee participation, and adopts an information system to monitor and measure environmental performance which enables customized reporting and benchmarking across its hotel chains.	• Provide training programs to educate employees about our environmental management practices • Motivate employees to participate in our environmental management practices • Formulate corporate environmental policies that are beyond compliance • Implement information systems to monitor and manage our environmental management practices and performances • Report and share up-to-date information about our environmental management practices and performances with stakeholders
Grove et al. (1996)	Hospitality, travel, and tourism	Hyatt and Marriott adopt an energy saving corporate policy (e.g., setting thermostats in the servicing location and back office at a two-degree difference).	• Use energy-saving technologies in our servicing location(s) • Formulate corporate environmental policies that are beyond compliance
	Hospitality, travel, and tourism	In New York, Hotel Nikko eliminates throw away hangers by placing baskets that can be recycled for guests to return their laundry.	• Reuse/recycle/ reduce resources used in servicing location(s)

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Grove et al. (1996)	Telecom-munication	AT&T reduces wide range of toxic pollutants by shifting to use environmentally responsible materials in the products and environmentally friendly manufacturing processes to color its products.	• Design manufacturing processes with minimum environmental impacts
	Financial	The Royal Bank of Canada saves paper in 1,600 of its branches by converting to the use of electronic transaction.	• Use environmentally friendly media to share information about our environmental management practices and performances with stakeholders
Halme (2001)	Hospitality, travel, and tourism	Alcudia, which is an ecotourism municipality network in Spain, creates an “Ecotouist plaque” for hotels, restaurants and bars, implements waste management, uses recycled products, uses water and energy saving measures, has waste water treatment, and collaborates with the government to evaluate the environmental situation of tourist destinations and design an action plan for the environmental improvement of the area.	• Use energy-saving technologies in our servicing location(s) • Use water-saving technologies in our servicing location(s) • Take sustainable design features into consideration when designing our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s) • Install waste treatment system to reduce waste in our servicing location(s)
	Hospitality, travel, and tourism	Calvia, an eco-tourism municipality network in Spain, implements environmental management initiatives that include halting new building projects, reforestation of a natural park, installation of double water supply system and solar panels in new buildings, and improvement of waste and water management in the municipality.	• Use water-saving technologies in our servicing location(s) • Design service delivery processes with maximized efficiency to avoid resources used in work duplication • Install waste treatment system to reduce waste in our servicing location(s) • Use renewable energy to support store operations

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Halme (2001)	Hospitality, travel, and tourism	Finnland Naturlich, which was established by the Agriculture Centre of Pirkanmaa County, markets the services of farms and other tourism SMEs to German-speaking population in Europe. It improves environmental practices in member enterprises by means of training, information dissemination and peer visits.	• Report and share up-to-date information about our environmental management practices and performances with stakeholders • Provide training programs to educate employees about our environmental management practices
	Hospitality, travel, and tourism	Salen, a mountain tourism resort of the Local Agenda 21 network, provides environmental education for companies together with an initial environmental review of the participating businesses with some environmental performance improvements based on the review.	• Follow corporate environmentally responsible purchasing guidelines in sourcing • Collaborate with our suppliers to minimize environmental impacts
	Hospitality, travel, and tourism	YSMEK, which is a network for developing environmentally friendly tourism in Finland, develops guidebooks on environmental management in tourism, which include: (i) environmental reviews on tourism enterprises, (ii) building and implementing environmental management system, and (iii) minimizing environmental impacts of mass events, for teaching in various tourism education programs as well as in environmental projects in tourism enterprises in Finland.	• Follow corporate environmentally responsible purchasing guidelines in sourcing • Implement information systems to monitor and manage our environmental management practices and performances • Reduce/ recycle/ reduce resources used in promotion activities • Educate customers on environmental protection and sustainable consumption practices
Hume and Gallagher (2010)	Channel, physical distribution, rental, and leasing	General Electric, which is a multinational firm, uses energy efficient fluorescent bulbs in 19 production facilities to replace regular bulbs which produced $6 million in cumulative savings over a three-year period, while reducing carbon emissions and saving energy at those plants.	• Use energy-saving technologies in our servicing location(s)

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Hume and Gallagher (2010)	Channel, physical distribution, rental, and leasing	Wal-mart creates the "Live Better Index" to give consumers a recognizable slogan when making decisions about which products to buy.	• Implement activities that raise customer awareness on environmental issues
	Channel, physical distribution, rental, and leasing	Home Depot has programs to make it easier for consumers to identify environmentally friendly products. It introduces the Eco-Options program by adding 2,500 environmentally friendlier products as part of its commitment to clean air, water conservation, and energy efficiency, healthy homes and sustainable forestry. It is also committed to reducing its impact on the environment not only in its retail stores, but also in its corporate headquarters.	• Educate customers on environmental protection and sustainable consumption practices • Motivate customers to engage in our environmental protection programs • Reuse/recycle/ reduce resources used in servicing location(s)
Jaruwach-irathanakul and Fink (2005)	Financial	The provision of online rather than physical financial services enables cost savings, reduces transportation, and executes transactions quickly and efficiently.	• Use environmentally friendly media to share information about our environmental management practices and performances with stakeholders
Kassinins and Soteriou (2003)	Hospitality, travel, and tourism	High-end hotels in Europe implement environmental management practices such as use of energy and water saving measures, and recycling practices.	• Reuse/recycle/ reduce resources used in servicing location(s) • Use energy-saving technologies in our servicing location(s) • Use water-saving technologies in our servicing location(s)
Kirk (1995)	Hospitality, travel, and tourism	The InterContinental Hotel at Hyde Park Corner reduces energy consumption by changing its lighting system, recovering heat from refrigeration equipment, and using energy management systems on boilers.	• Use energy-saving technologies in our servicing location(s)

Table 2.1 Review of GS practices the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Kirk (1995)	Hospitality, travel, and tourism	The Forte Crest Hotel in West Yorkshire reduces energy costs by 45 per cent and replacement costs by 85 per cent by installing energy-efficient lighting.	• Use energy-saving technologies in our servicing location(s)
Krafzig et al. (2005)	Insurance	Winterthur Group, a leading Swiss insurance company, reduces waste and redundant resource consumption by implementing an application service platform to consolidate workloads and simplify service delivery processes.	• Design service delivery processes with maximized efficiency to avoid resources used in work duplication • Reuse/recycle/ reduce resources used in servicing location(s)
Manaktola and Jauhari (2007)	Hospitality, travel, and tourism	In lodging industry, the green practices include: (i) visible communications about green practices to guests, shareholders, vendors and the public, thus influencing consumer attitude towards green practices in the hotel; (ii) participation in environmental partnerships or certification programs, such as ISO 9000; (iii) establishing of recycling program for materials in all sections of the hotel, (iv) offering a linen re-use option to multiple night guests, (v) provision of environmentally friendly products (i.e., low toxicity, organic or locally sourced/made), and (vi) encouraging business with environmentally friendly service providers (i.e., renewable energy, integrated pest management, alternative fuel vehicles) thus influencing consumer attitude towards green practices in the hotel.	• Reuse/recycle/ reduce resources used in servicing location(s) • Reuse/recycle/ reduce resources used in distribution • Motivate customers to engage in our environmental protection programs • Source products from environmentally responsible suppliers • Collaborate with our suppliers to minimize environmental impacts • Collaborate with our customers to improve environmentally responsible purchasing criteria • Design products and packaging with minimum environmental impacts • Formulate corporate environmental policies to comply with environmental regulations

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Manzini and Vezzoli (2003)	Personal and repair	Allegrini S.p.A., an Italian company that sells detergent and cosmetics, reduces the packaging cost of detergents for housekeeping by supplying detergents in mobile vans that move from house to house, and providing customers with reusable flacons to draw the detergent from the mobile van and taking only what they need.	• Design products and packaging with minimum environmental impacts • Deploy transportation vehicles with environmental technologies or designs • Reuse/recycle/ reduce resources used in distribution • Motivate customers to engage in our environmental protection programs
Meijkamp (1999)	Hospitality, travel, and tourism	Car-sharing service allows customers to access pay-per-use vehicles for a short period of time, which enables vehicles to be fully utilized in their life-cycle by sharing across customers, minimizing production of cars that may not be fully utilized in their life-cycle.	• Design products and packaging with minimum environmental impacts
Nunes and Bennett (2010)	Personal and repair	Toyota Motor Corporation has systems in place to ensure the proper collection, recycling/recovery and treatment of airbags, automobile shredder residue and ozone-depleting gases generated from end-of-life vehicles.	• Collect end-of-life products from customers • Recycle end-of-life products
	Personal and repair	GM Corporation has a dedicated group to coordinate the take-back and recycling of its European end-of-life vehicles, and provides access to vehicle recycling information by posting dismantling manuals on its website.	• Collect end-of-life products from customers • Recycle end-of-life products • Report and share up-to-date information about our environmental management practices and performances with stakeholders • Use environmentally friendly media to share information about our environmental management practices and performances with stakeholders

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Rueda-Manzanares et al. (2008)	Sports, arts, and entertainment	Ski resorts in 12 countries in western Europe and North America have composted organic matter, installed water-efficient equipment (e.g., low flow faucets/toilets), offered linen and towel reuse programs, used energy efficient lighting and equipment, used renewable energy, and trained employees about responsible environmental practices.	• Use water-saving technologies in our servicing location(s) • Use energy-saving technologies in our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s) • Use renewable energy to support store operations • Motivate customers to engage in our environmental protection programs • Have training programs to educate employees about our environmental management practices
Schendler (2001)	Sports, arts, and entertainment	The Aspen Skiing Company has deconstructed an old building to salvage useable materials (later sold at a yard sale), and composted the remaining wood and sheet rock. The Aspen Skiing Company has also changed its corporate culture by requesting their employees to recycle beer cans.	• Take sustainable design features into consideration when designing our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s)
Schrader (1999)	Hospitality, travel, and tourism	AVIS Club offers a club scheme for private user members to access pay-per-use vehicles for a short period of time, which enables vehicles to be fully utilized in their life-cycle by sharing across customers..	• Design products and packaging with minimum environmental impacts • Design manufacturing processes with minimum environmental impacts
	Personal and repair	An ecologically oriented company, Eco-Express Waschsalons GmbH, adopts innovated machines from Miele & Cie to reduce water, energy and detergent used in apartment laundries.	• Use energy-saving technologies in our servicing location(s) • Use water-saving technologies in our servicing location(s) • Reuse/recycle/ reduce resources used in servicing location(s)

Table 2.1 Review of GS practices in the literature (Continued from previous page)			
Author	**Classification of service industry**	**Example of GS practice**	**GS practice**
Schrader (1999)	Personal and repair	ECOMAT, an American laundry and launderette company, realizes resource savings by using environmentally friendly methods though its laundry collection and delivery services for residents of apartments which would otherwise have created additional transport costs.	• Optimize shipping routes • Maximize shipping capacity • Deploy transportation vehicles with environmental technologies or designs • Use low emission transportation modes • Reuse/recycle/ reduce resources used in distribution
Thierry et al. (1995)	Channel, physical distribution, rental, and leasing	CopyMagic, a multinational firm that provides copier leasing services, takes back used products from its customers for repairing or recycling. CopyMagic designs its products for disassembly and selects materials on the basis on life-cycle costs and performance instead of purchasing and manufacturing costs only.	• Collect end-of-life products from customers • Recycle end-of-life products • Design products and packaging with minimum environmental impacts • Evaluate environmental performance of our products • Make purchase decisions based on the total cost of purchasing, use, and waste management
Wheeland (2011)	Governmental and quasi-governmental	The U.S. Postal Service is “greening” its operations by using environmentally friendly fuels in their delivery trucks.	• Use alternative fuels in transportation

Table 2.2 Summary of GS practices in the literature (Continued on next two pages)	
GS practice	**Supporting literature**
Use of energy-saving technologies in servicing locations	Enz and Siguaw (1999); Foster Jr et al. (2000); Grove et al. (1996); Halme (2001); Hume and Gallagher (2010); Kassinins and Soteriou (2003); Rueda-Manzanares et al. (2008); Schrader (1999)
Use of water-saving technologies in servicing locations	Bartolomeo et al. (2003); Halme (2001); Kassinins and Soteriou (2003); Rueda-Manzanares et al. (2008); Schendler (2001); Schrader (1999)
Design of service delivery processes with maximized efficiency	Enz and Siguaw (1999); Krafzig et al. (2005)
Application of sustainable design features in servicing locations	Foster Jr et al. (2000); Halme (2001)
Reusing,recycling, reducing of resources used in servicing locations	Banerjee et al. (2003); Enz and Siguaw (1999); Foster Jr et al. (2000); Grove et al. (1996); Halme (2001); Hume and Gallagher (2010); Kassinins and Soteriou (2003); Kirk (1995); Krafzig et al. (2005); Manaktola and Jauhari (2007); Rueda-Manzanares et al. (2008); Schendler (2001); Goodman (2000)
Provision of maintenance service for equipment to prolong the usable life of equipment used in servicing locations	Burja and Burja (2009)
Installation of waste treatment system to reduce waste in our servicing locations	Foster Jr et al. (2000); Halme (2001)
Use of renewable energy to support store operations	Halme (2001); Rueda-Manzanares et al. (2008)
Optimization ofshipping routes	Burja and Burja (2009); Schrader (1999)
Maximized use of transportation capacity	Burja and Burja (2009); Schrader (1999)
Deployment of transportation vehicles with advanced technologies or designs	Manzini and Vezzoli (2003); Schrader (1999); Enz and Siguaw (1999)
Use of low-emission transportation modes	Schrader (1999)
Reusing, recycling, and reducing resources used in distribution	Burja and Burja (2009); Manaktola and Jauhari (2007); Manzini and Vezzoli (2003); Schrader (1999); Goodman (2000); Bartolomeo et al. (2003)
Use of alternative fuels in transportation	Wheeland (2011)
Implementing activities that raise customer awareness on environmental issues	Foster Jr et al. (2000); Hume and Gallagher (2010)
Educating customers on environmental protection and sustainable consumption practices	Callaway and Dobrzykowski (2009); Enz and Siguaw (1999); Halme (2001)
Motivating customers to engage in environmental protection programs	Callaway and Dobrzykowski (2009); Foster Jr et al. (2000); Hume and Gallagher (2010); Manaktola and Jauhari (2007); Manzini and Vezzoli (2003); Rueda-Manzanares et al. (2008)
Reusing,recycling, and reducing resources used in promotion activities	Halme (2001)

Table 2.2 Summary of GS practices in the literature (Continued from previous page)	
GS practice	Supporting literature
Following corporate environmentally responsible guidelines in sourcing	Halme (2001)
Making purchase decisions based on the total cost of purchasing, use, and waste management	Hume and Gallagher (2010); Thierry et al. (1995)
Sourcing products from environmentally responsible suppliers	Manaktola and Jauhari (2007)
Collaboration with suppliers to minimize environmental impacts	Banerjee et al. (2003); Halme (2001); Manaktola and Jauhari (2007)
Collaboration with customers to improve environmentally responsible purchasing criteria	Manaktola and Jauhari (2007)
Designing manufacturing processes with minimum environmental impacts	Grove et al. (1996); Schrader (1999); Álvarez Gil et al. (2001)
Designing products and packaging with minimum environmental impacts	Banerjee et al. (2003); Callaway and Dobrzykowski (2009); Manaktola and Jauhari (2007); Manzini and Vezzoli (2003); Meijkamp (1999); Schrader (1999); Thierry et al. (1995); Álvarez Gil et al. (2001); Brezet et al. (2001); Cook et al. (2006); Yang et al. (2009)
Evaluation of environmental performance of products	Thierry et al. (1995)
Provision of maintenance services to prolong usable life of products	Callaway and Dobrzykowski (2009); Schrader (1999); Bartolomeo et al. (2003); Hockerts (1995)
Collection of end-of-life products	Callaway and Dobrzykowski (2009); Enz and Siguaw (1999); Nunes and Bennett (2010); Thierry et al. (1995)
Recycling of end-of-life prod	Callaway and Dobrzykowski (2009); Enz and Siguaw (1999); Nunes and Bennett (2010); Thierry et al. (1995)
Implementation of information systems to monitor and manage environmental management practices and performances	Enz and Siguaw (1999); Goodman (2000); Halme (2001); Álvarez Gil et al. (2001)
Reporting and sharing up-to-date information about environmental management practices and performances with stakeholders	Goodman (2000); Halme (2001); Manaktola and Jauhari (2007); Nunes and Bennett (2010); Bartolomeo et al. (2003); Bartolomeo et al. (2003)
Use of environmentally friendly media to share environmental information with stakeholders	Grove et al. (1996); Jaruwach-irathanakul and Fink (2005); Nunes and Bennett (2010); Wong et al., 2013; Bartolomeo et al. (2003)
Provision of training programs to educate employees about environmental management practices	Foster Jr et al. (2000); Goodman (2000); Halme (2001); Rueda-Manzanares et al. (2008); Álvarez Gil et al. (2001)
Establishment of measureable environmental performance targets for employees	Foster Jr et al. (2000); Schendler (2001)
Evaluating the environmental performance of employees	Foster Jr et al. (2000)

Table 2.2 Summary of GS practices in the literature (Continued from previous page)	
GS practice	**Supporting literature**
Motivating employees to participate in environmental management practices	Foster Jr et al. (2000); Goodman (2000)
Development of a green team committee that comprises employees who represent each department to implement environmental management initiatives	Enz and Siguaw (1999); Foster Jr et al. (2000)
Creation of an environmental-program manager position to implement and monitor environmental management initiatives and performance	Enz and Siguaw (1999); Álvarez Gil et al. (2001)
Creation of a recycling department	Enz and Siguaw (1999)
Formulation of corporate environmental policies to comply with environmental regulations	Manaktola and Jauhari (2007); Halme (2001)
Formulation of corporate environmental policies that are beyond compliance	Goodman (2000); Grove et al. (1996)
Regular reviews and modifications of corporate environmental policies	Halme (2001)

2.4 Stakeholders, GS, and consumer-product firms

Consumer-product firms have been traditionally regarded as distributors of products, thus adding minimal value by providing customer services that are considered to be secondary (Lai et al., 2010). Today, individual consumers are intensifying their quest for such customer services as customizing products based on individual customer needs, handling customer complaints and inquires, and handling the returns and exchanges of products (Oliva and Kallenberg, 2003; Ghosh et al., 2010; Lai et al., 2010; McMurrian and Matulich, 2011). Consumer-product firms are involved in wide range of supply chain aspects, including product development, collection of market information about consumer preferences and behaviors to support their suppliers for modify products, and provision of product collection service, to add value to their product offerings to better satisfy customers (Nordås, 2008). Although these customer services are crucial in product production and operations management as they add value to satisfy the needs of customer (Oliva and Kallenberg, 2003; Roth and Menor, 2003; Lusch et al., 2010), the provision of these services require a wide range of physical equipment, materials, components, and natural resources (Wolfson et al., 2010). In sum, the provision of customer services by consumer-product firms poses threats to the natural environment (Grove et al., 1996; Salzman, 2000; Gatzweiler, 2002; Kassinis and Soteriou, 2003). Consumer-product firms, which make their core businesses to offer products along with services to satisfy the needs of individual customer, are increasingly encouraged by their stakeholders, which include consumers, the government and regulatory bodies, and the community group, to be environmentally responsible in their operations by adopting GS (Buysse and Verbeke, 2003; Wong et al., 2013).

Specifically, there is an increasing number of consumers who have knowledge of environmentally friendly products and services and raised their awareness of the environmental issues caused by operations of consumer-product firms (Lai et la., 2010). The environmentally conscious consumers are increasingly demanding not only environmentally friendly product offerings, but also GS offerings (Lai et al., 2010; Wong et al., 2013), which add value to better satisfying their needs of environmental protection. For example, while environmentally conscious consumers are characterized by their preferences for purchasing environmentally friendly products (Hartmann and Ibáñez, 2006), they demand such GS offerings as the provision of eco-labels and the provision of information about the source of materials that are used in the environmentally friendly products, which can assist them to identify environmentally friendly products from wide ranges of traditional products (Min and Galle, 2001; Ginsberg and Bloom, 2003; Pun, 2006; Ellram et al., 2008).

While environmentally conscious consumers prefer shopping at environmentally responsible stores with attributes that they perceive to be congruent with their personal values in environmental sustainability (Hyllegard et al., 2006), they are also concerned with such service quality aspects as the cleanliness and appearance of stores or customer service centers (Dabholkar et al., 1996; Ogle et al., 2004; Piell, 2009). Environmentally conscious consumers expect consumer-product firms to provide such GS offerings as the provision of environmentally responsible and convenient environment for shopping and facilitating the interaction between salespeople and customers through the integration of sustainable design features in servicing locations (Ogle et al., 2004; Piell, 2009).

Moreover, environmentally conscious consumers are concerned about the long-term environmental strategies of consumer-product firms, which have impact on the natural environment. Environmentally conscious consumers are increasingly expecting consumer-product firms to provide such GS offerings as the establishment of corporate environmental policy to show their commitment to protecting the environment (Poksinska et al., 2003; Pun, 2006) and the development of database to collect and publish information about corporate environmental goals and performance improvement, which are important for them to evaluate how the corporate goals of long-term environmental development are met by firms (Darnall et al., 2008).

While satisfying the needs of individual customers to generate revenue is the core business of consumer-product firms, it is desirable for consumer-product firms to consider the implementation of GS to meet customer demands on environmental protection and GS offerings for improving customer satisfaction, which is important to business performance improvement (Kassinis and Soteriou, 2003). Market research has found that environmentally conscious consumers account for 87% of the U.S. adult population (Agriculture and Agri-Food Canada, 2007). It is expected that the green consumer marketplace will reach US$845 million by 2015 (LOHAS, 2007). The increasing number of environmentally conscious consumers and considerable size of green segment have appealed consumer-product firms to develop environmental attractions into their customer service offerings (Lai et al., 2010). It is argued that consumer-product firms could attract environmentally conscious customers and suppliers by showing that they care about the environment and establishing a strong environmental image (Poksinska et al., 2002). In addition, the moral sanction enjoyed by consumer-product firms by doing so may be compounded by business advantages over their less environmentally conscious competitors (Price and Coy, 2001; Pun et al., 2002).

Besides, there are increasing statutory requirements of government environmental policies and regulations that exert greater pressure on consumer-product firms to emphasize environmental protection in their provision of customer services (Pun et al., 2002). For example, David Paterson, the governor of New York, has imposed a regulation that requires consumer-product firms to take-back and recycle plastic shopping bags since January 2009 (Lai et al., 2010). Non-compliance with environmental regulations imposed by the government is costly to consumer-product firms. For example, K-Mart, a discount chain store in the U.S., was fined US$102,422 to settle the violations of environmental regulation at its 17 distribution centers in 13 states (Environmental Leader, 2008). Community group pressure also compels consumer-product firms to implement GS (Price and Coy, 2001). In particular, environmental organizations are increasingly condemning business decisions or service offerings that may cause damage to the environment. For instance, B&Q PLC, a British-based consumer-product firm that sells home furniture, was criticized by environmental organizations for its sourcing of home furniture made of tropical hardwood (Price and Coy, 2001). This environmental crisis was eventually resolved by the development of environmental guidelines for procurement to ensure that its furniture is made of wood that conforms to environmental requirements and standards of the Forest Stewardship Council (Overdevest, 2004). In viewing of these, it is desirable for consumer-product firms to consider the implementation of GS to satisfy the needs of environmentally conscious consumers on environmental protection and GS offerings, to comply with the requirements of environmental regulations to avoid environmental liability, and to enhance corporate image by being environmentally responsible in their business operations.

Although GS provision is appealing to consumer-product firms in responding to the growing pressures of being environmentally responsible, there is limited knowledge about the organizational practices and activities involved in GS provision which comprise a combination of consumer products and services for consumer-product firms to implement GS for realizing the sustainable development of organization (Yang et al., 2011). Specifically, prior studies have provided practical examples on how firms in different service sectors engage in different practices as part of their environmental protection efforts (Grove et al., 1996) (shown in Table 2.1). However, these studies have conceptualized GS in a pure service context, such as banking (Grove et al., 1996), medical or personal care (Foster Jr et al., 2000; Manzini and Vezzoli, 2002), hospitality and tourism (Goodman, 2000; Manaktola and Jauhari, 2007; Burja and Burja, 2009), and so on and so forth, which are confined to specific and intangible service provision. The GS activities in this pure service context provide little insights into how consumer-product firms, whose core business is to provide products and services to satisfy the needs of individual customers, may handle tangible products in addition to intangible services such as product maintenance and delivery (Nordås, 2008). The insufficient know-how about the organizational practices and activities involved in GS provision which comprises a combination of consumer products and services virtually hinders the implementation of GS by consumer-product firms for realizing sustainable development of organization (Yang et al., 2011).

Although these studies offer insights into specific GS activities that may mitigate environmental damage, they are performed in isolation without coherence to relevant organizational functions and operations. Prior studies provide limited knowledge on how consumer-product firms can engage in different organizational practices and activities to mitigate environmental damages of their service activities in various stages of a supply chain (Kassinis and Soteriou, 2003). These perspectives of GS also pay little attention to GS practices as a competitive dimension of operations (Wong et al., 2013). They do not take into account the important environmental management traits of pollution prevention, product stewardship, and sustainable development (Hart, 1995), which are crucial for firms to be environmentally sustainable in their conducting of economic activities (Buysse and Verbeke, 2003).

Moreover, most of the prior studies fail to take into account the environmental damage induced by hardware infrastructures (e.g., use of facilities and equipment), operations (e.g., logistics processes), and cross-functional efforts (e.g., information sharing and learning) in service provision (Angell and Klassen, 1999; Roth and Menor, 2003). There is limited knowledge on how consumer-product firms can manage environmental damage induced by hardware infrastructures, operations, and cross-functional efforts in service provision (Angell and Klassen, 1999).

In addition, customer service activities deliver tangible products and intangible services (Roth and Menor, 2003) to customers which span from product development, in-store customer services, procurement, product distribution, promotion, education, after-sale service, research-development-innovation to information provision (Nordås, 2008; Burja and Burja, 2009), which take place in various stages of the supply chain (Clift and Wright, 2000; Mentzer et al., 2000; Kassinis and Soteriou, 2003; Nordås, 2008). Service activities at every stage of the supply chain bring about environmental impacts (Hart, 1995). In other words, service activities take place and pose environmental impacts in various stages of the supply chain. Stakeholders often hold them responsible for environmental degradation caused by their supply chain partners (Hart, 1995; Clift and Wright, 2000; Rao and Holt, 2005; Seuring and Müller, 2008). For example, consumer-product firms, such as Nike Inc., Walt Disney Company, and Levi Strauss & Co., have been accused of damaging the environment as their garment manufacturers were found to be polluting the local environment in their production of goods (Park and Lennon, 2006; De Brito et al., 2008; Seuring and Müller, 2008). Therefore, it is desirable for consumer-product firms to gain knowledge about GS that considers value-adding service activities in the various stages of the supply chain. Yet, there is a lack of GS measurement which comprises service activities in the various stages of a supply chain (Kassinis and Soteriou, 2003), and limited knowledge on how consumer-product firms can engage in different organizational practices and activities to mitigate environmental damages of their service activities in various stages of a supply chain.

While prior studies have investigated green supply chain management (GSCM), which is mainly concerned with integrating environmental concepts into the existing processes of supply chain operations (Sarkis et al., 2011), GS extends this notion by acknowledging the interactions amongst different processes and functions. In particular, GS facilitates these interactions by including practices such as in-store services, corporate policies, promotion, and human resources management. By doing so, GS not only takes into account the environmental impacts caused by tangible products, but also creates value by providing important infrastructures through service provision for products that would add value.

2.5 GS implementation and organizational performance

The organizational performance that is of interest to environmental and service management is multifaceted (Yang et al., 2011), which comprises environmental and business performances. Specifically, the former refers to organizational performance that addresses the environmental responsibilities of firms (Kleindorfer et al., 2005). The latter, on the other hand, is concerned with organizational responsibility towards shareholders and has a profit maximization objective in terms of revenue (i.e., market performance) and cost (i.e., financial performance) (Klassen and McLaughlin, 1996; Narasimhan and Kim, 2002; Lin et al., 2005; Menor et al., 2007).

The eco-efficiency theory suggests that it is possible to increase productivity and thus reduce costs, while simultaneously reducing materials and energy consumption (Stone, 1995; Bebbington, 2001; Lehman, 2002; Baroulaki and Veshagh, 2007). Recent work has suggested that GS contributes to eco-efficiency in three ways (e.g., Halme, 2001; Cook et al., 2006; Yang et al., 2001). First, if the material remains in the ownership of the producer, then there is a financial incentive for the producer to produce more durable goods and be responsible for product take-back for its residual value. Second, there is a financial incentive for the producer to ensure the correct use of the product and be responsible for product repairs to extend its life-cycle in order to reduce material consumption in production, thus lowering the cost of goods sold. Third, if consumers use the product in sequence through product sharing services, a smaller stock of products is needed to satisfy demand, which requires less materials and resources for production. Such services also enable the intensive use of a product, which can increase service yield before the product becomes obsolete or reaches its end-of-life (Halme et al., 2004). Likewise, prior studies have indicated that GS improve environmental performance in at least nine different ways (Bartolomeo et al., 2003), including: (i) product redesign, (ii) product life extension, (iii) resource utilization, (iv) revalorization, (v) dematerialization, (vi) behavioral change, (vii) capacity utilization, (viii) impact management, and (ix) system optimization. However, these studies lack clarity on how GS practices prompt service firms to achieve cost competitiveness with improved organizational level environmental performance (Wong et al., 2013).

Some prior studies have provided evidence on the positive business performance implications of GS, including reduced costs, and increased operation efficiency and employee morale (Goodman, 2000; Schendler, 2001). For example, the provision of environmental education programs for employees enable firms in the hospitality industry, such as the Colony Hotel, Hotel Bel Air, Hyatt Regency Chicago, and Hyatt Regency Scottsdale, to enhance the morale of their employees and their participation in environmental protection initiatives (Enz and Siguaw, 1999). Although prior studies have examined the performance impacts of GS practices, these are limited to case studies or anecdotal evidence. The empirical evidence on the relationship impact of GS implementation on organizational performance is limited (Hume and Gallagher, 2010), which provides scant justification for consumer-product firms to invest in GS or implement them to improve their environmental and business performances (Wong et al., 2013). The implementation of GS could be a cost burden in the efforts of firms to address environmental issues related to their tangible product and intangible service offerings (Waddock and Graves, 1997; Montabon et al., 2007). Some may also argue that the implementation of GS might not improve environmental performance, as they may encourage product turnover by reducing amortization times, encourage poor usage or maintenance of the product, and provide customers with additional opportunities to consume material-intensive products (Meijkamp, 1998; Bartolomeo et al., 2003). For example, the provision of repair services for a product allows customers to save on costs otherwise used to purchase a new product. It also provides opportunities for customers to spend money on other material intensive products or consume them (Bartolomeo et al., 2003). Managers are uncertain about the environmental results, financial gains, and costs of their efforts in addressing environmental issues related to product and service offerings by implementing GS (Montabon et al., 2007). It is therefore important to empirically examine the relationship between GS implementation and organizational performance to provide managers with evidence about the environmental benefits and business value of GS implementation (Meijkamp, 1998; Bartolomeo et al., 2003).

2.6 GS implementation and customer satisfaction

Customer satisfaction is a well-known and established concept in the service sciences (Andreassen and Lindtestad, 1998). Two different conceptualizations of customer satisfaction are (Anderson et al., 1994): transaction-specific and cumulative (Boulding et al., 1993). In the former, customer satisfaction is considered the post-choice evaluation of a specific purchase occasion (Oliver, 1993). The latter, on the other hand, is considered an overall evaluation based on the total purchase and consumption experience of a physical product or intangible service over time (Johnson and Fornell, 1991; Fornell, 1992). Whereas transaction-specific satisfaction may provide specific diagnostic information about a particular product or service encounter, cumulative satisfaction is an indicator of the past, current, and future performances of firms (Anderson et al., 1994). Firms are motivated by cumulative customer satisfaction to invest in enhancing customer satisfaction. From an environmental management perspective, customer satisfaction is the providing of a pleasurable level of consumption-related fulfillment to satisfy customer desire for environmental protection, and expectations for sustainable development (Chen, 2010), which is considered a good indicator of potential competitive advantage to be obtained from adopting environmental responsibility and environmental improvements in operations (Porter and Millar, 1985; Simpson et al., 2004).

There is a rich body of literature that has investigated the antecedents and consequences of customer satisfaction (Yi, 1990). On one hand, the literature indicates that an increase in customer satisfaction is imperative to business performance improvement (Sparks and McColl-Kennedy, 2001). First, higher customer satisfaction indicates increased loyalty from current customers (Fornell, 1992). The increased loyalty of current customers implies that more customers will repurchase or be retained by firms in the future, which enables firms to ensure a steady stream of future cash flow (Reichheld and Sasser, 1990; Yee et al., 2009).

Second, satisfied customers tend to pay for the benefits that they receive, and more likely to be tolerant of increases in prices. The decreased price elasticity leads to profit increase for firms that satisfy their customers (Garvin, 1998; Reichheld and Sasser, 1990). Third, firms that enjoy high customer satisfaction do not need to spend as much to acquire new customers each period (Anderson et al., 1994) as satisfied customers are likely to buy more frequently and in greater volume, and purchase other products and services offered by these firms (Garvin, 1998; Reichheld and Sasser, 1990). Fourth, firms that consistently enjoy high customer satisfaction will need fewer resources devoted to handling returns, reworking defective items, and handling and managing complaints. These enable such firms to reduces failure costs and improve profitability (Anderson et al., 1997). Fifth, an increase in customer satisfaction also enhances the overall reputation of firms (Anderson et al., 1994). A favorable corporate reputation enables firms to price premium (Kumar et al., 2003), which provides them with the means to recover from financial or environmental crises and brings about beneficial effects that may add to their profitability (Basdeo et al., 2006).

On the other hand, the literature indicates that the determinants of customer satisfaction include perceived quality, perceived value, and customer expectations (Fornell et al., 1996). In the case of consumer-product firms, the ever growing environmentally conscious consumers not only expect firms to establish corporate environmental policies to address environmental issues, but also be actively involved in environmental protection initiatives, such as end-of-life product recycling and plastic bag consumption reduction practices (Foster Jr et al., 2000; Kassinis and Soteriou, 2003). The provision of GS, which adds value and meets the demands of customers, and manages the involvement of customers without compromising or damaging the quality of customer services, could be an opportunity for consumer-product firms to achieve business performance improvement (Goodman, 2000; Schendler, 2001). It is therefore important for firms to understand the relationship between GS implementation and customer satisfaction, and if GS provision enhances customer satisfaction.

There is increasing interest in the relationship between the environmental practices of a firm and customer satisfaction (e.g., Kassinis and Soteriou, 2003; Simpson et al., 2004; Chen, 2010; Robinot and Giannelloni, 2010; Tang et al., 2012). Prior studies have examined the understating of the impact of certain environmental management practices, such as eco-designing and corporate governance, on customer satisfaction. Prior research studies have indicated that corporate environmental philanthropy or corporate governance improves performance through customer satisfaction (e.g., Kassinis and Soteriou, 2003; Simpson et al., 2004; Tang et al., 2012). A positive relationships among green brand image, green satisfaction and green trust was also observed (Chen, 2010). Some studies, however, argue that corporate environmental philanthropy practices have no significant impact on customer satisfaction (Robinot and Giannelloni, 2010). However, there is an absence of studies that empirically examine the impact of GS on customer satisfaction, and how GS practices allow service firms to enhance customer satisfaction.

2.7 GS implementation, customer satisfaction, customer loyalty, and revenue growth

Customer loyalty has been defined by two distinct perspectives, namely, behavioral and attitudinal (Dick and Basu, 1994; Dekimpe et al., 1997; Kassinis and Soteriou, 2003). In the former, customer loyalty is viewed as the continuous purchase of products and services from the same firm which increases the scale of the relationship, or the act of recommendation (e.g., word-of-mouth advertising) (Yi, 1990). In the latter, customer loyalty is viewed as customer feelings which create an attachment to a physical product, intangible service offerings, or consumer-product firm (Hallowell, 1996), as well as concerns brand preference and emotional commitment. Behavioral loyalty can be measured in terms of repurchase probability (Andreassen and Lindestad, 1998) and the long-term of a brand (Carpenter and Lehmann, 1985; Dekimpe et al., 1997), while attitudinal loyalty can be measured in terms of repeat purchase intention (Cronin and Taylor, 1992; Anderson and Sullivan, 2003), intention of word-of-mouth (Boulding et al., 1993), and willingness to pay premium price (Narayandas, 1996; Zeithaml et al., 1996). Loyal customers tend to show special preference, attachment, commitment, positive word-of-mouth, low switching to competitive brands, and willingness to pay premium price (Yi & La, 2004).

Oliver (1999) argued that consumers become loyal to a firm in a cognitive sense first, then in an affective sense, later in a conative manner, and finally in a behavioral manner, which is termed as action criteria. Oliver (1999) therefore extended the definition of attitudinal loyalty by including the consumption behavior. Specifically, customer loyalty is described as: "… a deeply held commitment to rebuy or repatronize a preferred product/ service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior". While the success of GS requires customer involvement and is concerned with attitudinal and behavioral customer loyalty, this study uses the definition of customer loyalty from Oliver (1999), which embraces both the attitudinal and behavioral aspects of loyalty. The literature is rich with evidence that customer satisfaction has positively and significantly relationship with customer loyalty (Kassinis and Soteriou, 2003). Loyalty behaviors result from the belief of customers that the value offered by a particular supplier is greater than the value offered by other suppliers (Kassinis and Soteriou, 2003). Such perceived value determines and affects customer satisfaction (Fornell et al., 1996; Yee et al., 2009). Some prior studies have provided evidence that loyalty behavioral variables (i.e., repurchase intentions and word-of-mouth recommendations) can be predicted from customer satisfaction (Oliver, 1999; Wang et al., 2001; Eggert and Ulaga, 2002; Lin and Wang, 2006). A satisfied customer purchases larger quantity of product or service from a particular firm, as well as recommends the firm to their friends and family (Anderson et al., 2004). On the contrary, a dissatisfied customer tends to search for and is likely to switch to firm's competitor (Anderson and Srinivasan, 2003).

The literature is rich with evidence that customer loyalty is a primary driver of profitability (Anderson et al., 1991; Heskett et al., 1997; Yee et al., 2009). The benefits of customer loyalty include a continuous stream of profit, reduction of marketing costs, growth of per-customer revenue, decrease of operating costs, increase in referrals, charging of premium price, and so on and so forth (Reichheld and Teal, 2001). In addition, loyalty behaviors (i.e., relationship continuance, increased scale or scope of purchase, and world-of-mouth recommendations) enable firms to increase profits through increasing revenues, reducing operation costs, lowering price sensitivity of customers, and reducing customer service costs as customers are familiar with the service offerings and quality of a firm (Reichheld and Sasser, 1990). As loyal customers are likely to purchase more than newly acquired customers (Sirohi et al., 1998), the profits generated from each individual customer grow the longer that this customer remains loyal (Sirohi et al., 1998).

Prior studies indicate that improvement in customer satisfaction leads to higher levels of customer loyalty, which resulted in reducing future transaction costs and making higher revenues (Kassinis and Soteriou, 2003). Customer satisfaction is a critical issue for firms that wish to increase customer loyalty and thereby improve revenue (Gronholdt et al., 2000). Prior studies have revealed that higher level of customer satisfaction means that customer loyalty is cultivated. The cultivated customer loyalty enables firms to generate more economic returns and sustain their profitability (Vickery et al., 2003; Yee et al., 2009).

As GS is concerned with the servicing of customers, its role in affecting customer satisfaction and loyalty becomes crucial to business performance. However, prior studies are confined to the use of case examples or anecdotal evidence to demonstrate the impact of GS implementation on cost savings, revenue growth, and environmental performance, which have neglected the impact of GS implementation on customer satisfaction and customer loyalty (Halme et al., 2004).

CHAPTER 3 THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

3.1 NRBV

The NRBV is an extension of the resource-based view (RBV), which ascribes the performance improvement or success of organization to valuable resources, organizational processes, and capability that are socially complex and tacit (Hart, 1995; Ahmad and Schroeder, 2003; Ray et al., 2005; Sarkis et al., 2010). Resources include tangible (e.g., capital equipment, information technology and assets) and intangible assets (e.g., knowledge of employees and intellectual property) (Delmas, 2001; Sarkis et al., 2010). Organizational capability represents the ability of management to develop innovated organization thoughts and make continuing adjustments in resources allocation. Such resource allocation activities include the integration of resource, configuration of resource, acquisition of resource, and release of resources (Eisenhardt and Martin, 2000). Business organizational processes that make use of firm's tangible and intangible assets enable firms to exploit and expose resources to the market (Ray et al., 2004), which is an important source of competitive advantage (Rugman and Verbeke, 2002).

In extending the RBV, the NRBV advocates that a firm is dependent on natural resources. The NRBV identifies the needs for organizational efforts to be environmentally sustainable in carrying out business activities, which are important for firms to reduce costs, preempt competitors, and enhance corporate reputation (Hart, 1995). Such organizational efforts include pollution prevention, product stewardship, and sustainable development (Hart, 1995). The environmental attributes of pollution prevention, product stewardship, and sustainable development of NRBV were summarized in Table 3.1.

Pollution prevention aims at waste reduction, which focuses on reducing waste, emissions, and effluents in internal operations. Pollution prevention can be achieved by such controlling pollution approaches as the use of pollution-control equipment to treat and dispose of emissions and effluents. Pollution prevention can also be achieved by taking prevention approach, such as housekeeping practices, substitution of materials, recycling of materials, or process innovation to reduce or prevent emissions and effluents (Hart, 1995). While pollution control approach relies on non-productive pollution control equipment, the pollution prevention approach reduces pollution during the GS delivery process. Pollution reduction focuses on the involvement of employee and continuous improvement of waste reduction rather than pollution control equipment that may incurred huge capital and investment costs.

Product stewardship of the NRBV also suggests the importance of waste reduction. Product stewardship focuses on the coordination of departmental functions and integration of external stakeholders into the organizational activities that are related to product (e.g., procurement, product design, and process development) to reduce life-cycle costs of products and waste. Several approaches can be used to achieve product stewardship. Such approaches include the use of an environmentally proactive approach to manage raw materials and component suppliers, the implementation of design activities for the environment, the use of life-cycle assessment to develop environmentally friendly products and assess environmental performance of products, and the collaboration with the marketing department and customers to reduce the environmental damage of products at their in-use and disposal stages (Hart, 1995). Communication across the different functions, departments and organizational boundaries is required.

The sustainable development of NRBV is central at reducing the environmental burden of the growth and development of firms. This may requires firms to invest in the development of competency and innovative technology, as well as to create a shared vision towards reducing organizational environmental burden with a view to attaining sustainable organizational growth and development (Hart, 1995).

Table 3.1 NRBV: The environmental traits of pollution prevention, product stewardship, and sustainable development

	Pollution prevention	Product stewardship	Sustainable development
Aim	Reducing waste, emissions, and effluents in internal operations	Reducing life-cycle costs of product	Reducing the environmental burden of organizational growth and development
Foci	• Waste reduction • Pollution control • Pollution prevention	• Environmental cost reduction • Competition preemption	• Business sustainability strategies • Infrastructure support
Approach	• Using housekeeping and recycling practices, substituting materials, or modifying operations processes to reduce or prevent emissions and effluents • Using pollution-control equipment to treat and dispose of emissions and effluents	• Taking an environmentally proactive approach to manage raw materials and component suppliers, implementing designing activities for the environment • Using environmental standards and conducting life-cycle assessment in product development process • Collaborating with the marketing department and customers to minimize the environmental impacts of products throughout the porduct life-cycle	• Investing in the development of technology and competency • Creating a shared vision towards reducing organizational environmental burden
Key resource	• Extensive employee involvement • Continuous improvement of emission and waste reduction	• Communication across the departmental functions, and organizational boundaries	• Development of new technology • Development of competency • Shared vision
Advantage	Lower costs	Preempt competition	Enhance future position

3.2 NRBV and GS practices

While the notion of GS is central to satisfying customer needs with reduced costs and environmental impacts for organizational sustainable development (Meijkamp, 1998), pollution prevention, product stewardship and sustainable development were recognized as organizational efforts that are important for firms to be environmentally sustainable in carrying out economic activities from the perspective of NRBV (Hart, 1995). Grounds in the NRBV, this study conceptualizes GS in consumer-product industry by taking account of the important environmental traits of pollution prevention, product stewardship, and sustainable development, which are crucial for firms to be environmentally sustainable in their economic activities (Hart, 1995; Buysse and Verbeke, 2003). The NRBV is also drawn to explain how GS practices create business value. The merits, demerits, critiques, or evolution of the NRBV were reviewed in the literature to make sure it is appropriate to adopt NRBV for the conceptualization of GS practices in this study (e.g., Hart and Dowell, 2011; Sarkis et al., 2011). NRBV was drawn by similar research on GS or environmental management practices (e.g., Sarkis et al., 2011; Wong et al., 2013) to explain how the environmental management practices create business value.

By drawing on the main attributes of premises of the NRBV, GS integrates the pollution prevention, product stewardship, and sustainable development concepts into the provision and delivery of customer service by utilizing resources, technologies and materials that are environmentally friendly, as well as expertise who has knowledge on environmental protection (Russo and Fouts, 1997). In other words, GS is a set of environmentally responsible practices that make use of materials, equipment and machineries that are environmentally friendly (e.g., recycled materials, energy-efficient lighting, and fuel-efficient trucks) (Wong et al., 2013), as well as environmental management expertise and knowledge, which are developed through education and training efforts, (Goodman, 2000) to satisfy customer needs with reduced environmental damage of the provision of customer services.

Pursuing service quality management is supported by the NRBV to prevent pollution in business operations processes of organization (Hart, 1995) with focus of organizational processes improvement and the quality of production to eliminate waste and disposal by achieving zero-defect (Hart, 1995). Such a management philosophy can be transformed into organizational efforts of improving efficiency and reducing waste in operations in environmental management context (Shrivastava, 1995). These can be achieved by redesign of business processes, installation of environmentally friendly technologies, and promotion of eco-products to end customers, which can fully utilize organizational resources and increase product acceptance, while eliminating waste and disposal (Hart, 1995). In addition, pursuing quality is important to GS provision where individual customers are involved in the servicing processes (Foster Jr et al., 2000; Kassinis and Soteriou, 2003), and customer satisfaction heavily depends on customer perception of the service quality

(Fornell et al., 1996; Cronin et al., 2000). In situations where both products and services are offered, service quality is concerned with the physical aspects of the servicing location (e.g., the appearance of facilities and equipment used to facilitate operations), service reliability (e.g., products and services are appropriately provided and as promised), problem solving capacity (e.g., the provision of customer assistance to source desired products and handle unwanted products), interaction with customers (e.g., the ability of salesperson to help customers to identify the products and services needed), and corporate policies (e.g., the extent to which corporate policies respond to customer needs) (Dabholkar et al., 1996). These characteristics of service quality are crucial to embed into GS to balance business, operation and environmental performances.

GS is environmentally responsible services (Wong et al., 2013), which is intangible in its nature (Grove et al., 1996; Hoffman et al., 2002; Roth and Menor, 2003). The provision of GS offering (e.g., introducing eco-products to customers and raising customer awareness on environmental protection) relies on the tacit skills of employees in serving the customers. In other words, GS involves tacit (i.e., skill based) and socially complex (i.e., large number of employees are engaged in implementing GS) resources. These tacit and decentralized natures of GS practices are difficult to be observed and duplicated by competitors (Hart, 1995). Moreover, GS manages customer involvement in environmental protection without compromising the quality of services, adds value, and meets customer demand on environmental protection, which has impact on customer satisfaction. In sum, GS is intangible, difficult to imitate, and impact customer satisfaction (Oliva and Kallenberg, 2003; Carmeli and Tishler, 2004). It is believed that GS, which involves organizational efforts such as pollution prevention, product stewardship and sustainable development, as well as resources that are tacit, socially complex, and/or rare, is crucial for organizational performance improvement. Figure 1 shows the theoretical model, within which each of the hypothesized relationships is explained through the NRBV.

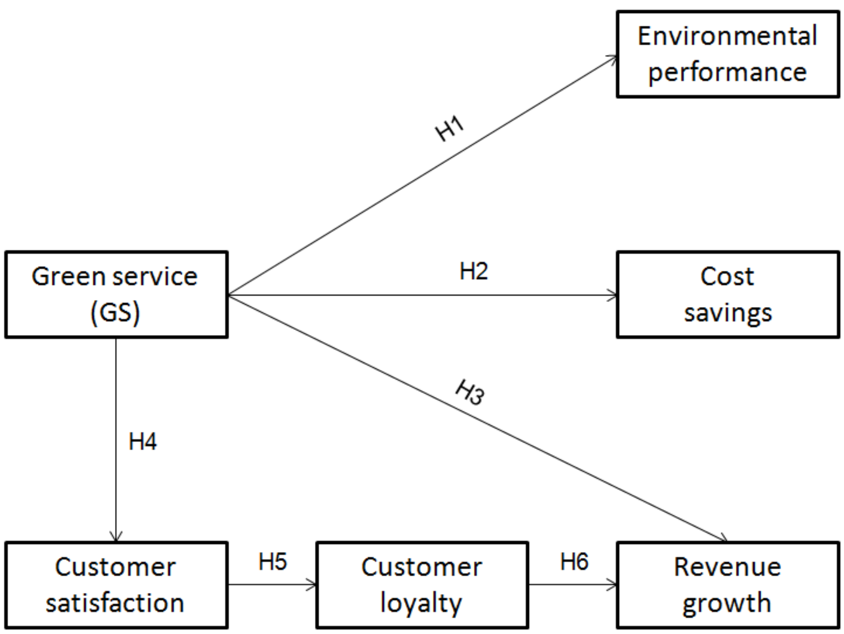


Figure 3.1 Theoretical model

3.3 Practices of GS

Three steps were taken to conceptualize GS practices. First, literature review was conducted to clarify the role of NRBV in conceptualization of GS practices and to identify the GS practices. Grounds in the NRBV, this study conceptualized GS in consumer-product industry by taking account of the important environmental traits of pollution prevention, product stewardship, and sustainable development, which are crucial for firms to be environmentally sustainable in their economic activities (Hart, 1995; Buysse and Verbeke, 2003). GS practices were identified in the environmental management literature, operations management literature, and service operations literature based on the environmental traits of pollution prevention, product stewardship, and sustainable development. Second, following grounded theory (Glaser and Strauss, 1967), exploratory qualitative research was conducted to collect primary data from managers of consumer-product firms through semi-structured interviews to identify the real-life organizational practices that constitute GS in consumer-product industry. In the analysis of the interview data, the practices of GS were identified by counting the pieces of evidence that have common themes. Third, the interview results were compared with those in the literature on the organizational practices of GS to confirm and conceptualize GS practices in consumer-product industry. Based on the NRBV, the GS practices that were identified in the literature, and the GS practices in consumer-product firms that are determined by interviewing managers of consumer-product firms in an exploratory research (shown in Chapter 5 of this study), GS comprises three practices: pollution prevention-oriented GS (PP-GS) practices, product-oriented GS (P-GS) practices, and long-term development-oriented GS (LTD-GS) practices.

3.3.1 Pollution prevention-oriented GS practices

The pollution-prevention dimension of the NRBV emphasizes the importance of reducing waste in firm's internal operations (Hart, 1995). As such, PP-GS practices focus on reducing emissions, effluents, and waste from service activities taken place in internal operations, such as store related services, logistics services, and promotion services (Lai et al., 2010). As suggested by the NRBV, waste reduction in firm's operation can be achieved by pollution prevention practices (e.g., substitution of material and redesign of operations processes to reduce emissions and effluents), and taking pollution control approach (e.g., the use of pollution-control equipment to treat and dispose of emissions and effluents) (Hart, 1995). By drawing on the main premises of pollution-prevention dimension of the NRBV, effective PP-GS practices incorporate pollution prevention practices and pollution control approach into waste reduction in firm's operations. As such, PP-GS practices are concerned with the use of such tools and facilities as recyclable display table and energy-saving equipment, process innovation, and application of sustainable design features (e.g., the harvest of sunlight for store illumination) in servicing locations (e.g., stores and customer service centers) to provide eco-friendly servicing environments to facilitate interaction with customers (Ogle et al., 2004; Chung and Tsai, 2007; Callaway and Dobrzykowski, 2009, Lai et al., 2010). These efforts provide customers with an environmentally responsible, convenient, and interactive servicing and shopping environment, which improves service quality (Lai et al., 2010). Environmental protection acts in logistics services are also concerned by PP-GS practices (Lai et al., 2010). Optimization of shipping routes and capacity, the usage of standardized reusable containers, and adoption of energy- or fuel-efficient transport and modes of transport (Wu and Dunn, 1994; Kam et al., 2006; Wheeland, 2011) are approaches that enable firm to make products available to consumers with minimum environmental impacts. Moreover, PP-GS practices are related to the implementation of promotion activities to provide customers with information and platforms to participate in environmental protection activities (e.g., recycling of hangers and reduction of plastic shopping bag consumption) (Ginsberg and Bloom, 2004; Leire and Thidell, 2005). The use of eco-label to disseminate information about environmental performance of products to customers is an example of a PP-GS practice (Gilley et al., 2000). This effort not only enhances corporate legitimacy, reputation, and image (Gilley et al., 2000), but also improves the service quality in terms of reliability of service by making the corporate environmental management practices more visible for their customers to determine if they have utilized their capabilities and resources to reduce environmental damage as promised in their environmental claims (Tang et al., 2012). Such efforts also increase customer awareness of environmental issues, and educate and motivate customers to select environmentally responsible options, which are important to mitigate environmental impacts (Ginsberg and Bloom, 2004; Leire and Thidell, 2005). The NRBV suggests that these PP-GS practices improve operational productivity and efficiency, while reducing cycle time by streamlining processes, liability costs, operation costs, and waste disposal due to improvements in the utilization of inputs (Hart, 1995). In addition, the provision of PP-GS practices relies on the tacit skills of employees in servicing the customers (e.g., introduction of eco-products). According to the NRBV, the tacit and decentralized natures of PP-GS practices are difficult to be observed and duplicated by competitors (Hart, 1995). Moreover, this people-oriented nature of PP-GS practices enables firms to develop an environmental-centric corporate culture within the organization and amongst customers, developing an environmentally reputation that is difficult to replicate.

3.3.2 Product-oriented GS practices

The product stewardship dimension of the NRBV suggests the importance of taking into account the reduction of product life-cycle costs (Hart, 1995). As such, P-GS practices are related to the management of the environmental impacts of service activities at various stages of the product life-cycle (i.e., procurement, product design and development, to after-sale product management) (Hart, 1995; Kleinforfer et al., 2005). As suggested by the NRBV, product stewardship can be achieved by taking an environmentally proactive approach to manage raw materials and component suppliers, implementing designing activities for the environment, conducting life-cycle assessment to assess the environmental impact and performance of product in product development process, and collaborating with the marketing department and individual customers to reduce the environmental impacts of products throughout product life-cycle (Hart, 1995). As such, the characteristics of P-GS practice include the development of environmental guidelines in sourcing, supplier selection, and production are important, which enable firms to source materials and products that have minimum environmental impacts for their customers (Rothenberg et al., 2001; Handfield et al., 2005; Bai and Sarkis, 2010). The environmental guidelines not only provide directions and standards for material selection at the product design stage, but also specify requirements on environmental management for suppliers in conducting of operations activities, including product production. Moreover, P-GS practices also stress the importance of eco-design, also known as design for the environment, to provide customers with environmentally friendly products. Eco-design consists of activities from product life-cycle assessment to design for disassembly (Ross and Evans, 2002; Kurk and Eagan, 2008; Chen, 2010) that seek to engage in production processes and produce products with minimum environment impacts (Sarkis et al., 2010). In addition, after-sale activities include the provision of product maintenance services such as repair and refurbishment, the take-back of end-of-life products, and recycling of end-of-life products. These after-sale activities are important P-GS practices that extend product life-cycle, reduce the consumption of resource in new product production, and reduce waste from end-of-life products (Bartolomeo et al., 2003). These P-GS practices improve service quality by providing solutions to help customers to maintain the condition of products in use and reduce the environmental impacts of their end-of-life products by taking back their end-of-life products and recycling of the components in end-of-life products. P-GS practices allow firms to reduce the environmental impacts of a product in its life-cycle. P-GS practices also enable firms to improve their organizational performance by capturing the residual values of products returned from their existing customers and gaining a better understanding of product usage patterns of their customers (Jayaraman and Luo, 2007). This in-depth knowledge is important for firm's future product development, which is an important resource to preempt competitors (Daugherty et al., 2002).

3.3.3 Long-term development-oriented GS practices

The sustainable development dimension of the NRBV recognizes the need of reducing the environmental burdens of organizational growth and development (Hart, 1995). It often requires competency development, such infrastructure support as new technology development, and a shared vision that is central at reducing organizational environmental burden with emphasis on attaining sustainable growth and development of organization (Hart, 1995). As such, LTD-GS practices are related to service activities that involve organizational infrastructures such as information systems (Green et al., 2012), human resource management (Sarkis et al., 2010), and corporate environmental policies (Subramanian et al., 2009), which are imperative for firms to nurture organizational growth (Lai et al., 2010). Specifically, information systems are important for firms to track corporate environmental management practices and performances (Melynk et al., 2003; Sroufe, 2003). Firms can utilize information systems to share information related to environmental management practices and performances across business functions and supply chain partners for better coordination of environmental protection efforts, such as environmentally responsible procurement and eco-design activities (Heng and De Moor, 2003; Ellram et al., 2004; Melville, 2010; Solér et al., 2010; Green et al., 2012). The application of information systems together with communication technologies, (e.g., email and corporate websites) enables firms to provide web-based support services to customers (Wong et al., 2013). As such, customer contact and consumption of physical resources can be reduced (Jaruwachirathanakul and Fink, 2005). Moreover, human resource management efforts that cultivate a corporate culture of environmental protection are significant to organizational sustainable development (Daily and Huang, 2001; Perron et al., 2006; Sarkis et al., 2010). Such efforts include education and training, establishment of performance targets, and provision of compensation packages to motivate employee participation in GS delivery and provision (Daily and Huang, 2001; Sarkis, 2003; Jabbour et al., 2008; Sammalisto and Brorson, 2008). The human resource management efforts are important for the success of the initial implementation of GS practices (Ahmad and Schroeder, 2003). The human resource management are also important for the maintenance and continuation of environmentally responsible operations of firms (Balzarova and Castka, 2008). These efforts improve service quality in terms of better interaction among employees and customers as well-trained and motivated employees are able to assist customers in identifying and accessing environmentally responsible products and services that they need (Goodman, 2000). Furthermore, corporate environmental policies are important to provide direction for the long-term environmental management development of firms by extending beyond compliance to sustain business growth in the long run (Barrieu and Sinclair-Desgagné, 2006; Subramanian et al., 2009). The establishment of corporate environmental policies enables firms to improve service quality by responding to the needs of customers for environmental protection through governing corporate practices and business routines (Jacobs et al., 2010; Tang et al., 2012). These LTD-GS practices create a shared vision across organizations, which can be considered as a rare organizational resource for firms to sustain business growth without compromising the natural environment (Hart, 1995). This is also a significant attribute for firms to improve their market positions, while consumers are increasing their expectations, requirements, and standards in evaluating the environmental management practices of consumer-product firms (Lai et al., 2010). Table 3.2 summarizes the practices of the PP-, P- and LTD-GS.

Table 3.2 The practices of GS				
GS practice	**Aim**	**Foci**	**Services involved in various stage of supply chain**	**Approach**
Pollution prevention -oriented GS practice	Minimizing waste, emissions, and effluents from service activities taken place in internal operation practices of firms (Hart, 1995)	Control Prevention	Store related services	Provision of eco-friendly servicing environment to facilitate interaction with customers (Ogle et al., 2004; Lai et al., 2010)
			Logistics services	Adoption of environmental protection acts in logistics services to make product available to customers with minimum environmental impacts (Kam et al., 2006; Wheeland, 2011)
			Promotion services	Implementation of promotion activities to provide customers with platforms and information to participate in environmental protection initiatives (Ginsberg and Bloom, 2004; Leire and Thidell, 2005)
Product-oriented GS practice	Managing the environmental impacts of service activities taken place at various stages of the product life-cycle through coordination with partner firms in a supply chain	Environme-ntal cost reduction Competition preemption	Procurement services	Adoption of environmentally responsible procurement practices to ensure materials and products sourced for consumers have minimum environmental impacts
			Product design and development services	Adoption of eco-design activities to provide customers with environmentally friendly products (Chen, 2010; Sarkis et al., 2010)
			After-sale services	Provision of after-sale services to assist customers to maintain and handle end-of-life products (Bartolomeo et al., 2003)
Long-term develop-ment-oriented GS practice	Minimizing the environmental burden of service activities that involve organizational infrastructure that are important to organizational growth and development	Infrastructure support Business sustainability strategies	Information system related services	Adoption of information systems to track information related to environmental management practices and performances and provide web-based support services to customers with minimum consumption of physical resources (Melville, 2010; Wong et al., 2013)
			Human resources management services	Cultivation of a corporate culture of environmental protection through human resource management efforts to assist customers in identifying and accessing environmentally responsible products and services that they need (Daily and Huang, 2001; Sarkis, 2003; Jabbour et al., 2008; Sammalisto and Brorson, 2008)
			Corporate policy related services	Development of corporate environmental policies to guide and direct the long-term environmental management development of firms and respond to the needs of customers for environmental protection (Barrieu and Sinclair-Desgagné, 2006; Subramanian et al., 2009)

3.4 GS – Environmental performance relationship

PP-GS practices requires the redesign and renovation of operations process and the use of environmentally friendly tools and facilities in servicing locations to provide environmentally friendly servicing environments to facilitate interaction with customers. Specifically, the process designing and innovation improve resource input-output efficiency by streamlining service delivery processes (Ogle et al., 2004). The use of environmentally friendly tools and facilities (e.g., eco-lighting systems and auto-off water taps) enable firms to reduce the consumption of resource (Bohdanowicz, 2006; van Berkel, 2007). PP-GS practices are also concerned the making products available to meet consumer needs with minimum environmental impacts by implementing environmental protection acts in logistics services. Such acts of environmental protection include the maximization of shipment capacity, consolidation of freight, use of standardized reusable containers, and application of fuel-efficient transport, which are useful to firms in reducing emissions, fuel consumption and waste (Wu and Dunn, 1994; Carter et al., 2007). Firms can reduce emissions and fuel consumption by optimizing shipping routes to develop the best sequence of deliveries and pickups enables (Aronsson and Brodin, 2006). Firms can also reduce fuel consumption and pollution through the logistics network design and planning for both inbound and outbound freights (Cooper et al., 1991; Burchill and Fine, 1997). Such promotional activities of PP-GS practices as advertising, the provision of eco-labeling, and application of incentive programs are useful to educate or motivate customers in participating in environmental protection initiatives, which are important for firms to realize corporate environmental protection efforts (Ginsberg and Bloom, 2004). For example, the provision of eco-labeling reduce the information asymmetry between the producer and consumers by providing information about the environmental attributes of a product (Crespi and Marette, 2005), thus promoting informed purchasing decisions of environmentally conscious consumers (Leire and Thidell, 2005).

PP-GS practices enable firms to manage the environmental impacts of a product throughout its life cycle spanning from production to disposal stages. The establishment of environmental guidelines for procurement enables the substitution or avoidance of hazardous materials in products through coordination with supply chain partners (Sroufe, 2003). Firms are able to purchase or source environmentally friendly materials which are recyclable, reusable, or have already been recycled (Sarkis, 2003) by making procurement decisions based on environmental guidelines, this enables. Environmental guidelines also improve supplier understanding on environmental requirements, thus motivating them to make efforts in the reduction of environmental impacts in their operations processes (Handfield et al., 2005; Bain and Sarkis, 2010). For example, suppliers will be motivated by the environmental criteria of distribution packing to adopt practices such as recycling of product packaging to reduce environmental damage (Lee and Klassen, 2008). By working closely with suppliers through collaborations in environmental management and sharing environmental management information, these can be useful for reducing the environmental impacts of products (Hines and Johns, 2001). For example, a compact liquid laundry detergent that requires less packaging materials and consumes less energy when used in washing machines was successfully introduced by Wal-Mart Stores Inc. and its supplier, Unilever Co.,While Unilever Co. developed the liquid laundry detergent, Wal-Mart Stores Inc. planned and launched promotional activities to promote the environmental benefits of the compact liquid laundry detergent and raise the awareness of customers, which would eventually lead to their purchase (Ellram et al., 2008). This collaborative effort by Wal-Mart Stores Inc. and Unilever Co. was greatly successful in eliciting customer acceptance of the detergent (Ellram et al., 2008). Moreover, the implementation of eco-design activities such as the use of material substitution, design for disassembly, and recycling of materials is also important in environmental protection (Lozada and Mintu-Wimsatt, 1995; Sroufe, 2003). The assessment of product life-cycle, which evaluates energy and material consumption, and emissions related to a specific product over a product life cycle (Tsoulfas and Pappis, 2006), assists firms to develop products with reduced environmental impacts throughout the product life-cycle (Sroufe, 2003; Kobayashi, 2005). In addition, GS are concerned with the provision of after-sale services to assist customers to maintain and handle end-of-life products. The provision of such product maintenance services as repair and refurbishment prolongs the use period of a product, thus reducing disposals in landfills (Daugherty et al., 2001; Kobayashi, 2005). By providing product take-back services to collect end-of-life products for recovery or resale of products or their components, firms are able to gain understanding on usage patterns for future product development while reducing environmental impacts by saving resources (Daugherty et al., 2001; Kobayashi, 2005).

LTD-GS practices utilize organizational infrastructures, including information systems, human resource management, and corporate environmental policies, to support and sustain corporate growth while reducing environmental burdens. Information systems play a critical role in reducing environmental impacts and addressing climate change (Watson et al., 2010; Melville, 2010). The application of information systems facilitates environmental information sharing across business units and among external partners to coordinate environmental protection efforts in activities such as new eco-product development (Geffen and Rothenberg, 2000; Ammenberg and Sundin, 2005; Pujari, 2006) and reverse logistics (Rogers and Tibben-Lembke, 2001; Daugherty et al., 2002; Tibben-Lembke and Rogers, 2002; Ellram et al., 2004). Firms can collect market information from downstream supply chain partners through their information systems to reduce waste and disposal due to overstocking or low market acceptance (Savaskan et al., 2004). The sharing of information also provides opportunities for firms to learn about successful environmental management projects, thus contributing to the diffusion of environmental management practices in a supply chain (Cetindamar, 2007). Human resource management efforts in cultivating a corporate culture of environmental protection can improve employee awareness and participation in environmental protection initiatives (Daily and Huang, 2001). Firms that invest in employee training and education to boost productivity, as well as information systems to assess ongoing operations processes, are able to eliminate waste from operation inefficiencies (Hart, 1995). By providing incentives to encourage their employees to suggest or implement environmental protection initiatives, firms can leverage their pollution prevention skills and environmental knowledge toward other integrated forms of environmental management (Darnall et al., 2008). Moreover, corporate environmental policies provide firms with direction for resource allocation to address environmental issues (Hassan and Ibrahim, 2012; Tang et al., 2012). Corporate environmental policies govern corporate practices and business routines, thus making firms environmentally legitimate (Berrone and Gomez-Mejia, 2009). Thus,

Hypothesis 1: The implementation of GS is positively related to environmental performance.

3.5 GS – Cost savings relationship

Firms can reduce costs by increasing productivity (Golhar and Stamm, 1991; Kinney and Wempe, 2002), reducing the consumption of materials (e.g., raw materials used in product production) and resources (e.g., energy, water, and fuel) (Christopher and Towill, 200l; Fullerton et al., 2002; Fullerton and Wempe, 2009), and avoiding environmental fines and liabilities (Klassen and McLaughlin, 1996). PP-GS practices lower costs by reducing the consumption of various operation inputs through the installation of energy- and water-saving equipment in servicing locations (Rothenberg et al., 2001; Sroufe, 2003; von Paumgartten, 2003; Callaway and Dobrzykowski, 2009; Lai et al., 2010). The optimizing of shipping routes and maximizing of shipping capacity in logistics services can also lower costs by reducing fuel consumption and increasing product delivery efficiency (Rao and Holt, 2005; Lai et al., 2010). The reusing or recycling of fixtures and equipment in servicing environments and distribution enable firms to save costs by reducing purchases of new equipment (Ogle et al., 2004). Moreover, customer involvement in organizational GS practices is also important for cost reduction (Kassinis and Soteriou, 2003). Tesco PLC, for instance, launched the Green Clubcard Point in 2006 to encourage its customers to bring their own shopping bags. As a result, Tesco saved costs equivalent to two billion plastic bags in two years after the program launched (Environmental Leader, 2008). In addition, the implementation of the people-oriented nature of PP-GS practices not only reduces disposal and mitigation costs, but also avoids the costs of installing and operating pollution control devices (Hart, 1995; Hart and Ahuja, 1996; Jacobs et al., 2010).

In following environmental guidelines, suppliers are required to reduce the consumption of various production inputs (e.g., energy and materials) (Rothenberg et al., 2001; Sroufe, 2003) by reengineering production processes, substituting polluting inputs, and recycling by-products to reduce waste disposal and new material costs (Christmann, 2000). The sharing of environmental management expertise and knowledge facilitates the coordination of cross-firm environmental management practices (Hines and Johns, 2001; Rao and Holt, 2005). Such collaborative efforts enable partner firms to streamline processes to improve efficiency and reduce redundancy (Pérez and Sánchez, 2001). On the other hand, such collaborations cultivate long-term relationships, thus reducing search-related costs that arise from identifying alterative supply chain partners for product development (Saeed et al., 2005). In working with customers to improve purchasing criteria or including customer requirements in traditional product designs (Maxwell and Van der Vorst, 2003), these are also useful for reducing the overall time to market products and the number of costly changes to the product, and thus significantly improving new product success (Burchill and Fine, 1997). Such customer focused GS practices reduce supply chain waste and associated costs (Vokurka and Lummus, 2003). Moreover, the life-cycle assessment and cradle-to-grave consideration of P-GS practices also facilitate firms to develop products with compact designs and less packaging materials, thus reducing manufacturing and material costs (Sroufe, 2003; Darnall et al., 2008). Both inbound and outbound logistics can enjoy cost savings from products that are developed with reduced product weight and packaging (Rao and Holt, 2005). Furthermore, the end-of-life product take-back and recycling services of P-GS practices enable firms to reap cost savings by capturing the residual values of returned components (Min and Galle, 2001; Linton and Jayaraman, 2005; Jayaraman and Luo, 2007), and reduce the disposal costs of end-of-life products (Rogers and Tibben-Lembke, 2001).

The development of corporate environmental policies based on the requirements of government environmental regulations to guide and direct the environmental management of firms enables firms to mitigate losses from environmental crises (Barrieu and Sinclair-Desgagné, 2006; Subramanian et al., 2009). Likewise, information systems used to collect and report the information of GS practices to assess their efficiency, effectiveness and adequacy enable firms to gain effective environmental management by pinpointing practices that fail to conform to government environmental regulations, thus avoiding expenses associated with lawsuits and legal settlements (Morrow and Rondinelli, 2002; Karpoff et al., 2005). Moreover, the provision of training programs for employees who are responsible for providing services is important for cost reduction (Ramus and Steger, 2000). Honda Motor Company, for example, educated its employees on the corporate objectives and environmental improvement priorities. As a result, Honda has achieved substantial cost savings associated with environmental accidents, and reduced waste and energy consumption (Morrow and Rondinelli, 2002). The establishment of stringent environmental standards and targets for employees can lower the costs to develop, maintain, and enforce policies and procedures for environmental protection, thus allowing easy transfer of accrued knowledge and increasing employee morale and productivity (Dowell et al., 2000). In addition, the offering of compensation packages to reward the contributions of employees towards environmental protection can encourage employee participation in environmental performance improvement. This is useful in improving the productivity, efficiency and effectiveness of their services delivery (Hanna et al., 2000). Thus,

Hypothesis 2: The implementation of GS is positively related to the cost savings of firms.

3.6 GS – Revenue growth relationship

The revenue of firms reflects income generated from business activities, which include the sale of products and rendering of services (O'Sullivan et al., 2008). Revenue growth can be achieved by increasing market share either through gains in existing markets or access to new markets (Jacobs et al., 2010), marking up of products, or achieving of economies of scale through better utilization of inputs and resources (Klassen and McLaughlin, 1996). The implementation of PP-GS practices, such as optimizing shipping routes and reducing fuel consumption in product delivery, enables firms to demonstrate organizational efforts in mitigating any adverse environmental impacts of their operations (Rao and Holt, 2005). Firms that demonstrate efforts or concerns in environmental protection are poised to attract and retain customers who show a preference to purchase from environmentally responsible firms (Hofer et al., 2012), while outperforming competitors that fail to demonstrate environmental management efforts (Klassen and McLaughlin, 1996). On the other hand, the application of environmentally responsible tools and facilities in servicing locations, and promotion activities of PP-GS practices enable firms to portray their environmental protection efforts to regulators, employees and the public (Jacobs et al., 2010), thus establishing an environmentally responsible image (Ginsberg and Bloom, 2004). An environmentally responsible image facilitates firms to expand their markets due to customer acceptance and expectations (Tang et al., 2012).

The life-cycle assessment and cradle-to-grave consideration in P-GS practices enable firms to develop products with reduced environmental damage to meet the environmental protection concerns of environmentally conscious consumers (Christmann, 2000; Rao and Holt, 2005), which are important to generating revenue (Sparks and McColl-Kennedy, 2001). The improving of environmental performance through the development of environmentally responsible products also enables firms to access new markets (Porter and Van der Linde, 1995). Examples range from high-fashion clothing produced with organic materials to hybrid vehicles (Binkley, 2007). Moreover, the sourcing of materials and products from environmentally responsible suppliers enables firms to exploit the ability and capacity of suppliers to produce eco-products with shorter new product development lead time (Kannan and Tan, 2002), thus improving organizational responsiveness to market needs (McWilliams and Siegel, 2001). Furthermore, the provision of end-of-life product take-back and recycling services enables firms to collect valuable data, such as product effectiveness, performance, deficiencies, and usage patterns (Jayaraman and Luo, 2007). This information is useful to improving marketing programs, product designing, and product quality to better satisfy customer needs (Daugherty et al., 2002). These GS practices also allow firms to economize the end-of-life product by taking the benefits of large-scale recycling (Christmann, 2000) while generating income by reselling reusable components (Jayaraman and Luo, 2007).

Corporate environmental policies in LTD-GS practices showcase the environmental goals and efforts of firms, thus shaping a positive corporate environmental reputation (Klassen and McLaughlin, 1996; Tang et al., 2012). The development of information systems to track and monitor the environmental performance of GS implementation is helpful to fulfilling the promises of firms in terms of environmental protection by monitoring the effectiveness of such efforts (Herbig et al., 1994). Customers tend to use the reputation of firms to infer the quality of their product or service in the face of imperfect information (Tang et al., 2012). Firms that have a favorable reputation through LTD-GS practices are able to mark up to achieve higher profits (Basdeo et al., 2006; Jacobs et al., 2010). It is also noted that most customers recommend firms that have a favorable reputation to their friends and relatives (Tang et al., 2012), and such word-of-mouth is useful for firms to expand their market share (Anderson et al., 1994). In addition, the adoption of information systems facilitates business units and external partners to share information about customer expectations and product offerings (Amato et al., 2008), thus increasing the acceptance of the emergence of eco-products, which in turn, improves organizational revenue (Daugherty et al., 2002; Ellram et al., 2004; Ashcroft and Murphy Smith, 2008).Thus,

Hypothesis 3: The implementation of GS is positively related to the revenue growth of firms.

3.7 GS – Customer satisfaction relationship

Customer satisfaction is determined by perceived quality and value, and customer expectations (Fornell et al., 1996). GS demands an explicit commitment to environmental management to prevent pollution in organizational processes (Hart, 1995) with emphasis on process improvement and production quality to eliminate waste and disposal by achieving zero-defect (Shrivastava, 1995). In addition, GS pursues service quality to better satisfy customers (Cronin et al., 2000) by improving the physical aspects of the servicing environment, service reliability, problem solving capacity, interaction with customers, and corporate policies (Dabholkar et al., 1996). For example, while customers are concerned about the cleanliness and appearance of stores or customer service centers and convenience of shopping (Dabholkar et al., 1996; Ogle et al., 2004; Plambeck, 2007; Piell, 2009), these physical aspects of the servicing locations can be improved by the implementation of PP-GS practices. For example, the reusing and recycling of fixtures, equipment and resources enable firms to reduce solid waste disposal (Maslennikova and Foley, 2000; Melynk et al., 2003). The application of sustainable design features in servicing locations enables firms to strengthen the overall attractiveness of the servicing environments (Ogle et al., 2004). Promotional activities, e.g., eco-labeling, also assist customers in identifying eco-products that they desire (Sammer and Wüstenhagen, 2006).

Perceived value can be referred to the overall assessment of the utility of a product or service based on the perceptions of consumers on what is received and what is given (Sweeney and Soutar, 2001). PP-GS practices are valued by a growing number of customers (Ogle et al., 2004). These customers prefer shopping at environmentally responsible stores with attributes that they perceive to be congruent with their personal values in environmental sustainability (Erdem et al., 1999; Hyllegard et al., 2006). Moreover, the development of corporate environmental policies to guide and direct long-term environmental management development (Jacobs et al., 2010) reinforces the corporate culture of environmental sustainability (Daily and Huang, 2001). Such LTD-GS practices serve to establish the long-term environmental orientation of firms, which is also one of the values that customers appreciate (Marsh and Hocevar, 1984; First and Khertriwal, 2010). In addition, customers realize that their purchasing behaviors have direct impacts on the natural environment (Laroche et al., 2001) and thus are increasingly searching for eco-products (Hartmann and Ibáñez, 2006). Such P-GS practices as product-life-cycle assessment (Ross and Evans, 2002), cradle-to-grave consideration, and development of environmental guidelines for production (Tsoulfas and Pappis, 2006) enable firms to develop eco-products, which are increasingly valued by customers.

Environmentally conscious customers demand firms to devote environmental efforts to demonstrate their environmental responsibility (Tang et al., 2012), which can be met by the implementation of PP-GS practices. For example, the promotional activities of PP-GS, e.g., in-store banners, which encourage customers to make donations to support the environmental sustainability activities of firms (Seifert et al., 2003), reflect the commitment of these firms to their customers on environmental protection (Hyllegard et al., 2006). Environmentally conscious customers are also characterized by their high and rising expectations that products are made of environmentally friendly materials and components (Tang et al., 2012), and with few environmental impacts in the production, usage, and disposal stages (Hartmann and Ibáñez, 2006). Such expectations can be met by the establishment of environmental guidelines for procurement in P-GS practices, which ensure that sourced materials and products are free from hazardous materials (Min and Galle, 2001; Pun, 2006; Ellram et al., 2008). The establishment of environmental guidelines for production in P-GS practices also enables firms to reduce waste of materials and energy (Tsoulfas and Pappis, 2006). The life-cycle assessments in P-GS practices, including life-cycle costing, impact and inventory analyses, and environmental auditing (Pun, 2006; Bovea and Wang, 2007), enable firms to examine the potential environmental aspects associated with a product and ensure that their products throughout their life-cycles are environmentally responsible (Lin et al., 2001). Besides that, customers expect that firms should have environmental governance, which is important for them in judging whether a firm is committed to protecting the environment (Tang et al., 2012). The corporate environmental policies in LTD-GS practices reflect the commitment of firms to environmental protection and show their goals of long-term environmental development to their customers, which inform customers about their commitment to protecting the environment (Salzman, 2000; Poksinska et al., 2003;

Pun, 2006). Moreover, the usage of information systems for environmental reporting provides customers with information to evaluate how their green expectations are fulfilled by firms (Darnall et al., 2008). The above discussion reasons that GS reinforces the determinants of customer satisfaction, including perceived quality and value, and customer expectations. Thus,

Hypothesis 4: The implementation of GS is positively related to customer satisfaction.

3.8 Relationships among GS, customer satisfaction, customer loyalty, and revenue growth

Prior studies have found a positive relationship between customer satisfaction and customer loyalty (Anderson et al., 1994; Yee et al., 2009). The implementation of GS meets customer expectations and enhances the perception of quality and value which may improve customer satisfaction and hence customer loyalty. The literature suggests that customers are loyal to firms that implement GS (Pun et al., 2002; Tang et al., 2012). Their loyalty behavior is evidenced by relationship continuance, increased scale or scope of relationship, increased recommendations (i.e., engaging in positive word-of-mouth), and increased tolerance of price increases (Reichheld and Sasser, 1990; Anderson et al., 1994; Loveman, 1998). Consumers are likely to patronize at firms that have integrated sustainable design features in their servicing locations than other firms in the future (Ogle et al., 2004). A survey found that 30% of consumers regularly purchase products at firms that have implemented environmental guidelines to source organic food products for them (Vermeir and Verbeke, 2006). Consumers will also purchase more products and services from firms that have environmental guidelines for sourcing and production to ensure that their products and operation processes are environmentally responsible (Pickett-Baker and Ozaki, 2008). Moreover, a survey conducted in the US found that 65.7% of the public would recommend firms that demonstrate environmentally responsible efforts (Reputation Institute, 2008). Likewise, a study found that consumers, especially Generation Y consumers (i.e., the Millennials), promote products of firms that are environmentally responsible to their friends (Smith, 2010). Furthermore, consumers who find out about the environmental attributes of products through the promotional activities of GS, such as energy-labeling of products, are willing to pay more for energy-efficient products (Sammer and Wüstenhagen, 2006). A UK study showed that 79% of female consumers would pay up to 40% more for eco-products (Smith, 2010). Another survey found that approximately 53% of the consumers are more likely to pay premium for eco-products than traditional products (Grundey, 2009).

The loyalty behaviors mentioned above, including relationship continuance, increased scale or scope of relationship, increased recommendations, and increased tolerance of increases in price, will improve the revenues of firms through several ways (Reichheld and Sasser, 1990). First, relationship continuance means that customers will repurchase in the future, which can ensure a steady stream of future revenue. The more loyal customers become, the longer that they are likely to continue to purchase from a firm (Anderson et al., 1994). Second, existing customers are likely to purchase frequently and in greater volume, and purchase other products and services offered by the same firm (Reichheld and Sasser, 1990). Firms that have high customer retention, which means low turnover of their existing customer base, do not need to spend as much to acquire new customers in each period of time (Anderson et al., 1994). Moreover, the costs to retain customers are about 80% lower than the costs to acquire new customers (Sirohi et al., 1998). Firms therefore can improve revenues by lowering costs from acquiring new customers (Fornell, 1992). Third, favorable word-of-mouth from customers to others increase the likelihood of future transactions and even a price premium (Kumar et al., 2003; Leung et al., 2011). Fourth, loyal customers are less sensitive to the price of products as they are more tolerant of price increases and are willing to pay premium for the benefits that they receive. Firms can improve profitability by marking up their products (Reichheld and Sasser, 1990). Fifth, the serving of customers who are familiar with the service system of a firm can save precious resources expended on handling and addressing returns, reworks, warranties and complaints, thus lowering operating costs and improving productivity (Anderson et al., 1997). Thus,

Hypothesis 5: Customer satisfaction of GS implementation of a firm is positively related to customer loyalty to the firm.

Hypothesis 6: Customer loyalty to a firm is positively related to the revenue growth of the firm.

CHAPTER 4 RESEARCH METHODOLOGY

4.1 Research design of the study

Grounded in the NRBV, this study conceptualizes GS from the supply chain perspective and develops a three-dimensional measurement model for GS in the consumer-product context. A multi-method research design that combines interviews, content analysis, and a mass survey is used to collect primary and secondary data to empirically validate the measurement scales of GS and performance outcomes, and test the hypothesis developed in this study. In contrast to mixed methods research, which integrates quantitative and qualitative research during the course of a single study for the purpose of obtaining a fuller picture and deeper understanding of a phenomenon, a multi-method research design conducts quantitative and qualitative research in parallel or sequence, but these are not integrated until inferences are made for the purpose of triangulation to ensure that the explained variance is the result of the underlying phenomenon or trait and not of the method (e.g., quantitative or qualitative) (Hammond, 2005; Johnson et al., 2007). In this study, qualitative exploratory research is first carried out, then qualitative content analysis, and finally quantitative survey research. Qualitative research was conducted in the earlier part of this study which generated an appropriate and comprehensive measurement to facilitate the quantitative survey research (Leahey, 2007).

Qualitative exploratory research is useful for gathering preliminary information that will help one to gain familiarity with a phenomenon or acquire new insights in order to formulate a more precise problem or develop a hypothesis (Kotler and Armstrong, 2010). In this study, it is used to collect primary data from managers of 8 consumer-product firms through semi-structured interviews to identify organizational practices that constitute GS. The interview results are compared with organizational practices of GS identified from the environmental management, operations management, and service operations literature to confirm the practices of GS for conceptualization of GS practices.

Qualitative content analysis is a useful method to collect large quantities of GS activity data at a low cost from accessible textual documents and communication materials (Boyer and Swink, 2008; Tangpong, 2011). In this thesis, it is used to collect and analyze secondary data from 30 corporate reports of consumer-product firms that are listed on Fortune 100 and Global Environmental Management Initiative to identify real-life GS activities under the conceptualization of GS practices for development of a GS measurement scale. Secondary data help to eliminate concerns, such as key informant bias and common method bias, which could affect the survey research component of this study (Gattiker and Parente, 2007; Roth, 2007).

While qualitative content analysis is questioned for its validity as the information collected from public sources might be carefully vetted to put firms in the best possible light for organizational reputation and image purposes (Tangpong, 2011), this threat to validity can be reduced through triangulation by conducting quantitative survey research (Jick, 1979; Bryman, 2006). Therefore, in this study, a large-scale quantitative survey has been conducted to collect primary data from 183 consumer-product firms to statistically validate the measurement scale of GS, as well as testing the hypotheses. The use of more than one method as part of the validation process is useful to ensure that the explained variance is the result of the underlying phenomenon or trait of GS and not the quantitative or qualitative method. Specifically, the convergence of findings, which stem from qualitative content analysis and quantitative survey research, reinforces the validity of the results and does not discount them as a methodological artifact (Johnson et al., 2007). While large-scale quantitative research provides a structural understanding of GS, qualitative research offers interpretive resonating of GS practices (Singhal and Singhal, 2012a; 2012b). In addition, the use of primary and secondary data is useful to improve study rigor by allowing triangulations and overcoming bias issues that may be incurred with the use of a single research method (Jick, 1979; Leahey, 2007; Boyer and Swink, 2008).

4.2 Research phases and methodological steps in multi-method research

By following the guidelines established by Campbell and Fiske (1959), Churchill (1976), and Nunnally (1984), and the scale development procedures suggested by Froehle and Roth (2004) and Menor and Roth (2007), four research phases and some methodological steps were utilized to collect the primary and secondary data to develop the measurement scale of constructs, and test the relationships between GS implementation and organizational performance outcomes. Table 4.1 summarizes the research phases and methodological steps involved in the multi-method research. Specifically, the details of the scale development and validation, and examination of the relationships between GS implementation and performance outcomes in the four research phases are presented in Appendix I. Chapters 5 – 7 will provide discussions on the data collection and analysis of the qualitative interviews, qualitative content analysis, and quantitative survey research of this study.

Table 4.1 Research phases and methodological steps involved in multi-method research (Continued on next two pages)	
Research phase 1: Conceptualization of GS practices	**Step 1– Literature review** ▪ The scope of GS and practices that constitute GS are defined based on the NRBV, for subsequent categorization of the activities in phase 2 of the research ▪ Environmental management, operations management, and service operations literature are reviewed to identify key organizational practices of GS **Step 2 – Exploratory research** ▪ Exploratory qualitative interviews with 8 practitioners are conducted to identify the practices of GS ▪ The practices of GS are identified by counting the pieces of evidence with common themes (e.g., pollution prevention-related GS practices, product-related GS practices, and long-term development related GS practices). ▪ The case evidence is compared with insights from environmental management, operations management, and service operations literature on various organizational practices of GS to confirm and conceptualize GS practices
Research phase 2: Measurement scales and items development	**Step 3 – Development of measurement scale and items of GS** ▪ Qualitative content analysis is carried out to collect secondary data for development of a GS measurement scale 1. 30 consumer-product firms are sampled based on sample selection criteria 2. Statements are extracted which describe environmental management activities from corporate reports 3. Coding categories are developed which are mutually exclusive based on the conceptualization of GS practices 4. Initial coding rules are developed to classify and assign each statement to its appropriate content category based on activities described in the statement 5. Initial coding rules are tested with a small sample of the statements extracted from the corporate reports by conducting inter-coder reliability testing to ensure the coding rules are complete and applicable 6. Initial coding rules are revised based on insights gained from the testing of the initial coding rules, and the coding rules are finalized 7. The finalized coding rules are applied to classify statements into content categories by two independent coders 8. Coding reliability is assessed by examining inter-coder reliability through the percentage of agreement between the coders, Cohen's kappa, and Krippendorff's alpha 9. GS activities that complement their respective GS practices are compared with GS activities identified in the literature to develop a GS measurement scale **Step 4 – Development of measurement scales and items of organizational performance outcomes** ▪ Measurement scales and items from environmental management and operations management, and marketing literature are adopted to measure environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty

Table 4.1 Research phases and methodological steps involved in multi-method research (Continued from previous page)

<table>
<tr><td>Research phase 3:</td><td>Measurement scales and items refinement</td><td>Step 5 – Pretesting of measurement scales and items
▪ Pre-testing is conducted to improve readability and clarity of the questions, and wording and seminal meaning of individual measurement items
1. Experts from the academia and the practitioners in the consumer-product industry are invited to review the measurement scales and items
2. Qualitative feedback on the measurement scales and items is solicited and collected
3. Items are rephrased, if needed, based on feedback

Step 6 – Pilot-testing of measurement scales and items
▪ Pilot-testing is conducted to ensure that the measurement scales are applicable to real life situations
1. Measurement scales are administered to executives in the field of environmental management and consumer-product trading in a pilot test
2. Reliability estimation by using Cronbach's alpha and corrected item-to-total correlation (CITC) are assessed to purify the measurement scales for each construct
3. Measurement items are discarded for content validity, if needed, based on the Cronbach's alpha coefficient of the constructs and results of CITC analysis
4. Measurement scales and items are finalized and applied to mass survey research</td></tr>
</table>

Table 4.1 Research phases and methodological steps involved in multi-method research (continued from previous page)	
Research phase 4:	**Step 7 – Quantitative research to collect primary data** ▪ Mass survey is carried out to collect primary data for validation of measurement scales and testing of hypotheses 1. A sample of 1000 consumer-product firms is randomly drawn from the database of *Dun & Bradstreet* 2. Survey package, which includes an invitation letter, questionnaire and a self-addressed pre-paid envelope, is sent out to solicit participation 3. Follow-up telephone calls are made to seek acknowledgement of package receipt ▪ Bias issues are addressed 1. Extrapolation method is used and t-test testing is conducted to test for potential non-response bias 2. Harman's one-factor, chi-square difference, and t-test testing are carried out, within-group interrater reliability is assessed, and the marker variable technique is used to test for potential common method variance **Step 8 – Analysis of measurement model** ▪ Confirmatory factor analysis is conducted 1. Unidimensionality of the measurement scales is tested 2. Goodness-of-fit of the factor structure is evaluated 3. Reliability of the measurement scales is tested 4. Convergent validity of the measurement scales is tested 5. Discriminant validity of the measurement scales is tested **Step 9 – Testing structure of GS constructs** ▪ Goodness-of-fit indices are used to evaluate the model fit of the first-order, second-order, and third-order models ▪ Target coefficient *T* is computed to examine the extent to which the second-order constructs account for the variance of the first-order constructs, and the extent to which the third-order construct accounts for the variance amongst the second-order constructs ▪ The significance of the path coefficients between the measurement items and their respective constructs is assessed **Step 10 – Testing of structural equation model and hypotheses** ▪ Multiple of goodness-of-fit indices are used to evaluate structural model ▪ Path significance between GS and its performance outcomes is assessed **Step 11 – Post hoc testing: Testing of mediation** ▪ Causal step approach is used to test for the existence of mediation effects 1. A mediation effect of customer satisfaction on the relationship between GS implementation and customer loyalty is tested 2. A mediation effect of customer loyalty on the relationship between customer satisfaction and revenue growth is tested

CHAPTER 5 DATA COLLECTION I: DESIGN AND FINDINGS OF QUALITATIVE EXPLORATORY RESEARCH

Exploratory qualitative research was conducted to collect primary data from managers of consumer-product firms through semi-structured interviews. The purpose of this phase of the study is to identify the organizational practices that constitute GS. The interview results were compared with those in the environmental management, operations management, and service operations literature on the organizational practices of GS to confirm GS practices for conceptualization of GS practices.

5.1 Exploratory research sample and data collection

Grounded theory (Glaser and Strauss, 1967) was followed, and exploratory qualitative research was carried out to identify organizational practices that constitute GS. The managers of consumer-product firms in Hong Kong were chosen as the sample of the exploratory research for two reasons. First, Hong Kong is a service-based economy. Consumer-product firms in Hong Kong inevitably provide services in addition to products as a means to differentiate themselves from their competitors and satisfy customer needs. Second, consumer-products firms in Hong Kong are required to practice environmental management to comply with environmental regulations. The sample was not constrained to a specific type of consumer-product firms to avoid homogeneity of the data so as to improve the generalizability of the findings. Managers of consumer-product firms were chosen as the respondents because of their knowledge on the organizational practices involved in GS provision. The exploratory research involved a convenience sample of managers of consumer-product firms. Eight managers of consumer-product firms were invited for interviews.

Case study protocol and interview guide for data collection per Yin (2009) were used to ensure the quality of the exploratory interviews. In total, eight interviews were conducted in English and on site, which lasted between one and two hours. Detailed notes were taken for all interviews during the interviewing processes. After each interview, a field report was drafted based on the notes for data analysis, and was sent to the corresponding interviewee for his/her review and comments. Field reports of interviews in exploratory qualitative research were presented in Appendix. The interviews did not lead to a systematic selection bias because they were distributed randomly across the data sets.

The key interview questions were as follows: (1) What are the practices involved in GS provision? (2) Why are these GS practices conducted? (3) What organizational infrastructures are important for supporting GS provision? The initial interviews were kept broad in scope in an effort to expose a wide range of motivations and guiding themes (i.e., PP-GS practices, P-GS practices, and LTD-GS practices). Each interview was commenced by asking what practices the firm had implemented with respect to the environmental protection. Then, the respondents were asked to trace the history of each initiative he or she mentioned and tell the motivation of the implementation of each initiative. To build internal validity, inconsistencies were probed further. Respondents were asked about other key aspects of firm’s environmental management strategy and operations. As the research project progressed and the theory was refined, interview questions became more focus to ascribe more detail on the emerging patterns (e.g., P-GS practices, P-GS practices, and LTD-GS practices). After answering the key interview questions, respondents were asked to comment directly on specific aspects of the GS practices they have implemented. Specific aspect of the GS practices was probed depended on the circumstances of each respondent. For example, if, according to respondent, it appeared that the implementation of PP-GS practices of his/her firms was motivated by legitimation, respondent was asked if legitimation, ecological responsibility, or competitiveness best described the firm's motivations to implement PP-GS practices. Moreover, the respondents were asked to comment on the relevance of the contextual variables. These data provided greater face validity to the emerging model. As such questions were asked in the latter part of the interviews, the integrity of the core data was preserved.

5.2 Exploratory research data analysis and findings

In the analysis of the interview data, the practices of GS were identified by counting the pieces of evidence that have common themes. GS practices identified in the exploratory research results were summarized in Table 5.1. From the interview results, three GS practices were identified. The GS practices identified from the exploratory research of this study were summarized in Table 5.2 – Table 5.4.

Table 5.1 GS practices identified in the exploratory research results (Continued on next three pages)

	Exploratory research results (Number of counts from interviews)
Pollution prevention-oriented GS practices	
• Use of energy-saving technologies in servicing locations	8
• Use of water-saving technologies in servicing locations	4
• Design of service delivery processes with maximized efficiency	3
• Application of sustainable design features in servicing locations	3
• Reusing, recycling, reducing of resources used in servicing locations	5
• Provision of maintenance service for equipment to prolong the usable life of equipment used in servicing locations	0
• Installation of waste treatment system to reduce waste in our servicing locations	0
• Use of renewable energy to support store operations	2
• Optimization of shipping routes	7
• Maximized use of transportation capacity	4
• Deployment of transportation vehicles with advanced technologies or designs	5
• Use of low-emission transportation modes	3
• Reusing, recycling, and reducing resources used in distribution	6
• Use of alternative fuels in transportation	0
• Implementing activities that raise customer awareness on environmental issues	5

Table 5.1 GS practices identified in the exploratory research results (Continued from previous page)	
	Exploratory research results (Number of counts from interviews)
Pollution prevention-oriented GS practices	
• Educating customers on environmental protection and sustainable consumption practices	4
• Motivating customers to engage in environmental protection programs	3
• Reusing, recycling, and reducing resources used in promotion activities	0
Product-oriented GS practices	
• Following corporate environmentally responsible guidelines in sourcing	2
• Making purchase decisions based on the total cost of purchasing, use, and waste management	2
• Sourcing products from environmentally responsible suppliers	3
• Collaboration with suppliers to minimize environmental impacts	5
• Collaboration with customers to improve environmentally responsible purchasing criteria	3
• Designing manufacturing processes with minimum environmental impacts	3
• Designing products and packaging with minimum environmental impacts	6
• Evaluation of environmental performance of products	3
• Provision of maintenance services to prolong usable life of products	1
• Collection of end-of-life products	6
• Recycling of end-of-life products	7
Long-term development-oriented GS practices	
• Implementation of information systems to monitor and manage environmental management practices and performances	7
• Reporting and sharing up-to-date information about environmental management practices and performances with stakeholders	4
• Use of environmentally friendly media to share environmental information with stakeholders	1
• Provision of training programs to educate employees about environmental management practices	8

Table 5.1 GS practices identified in the exploratory research results (Continued from previous page)	
	Exploratory research results (Number of counts from interviews)
Long-term development-oriented GS practices	
• Establishment of measureable environmental performance targets for employees	6
• Evaluating the environmental performance of employees	3
• Motivating employees to participate in environmental management practices	2
• Development of a green team committee that comprises employees who represent each department to implement environmental management initiatives	2
• Creation of an environmental-program manager position to implement and monitor environmental management initiatives and performance	1
• Creation of a recycling department	0
• Formulation of corporate environmental policies to comply with environmental regulations	5
• Formulation of corporate environmental policies that are beyond compliance	6
• Regular reviews and modifications of corporate environmental policies	1

All eight managers expressed their predominant concern about the pollution induced by their operations. They expressed the need to redesign service delivery processes (e.g., streamlining operations and consolidating space and facilities), adopting environmentally friendly tools (e.g., energy-efficient light bulbs and motion sensors), and incorporating sustainable design features (e.g., renewable building materials) in their servicing locations (e.g., stores) to improve efficiency and reduce waste and resource consumption. The managers also indicated that the adoption of environmentally responsible logistics practices (e.g., maximizing supply capacity, optimizing shipping routes, and using modes of transport with low emissions) is essential to reducing shipping costs and carbon footprints. They also suggested that investment in promoting and educating consumers about environmental issues (e.g., launching environmental education programs and environmental conservation activities) also play a significant role in contributing to their pollution prevention efforts. These practices of GS provision are related to the "pollution prevention-oriented GS practices" which aim to reduce waste, emissions and effluents in the internal operations of firms. In other words, pollution prevention-oriented GS practices are concerned with the minimizing of waste, effluents and pollution in operations. Pollution prevention-oriented GS practices are related to: (i) the design of service delivery processes, application of environmentally responsible tools and facilities, and application of sustainable design features in servicing locations (e.g., stores and customer service centers) to provide eco-friendly servicing environments to facilitate interaction with customers, (ii) the adoption of environmental protection acts in logistics services to make products available to consumers when they need them with minimum environmental impacts, and (iii) the use of promotion activities to provide platforms and information that enable consumers to participate into firm's environmental initiatives.

Table 5.2 Results of exploratory research: Pollution-prevention oriented GS practices (Continued on next four pages)	
Approach	**Example of GS practices**
Use of energy-saving technologies in servicing locations	• The application of energy-efficient lighting systems in our stores, as another example, enables us to use 25 percent less energy than fluorescent lights each year (Firm A). • Energy-saving technologies, such as advanced control of air compressors, and high-efficiency lights, and variable-drive electric motors, have been installed in our servicing locations to conserve energy (Firm B). • Our energy management program, which includes the installation of solar water heating systems, also helps to reduce energy consumption by 4.4 percent each year (Firm C). • These projects also include the installation of more efficient lighting and smart system controls, and ventilation, air conditioning and heat recovery improvements in our stores. We introduced a retrofit solution for existing stores that converts three-bulb or four-bulb fixtures into two-bulb fixtures in 2010 to conserve energy (Firm D). • Our stores are using LED lighting, energy-efficiency cold chests, and motion sensors in many of our service departments to reduce energy consumption. These sensors turn lights on when a customer approaches an aisle, while shutting them off when the aisle is empty (Firm E). • Eliminating waste, conserving energy, water and other natural resources, and driving operating efficiencies have reduced our operation costs and improved our bottom line (Firm F). • We have upgraded to energy-efficient lighting and more efficient heating and cooling systems in our stores. For example, LED systems that use less power than conventional lighting systems have been installed in our stores (Firm G). • We are also taking steps to reduce our impact by enhancing our energy-efficiency store design, using new lighting technologies, and experimenting with renewable energy (Firm H).
Use of water-saving technologies in servicing locations	• We seek opportunities to reduce resource consumption, improve the efficiency of our store operations, and conserve natural resources by using energy and water wisely (Firm B). • We also have initiatives to ensure sustainable water use in our operations. This commitment includes water reduction goals and the use of water-efficient technologies (Firm E). • Eliminating waste, conserving energy, water and other natural resources, and driving operating efficiencies have reduced our operation costs and improved our bottom line (Firm F). • We have upgraded to specialized water systems, improved our cleaning processes, used steam in place of water, and improved controls on building process equipment to reduce water consumption (Firm G).
Design of service delivery processes with maximized efficiency	• We seek opportunities to reduce resource consumption, improve the efficiency of our store operations, and conserve natural resources by using energy and water wisely (Firm B). • We strive to deliver products and services efficiently, while minimizing our environmental footprint (Firm E). • We are now striving to design our facilities and conduct our store operations to avoid adverse impacts to human health and operate in an environmentally sound, reliable, and efficient manner by streamlining operations, consolidating space and facilities, and installing solar water heating systems in our stores (Firm F).

Table 5.2 Results of exploratory research: Pollution-prevention oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Application of sustainable design features in servicing locations	• In servicing locations, we have included sustainable design features, such as the use of renewable building materials and natural light, and energy-efficient lighting systems, to create a comfortable and productive workplace for employees and improve the appearance our facilities while reducing operation costs. For example, harvesting natural light through a pattern of skylights in our stores enables us to provide light from outside to enhance the shopping experience of our customers while reducing the energy consumption in our stores. (Firm A) • We have incorporated green design features and installed solar water heating systems in our servicing locations (Firm C). • We believe that our approach to energy management through energy efficiency and efficient green store designs has built a strong and sustainable approach in using energy in an economical and environmentally conscious manner (Firm D).
Reusing, recycling, and reducing of resources used in servicing locations	• We seek opportunities to reduce resource consumption, improve the efficiency of our store operations, and conserve natural resources by using energy and water wisely (Firm B). • Eliminating waste, conserving energy, water and other natural resources, and driving operating efficiencies have reduced our operation costs and improved our bottom line (Firm F). • We go green by addressing energy and water conservation, resource conservation, sustainable food and product choices, and recycling and reducing waste (Firm G). • We are shifting from plastic packaging to paper, or packaging that contains recycled content or has been certified according to a sustainable forest management standard in order to reduce waste (Firm H).
Use of renewable energy to support store operations	• Our energy management program, which includes the installation of solar water heating systems, also helps to reduce energy consumption by 4.4 percent each year (Firm C). • We are now striving to design our facilities and conduct our store operations to avoid adverse impacts to human health and operate in an environmentally sound, reliable, and efficient manner by streamlining operations, consolidating space and facilities, and installing solar water heating systems in our stores (Firm F).
Motivating customers to engage in environmental protection programs	• We have different projects and marketing activities to inspire behaviors of environmental citizenship and stewardship (Firm F). • We include in each of our weekly circulars, products that are better for the environment, which help us to remind our customers that they can make sustainable purchasing decisions in daily life (Firm G) • We provided our customers with an incentive to use renewable bags with a 5-cent discount for each bag used during purchase, which helps to defer the equivalent of 1 million plastic bags to landfills (Firm H).

Table 5.2 Results of exploratory research: Pollution-prevention oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Optimization ofshipping routes	• We minimized the environmental impact caused by these vehicles by optimizing our logistics systems and using low emission transportation modes, such as rail and ship transport (Firm A). • We seek ways to plan routes more efficiently, create multi-commodity deliveries, and eliminate multi-stops to reduce emissions. For example, a logistics optimization program is implemented to more seamlessly manage the movement of our raw and packed materials, as well as finished products, through the supply chain (Firm B). • In our logistics operations, we have improved the fuel efficiency of product transport and reduced emissions by moving shipping containers from manufacturing plants by trucks, and then transferring to more efficient and cost effective rail or barge transport for longer distances, and finally shifting back to trucks for the final delivery (Firm C). • We also aim to reduce the number of empty miles driven each year through a combination of network reengineering and increasing backhauls and fronthauls. For example, we load trailers that are travelling back to our distribution centers with salvaged store returns and products to reduce empty miles (Firm D). • We are working to reduce greenhouse gases and other emissions from our facilities and vehicles by developing cleaner and more energy-efficient product distribution processes, improving the efficiency of our packaging and transportation logistics, and applying cleaner and more fuel-efficient vehicles for product distribution (Firm E). • We have optimized our efficiency in the logistics stage of the supply chain by making changes to rates, routes, modes and methods of transport. Specifically, we have implemented network enhancements, used modes of transport with low emissions, and optimized routes to reduce greenhouse gas emissions from product transport (Firm F). • We continue to reduce our carbon footprint of transporting products to our stores and customers. We achieve this by determining the best delivery routes for our products, improving the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries, using lower emission vehicles, and employing alternative modes of transport such as by rail or ship (Firm H).
Maximized use of transportation capacity	• We have also reduced the number of vehicles required to ship our products by eliminating the use of pallets and loading to fill all of the available space during our trailer loading processes to load more cartons onto a trailer (Firm A). • We have also introduced innovative materials that reduce our footprint and greenhouse gas emissions by reducing the size of the packaging, allowing more shipping with fewer materials and smaller boxes (Firm F). • In logistics operations, we have worked with logistics service providers to ensure that trucks are at maximum load capacity to reduce the number of trucks and fuel consumption (Firm G). • We improve the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries (Firm H).

Table 5.2 Results of exploratory research: Pollution-prevention oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Deployment of transportation vehicles with advanced technologies or designs	• We minimized the environmental impact caused by these vehicles by optimizing our logistics systems and using low emission transportation modes, such as rail and ship transport (Firm A). • We believe that advanced biofuels combined with several promising vehicles, combustion engines, and power-train technologies, including hybridization, offer the quickest and most effective pathway to a secure, low-carbon future. Therefore, we are now piloting electric-diesel hybrid trucks in our fleets to assess the economic impact and potential emissions reductions (Firm D). • We are working to reduce greenhouse gases and other emissions from our facilities and vehicles by developing cleaner and more energy-efficient product distribution processes, improving the efficiency of our packaging and transportation logistics, and applying cleaner and more fuel-efficient vehicles for product distribution (Firm E). • We continue to reduce our carbon footprint of transporting products to our stores and customers. We achieve this by determining the best delivery routes for our products, improving the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries, using lower emission vehicles, and employing alternative modes of transport such as by rail or ship (Firm H).
Use of low-emission transportation modes	• We minimized the environmental impact caused by these vehicles by optimizing our logistics systems and using low emission transportation modes, such as rail and ship transport (Firm A). • The use of low-emission transportation modes, such as rail transport, enables our firm to reduce greenhouse gas emissions and costs from improvements in fuel efficiency (Firm C). • We have optimized our efficiency in the logistics stage of the supply chain by making changes to rates, routes, modes and methods of transport. Specifically, we have implemented network enhancements, used modes of transport with low emissions, and optimized routes to reduce greenhouse gas emissions from product transport (Firm F). • We continue to reduce our carbon footprint of transporting products to our stores and customers. We achieve this by determining the best delivery routes for our products, improving the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries, using lower emission vehicles, and employing alternative modes of transport such as by rail or ship (Firm H).
Educating customers on environmental protection and sustainable consumption practices	• We have promoted environmental responsibility by educating consumers on ways to save water and energy at home (Firm B) • We seek innovative ways to reduce water use by our consumers as well as educate them about the opportunities to save water (Firm E). • We educate communities on environmental issues, and provide environmental education programs for teachers and students that develop critical thinking skills and improve environmental literacy (Firm F). • We have consumer education programs to educate consumers on how they can make informed environmental choices, and activities to promote sustainable consumption (Firm G).

Table 5.2 Results of exploratory research: Pollution-prevention oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Reusing, recycling, and reducing resources used in distribution	• We have also reduced the number of vehicles required to ship our products by eliminating the use of pallets and loading to fill all of the available space during our trailer loading processes to load more cartons onto a trailer (Firm A). • Our packaging programs also help to reduce transportation-related emissions by reducing the volume and weight of our product shipments through innovative packaging design. Our packaging engineers design solutions that minimize packaging waste by keep packaging to a minimum, while continuing to provide protection to the product being shipped to our stores (Firm D). • We are working to reduce greenhouse gases and other emissions from our facilities and vehicles by developing cleaner and more energy-efficient product distribution processes, improving the efficiency of our packaging and transportation logistics, and applying cleaner and more fuel-efficient vehicles for product distribution (Firm E). • Where possible, we source products from local suppliers to reduce impacts on the environment by reducing transportation and minimizing handling (Firm F). • We have also reduced the environmental impacts of our packaging through redesign, reuse, increased recyclability and use of recycled content, and increasing the use of cube utilization. These enable us to reduce the energy used in processing packaging materials, costs and emissions from transport, and storage and disposal space requirements (Firm G). • We continue to reduce our carbon footprint of transporting products to our stores and customers. We achieve this by determining the best delivery routes for our products, improving the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries, using lower emission vehicles, and employing alternative modes of transport such as by rail or ship (Firm H).
Implementing activities that raise customer awareness on environmental issues	• We have also put efforts into spreading awareness of climate change among our customers and the public, and helping local communities to achieve sustainable development through various promotion activities, such as hands-on environmental seminars and product exchange events (Firm A). • We have launched exhibitions and seminars to raise the awareness of water-related issues with our consumers with the aim of sustainability in the use of water (Firm B). • We have different programs to raise customer awareness of the importance of reducing plastic shopping bag consumption to reduce waste in our operations (Firm C). • These projects include the promotion of a wide range of environmental conservation activities, such as desertification prevention, reforestation, and protection of rare species (Firm D). • We have consumer education programs to educate consumers on how they can make informed environmental choices, and activities to promote sustainable consumption (Firm G).

All eight managers indicated that their stakeholders, such as regulatory bodies and customers, are sensitive to the potential environmental issues of their supply chain. The stakeholders will hold them responsible for neglecting the environmental impacts of their supply chain for any environmental damages caused by their supply chain partners. Thus, the managers suggested the importance of establishing environmental guidelines in sourcing, supplier selection, and production processes to ensure that products or materials sourced have minimal environmental impacts. The managers also mentioned that the adoption of eco-design activities, such as the incorporation of cradle-to-grave consideration and life-cycle assessment into the early stages of product design are important to design and the development of environmentally responsible products. The provision of after-sale services, such as product maintenance, take-back, and recycling, are also critical to prolonging product life-cycle, and reducing product disposal and waste. These practices of GS provision are termed “product-oriented GS practices” that aim to reduce the environmental impacts of products from their production, usage, to disposal. In other words, product-oriented GS practices focus on coordinating with supply chain partners to manage life-cycle costs of products from development, use, to the disposal stages. Product-oriented GS practices are related to: (i) the adoption of environmentally responsible procurement practices to ensure materials and products sourced for consumers have minimum environmental impacts, (ii) the adoption of eco-design activities to provide customers with environmentally responsible products, and (iii) the provision of after-sale services, such as product maintenance, take-back, and recycling, to assist customers to maintain their products and take-back their end-of-life products for recycling.

Table 5.3 Results of exploratory research: Product-oriented GS practices (Continued on next two pages)	
Approach	**Example of GS practices**
Following corporate environmentally responsible guidelines in sourcing	• As part of our sustainable materials strategy, we have incorporated sustainable materials where they meet performance requirements into our global materials specifications. For example, recycled material specifications were included into the same document that houses our virgin material specifications (Firm A). • We have environmental guidelines to procure raw materials and products to reduce environmental impacts, while maintaining continuity of supply and managing costs (Firm C).
Making purchase decisions based on the total cost of purchasing, use, and waste management	• More than 30 green criteria are incorporated into our purchasing guidelines, which provide our procurement department with a framework to evaluate the sustainability initiatives of suppliers (Firm C). • We are shifting from plastic packaging to paper, or packaging that contains recycled content or has been certified according to a sustainable forest management standard in order to reduce waste (Firm H).
Sourcing products from environmentally responsible suppliers	• We have also established an evaluation process for suppliers who make environmental marketing claims on product labels (Firm B). • One of our ultimate goals is to procure all raw materials and products from sustainable sources (Firm F).
Collaboration with suppliers to minimize environmental impacts	• We are actively working with our suppliers to bring more energy-efficient products into the market, and helping customers to save energy and money (Firm A). • We work with our suppliers to shift more than 90 percent of our lauan wood to wood certified by the Forest-Stewardship Council or other sustainable sources for producing wood products (Firm B). • We are also working with suppliers to reuse recycled and recyclable materials and promote reuse and recycling (Firm D). • We have implemented a number of sustainable purchasing initiatives, such as the establishment of clear environmental expectations for our suppliers to catalyze improved environmental performance. Full materials declarations are used to improve our eco-design processes by enabling us to select substances and components that have lower impacts on the environment or are easier to recycle (Firm F). • We work with our suppliers to develop new and greener alterative materials that will make our products more environmentally friendly, and promote the use of environmentally friendly manufacturing and cleaning practices that help to reduce the impacts of our operations on the environment (Firm H).
Collaboration with customers to improve environmentally responsible purchasing criteria	• In addition, we listened to our customers and developed innovative products for energy-efficiency (Firm A). • We consult with customers to make sure that our products are developed in line with their usage, and to deepen our understanding on the different ways of using products which can affect people and the environment (Firm B). • Before establishing a project for a new eco-product or improving a product's environmental performance, we research consumer needs in depth to identify and understand the needs that are not adequately met today (Firm H).

Table 5.3 Results of exploratory research: Product-oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Designing manufacturing processes with minimum environmental impacts	• We are increasingly integrating sustainability considerations into our product development, from product planning throughout the product life-cycle (Firm E). • The life-cycle assessment analyses used to improve our product designs and processes are helpful to improving the material yield and lowering the energy and water use over time in our manufacturing processes (Firm G). • We work with our suppliers to develop new and greener alterative materials that will make our products more environmentally friendly, and promote the use of environmentally friendly manufacturing and cleaning practices that help to reduce the impacts of our operations on the environment (Firm H).
Designing products and packaging with minimum environmental impacts	• We innovate our products and packaging to enable more efficient consumer product use and resource consumption (Firm B). • The products included in our catalog are able to help customers to reduce their environmental footprint, reduce waste via reuse, recyclability and compostability, and reduce their energy use (Firm C). • We are increasingly integrating sustainability considerations into our product development, from product planning throughout the product life-cycle. We avoid hazardous substances whenever possible, minimize resource use, and enhance opportunities for product recovery, reuse, and recycling when appropriate (Firm E). • We have also introduced innovative materials that reduce our footprint and greenhouse gas emissions by reducing the size of the packaging, allowing more shipping with fewer materials and smaller boxes (Firm F). • We also have material specifications for recycled content textiles and are working on specifications for renewable materials. These specifications make it easier for our designers to choose sustainable material options (Firm G). • We are dedicated to helping consumers to reduce their environmental footprint by designing eco-products that genuinely meet their needs relative to value and performance, and in addition, allow them to conserve resources (Firm H).
Evaluation of environmental performance of products	• We have also made significant investments in developing products with minimum environmental impacts. Our product development teams work to improve the environmental performance of our products by using life-cycle management. Attributes across the product's entire lifecycle, from raw materials, manufacturing, product design, customer use, to disposal, will be considered (Firm C) • Our research and product development operations work with environmental specialists to ensure that new products meet robust environmental design principles, comply with environmental regulations, and satisfy customer requirements (Firm E). • We use life-cycle assessment to evaluate hundreds of material and process flows, across life-cycle stages from material extraction, manufacturing, and transport to product use, and end-of-life management (Firm G).
Provision of maintenance services to prolong usable life of products	• We provide product repair, refurbishment and recycling services to extend the life-cycle of our products, and reduce the environmental impacts associated with product disposal and new product production (Firm A).

Table 5.3 Results of exploratory research: Product-oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Collection of end-of-life products	• We hope to make it easy for our customers to recycle end-of-life products in our community. Therefore, we often offer rechargeable battery, cardboard, and compact fluorescent lamp recycling events at our stores (Firm B). • When our customers return products that contain batteries to us, we send the batteries to a recycler whenever feasible or provide services for environmentally responsible disposal (Firm C). • Product packaging materials received through our recycling program are broken down for recycling (Firm D). • We have recycling stations in all of our stores for consumers to join in on our product end-of-life management (Firm E). • We have take-back programs to provide channels for obsolete apparel products and hangers to be reused and recycled. Consumers can return obsolete apparel products and hangers to us in our stores for recycling. We also collect plastic bags and recycle them into other products such as plastic landscape bricks, plastic lumber and other plastic bags (Firm G). • We also help consumers to reduce their environmental footprint by offering a wide variety of return, reuse, and recycling programs, which ensure that consumers can easily and responsibly return their end-of-life products to usefulness (Firm H).
Recycling of end-of-life products	• All of our end-of-life products are refurbished, broken down and recycled, and marketed for reuse to reduce waste (Firm B). • When our customers return products that contain batteries to us, we send the batteries to a recycler whenever feasible or provide services for environmentally responsible disposal (Firm C). • Product packaging recycling programs are also offered to our customers (Firm D). • We look for opportunities to partner with recycling firms to test the economic and logistical feasibilities of more efficient management of waste generated from our products (Firm E). • We continue to increase the number of partnerships with customers in which we recover and recycle packaging, and reduce landfill waste generated from our operations (Firm F). • We continue to promote recycling as a preferred alternative to disposal (Firm G). • We have recycled over 5 million pounds of aluminum, refurbished and recycled another 4 million pounds of product components, and reused more than 10,000 pieces of packaging since 2006 (Firm H).

In addition, all eight managers emphasized the importance of having corporate policies and infrastructural support to minimize the environmental burden of organizational growth and development. For example, the use of information systems is useful to track and communicate environmental performances across business functions and supply chain partners. The cultivation of corporate culture through human resource management (e.g., offering employees education and training programs on environmental issues and appraisal of individual environmental performance) can also facilitate organizational sustainable development, which is very important for the success of the environmentally responsible operations of firms. The managers also indicated that corporate environmental policies are critical to guiding and directing long-term environmental development, which ensure that different business functions work toward the same environmental goals. These practices of GS provision are called “long-term development-oriented GS practices” which aim to reduce the environmental burden of organizational growth and development. In other words, long-term development oriented GS practices is concerned with the long-term development of environmental management by providing infrastructures to support and direct environmental protection efforts. Long-term development oriented GS practices are related to: (i) the application of information systems to track and share information related to environmental management practices and performances, and provide web-based support services to customers, (ii) the provision of training, performance targets, and compensation packages that involve and motivate the active participation of employees in environmental protection, GS delivery, and assisting customers to meet their needs of environmental protection, and (iii) the development of corporate environmental policies to guide organizational development as well as environmental protection in response to the demand for environmental protection by consumers.

Table 5.4 Results of exploratory research: Long-term development-oriented GS practices (Continued on next three pages)	
Approach	**Example of GS practices**
Implementation of information systems to monitor and manage environmental management practices and performances	• Information systems used to track the progress of environmental protection practices are important for our senior management team in reviewing corporate environmental protection performance, approving corporate environmental policies, and reviewing the effectiveness of our environmental protection initiatives and results (Firm A) • Database, metrics, and key performance indicators are important to us in auditing and monitoring the progress and performance of our environmental protection initiatives (Firm B). • We have implemented a product stewardship software application to manage environmental and other information related to new and existing products. This includes information about product material content, which enables us to evaluate compliance to environmental regulations (Firm C). • Information technology is important for us to track and expand our efficiency projects with the goals of energy consumption and greenhouse gas emissions reductions (Firm D). • As we commit to continuous improvement in environment, information systems are important to us to measure progress and communicate results. Our trained auditors utilize information systems and databases to track our environmental performance progress and assess our environmental performance to ensure that we comply with environmental regulations and conduct operations responsibly (Firm F). • Information systems are important for managers to conduct routine environmental performance assessments to identify resource saving opportunities and track environmental protection progress quarterly against the firm's sustainability goals (Firm G). • Information technology is important for us to track our performance against our corporate environmental goals, and report to the public on our progress, whether negative or positive (Firm H).
Reporting and sharing up-to-date information about environmental management practices and performances with stakeholders	• This system is interfaced with our information systems of our suppliers, which allows us to better understand, manage, and optimize product environmental performances and meet customer needs (Firm C). • Information systems are also important for us to communicate our goals of environmental sustainability and share information about the sustainability programs of the firm with our employees (Firm E). • As we commit to continuous improvement in environment, information systems are important to us to measure progress and communicate results (Firm F). • Information technology is important for us to track our performance against our corporate environmental goals, and report to the public on our progress, whether negative or positive (Firm H).
Use of environmentally friendly media to share environmental information with stakeholders	• Information technology also enables us to work closely with suppliers to assess and audit their programs and performance of environmental sustainability without business travel, which is time consuming and incurs consumption of fuel and resources (Firm H).

Table 5.4 Results of exploratory research: Long-term development-oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Provision of training programs to educate employees about environmental management practices	• We believe that progress with the environmental protection activities of the company is only possible if all of the employees contribute to the effort. This is why we organize training programs, which focus on the practical application of environmental protection activities at the company and address questions that concern environmental responsibility, for all levels of employees, from front line to management (Firm A). • We provide employees with various workshops and training, including ISO14001, workplace standards, and training on our corporate vision and values (Firm B). • Training is provided to help our employees understand their responsibilities in environmental protection, and the resources available to them for implementing environmental protection initiatives (Firm C). • Employee education therefore is important for us to raise awareness of our sustainability commitment and expectations of employees. Employee education is also important for us to reinforce the concept of environmental sustainability (Firm D). • To achieve the goal of environmental sustainability, managers and employees need to understand what both the law and the company require of them, as well as have the knowledge and tools to succeed (Firm E). • We offer more than 100 online-learning programs that cover topics such as environmentally responsible products and services, eco-labeling and environmental protection initiatives, to our employees (Firm F). • Employees are required to complete at least 20 hours of annual environmental protection training (Firm G). • We train our employees accordingly to enhance understanding of environmental issues, policies, and eco-products offered in our stores (Firm H).
Establishment of measureable environmental performance targets for employees	• Every individual employee is obligated to ensure that his or her daily behavior on the job complies with the corporate environmental standards (Firm A). • We also produce and distribute leaflets and banners to educate employees on the corporate environmental sustainability goals and the importance of recycling, generate excitement, and explain the recycling program of our firm (Firm B). • Target-setting, data collection, training, employee appraisals and surveys are important to ensure that our firm lives up to our guiding principles of environmental protection (Firm C). • Our competency standard for employees with environmental responsibilities outlines the competencies needed at our operations. Relevant and measurable sustainability goals are also included in all business plans and communicated to employees (Firm E). • Across businesses, teams have embraced the targets and integrated sustainability into their daily work (Firm F). • Information systems are important for managers to conduct routine environmental performance assessments to identify resource saving opportunities and track environmental protection progress quarterly against the firm's sustainability goals (Firm G).

Table 5.4 Results of exploratory research: Long-term development-oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Evaluating the environmental performance of employees	• Database, metrics, and key performance indicators are important to us in auditing and monitoring the progress and performance of our environmental protection initiatives (Firm B). • Target-setting, data collection, training, employee appraisals and surveys are important to ensure that our firm lives up to our guiding principles of environmental protection (Firm C). • The manager of each division is responsible for ensuring that employees have sufficient training and resources to carry out their environmental responsibilities and achieve specific sustainability goals (Firm G).
Motivating employees to participate in environmental management practices	• We have also cultivated a culture that promotes employee pride and well-being, fosters integrity, and supports social and environmental responsibility (Firm A). • The provision of incentives to engage all employees in our sustainability initiatives is useful to carrying out our corporate environmental policies. We have a variety of monetary and non-monetary awards to show appreciation for exceptional sustainable contributions to our firm (Firm F).
Development of a green team committee that comprises employees who represent each department to implement environmental management initiatives	• We also foster and encourage passionate employees to create "Green Teams", and integrate sustainability into their work and their workplace (Firm C). • The manager of each division is responsible for ensuring that employees have sufficient training and resources to carry out their environmental responsibilities and achieve specific sustainability goals (Firm G).
Creation of an environmental-program manager position to implement and monitor environmental management initiatives and performance	• The leaders are responsible for ensuring that environmental management practices are aligned with operational systems and function to achieve compliance and company expectations (Firm H).

Table 5.4 Results of exploratory research: Long-term development-oriented GS practices (Continued from previous page)	
Approach	**Example of GS practices**
Formulation of corporate environmental policies to comply with environmental regulations	• We also believe that corporate environmental policies are important to reinforcing our commitment to environmental protection, and providing us with a standardized and streamlined approach to maintain compliance with all environmental regulations (Firm A). • Environmental policies are also developed that require all employees to comply with environmental laws, corporate environmental standards, and other corporate commitments related to environmental protection (Firm B). • Our research and product development operations work with environmental specialists to ensure that new products meet robust environmental design principles, comply with environmental regulations, and satisfy customer requirements (Firm E). • Our trained auditors utilize information systems and databases to track our environmental performance progress and assess our environmental performance to ensure that we comply with environmental regulations and conduct operations responsibly (Firm F). • Corporate environmental policies are also important to us to ensure that our programs and procedures comply with environmental laws (Firm G).
Formulation of corporate environmental policies that are beyond compliance	• Environmental policies are also developed that require all employees to comply with environmental laws, corporate environmental standards, and other corporate commitments related to environmental protection (Firm B). • Moreover, corporate environmental policies are also important in supporting our GS provision. The environmental policies in our warehouses encourage employees to use zero-emission material handling equipment, and reuse, reduce, and recycle material handling equipment or resources whenever possible (Firm C). • Corporate policy is important for us to appropriately respond to our environmental responsibilities and the public interest in the conduct of our business, including activities related to the improvement of the environment and community relations (Firm D). • Consumers are increasingly seeking out products with a positive environmental benefit, or avoiding those perceived as having a negative impact on the natural environment. One of our ultimate goals is to procure all raw materials and products from sustainable sources (Firm F). • Corporate environmental policies are also important to provide direction to our long-term environmental sustainability programs (Firm G). • Being good stewards of the environment include setting environment standards. Therefore, we have set standards for waste management, minimization, and decommissioning, and periodically review and revise our standards (Firm H).
Regular reviews and modifications of corporate environmental policies	• Being good stewards of the environment include setting environment standards. Therefore, we have set standards for waste management, minimization, and decommissioning, and periodically review and revise our standards (Firm H).

In order to confirm and conceptualize the GS practices, the case evidence was compared with insights from the environmental management (Meijkamp, 1998; Schrader, 1999; Bartolomeo et al., 2003), operations management (Foster Jr et al., 2000; Kassinis and Soteriou, 2003), service operations (Enz and Siguaw, 1999; Goodman, 2000; Álvarez Gil et al., 2001; Wolfson et al., 2010; Wong et al., 2013) literature on various organizational practices of GS. Table 5.5 showed the comparison of GS practices identified in the literature and exploratory research of this study. Only the GS practices that were identified in both the literature and exploratory research of this study were confirmed and used for conceptualization of GS practices in this study. In line with the theorization in this study, the interview results suggested that GS is multi-dimensional, which consists of pollution prevention-, product-, and long-term development oriented-GS practices. Chapter 3 of this study provided a detailed discussion on the attributes of pollution prevention-, product-, and long-term development oriented-GS practices.

Table 5.5 Comparison of the GS practices identified in the literature and exploratory research **(Continued on next page)**

	Literature	Exploratory research results
Pollution prevention-oriented GS practices		
• Use of energy-saving technologies in servicing locations	✓	✓
• Use of water-saving technologies in servicing locations	✓	✓
• Design of service delivery processes with maximized efficiency	✓	✓
• Application of sustainable design features in servicing locations	✓	✓
• Reusing, recycling, reducing of resources used in servicing locations	✓	✓
• Provision of maintenance service for equipment to prolong the usable life of equipment used in servicing locations	✓	×
• Installation of waste treatment system to reduce waste in our servicing locations	✓	×
• Use of renewable energy to support store operations	✓	✓
• Optimization ofshipping routes	✓	✓
• Maximized use of transportation capacity	✓	✓
• Deployment of transportation vehicles with advanced technologies or designs	✓	✓
• Use of low-emission transportation modes	✓	✓
• Reusing, recycling, and reducing resources used in distribution	✓	✓
• Use of alternative fuels in transportation	✓	×
• Implementing activities that raise customer awareness on environmental issues	✓	✓
• Educating customers on environmental protection and sustainable consumption practices	✓	✓
• Motivating customers to engage in environmental protection programs	✓	✓
• Reusing,recycling, and reducing resources used in promotion activities	✓	×
Product-oriented GS practices		
• Following corporate environmentally responsible guidelines in sourcing	✓	✓
• Making purchase decisions based on the total cost of purchasing, use, and waste management	✓	✓
• Sourcing products from environmentally responsible suppliers	✓	✓
• Collaboration with suppliers to minimize environmental impacts	✓	
• Collaboration with customers to improve environmentally responsible purchasing criteria	✓	✓
• Designing manufacturing processes with minimum environmental impacts	✓	✓
• Designing products and packaging with minimum environmental impacts	✓	✓
• Evaluation of environmental performance of products	✓	✓
• Provision of maintenance services to prolong usable life of products	✓	✓

✓: Practice that has been identified in the literature or exploratory research; ×: Practice that has not been identified in the literature or exploratory research

Table 5.5 Comparison between the GS practices identified in the literature and exploratory research (Continued from previous page)		
	Literature	**Exploratory research results**
Product-oriented GS practices		
• Collection of end-of-life products	✓	✓
• Recycling of end-of-life products	✓	✓
Long-term development-oriented GS practices		
• Implementation of information systems to monitor and manage environmental management practices and performances	✓	✓
• Reporting and sharing up-to-date information about environmental management practices and performances with stakeholders	✓	✓
• Use of environmentally friendly media to share environmental information with stakeholders	✓	✓
• Provision oftraining programs to educate employees about environmental management practices	✓	✓
• Establishment of measureable environmental performance targets for employees	✓	✓
• Evaluating the environmental performance of employees	✓	✓
• Motivating employees to participate in environmental management practices	✓	✓
• Development of a green team committee that comprises employees who represent each department to implement environmental management initiatives	✓	✓
• Creation of an environmental-program manager position to implement and monitor environmental management initiatives and performance	✓	✓
• Creation of a recycling department	✓	×
• Formulation of corporate environmental policies to comply with environmental regulations	✓	✓
• Formulation of corporate environmental policies that are beyond compliance	✓	✓
• Regular reviews and modifications of corporate environmental policies	✓	✓
✓: Practice that has been identified in the literature or exploratory research; ×: Practice that has not been identified in the literature or exploratory research		

CHAPTER 6 DATA COLLECTION II: DESIGN AND FINDINGS OF QUALITATIVE CONTENT ANALYSIS RESEARCH

A qualitative content analysis was conducted to collect and analyze secondary data from the corporate reports of 30 consumer-product companies listed on Fortune 100 and Global Environmental Management Initiative (GEMI) to identify real-life GS activities under the conceptualization of GS practices. GS activities that complement their respective GS practices were identified to develop GS measurements.

6.1 Secondary data collection

Content analysis was applied in the collection of secondary data on the activities of PP-GS, P-GS, and LTD-GS practices that are being implemented by consumer-product firms. Content analysis is a methodological technique that allows the systematic evaluation of qualitative content in all textual documents and communication materials, such as the news, annual reports, and so forth. It typically uses pre-established procedures and coding schemes to systematically categorize the contents of textual documents and communication materials (Weber, 1990; Montabon et al., 2003; Krippendorff, 2004a; Tangpong, 2011). As content analysis is a systematic and replicable technique for compressing a large amount of content into fewer categories based on the explicit rules of coding, it enables the filtering of large amounts of qualitative data in a systematic manner (Montabon et al., 2007).

A content analysis on corporate reports is carried out in this study as a means of secondary data collection for three reasons. First, a large amount of rich qualitative data on GS activities was embedded in the corporate reports, especially in the corporate social responsibility (CSR) reports (Duriau et al., 2007; Montabon et al., 2007). The CSR reports fairly reflect what upper management believes are the important environmental issues to stakeholders (Wilmshust and Frost, 2000). As demonstrated by Rondinelli and Berry (2000), the use of content analysis on the CSR reports of 38 multinational corporations enabled them to investigate environmental citizenship programs and their key success factors. Moreover, it is also economical in terms of time and cost in the collecting of data on GS activities for scale development (Babbie, 1995; Tangpong, 2011). A considerable amount of data on real-life GS activities can be inexpensively collected in a much shorter amount of time in comparison to other direct research methods, such as the use of surveys and case studies, or field interviews (Krippendorff, 2004a), and thus this advantage is taken into consideration while engaging in extensive data collection. Second, content analysis allows the studying of GS activities that are being implemented by consumer-product firms by systematically analyzing the contents of their corporate reports from a distance and in an unobtrusive manner (Krippendorff, 2004a; Wolf et al., 1993). With its unobtrusive nature, content analysis has minimal influence on the behaviors and responses of subjects who are being studied (Babbie, 1995; Krippendorff, 2004a). As such, content analysis is less susceptible than other direct observation methods to various data-contaminating errors that stem from the awareness of the subjects on being studied, their preferences in giving certain responses over others, and the influence of the researchers and data collection process on their responses (Tangpong, 2011). Third, content analysis not only can be used as a stand-alone method in a research study, but also used in parallel with other research methods, such as the use of surveys, case studies, and other secondary research methodologies (Tangpong, 2011).This multi-method research design approach reduces biases induced by other research methods (Boyer and Swink, 2008; Singhal and Singhal, 2012a).

Although the application of content analysis as a means of gathering data in operations management is quite rare (Montabon et al., 2007), it has been established as a rigorous methodological tool in other business disciplines. For example, researchers performed a computerized content analysis on speeches by President George W. Bush to investigate leadership (Blight et al., 2004). Prior studies used content analysis to examine beliefs and attitudes towards information technology (Bhattacherjee and Premkumar, 2004), and to investigate the leadership of self-managed teams (Druskat and Wheeler, 2003). Many accounting studies have also conducted content analysis on annual reports (e.g., Zeghal and Ahmed, 1990; Hackston and Milne, 1996). In addition, Gray et al. (1995) created a database that captured corporate social and environmental data over many years based on the content analysis of corporate reports. Montabon et al. (2007) performed content analysis to gather data about environmental management practices and used canonical correlation to explore the relationship between environmental management practices and performance measures. In contrast to Montabon et al., (2007), this study uses content analysis in parallel with a mass survey to establish the constructs of GS from both theoretical and practical perspectives, and empirically examine the relationships between GS implementation and organizational performance outcomes.

In this study, the qualitative data sources and textual documents used in the content analysis are corporate reports, including CSR and annual reports, as they contain the information needed (Montabon et al., 2007). Specifically, the CSR reports are widely used by our sample firms to report their environmental performance (Jones and Walton, 1999). Most of our sample firms report their environmental performance by following the voluntary guidelines of the Global Reporting Initiatives (GRI) (Global Reporting Initiative, 2004), which is one of the most popular reporting standards of CSR reporting (Adams, 2004). Annual reports, which do not have specific reporting requirements (Wilmshurst and Frost, 2000), are also used by some of the sample firms to communicate their environmental management practices and performances with stakeholders. Thus, both CSR and annual reports are used in this study to identify GS activities for developing GS measurements.

Online corporate reports in the fiscal year of 2010 were collected as they were available during the qualitative data collection period of this study (i.e., March – June 2012).

6.2 Sampling and sample characteristics

To gain an understanding of the real-life GS activities for developing GS measurements, 30 consumer-product firms were selected out of the 200 firms listed on the Fortune 100 and GEMI based on the sample selection criteria in the content analysis phase of this study. Although some of the consumer-product firms listed on the Fortune 100 and GEMI (e.g., BP PLC and 3M Company) have manufacturing operations or business customers, they have retail stores or have used brick-and-mortar approach to market and deliver their product and service offerings to individual customers. For instance, BP PLC not only focus on researching, sourcing, and drilling oil and gas, but also provides individual customers with fuel for transportation and energy for heart and light in its 17,800 retail sites (BP p.l.c. (2014). In other words, consumer-product firms in qualitative content analysis research is referred to retail firms that are business-to-customer oriented and offer product and service offerings to individual customer, from different sectors (e.g., apparel, accessories and grocery).

GEMI is an organization of companies committed to fostering global environmental, health, and safety (EHS) excellence through the sharing of tools and information to help business achieve EHS excellence. Firms that are listed on Fortune 100 are multinational corporations (MNCs) or large firms, which have support from stakeholders and slack resources to consider and implement more activities of PP-, P-, and LTD- oriented GS practices (Melynk et al., 2003; Simpson et al., 2004). MNCs and large firms also receive a significant amount of attention from the general public, which gives them pressure to implement sophisticated environmental management practices to be environmentally responsible (Stanwick and Stanwick, 1998). Many of sample firms in qualitative content analysis research are probably regional MNC units that produce the same corporate green talk as their parent firms, and their CSR and annual reports may be carefully vetted to put themselves in the best possible light for corporate reputation and image purposes (Tangpong, 2011). While content analysis of CSR and annual reports of the firms that seem sophisticated environmentally in qualitative research will be questioned for its validity (Tangpong, 2011), this study reduced such threat to validity by using quantitative survey research to collect primary data for triangulation (Jick, 1979; Bryman, 2006), which was discussed in Chapter 7 of this study.

The sample selection was guided by four criteria. First, the firms had to offer both services and products to end consumers in their stores. Second, the firms had to have experience with GS provision, which ensures that they have knowledge of the practices and activities of GS implementation. Third, the firms had to provide a variety of environmentally friendly products and services, which increase the likelihood that they are involved in different practices and activities of GS implementation, thus providing sufficient information to this study and allowing the capturing of a wide range of real-life GS activities. Fourth, the corporate reports, including the CSR and annual reports, of the firms had to be publicly available for content analysis.

Follow Montabon et al. (2007), consumer-product firms from different sectors were used in qualitative content analysis to construct a sample of consumer-product firms that would be diverse enough to capture a wide range of activities of PP-GS, P-GS, and LTD-GS practices for the development of GS measurement scale. Prior studies have made an attempt to identify the various ways in which the consumer-product firms in different sectors to deliver customer services with reduced environmental impacts or embrace a green orientation. For example, Grove et al. (1996) provided examples on how the consumer-product firms in different sectors reduce, recycle and reuse resources of service provision in an effort to become environmentally committed. For instance, consumer-product firms in financial sector (e.g., retail bank) reduce resources by reducing the size of patrons' monthly bank statement to save paper, recycle resources by collecting paper (e.g., computer print-outs) used in daily operations, and reuse resources by using pens and printer cartridges that are refillable rather than disposable in their service provision. Unlike the firms in financial sector, consumer-product firms in travel and tourism sector (e.g., hotel) reduce resources by closing off floor or wiring during slow period to control necessity of heating or cooling, recycle resources by collecting cans or bottles from restaurant and guest service operations, and reuse resources by reclaiming used water for ground-keeping purposes. Likewise, Foster Jr et al. (2000) undertook a series of case studies in consumer-product firms, including ski resorts, restaurants, and hospitals, to identify the environmental actions taken by consumer-product firms. Foster Jr et al. (2000) indicated that the environmental management practices taken by such consumer-product firms as ski resorts, restaurants, and hospitals vary enormously. For examples, ski areas pursue certain actions in favor of maintaining the physical appearance (beauty) of the facilities to avoid disposal of facilitates, whereas restaurants and hospitals maintain cleanliness as a means of protecting facilities. Restaurants install grease traps as a measure to save pipes from degradation, whereas hospitals install energy-saving lighting to illuminate operations areas.

There are few reasons of why the GS activities of consumer-product firms in different sectors are implemented vary enormously. First, GS is the provision of customer service that take into account environmental sustainability (Foster et al., 2000; Wolfson et al., 2010; Wong et al., 2013). The customer service offerings provided by consumer-product firms are very diverse and vary across sectors (Grove et al., 1996; Hoffman et al., 2002). It is therefore the GS activities differ substantially among consumer-product firms in different sectors. Second, the GS practices are often tailored to firm's strategic context (Wong et al., 2013), which vary across firms (Roth and Menor, 2003). Third, we agree with the reviewer that consumer-product firms in different sectors have various stakeholder expectations to meet (Montabon et al., 2007). Therefore, consumer-product firms in different sectors adopt different environmental management practices to respond to various stakeholder expectations (Rondinelli and Vastag, 1996; Rondinelli and Berry, 2000). In particular, customer is the single most important determinant in environmental management practices (Foster Jr et al., 2000). Consumer-product firms in different sectors may encompass different sets of GS activities to meet various customer demands (Foster Jr et al., 2000; Roth and Menor, 2003). For example, consumer-product firms in travel and tourism sector (e.g., ski resorts) eliminate paper backings to ski passes and use other environmental practices area, whereas firms in health care sector (e.g., hospitals) eliminate hazardous and infectious wastes due to the customer demand (Foster Jr et al., 2000). Legislation is another important driver of corporate ecological response (Bansal and Roth, 2000; Perez-Sanchez et al., 2003). Consumer-product firms in different sectors implement particular environmental management practice to comply with the requirements of environmental regulation imposed in particular sector by the government. For example, consumer-product firms in travel and tourism sector (e.g., ski resorts) relocate a wetland and prevent erosion in new parking lot construction, whereas consumer-product firms in food sector (e.g., restaurants) trap and keep grease out of sewer to comply with the environmental regulations imposed in the tourism and food sectors by the government. Therefore, the GS practices of consumer-product firms in different sectors are very diverse and vary enormously (Grove et al., 1996; Roth and Menor, 2003). Prior studies have examined and indicated the motivations of environmental actions taken by consumer-product firms in different sectors (e.g., Grove et al., 1996; Foster Jr et al., 2000).

Although the activities of GS practices, which were identified to develop GS measurement items, vary across sectors, four steps were taken by this study to ensure the validity and reliability of GS measurement scale in consumer-product industry. First, follow Tangpong's (2011) approach, content categories and coding rules were developed based on the definition and conceptualization of GS to identify the activities of PP-GS, P-GS, and LTD-GS practices from environmental management practices implemented by consumer-product firms in different sectors. The development of content categories and coding rules based on the definition and conceptualization of GS can tap into the important attributes of activities of GS practices, thus establishing face and content validity of the content analysis-based measurement of GS (Tangpong, 2011). Second, the results of content analysis research were compared with those in the literature on the activities of GS practices to confirm the activities that complement their respective GS practices (e.g., PP-GS, P-GS, and LTD-GS practices). Therefore, measurement items of each GS practice construct were supported by the literature (Menor and Roth, 2007). Third, pretesting and pilot-testing of GS measurement scale and items was conducted to obtain response from independent panels of informed judges to purify GS measurement items of each GS practice, which can establish tentative measurement item reliability and validity (Menor and Roth, 2007). Fourth, this study applied confirmatory factor analysis on primary data collected from key informants in mass survey research of this study to further demonstrate and validate the properties of the GS measurement items and scale. The second step, third step and fourth step were discussed in Chapter 7 of this study.

The sample size (n=30) of the content analysis in this study is consistent with prior studies that have a similar nature and research method (e.g., Rondinelli and Berry, 2000; Montabon et al., 2007). Table 6.1 summarizes the profiles of the case companies in the content analysis. The sample firms represent more than US$2.86 trillion in worldwide annual sales and employ more than 7.17 billion people. The sample firms range in size from those with about US$6.6 billion to more than US$368 billion in sales, and from 14,250 to over 2,100,000 employees.

Table 6.1 Profile of the respondents in content analysis (Continued on next page)			
Consumer-product firm	**Business segment**	**Annual retail sales (billion US$)**	**Number of employees**
3M Company	Health care, electronics, office, and household products	26.7	80,000
Baxter International Inc.	Medical products	13.1	47,600
BP PLC	Fuels and lubricants	297.1	79,700
Bristol-Myers Squibb Company	Pharmaceuticals and nutrition products	19.5	53,000
Hewlett-Packard Development Company	Laptops, printers, tablets, accessories, ink toner, and paper	126	325,000
Daimler AG Company	Vehicles (e.g., Mercedes-Benz Cars, Daimler Trucks, Mercedes-Benz Vans, and Daimler Buses)	97.8	260,100
Dell Inc.	Laptops, printers, tablets, accessories, ink toner, and paper	61.5	43,000
Dow Chemical Company	Technology-based products and solutions (e.g., personal care products, coating materials, electrical, and telecommunications)	53.7	50,000
Eastman Kodak Company	Photography, printers, film, digital cameras, and imaging products	15	96,200
Electrolux Company	Household and professional appliances, white goods, and floor care products	109	51,000
Ford Motor Company	Automobiles, trucks, and financial services	21	16,400
General Motors Company	Vehicles and components (e.g., trucks and military vehicles)	135.5	202,000
Goodyear Tire and Rubber Company	Tires, industrial automobile products, and chemicals	18.8	95,472
Chevron Co.	Fuel, motor oils, and fuel addictives	198.1	58,267
Home Depot Inc.	Plumbing, electrical and kitchen, hardware and seasonal, building materials, lumber, paint, and flooring	68	>300,000

Table 6.1 Profile of the respondents in content analysis (Continued from previous page)			
Consumer-product firm	**Business segment**	**Annual retail sales (billion US$)**	**Number of employees**
International Business Machines Co.	Computers and software	99.9	426,751
Intel Co.	Microprocessors and micro-communication components	43.6	825,000
Johnson & Johnson Inc.	Health care products, pharmaceuticals, and nutritional	61.6	116,000
Kroger Co.	Grocery, national brand apparel, general merchandise, and jewelry	82.2	338,000
Motorola Mobility Inc.	Internet, wireless mobility, computing, and media	11.5	19,000
PepsiCo Inc.	Beverages, snack foods, and restaurants	60	285,000
Royal Phillips Company	Lighting, consumer electronics, and appliances	34	120,000
Procter & Gamble Company	Beauty, grooming, snacks, and health-, pet-, fabric-, home-, baby- and family-care products	78.9	103,000
Royal Dutch Shell PLC	Oil, natural gas, chemicals, coal, and forestry	368	97,000
Target Co.	Grocery, national brand apparel, general merchandise, food, and jewelry	67.4	355,000
Toyota Motor Co.	Passenger cars and trucks	203.7	317,716
Unilever Co.	Food, detergent, personal products, and specialty chemicals	59.4	>167,000
Wal-Mart Stores Inc.	Grocery and general merchandise	405	>2,100,000
Weyerhaeuser Company	Wood products, lumber for home, and paper	6.6	14,250
Xerox Co.	Information technologies and services for workplace	22	136,000

6.3 Data analysis in content analysis

This study follows the approach from Tangpong (2011), which echoes the content analysis protocol in Weber (1990) and survey scale-development processes of Hinkin (1998), to perform content analysis that will collect secondary data on GS activities for developing GS measurements. Table 6.2 summarizes the methodological steps of using a content analytic approach to collect data for developing GS measurements.

Table 6.2 Methodological steps of using content analytic approach to collect data for the development of GS measurements
Step 1: Recording unit determined
• Statements that describe environmental protection activities in corporate reports are used as the recording units
Step 2: Content categories for coding determined
• Nine content categories based on the definitions and conceptualizations of GS practices are developed
Step 3: Initial coding rules developed and tested
• Coding rules that are consistent with the descriptions of the content categories based on the definitions and conceptualizations of GS practices are developed • Initial coding rules are tested by using a sample of the recorded text to assess the completeness of the coding rules and the coding reliability • Two independent coders are invited to use the initial coding rules for coding a sample of 10 CSR reports and 10 annual reports • Percentage of agreement between the coding of the two coders, Cohen's kappa and Krippendorff's alpha is calculated to assess the initial inter-coder reliability • Coding rules are revised, if needed, based on the insights gained from the reliability testing efforts • The iteration of the revision process is continued until an adequate level of coding reliability is achieved • The coding rules are finalized and applied in full-scale content analysis
Step 4: All corporate reports coded
• Two independent coders are invited to use the finalized coding rules for coding all of the corporate reports
Step 5: Coding reliability assessed
• Percentage of agreement between the coding of the two coders, Cohen's kappa and Krippendorff's alpha is calculated to assess the initial inter-coder reliability
Step 6: Content analysis results used to develop measurement scale of GS
• The GS activities of PP-GS, P-GS, and LTD-GS practices, which are identified from content analysis of corporate reports, are used to develop GS measurements

6.3.1 Determining recording unit

The recording unit can be a word, phrase, sentence, paragraph, theme, or an entire document. The statements that describe environmental protection activities were used as the recording units. The statements that describe environmental protection activities are typically placed in the environmental sustainability section of the CSR report or social responsibility section of the annual report. These statements provide information about the extent to which a firm is implementing environmental protection activities. Although it makes the coding process more labor-intensive, the use of the statements as the recoding unit has the advantage of largely preserving the meaning of text which enables the strengthening of the semantic validity and achieving of credibility (Krippendorff, 2004a).

6.3.2 Determining content categories for coding

The content categories that pertain to GS were developed so that the corporate reports could be content-analyzed with each recorded text which was assigned into its appropriate content category. As suggested by Tangpong (2011), the content categories should be consistent with the definition of the variables of interest and reflect whether the variables are being examined as a multi-dimensional or a higher order single construct. Moreover, the content categories should be specific to increase the clarification of the subsequent coding schemes. Per Tangpong (2011), nine content categories were developed, which are mutually exclusive in conceptualization, based on the definitions and conceptualizations of GS practices. The nine coding categories include store related, logistics, promotion, procurement, product design and development, after-sale, information system related, human resource management, and corporate policy related activities.

6.3.3 Developing and testing initial coding rules

The coding rules provide coders with specific instructions for classifying each recorded text unit to the appropriate content category. Coding rules that were consistent with the descriptions of the content categories were developed based on the definitions and conceptualizations of GS practices, which can tap into the important attributes of GS (i.e., activities and practices of GS), thus establishing face and content validity of the content analysis-based measurement of GS (Tangpong, 2011).

It is important to ensure that the coding rules are clear to the coders in order to achieve reliability in coding (Tangpong, 2011). Specifically, the initial coding rules were tested by using the recorded text collected from 10 CSR reports and 10 annual reports to ensure that the coding rules are complete and applicable (Weber, 1990). Two independent coders were invited to follow the initial coding rules to assign recorded texts to the appropriate content categories based on the environmental protection activities described in the recorded texts. The initial inter-coder reliability was assessed by the percentage of coding agreement between the two coders (Harwood and Garry, 2003). The insights gained from these testing efforts were used as inputs in the revision of the coding rules to reduce the ambiguity in the coding process and enhance coding reliability (Weber, 1990). The percentage of agreement, which was calculated by dividing the total number of agreements by the total number of coding decisions, was found to be 83.34% with the use of the initial coding rules. The result is similar to those in prior operations management studies (e.g., Tangpong, 2011). In addition, Cohen's kappa and Krippendorff's alpha, which are chance-corrected agreement coefficients and rigorous indicators of inter-coder reliability (Harwood and Garry, 2003; Krippendorff, 2004b), were used to assess the inter-coder reliability. Cohen's kappa and Krippendorff's alpha were found to be 0.83 and 0.84, respectively, which are above the recommended threshold of 0.70 (Neuendorf, 2002). These results suggest that the initial coding rules are reliable, and the coding rules were finalized and used in the full-scale content analysis. Table 6.3 presents the finalized coding rules used for content analysis in this study.

Table 6.3 Coding rules for classifying recorded text unit to the appropriate content category in full-scale content analysis (Continued on next page)	
Rule	**Description**
1	The statement was assigned to the "store related activities" category if its content indicates that the firm (a) applies energy-efficiency equipment in servicing location(s) to reduce energy consumption; (b) applies water-efficient equipment in servicing location(s) to reduce water consumption; (c) designs or innovates service delivery processes with improved efficiency; (d) designs layouts of servicing location(s) with reduced waste and resources; (e) reduces, reuses or recycles resources used in servicing location(s); and (f) uses renewable energy to support store operations.
2	The statement was assigned to the "logistics activities" category if its content indicates that the firm (a) optimizes shipping routes or capacity; (b) uses standardized reusable containers; (c) adopts energy- or fuel-efficient transport; (d) adopts environmentally responsible logistics operations; and (e) reduces, reuses or recycles resources used in distribution.
3	The statement was assigned to the "promotion activities" category if its content indicates that the firm (a) implements activities that raise customer awareness on environmental issues; (b) educates customers on environmental protection and sustainable consumption practices; (c) provides incentives to encourage customers to participate in environmental protection or select environmentally responsible options.
4	The statement was assigned to the "procurement activities" category if its content indicates that the firm (a) develops environmental guidelines for sourcing, supplier selection, or production sourcing to ensure materials and products sourced have little environmental impacts; (b) makes purchase decisions based on the total cost of purchasing, use and waste management; (c) works with suppliers to minimize environmental impacts; and (d) works with customers to improve environmentally responsible criteria.

Table 6.3 Coding rules for classifying recorded text unit to the appropriate content category in full-scale content analysis (Continued from previous page)	
5	The statement was assigned to the "product design and development activities" category if its content indicates that the firm (a) designs manufacturing processes with minimum environmental impacts; (b) designs products and packaging with minimum environmental impacts; and (c) conducts life-cycle assessments to improve the environmental performance of products.
6	The statement was assigned to the "after-sale activities" category if its content indicates that the firm (a) repairs or refurbishes products to extend the usable life of products; (b) takes back end-of-life products from customers for recycling; and (c) recycles end-of-life products or products returned by customers.
7	The statement was assigned to the "information system related activities" category if its content indicated that the firm (a) uses information systems to track corporate environmental management practices; (b) uses information systems to share information related to corporate environmental performance across business functions and supply chain partners; and (c) uses information systems that can support the sustainable development of the organization.
8	The statement was assigned to the "human resource management activities" category if its content indicates that the firm (a) provides employees with training on corporate environmental management practices; (b) sets environmental performance targets for employees; (c) evaluates the environmental performance of employees; (d) provides incentives that motivate employees to participate in environmental protection, (e) develops a green team committee that comprises employees who represent each department to implement environmental management initiatives; and (f) creates an environmental-program manager position to implement and monitor environmental management initiatives and performance.
9	The statement was assigned to the "corporate policy related activities" category if its content indicates that the firm (a) sets corporate policies to direct the long-term environmental management development of the firm; (b) sets corporate environmental policies that meet or exceed the requirements of existing environmental regulations; and (c) regularly reviews and modifies corporate environmental policies.

6.3.4 Coding all corporate reports

A full-scale content analysis was conducted by two independent coders who were familiar with the finalized coding rules to reduce potential bias due to misunderstanding and to strengthen coding reliability (Harwood and Garry, 2003; Tangpong, 2011). The use of two independent coders in the full-scale content analysis increases the objectivity of the content analysis results when a high degree of agreement between the coders is achieved (Weber, 1990). The recorded text was assigned to the appropriate content category based on the environmental protection activities described in each recorded text.

6.3.5 Assessing for coding reliability

Similar to the testing of the initial coding rules, the percentage of agreement, Cohen's kappa, and Krippendorff's alpha were used to assess inter-coder reliability (Harwood and Garry, 2003; Krippendorff, 2004b; Tangpong, 2011). The results of the inter-coder reliability assessment had a 98.02% agreement, with an inter-coder reliability of 0.96 for Cohen's kappa and 0.93 for Krippendorff's alpha, thus indicating a sufficient level of coding reliability (Neuendorf, 2002).

6.4 Content analysis research findings

A total of 34 GS activities were identified from the qualitative content analysis for developing GS measurements. Real-life examples of 34 GS activities are highlighted below. Table 6.4 – 6.6 summarizes the case examples of GS practices and activities.

6.4.1 Activities of pollution prevention-oriented GS practices

A total of 13 activities that fall under PP-GS practices were identified from the content analysis. Specifically, the five store related activities of PP-GS practices include: (1) *use of energy-saving technologies in servicing locations,* such as low-wattage light bulbs, high-efficiency lighting systems, and photovoltaic cells made from silicon alloys to convert sunlight into heat energy and electricity. For example, low-wattage light bulbs were installed by 3M Company in its signage to reduce energy consumption in servicing locations, (2) *use of water-saving technologies in servicing locations,* such as dual-flush toilets, low-flow faucet aerators, and underground tanks that can collect and recycle rainwater for toilet flushing and irrigation. For example, dual-flush toilets that require less water for toilet flushing were installed by Target Co. to reduce water consumption in it stores, (3) *Design of service delivery processes with maximized efficiency* by consolidating facilities that have low utilization rates, simplifying organizational structure, or streamlining operation processes to eliminate redundancy. The International Business Machines Co. is an example of a corporation that consolidates facilities which have a low utilization rate to execute the workloads of store operations in less space with less energy, (4) *application of sustainable design features in servicing locations.* For example, white roof membranes and metal roofs that reflect sunlight to reduce energy otherwise used for cooling were installed by Wal-Mart Stores Inc. at its facilities to reduce energy consumption, and (5) *reusing,recycling, reducing of resources used in servicing locations.* Target Co., for example, reused and recycled ceiling titles, corrugated cardboard, and light bulbs to reduce solid waste generated from its store refurbishment.

The five logistics activities of PP-GS practices are: (1) the *optimization of shipping routes* to reduce fuel consumption and emissions. Daimler AG Company is an example of a firm that employs computer models to develop the best sequence of deliveries and pickups to reduce fuel consumption and emissions, (2) the *maximized use of transportation capacity* by consolidating multiple deliveries and increasing capacity utilization. Firms such as Wal-Mart Stores Inc. and Hewlett-Packard Development Company fully utilize their truckloads by loading returned products from customers or distribution centers in backhaul to avoid empty loads on the way back, (3) the *deployment of transportation vehicles with advanced environmental technologies or designs,* such as trucks that are powered by cleaner fuel, diesel-electricity hybrid trucks, and vehicles with low emissions. For example, Wal-Mart Stores Inc. uses trucks that are powered by alternative fuel to substitute for trucks that are powered by petroleum products to reduce the emission of toxic chemicals into the air, (4) the *use of low-emission transportation modes,* such as ocean shipping and rail transport. Unilever Co. is an example of a company that transports products by rail, which is the most efficient land transportation method, to relieve traffic congestion and reduce air and noise pollution in urban areas, and (5) the *reusing, recycling, and reducing of resources used in distribution.* Firms such as Home Depot Inc. and Target Co. recycle solid waste that results from logistics activities (e.g., corrugated cardboard) to reduce waste.

The three promotional activities of PP-GS practices are: (1) the *implementing activities that raise customer awareness on environmental issues.* Firms such as Xerox Co. and Goodyear Tire and Rubber Company launched forums and seminars to raise customer awareness of the importance of environmental protection and sustainable consumption practices, (2) the *educating customers on environmental protection and sustainable consumption practices.* These can be done by conducting sustainability education and community outreach. For example, Toyota Motor Co. built learning centers and created hands-on learning programs to educate customers about eco-driving practices to reduce fuel consumption and emissions, and (3) the *motivating customers to engage in environmental protection programs (e.g., take-back and recycling)* by offering various incentives, such as purchase discounts and free shopping bags. Kroger Co., as an example, encourages their customers to avoid the use of plastic shopping bags by offering purchase discounts to those who bring their own bags.

6.4.2 Activities of product-oriented GS practices

A total of 11 activities that fall under P-GS practices were identified from the content analysis. Specifically, the five procurement activities of P-GS practices are: (1) the *following of corporate environmentally responsible purchase guidelines in sourcing,* including sustainable procurement criteria and materials specifications. Firms such as Electrolux Company and the Royal Phillips Company have material specifications to avoid sourcing products that are contaminated with toxic carcinogenic substances or chemical substances (e.g., polyvinyl chloride) which may have adverse effects on human health or the environment, (2) the *making purchase decisions based on the total cost of purchasing, use, and waste management.* For example, Weyerhaeuser Company considered the availability of wood fibers for future generation, and the possibility of regeneration of timber in their harvest areas, (3) *the sourcing of products from environmentally responsible suppliers*. For example, Target Co. purchases frozen and fresh seafood products certified by the Marine Stewardship Council or the Best Aquaculture Practices of the Global Aquaculture Alliance, (4) the *collaboration with suppliers to minimize environmental impacts,* such as joint development of eco-products and implementation of environmental management initiatives. Motorola Mobility Inc., as an example, worked with its suppliers to formulate a new recyclable plastic phone case that uses 20 percent less energy and plastics for production than the traditional plastic phone case, and (5) the *collaboration with customers to improve environmentally responsible purchasing criteria*. Firms such as Procter & Gamble Company and Wal-Mart Stores Inc. conducted interviews with customers to gain insights on their needs and preferences on eco-products in order to continually improve their eco-products.

The three product design and development activities of P-GS practices are: (1) the *designing manufacturing processes with minimum environmental impacts* to ensure that production processes cause minimum environmental impacts. For example, Hewlett-Packard Development Company built facilities to retreat and recycle wastewater, thus saving 3.5 million gallons of fresh water in its refinery, (2) the *designing of products and packaging with minimum environmental impacts,* such as designing products with minimum hazardous substances and packaging materials required, and developing products that are recyclable. Firms such as Bristol-Myers Squibb Company and Dell Inc. eliminated the use of toxic substances that potentially have adverse environmental impacts (e.g., polyvinyl chloride) in their products and packaging materials, and (3) the *evaluation of the environmental performance of products* by employing tools such as life-cycle assessment (LCA) and electronic product environmental assessment to identify improvement opportunities throughout product life-cycles. PepsiCo Inc., as an example, employed an independent third-party company, i.e., Carbon Trust, to conduct life-cycle assessment reviews on their products to improve their environmental performance.

The three after-sale activities of P-GS practices are: (1) the *provision of maintenance services to prolong usable life of products,* such as refurbishing, repairing, and recovering services, to prolong the usable life of products. Home Depot Inc., as an example, provides repair services for any of their home products to prolong their usable life and reduce the environmental impacts caused by their disposal, (2) the *collection of end-of-life products* for recycling and capturing the residual values of products by installing collection bins in stores or public areas, providing free mail back services, and collaborating with logistics service providers to expand networks of end-of-life product take back. For example, Ford Motor Company works with a logistics service provider, namely Cartakeback.com Limited, and expanded its network to approximately 250 facilities in order to collect end-of-life vehicles for recycling, and (3) the *recycling of end-of-life products* for the same or different usages. Firms such as Toyota Motor Co. and Ford Motor Company developed automobile recycle technical centers to advance dismantling and recycling technologies particularly for recovering and recycling automobile components at the end of their life-cycle.

6.4.3 Activities of long-term development-oriented GS practices

A total of 10 activities that fall under LTD-GS practices were identified from the content analysis. The three information system related activities of LTD-GS practices are: (1) the *implementation of information systems to monitor and manage environmental management practices and performances*. For example, Royal Dutch Shell PLC worked with Hewlett-Packard Development Company to develop a wireless sensing system to collect and store marine seismic data that would increase the amount of oil extracted from the drilling of exploratory wells with reduced resource consumption and environmental impacts, (2) the *reporting and sharing of up-to-date information on environmental management practices and performances with stakeholders* by improving corporate websites and periodically publishing corporate sustainability reports. BP PLC, as an example, publishes up-to-date information about its environmental restoration efforts in the Gulf Coast of Mexico and shares best environmental practices with other firms in the deepwater drilling industry, and (3) the *use of environmentally friendly media to report and share environmental information.* Such may involve the sharing of information via email and corporate website. Firms such as Baxtar International Inc. and Eastman Kodak Company use the intranet to offer environmental education programs for employees to learn about different topics on environmental issues.

The four human resource management activities of LTD-GS practices are: (1) the *provision of training programs to educate employees about environmental practices* with the aim to raise environmental awareness and enhance employee competency to execute environmental management practices. For instance, Goodyear Tire and Rubber Company educate their drivers on eco-driving practices (e.g., avoiding idling time and driving at a constant speed), thus saving nearly four million gallons of diesel fuel each year, (2) the *establishment of measurable environmental performance targets for employees* to facilitate the implementation of environmental management practices in firms. For example, Ford Motor Company set a target for its product design teams to use at least 25% post-industrial or post-consumer recycled materials for vehicle seats to improve the environmental attributes of its vehicles, (3) *evaluating the environmental performance of employees* to reinforce the importance of environmental sustainable development. Baxtar International Inc., as an example, developed web-based learning tests to assess the individual competencies and performances of employees in critical areas of environmental management practices execution, and (4) *motivating employees to participate in environmental management practices* by offering incentives. For example, 3M Company motivates its employees to align with corporate environmental objectives by presenting awards to honor those who have contributed to improving environmental performance in the firm.

The three corporate policy related activities of LTD-GS practices are: (1) the *formulation of corporate environmental policies to comply with environmental regulations*. Firms such as Hewlett-Packard Development Company and Royal Dutch Shell PLC have corporate policies in place that stipulate the avoidance of the use of hazardous materials in their products, in accordance with the requirements of Registration, Evaluation, Authorization and Restriction of Chemicals, (2) the *formulation of corporate environmental policies that are beyond compliance*. For example, going beyond legislative requirements, firms such as International Business Machines Co. and Intel Co. have corporate policies to proactively prohibit and restrict the use of substances that potentially have adverse effects on human health or the environment in their production processes and products to satisfy the safety concerns of customers as well as employees, and (3) the *regular reviews and modifications of corporate environmental policies* in response to emerging environmental regulations and markets. General Motors Company, as an example, worked with government bodies and agencies to review and revise its corporate environmental policies to be more technically sound and financially responsible.

Table 6.4 Case examples of pollution prevention-oriented GS practices and activities (Continued on next two pages)		
Pollution prevention-oriented GS practices that focus on minimizing pollution in operations and enhancing operations efficiency		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Store related activities of PP-GS practices	Use of energy-saving technologies in servicing locations	• Low-wattage light bulbs (e.g., 3M Company; Wal-Mart Stores Inc.) • High-efficiency lighting systems (e.g., BP PLC; General Motors Company) • Photovoltaic cells made from silicon alloys to convert sunlight into heat and electricity (e.g., Goodyear Tire and Rubber Company; Chevron Co.)
	Use of water-saving technologies in servicing locations	• Dual-flush toilets that require less water to remove waste (e.g., Target Co.; Procter & Gamble Company) • Low-flow faucet aerators to reduce splashing (e.g., Electrolux Company; Wal-Mart Stores Inc.) • Underground tanks that can collect and recycle rainwater for toilet flushing and irrigation (e.g., General Motors Company; Ford Motor Company)
	Design of service delivery processes with maximized efficiency	• Consolidated facilities that have low utilization rates to execute workloads of firm's operations in less space with less energy (e.g., International Business Machines Co.; Dell Inc.) • Simplified organizational structure to improve operation process efficiency (e.g., BP PLC; Weyerhaeuser Company) • Streamlined approaches at various stages throughout operation processes (e.g., Electrolux Company; Xerox Co.)
	Application of sustainable design features in servicing locations	• White roof membranes and metal roofs that reflect sunlight to reduce energy otherwise needed for cooling at facilities to reduce energy consumption (e.g., Wal-Mart Stores Inc.; Target Co.) • Environmentally preferred building materials and fixtures (e.g., Kroger Co.; Ford Motor Company) • Low volatile organic compounds paints to reduce air pollution (e.g., Intel Co.; Chervon Co.)
	Reusing, recycling, and reducing of resources used in servicing locations	• Recycling of waste from construction activities, including ceiling titles, corrugated cardboard, light bulbs and obsolete computers (e.g., Target Co.; Unilever Co.) • Reducing of paper used in corporate reports (e.g., Bristol-Myers Squibb Company; Unilever Co.) • Reusing of treated wastewater for irrigation and applications (e.g., PepsiCo Inc.; General Motors Company)

Table 6.4 Case examples of pollution prevention-oriented GS practices and activities (Continued from previous page)		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Logistics activities of PP-GS practices	Optimization of shipping routes	• Employing computer model to develop the best sequence of deliveries and pickups to reduce fuel consumption and emissions (e.g., Target Co.; Daimler AG Company). • Reengineering of distribution networks for fewer and shorter trips (e.g., Wal-Mart Stores Inc.; Procter & Gamble Company) • Seeking closest vendor location to pick up freights destined for distribution centers (e.g., Weyerhaeuser Company; Royal Dutch Shell PLC)
	Maximized use of transportation capacity	• Loading trailers that are travelling back to the distribution centers with end-of-life products (e.g., Wal-Mart Stores Inc.; Hewlett-Packard Development Company) • Maximizing use of truck load capacity (e.g., 3M Company; Baxter International Inc.) • Consolidating multiple deliveries (e.g., Daimler AG Company; Unilever Co.)
	Deployment of transportation vehicles with environmental technologies or designs	• Using trucks that are powered by cleaner fuel to reduce emissions (e.g., Target Co.; Wal-Mart Stores Inc.) • Using diesel-electricity hybrid trucks that can reduce fuel consumption (e.g., Johnson & Johnson Inc.; BP PLC) • Using vehicles with low emissions (e.g., BP PLC; Unilever Co.)
	Use of low-emission transportation modes	• Transporting products by rail, which is the most efficient land transportation method (e.g., Target Co.; Unilever Co.) • Reducing air shipments to reduce emissions and fuel consumption (e.g., Dell Inc.; Bristol-Myers Squibb Company) • Employing third party logistics service providers who voluntarily improve fuel efficiency (e.g., Baxter International Inc.; Hewlett-Packard Development Company)
	Reusing, recycling, and reducing of resources used in distribution	• Recycling solid waste from logistics activities, including corrugated cardboard (e.g., Home Depot Inc.; Target Co.) • Reusing pallets used in materials handling processes (e.g., 3M Company; Daimler AG Company) • Reducing packaging materials by increasing the use of recyclable containers (e.g., Baxter International Inc.; Hewlett-Packard Development Company)

Table 6.4 Case examples of pollution prevention-oriented GS practices and activities (Continued from previous page)		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Promotion activities of PP-GS practices	Implementing activities that raise customer awareness on environmental issues	• Launching sustainability seminars for customers to increase their awareness of environmental issues (e.g., Goodyear Tire and Rubber Company; Xerox Co.) • Launching exhibitions to raise customer awareness of growing environmental problems and how customers can help to mitigate environmental damage (e.g., Electrolux Company; Eastman Kodak Company) • Engaging in climate change policy or social policy debates and seeking to spread awareness of climate change or social issues among the public (e.g., BP PLC; Bristol-Myers Squibb Company)
	Educating customers on environmental protection and sustainable consumption practices	• Building learning centers and creating hands-on learning programs for customers, students and teachers to develop critical thinking skills and improve environmental literacy (e.g., Weyerhaeuser Company; Toyota Motor Co.) • Creating educational materials that focus on in-home resource conservation to inspire behaviors of environmental citizenship and stewardship (e.g., Wal-Mart Stores Inc.; Procter & Gamble Company) • Raising funds to support educational institutions to create sustainability education programs (e.g., Toyota Motor Co.; Unilever Co.)
	Motivating customers to engage in environmental protection programs	• Offering purchase discounts to customers who bring their own shopping bags (e.g., Target Co.; Kroger Co.) • Offering customers with reward points that can be redeemed for entertainment discounts if they return end-of-life products for recycling (e.g., PepsiCo Inc.; Target Co.) • Providing customers with free reusable shopping bags to encourage them to reduce plastic shopping bag consumption (e.g., Wal-Mart Stores Inc.; Target Co.)

Table 6.5 Case examples of product-oriented GS practices and activities (Continued on next two pages)		
Product-oriented GS practices that focus on collaborating with supply chain partners to manage life-cycle cost of products		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Procurement activities of P-GS practices	Following corporate environmentally responsible purchase guidelines in sourcing	• Developing material specifications for procurement to avoid sourcing products contaminated with toxic carcinogenic or chemical substances (e.g., Electrolux Company; Royal Phillips Company) • Developing wood purchasing guidelines for responsibly sourcing wood fibers from forest areas (e.g., Weyerhaeuser Company; Home Depot Inc.) • Integrating environmentally friendly purchasing criteria into purchasing procedures to provide procurement department with a framework to evaluate the sustainability initiatives of suppliers (e.g., Baxter International Inc.; Motorola Mobility Inc.)
	Making purchase decisions based on the total cost of purchase, use, and waste management	• Embracing social and economic issues which must be considered in recognizing "endangered regions" of forests when sourcing wood (e.g., Home Depot Inc.; Weyerhaeuser Company) • Taking into account the availability of local recycled materials and whether recycled materials have significant energy demand in collection or recycling (e.g., Ford Motor Company; Toyota Motor Co.) • Procuring materials only if they help firms to reduce environmental impacts, while maintaining continuity of supply and managing costs (e.g., Baxter International Inc.; Dow Chemical Company)
	Sourcing products from environmentally responsible suppliers	• Purchasing materials or products from Forestry Stewardship Council and Marine Stewardship Council (e.g., Home Depot Inc.; Target Co.) • Working with suppliers who work in accordance with the provisions in the supplier sustainability declaration of the firm (e.g., Baxter International Inc.; Royal Phillips Company) • Seeking suppliers who can demonstrate a similar commitment to environmental protection through their practices, goal setting and positive impacts (e.g., International Business Machines Co.; Johnson & Johnson Inc.)

Table 6.5 Case examples of product-oriented GS practices and activities (Continued from previous page)

Services involved in GS practices	GS activities	Examples of GS activities (case examples)
Procurement activities of P-GS practices	Collaboration with suppliers to minimize environmental impacts	• Working with suppliers to develop products that are better for the environment and people's health (e.g., Motorola Mobility Inc.; Dell Inc.) • Assisting suppliers in implementing environmental management initiatives by sharing best practices, defining corrective actions, monitoring implementation, and organizing training sessions on environmental management (e.g., Baxter International Inc.; Hewlett-Packard Development Company) • Helping suppliers to improve the environmental performance of communities where firms operate and serve (e.g., Eastman Kodak Company; Weyerhaeuser Company)
	Collaboration with customers to improve environmentally responsible purchasing criteria	• Conducting interviews with customers to gain insights on their needs and preferences on eco-products (e.g., Procter & Gamble Company; Wal-Mart Stores Inc.) • Inviting customers to work with product development and procurement teams to improve environmental attributes of products (e.g., Xerox Co.; Toyota Motor Co.) • Conducting market surveys on expectations of customers on environmentally responsible products and services (e.g., Procter & Gamble Company; Hewlett-Packard Development Company)
Product design and development activities of P-GS practices	Designing manufacturing processes with minimum environmental impacts	• Building or redesigning facilities to improve energy- or water-efficiency in plants (e.g., Hewlett-Packard Development Company; Royal Phillips Company) • Adopting innovative manufacturing processes, such as water-saving machineries to conserve water (e.g., Ford Motor Company.; PepsiCo Inc.) • Modifying manufacturing processes to reduce waste, emissions and the use of hazardous substances (e.g., Dow Chemical Company; DuPont Company)
	Designing products and packaging with minimum environmental impacts	• Avoiding the use of hazardous substances in products and packaging (e.g., Dell Inc.; Bristol-Myers Squibb Company) • Designing product packaging with minimum materials (e.g., 3M Company; Motorola Mobility Inc.) • Developing products that are made of recyclable materials or recyclable (e.g., Hewlett-Packard Development Company; Eastman Kodak Company)

Table 6.5 Case examples of product-oriented GS practices and activities (Continued from previous page)		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Product design and development activities of P-GS practices	Evaluation of environmental performance of products	• Employing independent third-party company (e.g., Carbon Trust) to conduct life-cycle assessment reviews on products to measure carbon footprint of products over their life-cycle (e.g., Motorola Mobility Inc.; PepsiCo Inc.) • Conducting product sustainability review during the early stages of the product development process (e.g., Baxter International Inc.; Bristol-Myers Squibb Company) • Developing metrics to measure the environmental impacts of products over their life-cycle (e.g., Procter & Gamble Company; Dell Inc.)
After-sale activities of P-GS practices	Provision of maintenance services	• Product repair services that can prolong the usable life of products (e.g., Home Depot Inc.; Unilever Co.) • Product refurbishment services to reduce environmental impacts caused by new product production and facilitate other customers to use the same product (e.g., Xerox Co.; Eastman Kodak Company) • Recovery services for used parts and components to facilitate recycling (e.g., Dell Inc.; International Business Machines Co.)
	Collection of end-of-life products	• Collaborating with logistics service providers to expand networks for waste collection or end-of-life product take-back (e.g., Ford Motor Company; Toyota Motor Co.) • Placing collection bins in public areas or stores to collect end-of-life products from individual customers (e.g., PepsiCo Inc.; Eastman Kodak Company) • Providing free mail back services for end-of-life products (e.g., Dell Inc.; Ford Motor Company)
	Recycling of end-of-life products	• Investing in recycling facilities for waste management and recycling of end-of-life products (e.g., Toyota Motor Co.; Ford Motor Company) • Developing partnerships with governmental agencies, qualified recyclers or environmental groups for recycling (e.g., Xerox Co.; Ford Motor Company) • Sending end-of-life products to qualified recyclers for recycling and waste management (e.g., Intel Co.; Xerox Co.)

Table 6.6 Case examples of long-term development-oriented GS practices and activities (Continued on next two pages)		
Long-term development-oriented GS practices that focus on sustaining firm growth and development		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Information system related activities of LTD-GS practices	Implementation of information systems to monitor and manage environmental management practices and performances	• Employing wireless sensing system to collect data on environmental performance (e.g., Hewlett-Packard Development Company; Royal Dutch Shell PLC) • Development of database to track environmental performance, such as energy and water consumption, at facilities (e.g., Ford Motor Company; Bristol-Myers Squibb Company) • Development of system to trace the source of materials used in products and packaging to facilitate sustainable sourcing (e.g., Home Depot Inc.; Wal-Mart Stores Inc.)
	Reporting and sharing up-to-date information on environmental management practices and performances with stakeholders	• Updating the contents of corporate website to share best environmental management practices in industry and sustainable consumption practices with stakeholders (e.g., BP PLC; PepsiCo Inc.) • Publishing information on end-of-life product collection methods on corporate website (e.g., Baxter International Inc.; Toyota Motor Co.) • Periodically publishing corporate sustainability reports to provide stakeholders with up-to-date information about environmental management practices and performances (e.g., Weyerhaeuser Company; Chevron Co.)
	Use of environmentally friendly media to report and share environmental information	• Using intranet to offer environmental education programs for employees to learn about different topics on environmental issues (e.g., Baxtar International Inc.; Eastman Kodak Company) • Using corporate website to disseminate information on corporate environmental protection initiatives to customers (e.g., Unilever Co.; Xerox Co.). • Using videoconferencing to avoid fuel consumption and emissions in business travel (e.g., International Business Machines Co.; Hewlett-Packard Development Company)

Table 6.6 Case examples of long-term development-oriented GS practices and activities (Continued from previous page)		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Human resource management activities of LTD-GS practices	Provision of training programs to employees	• Rolling out training programs to educate truck drivers in planning journeys to anticipate potential hazards and reduce emissions (e.g., Royal Dutch Shell PLC; Goodyear Tire and Rubber Company) • Launching on-site training programs such as a workshop for sales associates to demonstrate the ways that can reduce plastic shopping bags consumption (e.g., Wal-Mart Stores Inc.; Target Co.) • Providing online-learning materials or web-based training sessions with different sustainability topics (e.g., Eastman Kodak Company; Daimler AG Company)
	Establishment of measurable environmental performance targets for employees	• Setting targets for product design team to reduce raw material consumption or reduce the size of product packaging for reducing material consumption (e.g., Ford Motor Company; Home Depot Inc.) • Setting targets for marketing team to reduce post-consumer paper waste (e.g., Target Co.; Wal-Mart Stores Inc.) • Setting targets for workers in plants to reduce energy consumption (e.g., Toyota Motor Co.; Weyerhaeuser Company)
	Evaluating individual environmental performance of employees	• Conducting sustainability learning tests or training assessments for all employees to evaluate their environmental knowledgeable and performance (e.g., Electrolux Company; Baxter International Inc.) • Evaluating employee environmental performance in critical areas of execution of environmental management practices to ensure that objectives of sustainable development are met (e.g., Weyerhaeuser Co.; Wal-Mart Stores Inc.) • Development of appraisal system with key performance metrics and score cards for senior managers to evaluate and track environmental performance of employees (e.g., Target Co.; Wal-Mart Stores Inc.)
	Motivating employees to participate in environmental management practices	• Presenting of awards to honor employees who have contributed to improving environmental performance (e.g., 3M Company; Eastman Kodak Company) • Linking compensation package to environmental protection performance of all employees (e.g., Intel Co.; Eastman Kodak Company) • Providing funding to support employees to participate in various environmental protection projects (e.g., Intel Co.; Weyerhaeuser Company)

Table 6.6 Case examples of long-term development-oriented GS practices and activities (Continued from previous page)		
Services involved in GS practices	**GS activities**	**Examples of GS activities (case examples)**
Corporate policy related activities of LTD-GS practices	Formulation of corporate environmental policies to comply with environmental regulations	• Formulation of policy to develop products that are free of hazardous materials to comply with the requirements of Registration, Evaluation, Authorization and Restriction of Chemicals (e.g., Hewlett-Packard Development Company; Royal Dutch Shell PLC) • Formulation of policy to provide customers with end-of-life vehicles take-back service to comply with the requirements of End-of-Life Vehicles Directive (e.g., DaimlerChrysler Co.; Ford Motor Company) • Formulation of policy to collect end-of-life electrical products from individual consumers for recycling to comply with the requirements of Waste Electrical and Electronic Equipment Directive (e.g., Home Depot Inc.; International Business Machines Co.)
	Formulation of corporate environmental policies that are beyond compliance	• Formulation of policy to prohibit, restrict, or substitute toxic substances used in manufacturing processes and products even when the existing regulations permit the use of the substances (e.g., International Business Machines Co.; Intel Co.) • Formulation of policy to improve the energy-efficiency of products (e.g., Motorola Mobility Inc.; Eastman Kodak Company) • Formulation of no-idling policy for trucks that are entering distribution centers (e.g., Hewlett-Packard Development Company; Wal-Mart Stores Inc.)
	Regular reviews and modifications of corporate environmental policies	• Participating in external policy-making development activities to work with governmental agencies to develop environmentally and financially responsible corporate environmental regulations (e.g., Chevron Co.; General Motors Company) • Working with governmental agencies or environmental organizations to review and update corporate policies with the aim to understand and participate in policy development (e.g., Procter & Gamble Company; Kroger Co.) • Regular meetings by senior managers to assess and revise corporate policies to respond to emerging environmental regulations and social trends that will affect operations (e.g., Baxter International Inc.; Wal-Mart Stores Inc.)

CHAPTER 7 DATA COLLECTION III: DESIGN AND FINDINGS OF QUANTITATIVE SURVEY RESEARCH

A large quantitative survey research was conducted to collect primary data to statistically validate the measurement scales of GS and performance outcomes, and test the hypotheses stated in Chapter 3.

7.1 Survey data collection and sample characteristics

This study focuses on the consumer-product industry in Hong Kong, which has developed into a cosmopolitan service based economy (Chan, 2012). In meeting the challenges from rapid technological changes and increasing intense competition brought about by globalization, the Hong Kong economy is shifting towards value-added services and a knowledge-based economy (Information Services Department, 2013). In addition, the economic and financial integration of Hong Kong and China has offered abundant business opportunities for a wide range of services. These evolving developments have seen rapid expansion in the service industry in Hong Kong over the past two decades (Information Services Department, 2013). In 2012, the service industry contributed to more than 90% of the GDP in Hong Kong (Hong Kong Retail Management Association, 2013; Information Services Department, 2013). Consequently, the government of the HKSAR of the People's Republic of China provides various forms of support and carries out service promotion for specific service industries (e.g., global marketing and business matching services for traders and service sectors). Nowadays, the service industry in Hong Kong is among the most developed in East Asia (Information Services Department, 2013).

The consumer-product industry is one of the largest service industries in Hong Kong, accounts for 28% the GDP, and employs a workforce of about 255,000 individuals (Hong Kong Retail Management Association, 2013). According to the Census and Statistics Department of Hong Kong, the total sales of consumer products for 2012 amounted to over HK$445.4 billion (Census and Statistics Department, 2013). The consumer-product industry is an inseparable part of the Hong Kong service-based economy, and will continue to contribute to the growth and prosperity of Hong Kong. However, the activities in this industry have caused huge environmental problems. For example, the disposal of end-of-life consumer-products and plastic shopping bags used for product packaging has created imminent and serious landfill and pollution problems in Hong Kong (Environmental Protection Department, 2012). The government of the Hong Kong HKSAR of the People’s Republic of China has policies in place (i.e., Product Eco-responsibility (Plastic Shopping Bags) Regulation) that strive for sustainable development as well as maintain economic growth.

The Hong Kong consumer-product industry is chosen as the empirical setting of this study for two reasons. First, consumer-product firms in Hong Kong have experience with GS provision as they are required to comply with the environmental regulations imposed by the local government, such as the Product Eco-responsibility (Plastic Shopping Bags) Regulation. To comply with the regulations, consumer-product firms have developed information systems to record the number of plastic bags given and amount of levy charged, and launched promotion activities to encourage consumers to bring their own shopping bags to avoid plastic shopping bag consumption. Likewise, under the Mandatory Energy Efficiency Labeling Scheme of the Energy Efficiency Ordinance, consumer-product firms are required to inform customers about the energy efficiency performance of home appliances. Second, due to the increasingly keen competition, consumer-product firms in Hong Kong provide a wide range of products as well as services to differentiate themselves from their competitors and satisfy customer needs. Thus, this sample frame provides an appropriate research setting that enables the capture of data on GS practices related to different products and services, thus improving the generalizability of the study findings.

Sample selection bias arises mostly because data are collected through surveys and when a researcher is limited to information on a non-random sub-sample of the population of interest (Bushway et al., 2007). In most cases, respondents that respond to a survey are self-selected, which do not constitute a random sample of the general population (Zardrozny, 2004). In this study, simple random sampling, which is an unbiased surveying technique, was used in quantitative survey to avoid the sample selection bias (Zardrozny, 2004). In doing so, the primary data was collected by randomly drawing a sample of 1,000 Hong Kong consumer-product firms in different sectors from the database of *Dun & Bradstreet.* This can ensure randomness (i.e., the ability of the sample to represent the population of interest) to improve the generalizability of the findings (Forza, 2002). Moreover, the sample was not constrained to a specific type of consumer-product firm or consumer-product firms in a particular sector to avoid homogeneity of the data so as to improve the generalizability of the findings. Undoubtedly, sample firms in qualitative content analysis research such as Wal-Mart Stores Inc. and Royal Dutch Shell PLC are MNCs, which have support from stakeholders and slack resources to consider and implement more activities of pollution-prevention (PP)-, product (P)-, and long-term development (LTD)- oriented GS practices (Melynk et al., 2003; Simpson et al., 2004). MNCs also receive a significant amount of attention from the general public, which gives them pressure to implement sophisticated environmental management practices to be environmentally responsible (Stanwick and Stanwick, 1998). In contrast, most of the firms in the database of *Dun & Bradstreet* used in quantitative survey research of this study are small and medium enterprises (SMEs), which seem to have little resources and environmental management skills and expertise to consider and implement GS activities (Perez-Sanchez et al., 2003). However, the public concern about the ability and willingness of the SMEs to manage the environmental impact of their businesses is escalating (Gadenne et al., 2009). There has been increasing pressure emanated from stakeholders such as legislators and suppliers for managers of SMEs to reduce the adverse environmental impact of their operations by implementing environmental management activities and practices (Perez-Sanchez et al., 2003; Hillary, 2004; Gadenne et al., 2009). While SMEs could contribute up to 70% of all industrial pollution (Hillary, 2004), SMEs are required by legislators to institute formal environmental management programs to reduce the environmental impact of their businesses and achieve international environmental standards (e.g., ISO 14001) (Hillary, 2004). While stakeholders hold MNCs responsible for environmental degradation caused by their supply chain partners (Rao and Holt, 2005; Seuring and Müller, 2008), MNCs also demand SMEs to be their recognized suppliers by implementing environmental management practices that are similar to their environmental management programs or obtaining ISO 14001 certification (Perry, 2001). In view of these, SMEs are increasingly engaging in environmental management activities, which are similar to the MNCs, for compliance to the environmental regulations and to meet the demands of their stakeholders (Perez-Sanchez et al., 2003; Castka et al., 2004).

A survey package that contained a cover letter which explained the purpose of the study, a questionnaire, and a self-addressed pre-paid envelope was mailed to the sample firms. A mailed questionnaire was used as it can be completed at the convenience of the respondent, created to give a professional impression, ensure anonymity, and reduce interviewer bias (Forza, 2002). Top management staff members, such as the CEO, COO, Chairman, Director, Operations Manager, Supply Chain Manager, or Environmental Management Manager, were determined as the appropriate respondents, because they are likely to be familiar with the environmental management services and activities implemented and their organizational performance outcomes. Appendix IV presents the questionnaire used to collect firm-level data in the quantitative survey research.

Follow-up telephone calls were made three days after the initial mailing to seek acknowledgement of package receipt, clarify the research objectives, and emphasize the importance of the responses of the targeted participants to the study. In the first mailout, 105 questionnaires were returned. The survey package was sent in a second mailout to the non-respondents three weeks after the follow-up phone calls of the initial mailing. Follow-up calls were made three days after the second mailing. Fifty-six questionnaires were subsequently returned. Another survey package was sent to the non-respondents three weeks after the follow-up phone calls of the second mailout. Twenty-two questionnaires were returned three weeks after the final mailing. One hundred and eighty-three completed questionnaires were received from the sample firms for data analysis. Table 7.1 summarizes the demographic characteristics of the respondents in the mass survey research. The response rate of this study is 18.3%, which is similar to those in other survey-based operations management and environmental management studies that targeted the top management (e.g., Kassinis and Soteriou, 2003; Rosenzweig and Roth, 2004).

Table 7.1 Profiles of the respondents in mass survey research (n=183) (Continued on next page)		
Company characteristics	**n**	**%**
Position of respondent		
• Director	113	62
• Chairman	2	1
• Manager of Operations Management Department	26	14
• Manager of Environmental Management Department	6	3
• Manager of Supply Chain Management	18	10
• COO	18	10
• CEO	0	0
Respondent's years of service (years)		
• < 2	6	3
• 2 – 4	21	11
• 5 – 9	49	27
• 10 – 14	27	15
• 15 – 19	45	25
• ≥ 20	35	19
Ownership of the firm		
• State-owned	2	1
• Privately-owned	153	84
• Collectively-owned	7	4
• Listed	12	6
• International joint venture	9	5
Number of employees		
• 1 – 10	125	68
• 11 – 50	26	14
• 51 – 100	5	3
• 101 – 500	16	9
• > 500	11	6
Number of years that the firm has adopted environmental management practices		
• < 2	68	37
• 2 – 4	60	33
• 5 – 9	36	20
• 10 – 14	17	9
• 15 – 19	1	0.5
• ≥ 20	1	0.5

Table 7.1 Profiles of the respondents in mass survey research (n=183) (Continued from previous page)		
Company characteristics	**n**	**%**
Consumer product type		
• Jewelry	11	6
• Apparel and other finished products made from fabric and similar products	43	24
• Accessories	24	13
• Used merchandise	1	0.5
• General merchandise	5	3
• Luggage and leather goods	9	5
• Books and magazines	7	4
• Sporting goods	7	4
• Needlework and piece goods	7	4
• Tobacco products	4	2
• Toy and game products	21	11
• Building materials, hardware, and garden supplies	2	1
• Liquor	2	1
• Gasoline	0	0
• Gifts, novelties and souvenirs	1	0.5
• Drugs and proprietary	15	8
• Radio, television, and consumer electronics	10	5
• Food	2	1
• Other	12	7

7.2 Measurement development

A structured survey instrument was developed to measure the perspective of the practicing managers. Based on the findings of the qualitative content analysis research and conceptualization of GS practices, a new multi-item measurement scale of GS was developed. Measurement items on organizational performance outcomes after adopting suitable existing scales were also included.

7.2.1 Independent variable

An independent variable is also known as a predictor variable. In this study, GS is the independent variable. A new scale was developed to operationalize the GS constructs based on the literature, exploratory research findings, and content analysis findings. Only the activities that complement their respective GS practices identified in literature, as well as exploratory research and quantitative content analysis research of this study were retained to develop GS measurements for confirmatory factor analysis. Appendix III showed the measurement items of GS constructs that were generated, eliminated or retained in different research phases of this study, and the supporting literature.

GS: According to the conceptualization of GS practices and content analysis findings, GS comprises PP-GS, P-GS, and LTD-GS practices where each of these practices contains a collection of GS activities. Respondents were asked to assess the extent to which their firms implement the environmental management practices on a 5-point Likert-scale, where 1 = 0-20% implementation, and 5 = 81-100% implementation.

7.2.2 Dependent variables

The organizational performance outcomes are the dependent variables in this study. Existing measurement scales were adapted from the literature on environmental and operations management to measure the environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty.

Environmental performance: Environmental performance was conceptualized as the performance of an organization with respect to its environmental management results (Kleindorfer et al., 2005; Yang et al., 2011). As firms implement GS to achieve eco-efficiency by maximizing value creation with reduced resource consumption and emissions (Meijkamp, 1998; Brezet et al., 2001), environmental performance was operationalized by using a five-item scale based on Verfaillie and Bidwell (2000), which is a set of eco-efficiency indicators for firms to measure their progress in environmental performance (World Business Council for Sustainable Development, 2006). The indicators emphasize direct environmental management control as well as relevant environmental issues upstream (e.g., with suppliers) and downstream (e.g., in product use) of the activities of firms (Verfaillie and Bidwell, 2000), which are suitable for adoption to measure the environmental performance of GS implementation which takes into account the environmental impacts in upstream and downstream activities along a supply chain. The use of eco-efficiency indicators to measure the environmental performance of firms also solves the problem where fluctuations may occur as a result of changes in production volume and thus conceal the real changes in environmental performance as was the case with conventional environmental performance indicators (Michelsen et al., 2006). The five items for measuring environmental performance are: energy, water and raw material consumption, greenhouse gas emission, and the amount of total waste. The respondents were asked to assess the extent to which firm-level environmental performance has improved relative to their environmental performance since the last two years on a 5-point Likert-scale, where 1 = 0-20% improvement, and 5 = 81-100% improvement.

Revenue growth: Revenue growth was conceptualized as the performance of an organization with respect to its profit maximization objectives (Klassen and McLaughlin, 1996). Firms increase their revenue in three ways: increasing market share, marking up products, and achieving economies of scale through better utilization of inputs and resources (Klassen and McLaughlin, 1996). Revenue was therefore operationalized by using a three-item scale based on that of Klassen and McLaughlin (1996) to evaluate the extent to which firms improved their revenue. Respondents were asked to assess the extent to which the revenue of their firm has improved relative to their performance in the past two years on a 5-point Likert-scale, where 1 = 0-20% improvement, and 5 = 81-100% improvement.

Cost savings: Cost savings were conceptualized as the performance of organizations with respect to their cost structure (Klassen and McLaughlin, 1996). Firms commonly lowered their cost structures through three ways: increasing productivity, reducing operations costs, and avoiding environmental fines and liabilities (Klassen and McLaughlin, 1996). An existing scale from Klassen and McLaughlin (1996) was adopted to provide a three-item measure to evaluate the extent to which firms reduced their costs of operations. The respondents were asked to assess the extent to which their costs were reduced relative to their cost performance in the past two years on a 5-point Likert-scale, where 1 = 0-20% improvement, and 5 = 81-100% improvement.

Customer satisfaction: Customer satisfaction was conceptualized as the overall satisfaction of customers with the total purchase and consumption experience at the firm level. A three-item scale that measures customer satisfaction was adopted on the basis of (Gutafsson et al., 2005) with focus on the overall evaluation by customers on their total purchase and consumption experience, expectancy disconfirmation, and firm performance against the ideal service provider of the customers that pertains to a specific brand. The respondents were asked to assess the extent to which they agree that their customers are satisfied with the purchase and consumption experience at their stores on a 5-point Likert-scale, where 1 = strong disagree, and 5 = strongly agree.

Customer loyalty: Customer loyalty was conceptualized as a deeply held commitment to consistently rebuy or repatronize a preferred product or service in the future (Oliver, 1997), which included the attitudinal and behavioral aspects of loyalty (Yi and La, 2004). On the one hand, researchers have used repurchasing as a long-term choice probability for a brand or switching to another brand to measure loyalty in the behavioral sense (Kassinis and Soteriou, 2003; Yi and La, 2004). On the other hand, attitudinal loyalty is operationalized as brand preference or emotional commitment, and thus measured with repeat purchase intention, resistance against better alternatives, intention of word-of-mouth, and willingness to pay premium price (Yi and La, 2004). Both the behavioral and attitudinal measures of loyalty provide insights into the nature of loyal customers. A four-item scale that measures both behavioral and attitudinal loyalty on the basis of Yi and La (2004) was adopted, with a focus on attachment (repurchase), special preference, increased scale and scope of relationship, and engagement in positive word-of mouth. The respondents were asked to assess the frequency of which their customers repurchase, consider purchasing and spend more at their stores, and recommend their stores to others on a 5-point Likert-scale, where 1 = rarely, and 5 = very often.

7.2.3 Control variables

Factors that have possible confounding impacts on the dependent variables were considered. These factors can potentially affect revenue growth, cost savings and environmental performance, as well as the extent of GS activities implemented by firms. Three factors have been identified for inclusion in this study: (1) firm size as measured by the number of employees in the firm; (2) stakeholder forces; and (3) regulatory forces.

Firm size: Firm size was included to control its confounding impact as prior studies have indicated that firm size is related to the level of organizational investment and efforts in environmental protection (Sroufe, 2003), and the degree to which various environmental management options are considered (Melynk et al., 2003). Large firms seem to have support from stakeholders to implement GS, and slack resources to consider and implement more GS activities (Melynk et al., 2003; Simpson et al., 2004). It was anticipated that higher levels of resources available to a firm means greater positive impacts on GS implementation, and the level of performance observed (Melynk et al., 2003). Also, large firms receive a significant amount of attention from the general public, which gives them pressure to be environmentally responsible (Stanwick and Stanwick, 1998). Thus, the firm size was included as a control variable. The firm size is measured in terms of the number of employees in a firm in this study, which has been widely used by the production and operations management literature (Wong et al., 2013).

Stakeholder forces: Stakeholder forces were included as a control variable as stakeholders can influence the organizational practices of firms by exerting pressure (Kassinis and Vafeas, 2006; Sarkis et al., 2010), thus affecting the implementation of GS. As posited by the stakeholder theory, stakeholder pressure results in significant motivation for firms to adopt various environmental management practices (Buysse and Verbeke, 2003; Eesley and Lenox, 2006; Sarkis et al., 2011). For example, managerial attitudes and views (Cordano and Frieze, 2000), managerial interpretations (Sharma, 2000), and environmental values and leaders (Egri and Herman, 2000) all influence the decisions of firms with regards to their environmental activities (Sharma, 2000; Fernández et al., 2003). A scale from Berry and Rondinelli (1998) was adopted to provide a three-item measure that evaluates the amount of stakeholder pressure experienced by firms. The respondents were asked to assess the extent to which firms are compelled by stakeholder forces to implement environmental management practices on a 5-point Likert scale, where 1 = not at all, and 5 = to a great extent.

Regulatory forces: Regulatory bodies and the government can influence the implementation of GS by firms through the exertion of coercive pressure to reduce environmental impacts (Zhu and Sarkis, 2007). Firms must comply with environmental regulations due to possible penalties and fines (Sarkis et al., 2010). Such pressure and threats will hurt corporate image and customer relations (Darnall et al., 2008). As such, regulatory forces were included in this study to control for their potential impact on GS implementation and its performance outcomes. An existing scale from Berry and Rondinelli (1998) was adopted to measure the amount of environmental regulatory pressure experienced by firms. The respondents were asked to assess the extent to which firms are compelled by regulatory forces to implement environmental management practices on a 5-point Likert scale, where 1 = not at all, and 5 = to a great extent.

7.3 Bias issues

7.3.1 Non-response bias

Non-respondents alter the sample frame and lead to a sample that does not represent the population, thus limiting the generalizability of the results (Forza, 2002). The non-response bias was examined by following the extrapolation method as suggested by Armstrong and Overton (1977). A comparison of the early and late responses showed no statistical differences in the nine types of GS activities, environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty at $p < 0.05$. This indicates that non-response bias is not a concern in this study. In addition, t-testing was used to examine whether there is any significant difference in the nine types of GS activities, environmental performance, revenue growth, cost savings, customer satisfaction and customer loyalty between the early and late respondents, with the latter who initially declined to participate, but later returned the questionnaire. The results of the t-testing showed that there are no significant differences at $p < 0.05$. This suggests that non-response bias does not appear to be a problem.

7.3.2 Common method variance

Common method bias is one of the main sources of measurement errors, which can threaten the validity of the conclusions (Podsakoff et al., 2003). As primary data was collected from the key informants, steps were taken to address common method variance. First, the survey questions were segmented into different sections based on the position of their respective variables in the model, e.g., dependent or independent variables (Podsakoff et al., 2003). Per Kassinis and Soteriou (2003), the dependent variables were placed after the independent variables in the survey to diminish the effects of consistency artifacts.

Second, per Podsakoff et al. (2003), a Harmon's one-factor test was used to examine whether a single-latent factor would account for all the theoretical constructs. The theoretical constructs included nine types of GS activities, environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty. The factor analysis showed that fourteen factors with eigenvalues greater than 1.0 account for 75.5% of the total variance. The first factor only accounted for 31.5% of the variance. There is no single factor that accounts for more than 40% of the total variance, which suggests that the problem of the common method variance does not seem to be an issue. Moreover, a chi-square difference test was conducted between the single latent factor model (χ^2 = 1864.96, df = 528; CFI = 0.82; RMSEA = 0.12; RMR = 0.22; IFI = 0.82; TLI = 0.81) and the hypothesized fourteen-factor model (χ^2 = 1283.01, df = 518; CFI = 0.90; RMSEA = 0.08; RMR = 0.07; IFI = 0.90; TLI = 0.90). A significant difference was found between the chi-square values of the two models ($\Delta\chi^2$ = 581.95, Δdf = 10, $p < 0.001$), thus providing preliminary evidence that common method variance is not a problem in this study.

Third, by following Lindell and Whitney (2001) and Malhotra et al. (2006), firm ownership type (i.e., state-, privately-, and collectively-owned, listed firms, international joint ventures, or other) was chosen as the marker variable, which is theoretically unrelated to the dependent and independent variables in this study, to test for potential common method variance. As shown in Table 7.2, the results show that firm type ownership is not significantly related to any of the dependent and independent variables, thus providing further evidence that common method variance is not an issue in this study (Malhotra et al., 2006).

Table 7.2: Descriptive statistics and correlations of the constructs

Factor	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Panel A: First-order constructs																							
1	3.62	1.08	.93																				
2	3.52	1.06	.86*	.87																			
3	3.50	.98	.80*	.80*	.81																		
4	3.44	1.00	.77*	.78*	.78*	.79																	
5	3.50	1.04	.82*	.78*	.80*	.73*	.83																
6	3.51	1.00	.76*	.75*	.77*	.78*	.75*	.79															
7	3.58	1.06	.86*	.85*	.80*	.73*	.82*	.78*	.91														
8	3.56	1.03	.85*	.81*	.80*	.75*	.80*	.72*	.88*	.89													
9	3.53	1.07	.83*	.84*	.80*	.78*	.79*	.74*	.83*	.84*	.85												
10	3.16	.75	.59*	.62*	.64*	.66*	.61*	.61*	.60*	.58*	.60*	.76											
11	3.27	.77	.68*	.71*	.76*	.72*	.66*	.65*	.72*	.69*	.73*	.58*	.86										
12	3.25	.76	.67*	.67*	.67*	.62*	.61*	.61*	.68*	.66*	.67*	.61*	.85*	.72									
13	3.46	.86	.58*	.62*	.65*	.65*	.60*	.62*	.64*	.61*	.62*	.59*	.63*	.49*	.86								
14	3.51	.87	.71*	.78*	.80*	.80*	.73*	.75*	.78*	.71*	.74*	.64*	.76*	.60*	.77*	.87							
15	1.70	1.23	.03	-.03	-.04	-.03	-.02	-.02	-.01	.03	-.03	.02	.02	-.11	.67	-.04	-						
16	3.32	.81	.33*	.37*	.33*	.37*	.31*	.37*	.35*	.37*	.33*	.48*	.03*	.32*	.33*	.32*	.03	.89					
17	3.37	.75	.38*	.41*	.41*	.43*	.35*	.41*	.36*	.38*	.42*	.50*	.33*	.29*	.35*	.38*	-.12	.34*	.84				
Panel B: Second-order constructs																							
18	3.55	.99																		.97			
19	3.47	.94																		.89*	.96		
20	3.56	1.01																		.91*	.88*	.97	
Panel C: Third-order construct																							
21	3.53	.94																		.97*	.95*	.96*	.98
Marker variable																							
22	N/A	N/A	-.02	-.06	-.07	-.08	-.05	-.07	-.01	.03	-.05	-.07	-.04	-.10	.05	-.09	N/A	N/A	N/A	-.05	-.08	-.01	-.05

*Correlations are significant at the 0.01 level(two-tailed); square root of AVE is on the diagonal; 1: store related activities; 2: promotion activities; 3: logistics activities; 4: procurement activities; 5: product design and development activities; 6: after-sale activities; 7: information system related activities; 8: human resource management activities; 9: corporate policy related activities; 10: environmental performance; 11: revenue growth; 12: cost savings; 13: customer satisfaction; 14: customer loyalty; 15: firm size; 16: stakeholder forces; 17: regulatory forces; 18: pollution prevention-oriented GS practices; 19: product-oriented GS practices; 20: long-term development-oriented GS practices; 21: GS; 22: firm ownership type

Although firm-level data have been widely used by prior operations management and environmental management studies (Choi and Eboch, 1998; Kassinis and Soteriou, 2003), steps were taken to address any common method variance that may be introduced. By following Koys (2001) and Podsakoff et al. (2003), primary data on customer satisfaction and customer loyalty was collected from an additional source – the customers. Customer satisfaction and customer loyalty were measured via a survey of customers from a random sample of 20 consumer-product firms to examine whether there is any significant difference in the customer satisfaction and customer loyalty between the responses of the managers and customers. A survey package with a cover letter that explained the purpose of this study and the questionnaire were distributed outside the retail outlets of the consumer-product firms by research assistants. Customers who were leaving these retail outlets were intercepted to complete and return the survey to the research assistants. Eighty completed questionnaires (4 customer responses per sample firm) were received from customers to test for potential common-method variance. Table 7.3 summarizes the demographic characteristics of the respondents in the customer survey research. Appendix V presents the questionnaire used to collect customer-level data for testing the potential of common method variance in the quantitative survey research.

The measures of customer satisfaction were adopted from Gustafsson et al. (2005), and the measures of customer loyalty were adopted from Yi and La (2004). The respondents were asked to assess the extent to which they agree with the statements on a 5-point Likert-scale, where 1 = strong disagree, 5 = strongly agree**,** and the frequency in which they engaged with a series of activities related to the store on a 5-point Likert-scale, where 1 = rarely, and 5 = very often. The internal consistency of customer satisfaction and customer loyalty were assessed by Cronbach's alpha. As shown in Table 7.4, the Cronbach's alpha coefficients of the scales of customer satisfaction and customer loyalty are 0.82 and 0.83, respectively, which are above the threshold value of 0.70, thus suggesting that the scales of customer satisfaction and customer loyalty are sufficiently reliable (Bagozzi and Yi, 1988). The data collected from the customers about each consumer-product firm was aggregated to the organizational level as a unit. This aggregation is justified given that the within-group interrater reliability scores for each of the unit was above the threshold value of 0.70, which ranged from 0.70 to 0.96, and hence acceptable (James et al., 1984; LeBreton and Senter, 2008). Table 7.5 summarizes the within-group interrater reliability scores of customer satisfaction and customer loyalty. A t-test was also used to determine whether there is any significant difference in customer satisfaction and customer loyalty between the responses of the managers and customers. The results of the t-test showed that there are no significant differences at $p < 0.05$, thus providing further evidence that common method variance is not an issue in this study.

Table 7.3 Profiles of the respondents in customer survey research (n=80)		
Respondent characteristics	**n**	**%**
Gender		
• Male	37	46
• Female	43	54
Age		
• <16	2	3
• 16-25	9	11
• 26-35	29	36
• 36-45	24	30
• 46-55	11	14
• >55	5	6
Education level		
• Primary or above	1	1
• Secondary	13	16
• Diploma	9	11
• Higher diploma	32	40
• Bachelor degree	23	29
• Postgraduate or above	2	3
Monthly income level (HK$)		
• <$7,500	7	9
• $7,500 - 9,999	35	44
• $10,000 - 14,999	24	30
• $15,000 - 19,999	10	12
• $20,000 - 24,999	4	5
• $≥$25,000	0	0

Table 7.4 Cronbach's alpha coefficients of the scales of customer satisfaction and customer loyalty of customer-level data
Customer satisfaction (Gustafsson et al. 2005) **(**Cronbach's alpha= 0.82) SAT1: I am satisfied with the firm's eco-friendly products and environmental protection activities SAT2: The performance of this store in environmental protection exceeds my expectations SAT3: The performance of this store is close to my ideal provider of eco-friendly products and environmental protection activities
Customer loyalty (Yi and La, 2004) (Cronbach's alpha= 0.83) LOY1: I repurchase products at the store LOY2: I consider the store as my choice LOY3: I spend more at the store compared with its competitors LOY4: I recommend the store to my friends and/or relatives

Table 7.5 Within-group interrater reliability scores of customer satisfaction and customer loyalty (customer-level data)		
Firm	Within-group interrater reliability score of customer satisfaction	Within-group interrater reliability score of customer loyalty
1	0.79	0.92
2	0.75	0.89
3	0.88	0.73
4	0.88	0.82
5	0.80	0.74
6	0.75	0.85
7	0.80	0.88
8	0.82	0.82
9	0.80	0.84
10	0.89	0.70
11	0.75	0.95
12	0.88	0.71
13	0.92	0.79
14	0.96	0.77
15	0.77	0.93
16	0.88	0.96
17	0.75	0.88
18	0.86	0.96
19	0.92	0.76
20	0.75	0.78

7.4 Pre-testing of measurement scales and items

The scales were refined based on the results of the pilot- and pre-tests. Since the measurement items and scales developed in this study or adapted from the literature are in English, they were translated from English into Chinese by two bilingual researchers in Hong Kong. A back-translation process was conducted to ensure conceptual equivalence (Douglas and Craig, 2007; Cai et al., 2010). In order to improve the readability and clarity of the questions, and wording and seminal meaning of individual measurement item, pre-testing was conducted to refine the measurement scales. The pre-testing of the measurement scales involved a convenience sample of five operations management experts from the academia and five practitioners from the consumer-product industry who were invited to review the measurement items. The purpose of the study was explained to these experts, and their inputs were requested on the completeness, understandability, terminology used, and ambiguity of the measurement items. They were asked for feedback. Based on their comments and suggestions, a few items were modified by rewording certain items to clarify the statements.

7. 5 Pilot-testing of measurement scales and items

A pilot-test for the measurement scales was conducted by simulating the actual data collection process on a small sample scale to examine whether the measurement scales are applicable in a mass survey. The pilot-testing of the measurement scales involved a random sample of 300 practitioners from the consumer-product industry from the database of *Dun & Bradstreet*. Practitioners were recruited through mail solicitation. Business executives in the field of environmental management and consumer-product trade were chosen as the respondents in the pilot test because of their knowledge on the organizational practices involved in their GS provision and the performance consequences of their GS provision. A questionnaire was mailed to 300 practitioners to collect primary data on the extent that their firm implemented GS activities and improved their organizational performance. Forty completed surveys were received, with a response rate of 13.3%. Table 7.6 summarizes the demographic characteristics of the respondents in the pilot test.

Cronbach's alpha coefficients were assessed and a CITC analysis was performed to purify the measurement scales to ensure that each scale is as homogenous and measure is as congeneric as possible. As shown in Table 7.7, all of the scales surpass the minimally acceptable level of 0.70 (Nunnaly, 1978), which suggest that the scales have a high degree of internal reliability (Nunnaly, 1978). Moreover, all measurement items were kept because their CITC was above a threshold of 0.30 (Koufteros, 1999). These findings suggest that the measurement scales are applicable to a mass survey. The survey instrument was subsequently administered to sample firms in a mass survey to validate the GS measurement and performance outcomes measurement. Table 7.7 summarizes the measurement items and their respective constructs, source of the measurement items adopted, Cronbach's alpha coefficients of scale, and CITC of the measurement items in the pilot test.

Table 7.6 Profiles of the respondents in pilot test (n=40) **(Continued on next page)**		
Company characteristics	**n**	**%**
Position of respondent		
• Director	3	7.5
• Chairman	4	10
• Manager of Operations Management Department	16	40
• Manager of Environmental Management Department	2	5
• Manager of Supply Chain Management	2	5
• COO	0	0
• CEO	13	32.5
Respondent's years of service (years)		
• < 2	5	12.5
• 2 – 4	12	30
• 5 – 9	12	30
• 10 – 14	4	10
• 15 – 19	5	12.5
• ≥ 20	2	5
Ownership of the firm		
• State-owned	2	5
• Privately-owned	18	45
• Collectively-owned	2	5
• Listed	12	30
• International joint venture	6	15
Number of employees		
• 1 – 10	0	0
• 11 – 50	14	35
• 51 – 100	22	55
• 101 – 500	2	5
• >500	2	5

Table 7.6 Profiles of the respondents in pilot test (n=40) (Continued from previous page)		
Company characteristics	**n**	**%**
Consumer product type		
• Jewelry	3	7.5
• Apparel and other finished products made from fabric and similar products	7	17.5
• Accessories	2	5
• Used merchandise	4	10
• General merchandise	5	12.5
• Luggage and leather goods	2	5
• Books and magazines	0	0
• Sporting goods	1	2.5
• Needlework and piece goods	0	0
• Tobacco products	0	0
• Toy and game products	2	5
• Building materials, hardware, and garden supplies	2	5
• Liquor	3	7.5
• Gasoline	0	0
• Gift, novelties and souvenirs	4	10
• Drugs and proprietary	2	5
• Radio, television, and consumer electronics	2	5
• Food	1	2.5
• Other	0	0
Number of years that the firm has adopted environmental management practices		
• < 2	5	12.5
• 2 – 4	12	30
• 5 – 9	16	40
• 10 – 14	4	10
• 15 – 19	3	7.5
• ≥ 20	0	0

Table 7.7 Cronbach's alpha coefficients and CITC of measurement items in pilot test (Continued on next three pages)	
Panel A: First-order construct and reflective indicator	CITC
Store related activities (S) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.97)	
S1: We use energy-saving technologies in our servicing location(s)	0.92
S2: We use water-saving technologies in our servicing location(s)	0.92
S3: We design service delivery processes with maximized efficiency to avoid resources used in work duplication	0.90
S4: We take sustainable design features into consideration when designing our servicing location(s)	0.92
S5: We reuse/recycle/ reduce resources used in servicing location(s)	0.92
Promotion activities (PRO) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.91)	
PRO1: We implement activities that raise customer awareness on environmental issues	0.79
PRO2: We educate customers on environmental protection and sustainable consumption practices	0.83
PRO3: We motivate customers to engage in our environmental protection programs	0.83
Logistics activities (LOG) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.91)	
LOG1: We optimize shipping routes	0.80
LOG2: We maximize shipping capacity	0.83
LOG3: We deploy transportation vehicles with environmental technologies or designs	0.72
LOG4: We use low emission transportation modes	0.74
LOG5: We reuse/recycle/ reduce resources used in distribution	0.75
Procurement activities (PCU) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.89)	
PCU1: We follow corporate environmentally responsible purchasing guidelines in sourcing	0.77
PCU2: We make purchase decisions based on the total cost of purchasing, use, and waste management	0.70
PCU3: We source products from environmentally responsible suppliers	0.80
PCU4: We collaborate with our suppliers to minimize environmental impacts	0.71
PCU5: We collaborate with our customers to improve environmentally responsible purchasing criteria	0.73
Product design and development activities (PDD) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.89)	
PDD1: We design manufacturing processes with minimum environmental impacts	0.77
PDD2: We design products and packaging with minimum environmental impacts	0.74
PDD3: We evaluate environmental performance of our products	0.73

Table 7.7 Cronbach's alpha coefficients and CITC of measurement items in pilot test (Continued from previous page)	
Panel A: First-order construct and reflective indicator	CITC
After-sale activities (AS) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.83)	
AS1: We provide maintenance services to prolong usable life of our products	0.72
AS2: We collect end-of-life products from customers	0.62
AS3: We recycle end-of-life products	0.71
Information system related activities (IS) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.94)	
IS1: We implement information systems to monitor and manage our environmental management practices and performances	0.87
IS2: We report and share up-to-date information about our environmental management practices and performances with stakeholders	0.87
IS3: We use environmentally friendly media to share information about our environmental management practices and performances with stakeholders	0.87
Human resource management activities (HRM) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.94)	
HRM1: We have training programs to educate employees about our environmental management practices	0.88
HRM2: We establish measureable environmental performance targets for our employees	0.88
HRM3: We evaluate the environmental performance of our employees	0.78
HRM4: We motivate employees to participate in our environmental management practices	0.86
Corporate policy related activities (POL) (Source: the conceptualization of GS practices and content analysis findings; 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.89)	
POL1: We formulate corporate environmental policies to comply with environmental regulations	0.79
POL2: We formulate corporate environmental policies that are beyond compliance	0.82
POL3: We review and modify our corporate environmental policies regularly	0.77
Environmental performance (EP) (Source: Verfaillie and Bidwell (2000); 1 = 0-20% improvement, 5 = 81-100% improvement; Cronbach's alpha coefficient = 0.87)	
EP1: We have reduced our total energy consumption	0.82
EP2: We have reduced our virgin material consumption	0.74
EP3: We have reduced our fresh water consumption	0.67
EP4: We have reduced the amount of greenhouse gas emissions	0.64
EP5: We have reduced total waste disposal (e.g., packaging waste)	0.59

Table 7.7 Cronbach's alpha coefficients and CITC of measurement items in pilot test (Continued from previous page)	
Panel A: First-order construct and reflective indicator	CITC
Revenue growth (REV) (Source: Klassen and McLaughlin (1996); 1 = 0-20% improvement, 5 = 81-100% improvement; Cronbach's alpha coefficient = 0.74)	
REV1: We have increased our market share	0.66
REV2: We have marked up our products	0.59
REV3: We have increased economies of scale	0.45
Cost savings (CS) (Source: Klassen and McLaughlin (1996); 1 = 0-20% improvement, 5 = 81-100% improvement; Cronbach's alpha coefficient = 0.73)	
CS1: We have increased our productivity	0.62
CS2: We have reduced the material and resource consumption	0.62
CS3: We have reduced our environmental fines and liabilities	0.43
Customer satisfaction (SAT) (Source: Gustafsson et al. (2005); 1 = strongly disagree, 5 = strongly agree; Cronbach's alpha coefficient = 0.88)	
SAT1: Our customers are satisfied with our eco-friendly products and environmental protection programs	0.81
SAT2: Our performance in environmental protection exceeds the expectations of our customers	0.82
SAT3: Our performance is closer to the ideal provider of eco-friendly products and environmental protection programs of our customers	0.69
Customer loyalty (LOY) (Source: Yi and La (2004); 1 = rarely, 5 = very often; Cronbach's alpha coefficient = 0.92)	
LOY1: Our customers repurchase products at our store(s)	0.89
LOY2: Our customers consider our store(s) as their choice	0.76
LOY3: Our customers spend more at our store(s) than other stores	0.82
LOY4: Our customers recommend our store(s) to their friends and/or relatives	0.79
Firm size (FS) (Source: Wong et al. (2013)**;** 1= 1-10, 2= 11-50, 3= 51-100, 4= 101-500, 5= >500; Cronbach's alpha coefficient = N/A)	
FS: Please indicate the number of employees in your company	N/A
Stakeholder forces (SF)(Source: Berry and Rondinelli (1998); 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.82)	
SF1: Our customers demand eco-friendly products	0.87
SF2: The public demands environmental protection	0.84
SF3: Our shareholders avoid any environmental risks in our operations	0.81
Regulatory forces (RF) (Source: Berry and Rondinelli (1998); 1 = not at all, 5 = to a great extent; Cronbach's alpha coefficient = 0.87)	
REG1: The environmental regulations in Hong Kong are stringent towards consumer-product firms	0.84
REG2: The enforcement of environmental regulations in Hong Kong is stringent towards consumer-product firms	0.72
REG3: The environmental liabilities and fines in Hong Kong are excessive for consumer-product firms	0.72

Table 7.7 Cronbach's alpha coefficients and CITC of measurement items in pilot test (Continued from previous page)	
Panel B: Second-order construct and reflective indicator	CITC
Pollution prevention-oriented GS practices (PP-GS) (Source: the conceptualization of GS practices and content analysis findings; Cronbach's alpha coefficient = 0.97)	
PP-GS1: Store related activities	0.89
PP-GS2: Promotion activities	0.91
PP-GS3: Logistics activities	0.90
Product-oriented GS practices (P-GS) (Source: the conceptualization of GS practices and content analysis findings; Cronbach's alpha coefficient = 0.94)	
P-GS1: Procurement activities	0.87
P-GS2: Product design and development activities.	0.83
P-GS3: After-sale activities.	0.81
Long-term development-oriented GS practices (LTD-GS) (Source: the conceptualization of GS practices and content analysis findings; Cronbach's alpha coefficient = 0.97)	
LTD-GS1: Information system related activities	0.92
LTD-GS2: Human resource management activities	0.89
LTD-GS3: Corporate policy related activities	0.89
Panel C: Third-order construct and reflective indicator	
GS (Source: the conceptualization of GS practices and content analysis findings; Cronbach's alpha coefficient = 0.99)	
GS1: Pollution prevention-oriented GS practices	0.93
GS2: Product-oriented GS practices	0.90
GS3: Long-term development-oriented GS practices	0.92

7.6 Measurement validation

The psychometric properties of the finalized measurement scales were assessed by using reliability testing and confirmatory factor analysis (CFA) via AMOS 21.0 to evaluate the unidimensionality, and convergent and discriminant validities of the measurement scales. By following the guidelines of Gerbing and Anderson (1988), maximum likelihood estimation was used with a sample covariance matrix as the input in the CFA. Table 7.8 summarizes the measurement items, item loadings, goodness-of-fit indices, Cronbach's alpha, average variance extracted (AVE), and composite reliability of each construct.

Table 7.8 Confirmatory factor analysis results of the latent factors (Continued on next three pages)							
Indicator	**Direction**	**Construct**	**Standardized estimate**	**Estimate**	**S.E.**	**t-value**	***p*-value**
Panel A: First-order construct and reflective indicator							
Store related activities (χ^2 = 7.23, df = 5; CFI = 0.99; RMSEA = 0.05; RMR = 0.01; IFI= 0.99; NFI = 0.99; Cronbach's alpha = 0.97; Composite reliability = 0.97; AVE = 0.89)							
S1	←	Store related activities (S)	0.93	1.00			
S2	←	Store related activities (S)	0.93	0.96	0.04	23.78	0.00
S3	←	Store related activities (S)	0.92	0.94	0.04	22.49	0.00
S4	←	Store related activities (S)	0.94	0.95	0.04	24.27	0.00
S5	←	Store related activities (S)	0.94	0.95	0.04	24.72	0.00
Promotion activities (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.91; Composite reliability = 0.91; AVE = 0.76)							
PRO 1	←	Promotion activities (PRO)	0.90	1.00			
PRO 2	←	Promotion activities (PRO)	0.85	0.94	0.06	16.75	0.00
PRO 3	←	Promotion activities (PRO)	0.86	0.95	0.06	17.17	0.00
Logistics activities (χ^2 = 7.42, df = 5; CFI = 0.99; RMSEA = 0.05; RMR = 0.03; IFI = 0.99; NFI = 0.99; Cronbach's alpha = 0.91; Composite reliability = 0.91; AVE = 0.66)							
LOG 1	←	Logistics activities (LOG)	0.90	1.00			
LOG 2	←	Logistics activities (LOG)	0.86	0.97	0.06	17.01	0.00
LOG 3	←	Logistics activities (LOG)	0.74	0.94	0.07	12.95	0.00
LOG 4	←	Logistics activities (LOG)	0.77	0.92	0.07	13.89	0.00
LOG 5	←	Logistics activities (LOG)	0.78	0.96	0.07	14.04	0.00
Procurement activities (χ^2 = 27.04, df = 5; CFI = 0.96; RMSEA = 0.07; RMR = 0.07; IFI = 0.96; NFI = 0.95; Cronbach's alpha = 0.89; Composite reliability = 0.89; AVE = 0.63)							
PCU 1	←	Procurement activities (PCU)	0.90	1.00			
PCU 2	←	Procurement activities (PCU)	0.71	0.89	0.07	11.68	0.00
PCU 3	←	Procurement activities (PCU)	0.85	0.97	0.06	16.52	0.00
PCU 4	←	Procurement activities (PCU)	0.71	0.86	0.07	11.69	0.00
PCU 5	←	Procurement activities (PCU)	0.77	0.91	0.07	13.44	0.00
Product design and development activities (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.89; Composite reliability = 0.87; AVE = 0.69)							
PDD 1	←	Product design and development activities (PDD)	0.88	1.00			
PDD 2	←	Product design and development activities (PDD)	0.81	0.99	0.07	14.32	0.00
PDD 3	←	Product design and development activities (PDD)	0.79	0.96	0.07	13.72	0.00

Table 7.8 Confirmatory factor analysis results of the latent factors (Continued from previous page)							
Indicator	**Direction**	**Construct**	**Standardized estimate**	**Estimate**	**S.E.**	**t-value**	***p*-value**
Panel A: First-order construct and reflective indicator							
After-sale activities (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.83; Composite reliability = 0.83; AVE = 0.63)							
AS1	←	After-sale activities (AS)	0.87	1.00			
AS2	←	After-sale activities (AS)	0.71	0.92	0.08	11.07	0.00
AS3	←	After-sale activities (AS)	0.78	0.95	0.07	12.78	0.00
Information system related activities (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.94; Composite reliability = 0.94; AVE = 0.83)							
IS1	←	Information system related activities (IS)	0.92	1.00			
IS2	←	Information system related activities (IS)	0.90	0.99	0.05	20.82	0.00
IS3	←	Information system related activities (IS)	0.91	0.98	0.05	21.53	0.00
Human resource management activities (χ^2 = 6.04, df = 2; CFI = 0.99; RMSEA = 0.05; RMR = 0.02; IFI = 0.99; NFI = 0.99; Cronbach's alpha = 0.94; Composite reliability = 0.94; AVE = 0.79)							
HRM 1	←	Human resource management activities (HRM)	0.92	1.00			
HRM 2	←	Human resource management activities (HRM)	0.92	0.96	0.05	21.47	0.00
HRM 3	←	Human resource management activities (HRM)	0.83	0.92	0.06	16.36	0.00
HRM 4	←	Human resource management activities (HRM)	0.89	0.94	0.05	19.56	0.00
Corporate policy related activities (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.89; Composite reliability = 0.89; AVE = 0.73)							
POL 1	←	Corporate policy related activities (POL)	0.90	1.00			
POL 2	←	Corporate policy related activities (POL)	0.85	0.97	0.06	16.45	0.00
POL 3	←	Corporate policy related activities (POL)	0.82	0.95	0.06	15.35	0.00
Environmental performance (χ^2 = 19.32, df = 5; CFI = 0.97; RMSEA = 0.07; RMR = 0.03; IFI = 0.97; NFI = 0.96; Cronbach's alpha = 0.87; Composite reliability = 0.87; AVE = 0.58)							
EP1	←	Environmental performance (EP)	0.92	1.00			
EP2	←	Environmental performance (EP)	0.76	0.93	0.07	13.14	0.00
EP3	←	Environmental performance (EP)	0.72	0.96	0.08	11.82	0.00
EP4	←	Environmental performance (EP)	0.70	0.94	0.08	11.39	0.00
EP5	←	Environmental performance (EP)	0.69	0.85	0.08	11.26	0.00
Revenue growth (χ^2 = N/A, d f= N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.74; Composite reliability = 0.76; AVE = 0.74)							
REV 1	←	Revenue (REV)	0.80	1.00			
REV 2	←	Revenue (REV)	0.75	0.94	0.09	10.66	0.00
REV 3	←	Revenue (REV)	0.59	0.84	0.10	8.06	0.00

Table 7.8 Confirmatory factor analysis results of the latent factors (Continued from previous page)							
Indicator	**Direction**	**Construct**	**Standardized estimate**	**Estimate**	**S.E.**	**t-value**	***p*-value**
Panel A: First-order construct and reflective indicator							
Cost savings (χ^2 = N/A, d f= N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.73; Composite reliability = 0.75; AVE = 0.52)							
CS1	←	Cost savings (CS)	0.84	1.00			
CS2	←	Cost savings (CS)	0.77	0.78	0.07	11.16	0.00
CS3	←	Cost savings (CS)	0.49	0.55	0.08	6.59	0.00
Customer satisfaction (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.88; Composite reliability = 0.89; AVE = 0.74)							
SAT 1	←	Customer satisfaction (SAT)	0.94	1.00			
SAT 2	←	Customer satisfaction (SAT)	0.89	0.94	0.05	18.47	0.00
SAT 3	←	Customer satisfaction (SAT)	0.73	0.86	0.07	12.45	0.00
Customer loyalty (χ^2 = 0.84, df = 2; CFI = 1.00; RMSEA = 0.05; RMR = 0.02; IFI = 1.00; NFI = 1.00; Cronbach's alpha = 0.92; Composite reliability = 0.92; AVE = 0.76)							
LOY 1	←	Customer loyalty (LOY)	0.93	1.00			
LOY 2	←	Customer loyalty (LOY)	0.81	0.94	0.06	15.74	0.00
LOY 3	←	Customer loyalty (LOY)	0.88	0.92	0.05	18.93	0.00
LOY 4	←	Customer loyalty (LOY)	0.84	0.95	0.06	17.13	0.00
Firm size (χ^2 = N/A, df = N/A; CFI= N/A; RMSEA= N/A; RMR= N/A; IFI= N/A; NFI= N/A; Cronbach's alpha= N/A; Composite reliability= N/A; AVE= N/A)							
FS1	←	Firm size (FS)	N/A	N/A	N/A	N/A	N/A
Stakeholder forces (χ^2= N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.92; Composite reliability = 0.92; AVE = 0.79)							
SF1	←	Stakeholder forces (SF)	0.94	1.00			
SF2	←	Stakeholder forces (SF)	0.89	0.96	0.05	18.50	0.00
SF3	←	Stakeholder forces (SF)	0.85	0.87	0.05	16.80	0.00
Regulatory forces (χ^2 = N/A, df = N/A; CFI = N/A; RMSEA = N/A; RMR = N/A; IFI = N/A; NFI = N/A; Cronbach's alpha = 0.87; Composite reliability = 0.88; AVE = 0.71)							
RF1	←	Regulatory forces (RF)	0.93	1.00			
RF2	←	Regulatory forces (RF)	0.80	0.90	0.07	13.23	0.00
RF3	←	Regulatory forces (RF)	0.80	0.83	0.06	13.33	0.00
Panel B: Second-order construct and reflective indicator							
Pollution prevention-oriented GS practices (χ^2 = 183.18, df = 62; CFI = 0.96; RMSEA = 0.07; RMR = 0.05; IFI = 0.96; NFI = 0.94 ; Cronbach's alpha = 0.97; Composite reliability = 0.98; AVE = 0.94)							
S	←	Pollution prevention-oriented GS practices (PP-GS)	0.96	1.00			
PRO	←	Pollution prevention-oriented GS practices (PP-GS)	0.99	0.97	0.05	17.86	0.00
LOG	←	Pollution prevention-oriented GS practices (PP-GS)	0.98	0.91	0.05	18.01	0.00

Table 7.8 Confirmatory factor analysis results of the latent factors (Continued from previous page)							
Panel B: Second-order construct and reflective indicator							
Indicator	**Direction**	**Construct**	**Standardized estimate**	**Estimate**	**S.E.**	**t-value**	***p*-value**
Product-oriented GS practices (χ^2 = 124.03, df = 41; CFI = 0.94 : RMSEA = 0.07; RMR = 0.07; IFI = 0.95; NFI = 0.92; Cronbach's alpha = 0.94; Composite reliability = 0.97; AVE = 0.92)							
PCUR	←	Product-oriented GS practices (P-GS)	0.97	1.00			
PDD	←	Product-oriented GS practices (P-GS)	0.97	0.97	0.06	15.87	0.00
AS	←	Product-oriented GS practices (P-GS)	0.93	0.90	0.06	14.47	0.00
Long-term development-oriented GS practices (χ^2 = 95.21, df = 33; CFI = 0.97; RMSEA = 0.07; RMR = 0.04; IFI = 0.97; NFI = 0.96; Cronbach's alpha = 0.97; Composite reliability = 0.98; AVE = 0.94)							
IS	←	Long-term development-oriented GS practices (LTD-GS)	0.99	1.00			
HRM	←	Long-term development-oriented GS practices (LTD-GS)	0.94	0.96	0.05	18.27	0.00
POL	←	Long-term development-oriented GS practices (LTD-GS)	0.98	0.98	0.05	19.19	0.00
Panel C: Third-order construct and reflective indicator							
GS (χ^2 = 1222.86, df = 517; CFI = 0.91: RMSEA = 0.07; RMR = 0.06; IFI = 0.91; NFI = 0.95; Cronbach's alpha = 0.99; Composite reliability = 0.98; AVE = 0.96)							
PP-GS	←	GS	0.98	1.00			
P-GS	←	GS	0.98	0.93	0.06	16.05	0.00
LTD-GS	←	GS	0.97	0.97	0.06	17.43	0.00

7.6.1 Unidimensionality

Per Koufteros (1999) and Segars (1997), the unidimensionality of constructs was examined by using multiple goodness-of-fit indices to evaluate the fit of the factor structure of the CFA. Overall, the CFA results showed that the measurement model exhibits a good fit with the data (χ^2 = 2677.72, df =1605; CFI = 0.90; RMSEA = 0.06; RMR = 0.05; IFI = 0.90; TLI = 0.90). Specifically, the CFA results showed that the CFI, NFI and IFI are above the recommended cut-off value of 0.90 (Hu and Bentler, 1999). The RMSEA is less than the maximum recommended value of 0.08 (Steiger, 1990), and the RMR is well below the recommended value of 0.1. The χ^2

value of the model (i.e., $\chi^2 = 2677.72$) corresponds to a significance level (p-value = 0.16) greater than the minimum threshold of 0.05 (Bagozzi and Yi, 1988; Bentler, 1995), thus providing evidence of the adequate fit of the overall model to meet the conditions for unidimensionality (Bagozzi and Yi, 1988; Bentler, 1995; Koufteros, 1999). In addition, the ratio of χ^2 to the degree of freedom (χ^2/df = 1.67) is less than 2, thus providing additional evidence of the adequate fit of the model overall (Koufteros, 1999).

7.6.2 Reliability

The reliability of the constructs and scales was assessed by using Cronbach's alpha and composite reliability. As shown in Table 7.8, the Cronbach's alpha values are above the threshold value of 0.70, in a range of 0.73 to 0.99, thus suggesting that the construct measures are sufficiently reliable (Bagozzi and Yi, 1988). The composite reliability coefficients of the constructs are also above the threshold value of 0.70, in a range of 0.75 to 0.98, thus suggesting internal consistency for each set of observed variables in its respective latent construct (Fornell and Larcker, 1981). These results indicate that the measurement scales have adequate reliability (Nunnally, 1984).

7.6.3 Convergent and discriminant validities

Per O'Leary-Kelly and Vokurka (1998), the convergent validity of each measurement scale was evaluated by conducting another CFA by using the maximum likelihood approach. As summarized in Table 7.8, the standardized factor loadings range from 0.49 to 0.99, and are statistically significant at the $p < 0.01$ level. These results suggest that the theoretical constructs have convergent validity (Gerbing and Anderson, 1988). Furthermore, per Fornell and Larcker (1981), the AVE was constructed for each construct. As shown in Table 7.8, the AVE of each construct exceeds the recommended minimum value of 0.5(Fornell and Larcker, 1981), thus indicating convergent validity.

The discriminant validity was also tested per Fornell and Larcker (1981). The square root of the AVE of each construct was calculated and compared with the correlation between the construct and all of the other constructs. As shown in Table 7.2, the square root of the AVE of all the constructs is greater than the correlation between any pair of them, thus indicating discriminant validity (Fornell and Larcker, 1981).

Table 7.2 also presents the means, standard deviations, and correlations of all the theoretical constructs. The bivariate correlations between the GS activities and their performance outcomes including environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty range from 0.49 to 0.88 with a significance of $p < 0.01$, which indicates an acceptable criterion validity (Nunnally, 1978). In addition, the χ^2 differences between nested CFA models for all pairs of constructs to assess discriminant validity. As shown in Table 7.9, significant differences ($p < 0.05$) were found between all pairs of constructs, indicating discriminant validity of the measurement.

7.6.4 Structure of the GS measurement

The GS construct was tested to determine if it should be a more parsimonious measure as a third-order level construct that consists of three dimensions (i.e., PP-GS, P-GS, and LTD-GS practices), and nine sub-dimensions (i.e., store related activities, logistics activities, promotion activities, procurement activities, product design and development activities, and after-sale activities, information system-related, human resource management activities, and corporate policy related activities). By following the suggestion from Tanriverdi (2006), the structure of the GS measurement was examined by conducting a series of SEM. The results showed that the first-order model (χ^2 = 1170.32, df = 491; CFI = 0.91; RMSEA = 0.07; RMR = 0.06; IFI = 0.91; TLI = 0.90), second-order model (χ^2 = 1222.86, df = 515; CFI = 0.91; RMSEA = 0.07; RMR = 0.06; IFI = 0.91; TLI = 0.90), and third-order model (χ^2 = 1224.82, df = 517; CFI = 0.91; RMSEA = 0.07; RMR = 0.06; IFI = 0.91; TLI = 0.90) exhibit good fit with the data.

Then, two tests were conducted to compare the first-, second-, and third-order models. First, the target coefficient *T* was estimated (Marsh and Hocevar, 1984) to examine the extent to which the second-order constructs account for the variance of the first-order constructs. The *T* was computed by using the following formula: $T = \chi^2$ (first order model)/ χ^2 (second-order model). A high *T* ratio of 0.96 (i.e., 1170.32 / 1222.86) between the first- and second-order models was found. The ratio is close to 1.00, which indicates that the relationship amongst the first-order constructs are sufficiently captured by the second-order constructs (Marsh and Hocevar, 1984). Likewise, the target coefficient *T* was estimated (Marsh and Hocevar, 1984) to examine the extent to which the third-order constructs account for the variance amongst the second-order constructs. A high ratio of 0.99 (i.e., 1222.86 / 1224.82) was found between second- and third-order constructs (Marsh and Hocevar, 1984), thus indicating that the relationship amongst the second-order constructs are sufficiently captured by the third-order constructs (Marsh and Hocevar, 1984).

Second, the path coefficients were examined and it was found that the path coefficients between the measurement items and their respective first-order constructs, between the first- and second-order constructs, and between the second- and third-order constructs are positively significant at $p < 0.05$ as summarized in Table 7.8. While it is desirable to have a parsimonious measure, and in line with the theoretical conceptualization of GS practices, GS as a third-order construct is tenable.

Table 7.9 Results of discriminant validity analysis

Factors	1	2	3	4	5	6	7	8
1. Store related activities								
2. Promotion activities	44.61(19)[a] 48.49(20)[b] 3.88* [c]							
3. Logistics activities	58.32(34) 70 (35) 11.68***	103.37(19) 107.98(20) 4.61*						
4. Procureme-nt activities	80.70(34) 93.32(35) 12.62***	82.98(19) 87.07(20) 4.09*	130.02(34) 133.82(35) 3.80*					
5. Product design and development activities	26.86(19) 39.30(20) 12.44***	20.44(8) 24.60(9) 4.16*	53.31(19) 60.73(20) 7.41**	66.38(19) 76.00(20) 9.62***				
6. After-sale activities	25.86(19) 42.59(20) 16.73***	43.94(8) 51.59(9) 7.65**	63.48(19) 68.49(20) 4.01*	65.48(19) 69.52(20) 4.04*	24.06(8) 28.66(9) 4.60*			
7. Informat-ion system related	33.88(20) 25.96(19) 7.92***	28.94(8) 39.84(9) 10.90***	45.42(19) 49.41(20) 3.99*	74.98(19) 79.04(20) 4.06*	12.71(8) 17.66(9) 4.95*	20.97(8) 27.21(9) 6.24*		
8. Human resource management	44.36(26) 53.02(27) 8.66***	72.80(13) 76.88(14) 4.08*	112.99(26) 117.06(27) 4.07*	80.67(26) 84.86(27) 4.19*	30.41(13) 37.13(14) 6.72**	38.88(13) 43.71(14) 4.83*	33.88(13) 38.34(14) 4.46*	
9. Corporate policy related activities	34.80(19) 42.09(20) 7.29**	42.90(8) 48.92(9) 6.02**	70.30(19) 75.13(20) 4.83*	72.69(19) 76.67(20) 3.98*	26.68(8) 30.54(9) 3.86*	40.12(8) 44.04(9) 3.92*	21.19(8) 28.54(9) 7.54**	51.43(13) 56.22(14) 4.79*

[a]Unconstrained model χ^2 and df
[b]Constrained model χ^2 and df
[c] χ^2 difference between unconstrained and constrained paths
**p*<0.05; ***p*<0.05; ****p*<.001

7.7 Structural equation model and hypothesis testing

7.7.1 Structural equation model testing

The structural model used to test the hypothesis consisted of the seventeen factors validated in the measurement model, including nine types of GS activities, environmental performance, cost savings, revenue growth, customer satisfaction, customer loyalty, firm size, and stakeholder and regulatory forces.

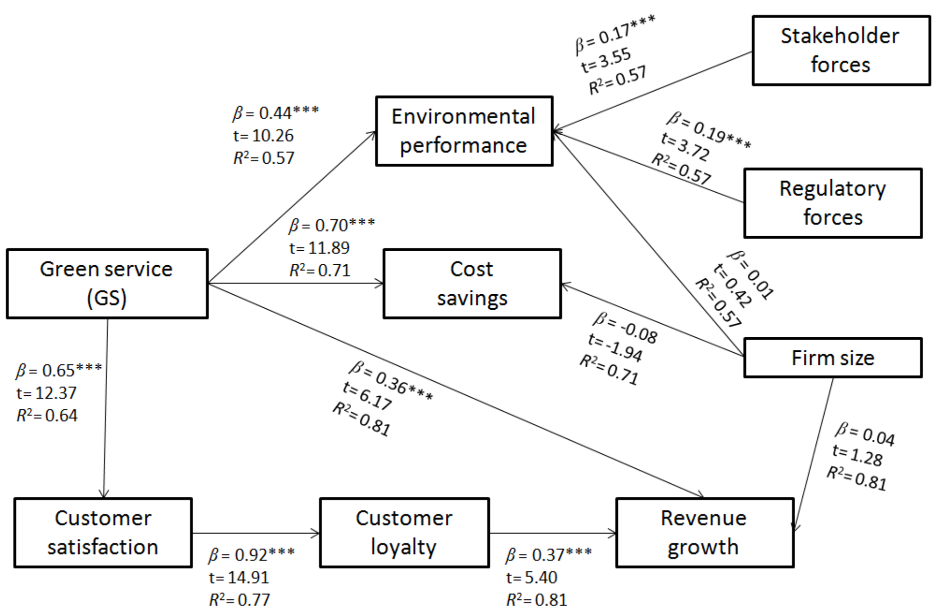
The model was tested by using maximum likelihood estimation with path analysis by AMOS 21.0. The results suggested that the proposed model for evaluating the structural relationships between GS implementation and its performance outcomes show a reasonable fit to the survey data (χ^2 = 2828.47, df = 1632; CFI = 0.90; RMSEA = 0.06 RMR = 0.06; IFI = 0.90; TLI = 0.90). These goodness-of-fit indices provide evidence of model fit, which suggests that the hypothesized model adequately represents the observed data. The RMSEA value was below the recommended value of 0.08, the RMR value was below the recommended value of 0.1, and the CFI, IFI and TLI exceeded the recommended level of 0.9 (Hu and Bentler, 1999), which provide further evidence of the model fit. The χ^2 value of 2828.47 and df of 1632 yielded a normed chi-square (χ^2/df) value of 1.73, which falls well within the recommended range for the conditional support of model parsimony. In sum, the various indices of the overall goodness-of-fit for the model lend sufficient empirical support that the results acceptably represent the hypothesized relationships.

7.7.2 Hypothesis testing

Figure 7.1 summarizes the results of the path estimates, which show that the relationship between GS and environmental performance is positively significant (β = 0.44, t = 10.26 with p = 0.00 < 0.01) with an R^2 of 0.57, GS and cost savings is positively significant (β = 0.70, t = 11.89 with p= 0.00 < 0.01) with an R^2 of 0.71, GS and revenue growth is positively significant (β = 0.36, t = 6.17 with p = 0.00 < 0.01) with an R^2 of 0.81, and GS and customer satisfaction is positively significant (β = 0.65, t = 12.37 with p = 0.00 < 0.01) with an R^2 of 0.64. Therefore, Hypotheses 1-4 which state that GS implementation is positively associated with environmental performance, cost savings, revenue growth, and customer satisfaction are supported.

Moreover, the path analytic results in this paper also showed that the relationship between customer satisfaction and customer loyalty is positively significant (β = 0.92, t = 14.91 with p = 0.00 < 0.01) with an R^2 of 0.77, and customer loyalty and revenue growth is positively significant (β = 0.37, t = 5.40 with p = 0.00 < 0.01) with an R^2 of 0.81. Therefore, Hypothesis 4 which states that customer satisfaction towards GS implementation of a firm is positively related to customer loyalty to the firm, and Hypothesis 5 which states that customer loyalty to a firm is positively related to the revenue growth of the firm, are supported, respectively.

The control variables, including firm size, and stakeholder and regulatory forces were incorporated into the structural model as determinants to the dependent variable. The control variable of firm size ($p > 0.05$) has no significant impact on the environmental performance ($\beta = 0.01$, $t = 0.42$ with $p = 0.672$) with an R^2 of 0.57, cost savings ($\beta = -0.08$, $t = -1.94$ with $p = 0.052$) with an R^2 of 0.71, and revenue growth ($\beta = 0.04$, $t = 1.28$ with $p = 0.201$) with an R^2 of 0.81. However, it was found that stakeholder forces ($\beta = 0.17$, $t = 3.55$ with $p < 0.01$) with an R^2 of 0.57 and regulatory forces ($\beta = 0.19$, $t = 3.72$ with $p = < 0.01$) with an R^2 of 0.57 have significant impacts on environmental performance. Table 7.10 summarizes the hypothesis testing results.



*** $p < 0.001$

Fit indices: χ^2 = 2828.47, df = 1632; CFI = 0.90; RMSEA = 0.06 RMR = 0.06; IFI = 0.90; TLI = 0.90

Figure 7.1. Results of path estimates

Table 7.10 Results of hypothesis testing									
	Construct	Direction	Construct	Estimate	Standardized estimate	S.E.	t-value	*p*-value	Conclusion
1	Environmental performance	←	Green service	0.44	0.69	0.04	10.26	0.00	Support
2	Cost savings	←	Green service	0.70	0.83	0.06	11.89	0.00	Support
3	Revenue growth	←	Green service	0.36	0.52	0.06	6.17	0.00	Support
4	Customer satisfaction	←	Green service	0.65	0.80	0.05	12.37	0.00	Support
5	Customer loyalty	←	Customer satisfactio n	0.92	0.88	0.06	14.91	0.00	Support
6	Revenue growth	←	Customer loyalty	0.37	0.45	0.07	5.40	0.00	Support

7.7.3 Post hoc test: Mediation test

The examination of the mediation effect can explain and specify the mechanism by which a given relationship occurs (Baron and Kenny, 1986). By following the three-step guidelines as suggested by Baron and Kenny (1986) and MacKinnon et al. (2000), a causal step approach was used to test the existence of mediation effects on the corresponding relationships. Specifically, the existence of a mediation effect of customer satisfaction on the relationship between GS and customer loyalty was examined in three steps. First, GS was tested to determine whether it influences customer satisfaction (path *a* in Fig.7.2), and it was found that the relationship between GS and customer satisfaction is significant (β = 0.60, t = 10.90 with p= 0.00 < 0.01) with an R^2 of 0.52. Second, GS was assessed to determine whether it influences customer loyalty (path *b* in Fig.7.2), and it was found that they have a significant relationship (β = 0.75, t= 14.74 with p= 0.00 < 0.01) with an R^2 of 0.75. Third, customer satisfaction was examined to see if it affects customer loyalty (path *c* in Fig.7.2) with the control of the relationship between GS implementation and customer satisfaction (path *a* in Fig.7.2), as well as the relationship between customer satisfaction and customer loyalty (path *c* in Fig.7.2). The results suggest that the previously significant path of GS on customer loyalty (path *b* in Fig.7.2) is no longer significant (β = 0.13, t = 1.57 with p= 0.07> 0.05) with an R^2 of 0.82. The results suggested customer satisfaction has a mediating effect on the relationship between GS and customer loyalty.

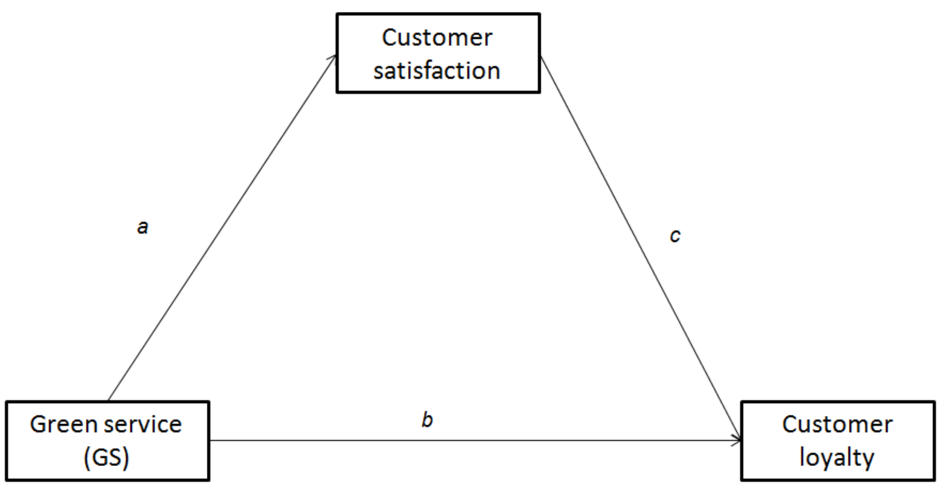


Figure 7.2. Path diagram showing indirect paths to test mediation effect of customer satisfaction on the relationship between GS and customer loyalty

Similarly, the existence of a mediation effect of customer loyalty on the relationship between customer satisfaction and revenue growth was tested in three steps. First, customer satisfaction was tested to determine whether it influences customer loyalty (path *d* in Fig. 7.3), and it was found that the relationship between customer satisfaction and customer loyalty is significant (β = 0.83, t = 13.36 with p = 0.00 < 0.01) with an R^2 of 0.65. Second, customer satisfaction was assessed to determine whether it influences revenue growth (path *e* in Fig. 7.3), and it was found that they have a significant relationship (β = 0.65, t = 9.60 with p = 0.00 < 0.01) with an R^2 of 0.58. Third, customer loyalty was tested to determine whether it affects revenue growth (path *f* in Fig. 7.3) with the control of the relationship between customer satisfaction and customer loyalty (path *d* in Fig. 7.3), as well as the relationship between customer loyalty and revenue growth (path *f* in Fig. 7.3). The results suggested the previously significant path of customer satisfaction on revenue growth (path *e* in Fig. 7.3) is no longer significant (β = 0.16, t= 1.77 with p=0.08 > 0.05, R^2 of 0.76). The results suggested the presence of customer loyalty in mediating the relationship between customer satisfaction and revenue growth.

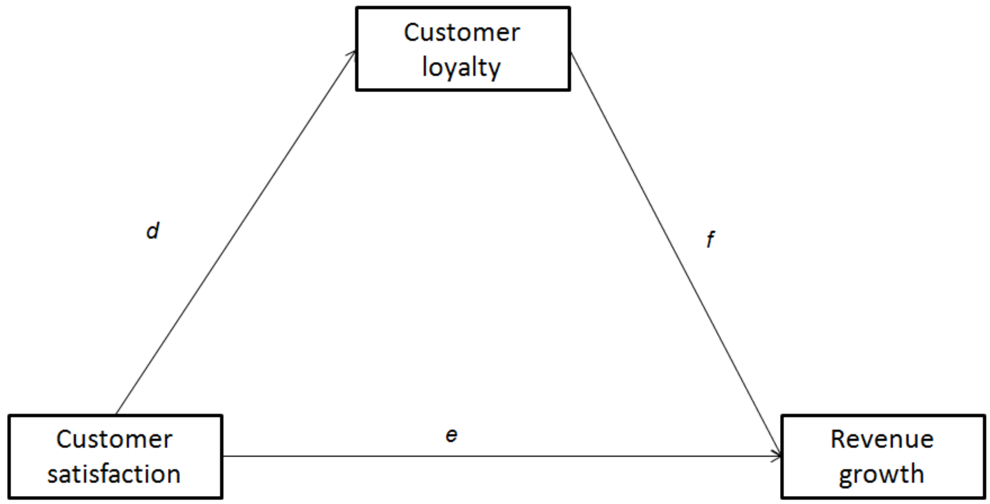


Figure 7.3. Path diagram showing indirect paths to test mediation effect of customer loyalty on the relationship between customer satisfaction and revenue growth

CHAPTER 8 DISCUSSION AND IMPLICATIONS

8.1 Discussion of results

Grounded in the NRBV, this paper conceptualizes GS in consumer-product industry from the supply chain perspective. The empirical findings of this study suggest that GS is multi-facet with interrelated sub-dimensions. The empirical findings indicate that GS in consumer-product industry is a third-order construct with three theoretical dimensions, namely, PP-GS, P-GS and LTD-GS practices, where each consists of a collection of GS activities, thus resulting in a total of 34 measurement items. Specifically, PP-GS is concerned with the minimizing of pollution in operations and enhancing operation efficiency. The empirical findings suggest that PP-GS practices are related to: (i) the design of service delivery processes, application of environmentally responsible tools and facilities, and application of sustainable design features in servicing locations (e.g., stores and customer service centers) to provide eco-friendly servicing environments to facilitate interaction with customers, (ii) the adoption of environmental protection acts in logistics services to make products available to consumers when they need them with minimum environmental impacts, and (iii) the use of promotion activities to provide platforms and information that enables consumers to participate into firm's environmental management initiatives. P-GS focuses on coordinating with supply chain partners to manage life-cycle costs of products from development, use, to the disposal stages. The empirical findings suggest that P-GS practices are related to: (i) the adoption of environmentally responsible procurement practices to ensure materials and products sourced for consumers have minimum environmental impacts, (ii) the adoption of eco-design activities to provide customers with environmentally responsible products, and (iii) the provision of after-sale services, such as product maintenance, take-back, and recycling, to assist customers to maintain their products and take-back their end-of-life products for recycling. LTD-GS is concerned with the long-term development of environmental management by providing infrastructures to support and direct environmental protection efforts. The empirical findings suggest that LTD-GS practices are related to: (i) the application of information systems to track and share information related to environmental management practices and performances, and provide web-based support services to customers, (ii) the provision of training, performance targets, and compensation packages that involve and motivate the active participation of employees in environmental protection, GS delivery, and assisting customers in identifying and accessing the environmentally responsible products and services they need, and (iii) the development of corporate environmental policies to guide organizational development as well as environmental protection in response to the demand for environmental protection by consumers.

The empirical findings suggest that the implementation of GS is positively related to environmental performance, revenue growth, and cost savings. Specifically, the implementation of GS is useful for consumer-product firms to reap environmental benefits by reducing emissions, consumption of resources, and waste from service activities. On the other hand, the empirical analysis in this study suggests that the implementation of GS contributes to various business performance aspects that include increased market share, higher markup, and improved economies of scale, which enable firms to improve revenue growth. In addition, the implementation of GS also enables firms to reduce costs by increasing productivity, reducing material and resource consumption, and avoiding environmental fines and liabilities. These findings are consistent with those in the literature (Kassinis and Soteriou, 2003), which suggests that organizational performance gains associated with the adoption of environmental practices are related to cost reductions, resource saving, and revenue improvement.

The empirical findings of this study also largely confirm the theories in this paper on the positive relationships of GS implementation, customer satisfaction and loyalty, and revenue growth of consumer-product firms. The empirical findings show that the implementation of GS is positively related to customer satisfaction, which in turn, is positively related to customer loyalty. GS adds value for customers by meeting their demands. GS improves the physical aspects of the serving environment, service reliability, problem solving capacity, interaction with customers, and corporate policies, which enables firms to better satisfy customers. Therefore, GS enables firms to improve customer satisfaction. This finding is consistent with those in the literature (Simpson et al., 2004; Tang et al., 2012), which suggests that corporate environmental practices or philanthropy will create more satisfied customers. The results also suggest that satisfied customers will turn into loyal customers, who purchase frequently and in a greater volume from firms, and recommend firms to their friends and relatives. Thus, consistent with the theorization in this study, the findings indicate that an increase in customer loyalty enables firms to improve their revenue growth. These findings are supported by the quality, marketing, and retailing management literature (Heskett and Schlesinger, 1994; Sirohi et al., 1998; Yi and La, 2004; Yee et al., 2009). A high level of customer satisfaction cultivates customer loyalty, which enables firms to generate an above normal rate of economic return and sustain profitability (Heskett et al., 1997; Yee et al., 2009). While prior studies (e.g., Christmann, 2000; Kassinis and Soteriou, 2003) suggest that the direct relationship between environmental practices and market performance may exist through the mediating effects of customer satisfaction and loyalty, the empirical findings suggest that customer satisfaction has a mediating effect on the relationship between GS and customer loyalty, and customer loyalty has a mediating effect on the relationship between customer satisfaction and revenue growth.

8.2 Theoretical implications and contributions

GS is an emerging and important research area that addresses environmental issues related to the provision of customer services of consumer-product firms, while satisfying end customers and sustaining business growth. Prior studies have provided limited information on the organizational practices and activities involved in GS provision, thus hindering GS implementation for organizational sustainable development. This study is one of the first attempts to fill this research gap by developing a measurement scale of GS in the context of consumer-product industry. Based on the environmental practices of the NRBV, this study empirically validates a GS measurement scale to measure the GS practices of consumer-product firms that are related to hardware infrastructures (e.g., use of facilities and equipment), operations (e.g., logistics processes), and cross-functional efforts (e.g., information sharing and learning) induced in service provision, which have been largely neglected in prior studies. The empirical findings indicate that GS comprise PP-GS, P-GS and LTD-GS practices, where each consists of a collection of GS activities.

The validated measurement scale of GS covers customer service activities in the various stages of the supply chain which span from environmental product development, in-store customer service, procurement, product distribution, promotion, education, after-sale service, innovation to information provision (Kassinis and Soteriou, 2003). While GSCM is concerned with integrating environmental concepts into the existing processes of supply chain operations (Sarkis et al., 2011), the validated GS measurement extends the notion of GSCM by acknowledging the interactions amongst different processes and functions. For example, the interactions amongst information systems and policy development related activities are important organizational infrastructures for reducing the environmental burden of organization growth and development. While consumer-product firms formulate environmental policies to comply with environmental regulations, they adopt information system facilities and carry out corporate environmental policies for compliance. On the other hand, information systems allow consumer-product firms to track corporate environmental performance, which enables them to pinpoint practices that fail to conform to government environmental regulations, thus allowing consumer-product firms to review and modify their existing GS practices.

The validated measurement scale of GS also provides insight into the dimensions of the NRBV by acknowledging that organizational GS activities are tacit, socially complex, and rare so that consumer-product firms can lower costs, preempt competitors, and enhance future positions. For example, the provision of product maintenance, take-back, and recycling services of P-GS practices enable consumer-product firms to gain in-depth knowledge of product usage patterns for future product development, which can be an important resource to preempting competitors. While consumers are increasing their expectations, requirements, and standards in evaluating the environmental management efforts of consumer-product firms, the establishment of corporate environmental policies from LTD-GS practices enables consumer-product firms to demonstrate their concern and efforts towards environmental protection, which can be an important resource to enhance their market position.

The validated measurement scale of GS also advances knowledge on the dimensions of the NRBV in terms of pollution prevention, product stewardship, and long-term sustainable development practices of GS by taking into account service quality issues in the context of consumer-product firms (i.e., physical aspects of servicing location, service reliability, problem solving capacity, interaction with customers, and corporate policies). For example, the concern with pollution prevention in GS means the application of environmentally responsible facilities and sustainable design features in servicing locations, the improving of efficiency in service delivery processes, and the reusing, reducing, and recycling of resources in servicing locations. These PP-GS activities help to reduce waste and resource consumption in the servicing environment, while satisfying customers by being environmentally responsible in the physical aspects of servicing locations. The product stewardship aspect in GS is concerned with the provision of product maintenance, take-back, and recycling services to prolong product life-cycle. These P-GS activities help to reduce the life-cycle costs of products, while satisfying customers by providing solutions that assist them in the maintenance of their products and also take-back their end-of-life products for recycling.

This study advances GS research by providing empirical evidence of the relationship between GS implementation and organizational performance, which comprises environmental and business performances. Although prior studies have indicated that the implementation of GS might not improve environmental performance (e.g., Meijkamp, 1998; Bartolomeo et al., 2003) and could be a cost burden (Waddock and Graves, 1997; Montabon et al., 2007), this study sheds light on the environmental benefits and business value of GS implementation by empirically demonstrating that the implementation of GS is positively related to environmental performance, revenue growth, and cost savings. Although prior studies (e.g., Christmann, 2000; Kassinis and Soteriou, 2003) have not reported any evidence of a direct relationship between environmental practices and market performance, the empirical findings in this thesis show that the implementation of GS improves environmental performance, cost savings (i.e., financial performance), and revenue growth (i.e., market performance). GS contributes to eco-efficiency which is concerned with simultaneously maximizing productivity and environmental performance (Halme, 2001; Cook et al., 2006; Yang et al., 2011). The empirical findings are consistent with the eco-efficiency theory which advocates that increased productivity reduces costs, while simultaneously reducing materials and energy consumption (Stone, 1995; Bebbington, 2001; Lehman, 2002; Baroulaki and Veshagh, 2007).

This study advances GS research by drawing on the NRBV to explain how GS creates business value and environmental benefits. Hart (1995) conjectured that GS practices are manifested as organizational processes that utilize environmentally friendly materials and facilities, as well as environmental management expertise and knowledge, thus facilitating firms to leverage their tangible and intangible assets to achieve performance gains. While the findings show that GS implementation is positively related to environmental performance, revenue growth, and cost savings, these findings support the assertion of the NRBV that organizational success is rooted in the organizational capabilities to prevent pollution, perform product stewardship, and reengineer organizational infrastructures to sustain economic growth and reduce environmental impacts (Hart, 1995). These findings advance the NRBV by providing evidence that such contention is not limited to the product manufacturing environment, but also in the consumer service context. The application of the NRBV to develop GS constructs and theories in this study has answered to the call for more research on "redefining operations resources for service operations management research" (Roth and Menor, 2003).

Although the notion of GS is central to satisfying customer needs with reduced costs and environmental impacts, there is an absence of studies that empirically examine the relationship between GS and customer satisfaction. This study empirically demonstrates that the implementation of GS by consumer-product firms is positively related to customer satisfaction. This result suggests the importance of GS towards customer satisfaction. This result also adds to the literature by providing evidence that the implementation of GS enables firms to better satisfy customers in addition to cost and environmental damage reduction. While the literature is rich in evidence that an increase in customer satisfaction is imperative to business performance improvement (Ittner and Larcker, 1998; Sparks and McColl-Kennedy, 2001; Tang et al., 2012), the findings here suggest that the implementation of GS, which has impacts on customer satisfaction, could be important for firms in improving their business performance. Moreover, this study advances knowledge about the way or the mechanism through which environmental practices enhance customer satisfaction (Kassinis and Soteriou, 2003). For example, while consumers have high and rising expectations that products are made of environmentally friendly materials and components, the establishment of environmental guidelines for procurement to ensure sourced products are free from hazardous materials in PP-GS practices enables firms to better satisfy customers.

This study is one of the first attempts to fill the research gap by empirically examining the relationships among GS implementation, customer satisfaction and loyalty, and revenue growth. The empirical findings suggest that the implementation of GS is positively related to customer satisfaction, which in turn, is positively related to customer loyalty. Such findings can be explained by the service-profit chain (Heskett and Schlesinger, 1994), which is a framework that links service operations, and employee and customer assessments to the profitability and growth of firms (Kamakura et al., 2002). GS is placed at the “front end” of a service-supply chain and affects customer satisfaction and loyalty, which are crucial to consumer-product firm performance. Moreover, this study also explains and specifies the mechanism by which the relationships between GS and customer loyalty, and customer satisfaction and revenue growth, occur (Baron and Kenny, 1996). Specifically, the empirical findings indicate that customer satisfaction mediates the relationship between GS and customer loyalty. This result shows that consumer-product firms are only able to cultivate customer loyalty to their firms if customer satisfaction is increased. Thus, the improving of customer satisfaction rates is required in order to use GS to cultivate customer loyalty to a firm, which is the primary driver of profitability (Reichheld and Sasser, 1990). Without customer satisfaction, the implementation of GS may go unheeded. The empirical findings also indicate that customer loyalty has a mediating effect on the relationship between customer satisfaction and revenue growth. This result shows that firms are only able to improve profitability if customer loyalty is in effect. Thus, the cultivating of customer loyalty to a firm is necessary to utilize customer satisfaction from GS implementation to realize profits. Without cultivated customer loyalty, customer satisfaction from GS implementation lacks any business value.

Measuring the Environmental Performance of Industry (Science and Technology Policy Research, 2011), the Global Environmental Management Initiative (GEMI), and the GRI are environmental reporting systems that provide guidelines for environmental reporting by firms (Montabon et al., 2007). Amongst the existing reporting systems, the GRI is relatively well known and the most influential on the environmental reporting of consumer-product firms (Adams, 2004). The GRI aims to develop a voluntary reporting framework that will evaluate sustainability reporting practices to a level equivalent to that of financial reporting in rigor, comparability, auditability, and general acceptance (Global Reporting Initiative, 2004). The GRI suggests 30 environmental indicators (EN) that cover performance related to inputs (e.g., material, energy, and water), outputs (e.g., emissions, effluents, and waste), biodiversity, environmental compliance, and other relevant information, such as environmental expenditures and the impacts of products and services. Although the EN suggested in the GRI guidelines were used by most of the consumer-product firms to report on the environmental aspects in their logistics activities (EN 29), product and service related activities (EN 26) and corporate policy related activities (EN 28), the empirical findings of this study suggest a more comprehensive set of indicators, which include activities such as procurement, promotion, and human resource management that are important to supporting the development of GS. The empirically validated measurement scale of GS adds to the existing GRI guidelines, which are argued to be generic and applicable to all types of firms (Willis, 2003), by providing industry specific EN to improve the usefulness and quality of information reported by consumer-product firms on environmental, social, and economic phenomena and performances.

The application of content analysis as an observational method to collect data and operationalize constructs in operations management is rare (Montabon et al., 2007). Per the content analytic approach from Tangpong (2011), this study provides an exemplar research design that uses content analysis to collect data and operationalizes the constructs of GS in operations management. This study has synergistically used the content analytic approach with survey research. This advances the framework in Tangpong (2011) for the content analytic approach to measure development by providing methodological steps in the survey research for measurement validation purposes. By adding to the predominantly survey- and analytical-based extant literature, this study has combined the content analysis approach with a survey method to empirically validate the measurement scale of GS. While content analysis can be questioned for its validity when the information is collected from public sources, which might be carefully vetted to put firms in the best possible light in consideration of organizational reputation and image (Tangpong, 2011), such challenges can be reduced through triangulation by using content analysis in parallel with survey research (Jick, 1979). With increasingly large quantities of accessible textural documents and communication materials, content analysis is a useful method (Boyer and Swink, 2008) to inexpensively collect large volumes of data. The use of survey research complements content analysis by triangulating the findings of the content analysis component of the study, thus improving reliability and validity of the study findings, and reducing biases (Boyer and Swink, 2008). Such an approach advances research methodology by providing an exemplar research design that combines the use of primary and secondary data to improve rigor by allowing triangulations to overcome bias issues that may be otherwise incurred with the use of a single research method.

8.3 Managerial implications and contributions

In understanding that the three practices of GS are essential for managers to design, develop, and implement service activities that prevent environmental pollution, achieve product stewardship, and support sustainable development, this study provides a useful reference for consumer-product firms to understand the practices of GS, and the breadth and depth of their implementation. The case examples collected from the content analysis and the validated measurement scale provide examples of GS implementation. For example, consumer-product firms can consider the approaches adopted by the sample firms in the content analysis in this paper to optimize shipping routes. Such approaches include: (i) the development of the best sequence of deliveries and pickups to reduce fuel consumption, (ii) the re-engineering of distribution networks for fewer and shorter trips, and (iii) the seeking of the closest vendor location to pick up freight destined for distribution centers. Likewise, consumer-product firms can motivate customers to engage in environmental protection programs by following the approaches taken by the sample firms in the content analysis, such as offering purchase discounts to customers who bring their own shopping bags, reward points to redeem for entertainment if customers return end-of-life products for recycling, and free reusable shopping bags to encourage customers to reduce plastic shopping bag consumption. The validated GS measurement scale could serve as a diagnostic tool that is suitable for consumer-product firms and allows them to offer a mix of products and services to assess their current GS implementations, and conduct periodical “checks” to measure improvements in GS implementation. The analysis of GS implementation enables managers to determine and identify areas for GS implementation and improvement actions. The analysis results will be useful for managers to plan their assessment, reporting, and monitoring mechanisms for GS implementation.

Although consumer-product firms are increasing encouraged by their stakeholders to consider the investment and implementation of GS, the implementation of GS could be a cost burden in the efforts of consumer-product firms to address environmental issues related to their tangible product and intangible service offerings (Montabon et al., 2007). Some prior studies also indicated that the implementation of GS might not improve organizational level environmental performance, as they may encourage product turnover by reducing amortization times, encourage poor usage or maintenance of the product, and provide customers with additional opportunities to consume material-intensive products (Meijkamp, 1998; Bartolomeo et al., 2003). For example, the provision of repair service for a product not only allows customers to save on costs otherwise used to purchase a new product, but also provides opportunities for customers to spend money on other material intensive products or consume them (Bartolomeo et al., 2003). Managers of consumer-product firms are uncertain about the environmental results, financial gains, and costs of their efforts in addressing environmental issues related to product and service offerings by implementing GS (Montabon et al., 2007). This uncertainty hinders the implementation of GS by consumer-product firms to respond to the growing stakeholder pressure to be environmentally responsible. This uncertainty may also explain the reason why some consumer-product firms have stopped the provision of GS offerings. Although prior studies have examined the performance impacts of GS practices, these are limited to case studies or anecdotal evidence. The limited empirical evidence on the relationship between GS implementation and organizational performance provides scant justification for consumer-product firms who are planning to take a step further to invest in GS to improve their environmental and business performances (Hume and Gallagher, 2010; Wong et al., 2013). By empirically examining the relationship between GS implementation and organizational performance, the empirical findings of this study provides managers with five reasons to invest in GS or implement GS in their firms by shedding light on the business value and environmental benefits of GS implementation. First, GS improves environmental performance by reducing emissions, consumption of resources, and waste from service activities, which enables consumer-product firms to cope with the growing pressure and expectations of stakeholders for environmentally responsible operations (Buysse and Verbeke, 2003; Wong et al., 2013). Second, the implementation of GS enables firms to have market performance gains through increased market share, higher markup, and improved economies of scale. Third, the implementation of GS enables firms to lower their cost structure by improving productivity and reducing material and resource consumption, while the costs of resources and materials are increasing (Lai et al., 2010). Fourth, the provision of GS, which adds value and meets the demands of customers, and manages customer involvement without compromising the quality of services, enable firms to better satisfy customers and differentiate from their competitors in today's competitive environment (Oliva and Kallenberg, 2003; Lusch et al., 2010). Fifth, GS, which involves the tacit skills of employees in servicing customers (e.g., introducing eco-products), resources to preempt competitors (e.g. take-back end-of-life products that enables firms to capture residual values of end-of-life products and gain an understanding of product usage patterns for future product development), and rare resources (e.g., shared vision across organizations), is valuable to firms in gaining sustainable cost and service advantages (Hart, 1995).

This study has identified that GS implementation is critical to the success of environmental protection, cost reduction, revenue growth, and better satisfying customers. In particular, it is possible that consumer-product firms to use related resources such as environmentally friendly resources, materials and machineries in their customer service provision to reduce pollution in service operations and life-cycle costs of products. Therefore, it is recommended that managers take environmentally friendly resources, materials and machineries into consideration when implementing GS. It is also recommended that they implement GS to add value, meet customer demands, and pursue production and service quality to increase customer satisfaction and hence customer loyalty to their firms. In particular, loyal customers are likely to repurchase in the future and even at a price premium, purchase more frequently and in greater volume, and purchase other products and services offered by the same firm, which are important for consumer-product firms to improve profitability (Reichheld and Sasser, 1990). In addition, better and longer term relationships enable firms to reduce costs by saving precious resources otherwise expended on handling and addressing returns, reworks, warranties and complaints, thus improving firm revenue (Anderson et al., 1997).

8.4 Limitations and future research

This study is subjected to a few limitations and they can serve as topics for future research. First, CSR and annual reports may be carefully vetted by organizations to put themselves in the best possible light, thus overstating the performance results of the environmental initiatives. Although the collection of secondary data from these sources provides an overview of GS implementation in the real-world, future studies should not underestimate the potential problems (Ginsberg and Bloom, 2004), and it is recommended that they consider the use of multiple sources of objective data to reduce the bias that might be induced by the reporting from corporate reports.

Second, the sample frame in the quantitative survey research component of this study focused on consumer-product firms in Hong Kong. Although this sample provides solid empirical grounds to understanding GS provision that takes into account products as well as services that create customer value, future studies may consider other industries such as the manufacturing industry to improve the generalizability of the findings. In particular, manufacturing firms increasingly extend and integrate their products with services that target to satisfy customers and establish barriers to entry (Oliva and Kallenberg, 2003; Schmenner, 2009). While this study focuses on GS that adds value and satisfies individual customers, manufacturing firms that serve business customers such as wholesalers and retailers may be considered in future research to improve the understanding of GS in a business-to-business context. Similarly, future studies may consider the online-retailing industry as the sample to improve the generalizability of the findings. In particular, consumer-product firms increasingly use online services (i.e., online payment and inquiry) to improve service quality that target to improve customer satisfaction (Balakrishnan and Geunes, 2004; Lee and Lin, 2005). While this study focuses on GS that satisfies consumers by taking into account quality issues such as physical aspects of the servicing locations, service reliability, problem solving capacity, interaction with customers and corporate policies, online consumer-product firms that provide online services and take into account issues such as contact interactivity, reliability, responsiveness, trust, and personalization (Srinivasan et al., 2002; Lee and Lin, 2005), can be considered in future research in an online business-to-consumer context. In addition, future studies may consider other countries such as Spain and Turkey to improve the generalizability of the findings. In particular, Spain may not be as culturally or politically sensitive to environmental issues as other countries such as Japan and Germany (Sarkis et al., 2010) or newly industrialized countries such as Brazil and China (Lai and Wong, 2012). Firms in less developed countries such as Turkey may be more concerned about economic growth and therefore disregard the environmental benefits of GS implementation (Bodur and Sarigöllü, 2005). Richer insights can be generated if future studies are conducted across different cultural and social settings, which will improve the generalizability of findings and help understand the influences of cultural and social contexts on the development of GS.

Third, there are broader organizational activities that can be leveraged for environmental management, such as total quality management (Kaynak, 2003) and strategic alliances with environmental non-governmental organizations (NGOs) (Stafford et al., 2000), which are potential areas that could influence the environmental and business performances of firms (Angell and Klassen, 1999). In particular, total quality management combined with environmental efforts can be adopted by firms to improve the efficiency of production, minimize waste, and reduce costs throughout the entire corporate system (Kaynak, 2003) by continuously improving every step of the operation process with a view to attaining total elimination of waste (Shrivastava, 1995). Strategic alliances with environmental NGOs to address environmental problems can be established by firms to improve operational efficiencies through the reducing of waste, and gain competitive advantages through environmentally friendly technologies and eco-products (Stafford et al., 2000). Although the validated GS measurement scale here covers service activities in various stages of the supply chain, organizational activities such as environmental NGO-business collaborations and total quality management may be considered in future research to advance the development of GS measurements. It is also worthwhile to examine how GS can be integrated with total quality management principles and strategic alliances with environmental NGOs to continuously improve quality in all aspects of the product life cycle to exceed market expectations, and collaborate with environmental NGOs to improve operational efficiencies, respectively. Answers to these questions will be helpful for consumer-product firms to reach ecological modernization goals that improve and balance environmental and business performances in their operations.

Fourth, the measurement items of business performance in terms of cost savings and organizational revenue employed in this study are subjective. Although the perceptual measures were assessed for potential biases inherently associated with the survey data, it is desirable to gauge objective performance measures such as stock equity returns (Klassen and McLaughlin, 1996) and return on investment in future studies (Montabon et al., 2007).

Fifth, this study aims to examine the impact of GS implementation on firm performance, especially environmental performance, revenue growth and cost savings. Therefore, this study focuses on including factors that have possible confounding impacts on the extent of GS activities implemented by firms and therefore environmental performance, revenue growth and cost saving as control variables. By reviewing the literature, firm size, stakeholder forces and regulatory forces were identified and included as control variables in this study. However, there are several factors that can affect other business performance such as stock equity returns and return on investment. For example, market conditions (e.g., Gupta, 1995; Aragon and Sharma, 2003), competition (e.g., Christmann, 2000; Bernauer and Caduff, 2004), and various costs (e.g., Bansal and Roth, 2000; Montabon et al., 2007) can potentially affect stock equity returns and return on investment. Future research may consider to include market conditions, competition, and various costs as control variables to control their confounding impacts on such business performance as stock equity returns and return on investment.

Sixth, this study has a cross-sectional research design in the quantitative survey research component. A cross-sectional research design lacks longitudinal insights on the proposed relationships amongst GS implementation, environmental performance, cost savings, revenue growth, and customer satisfaction and loyalty. A longitudinal research design and case studies are recommended for future research to advance the understanding of the mechanisms and conditions of GS implementation and provide evidence on the causal direction of GS implementation, environmental performance, cost savings, organizational revenue, and customer satisfaction and loyalty.

Seventh, this study focuses on investigating the consequences of the combined performance among three dimensions of GS implementation. Future research may consider the examining of the relative impacts of PP-GS, P-GS, and LTD-GS practices on performance outcomes such as environmental performance, cost savings, and revenue growth to advance the understanding of the performance implications of three dimensional GS implementation (Flynn et al., 1990; Germain and Iyer, 2006). The empirical validation of the relationships between GS implementation and other performance outcomes such as corporate reputation and employee satisfaction are also encouraged and are good avenues to extend this line of research. In particular, the sharing of up-to-date information on corporate environmental management practices and performances with stakeholders will enable firms to communicate corporate environmental goals and their underlying organizational capabilities to achieve corporate environmental goals, which may shape the perception of customers of their green reputation (Tang et al., 2012). The evaluation of the environmental performance of employees in GS gives firms the opportunity to provide feedback on their environmental performance, which can improve employee relations and satisfaction (Govindarajulu and Daily, 2004). Future research may consider the examining of the relationships among GS implementation, employee satisfaction, employee loyalty, and revenue growth to advance understanding on the nature of the relationship between GS implementation and performance. In particular, employee satisfaction and loyalty are prerequisites to reaping the benefits of improved firm performance (Heskett et al., 1997; Yee et al., 2009). Moreover, researchers in the service-profit chain literature have been recently paying increasing attention to bridging the gap between employee and customer loyalties (Yee et al., 2009). The postulation is that loyal employees envision a long tenure of employment, are willing to make discretionary efforts to contribute, and eager to take extra care of their customers for their employing organization. Such actions not only improve the efficiency and effectiveness of the delivery of their services, but also enhance the perception of the quality of the company's services, the satisfaction felt by customers, and customer loyalty. The latter, in turn, improves the profitability of the organization. Future research may consider the investigating of the relationships among employee satisfaction, employee and customer loyalties, and customer satisfaction, in the context of GS implementation to advance the service-profit chain literature.

Eighth, this study focuses on establishing links between GS implementation and performance outcomes, thus providing limited understanding on the antecedent factors of GS implementation. It is therefore worthwhile for future research to examine the institutional forces from different stakeholders that shape the environmental responses of consumer-product firms. Different types of stakeholder pressure, such as that from employee and customer, could result in significant motivation for consumer-product firms to adopt environmentally responsible operations (Buysse and Verbeke, 2003; Eesley and Lenox, 2006; Pun, 2006).

APPENDICES

Appendix I Phases of research for scale development and validation, and examination of the relationships between GS implementation and performance outcomes

Research phase 1: Conceptualization of GS practices

In Phase 1, GS practices were conceptualized to provide theoretical grounds for the subsequent categorization of GS activities by taking two steps. First, the scope of GS and practices that constitute GS were defined based on the NRBV. The environmental management, operations management, and service operations literature were also reviewed to identify the key organizational practices of GS. Second, the grounded theory (Glaser and Strauss, 1967) was followed, and qualitative exploratory research was carried out to contextually gain an understanding of organizational practices that constitute GS by interviewing managers of 8 consumer-products firms. GS practices were identified by counting the pieces of evidence that have common themes, including product-related, pollution prevention-related, and long-term development-related GS practices. Chapter 5 provided a detailed discussion on the data collection method and the results of the qualitative exploratory research. The case evidence was compared with the GS practices identified from the environmental management, operations management, and service operations literature to confirm the practices of GS for conceptualization of GS practices. Chapter 3 provided a detailed discussion on the practices of GS. The extensive literature reviews and interviews with practitioners tentatively established the content validity of the constructs of GS practices (Froehle and Roth, 2004). The structure, reliability, and validity of the constructs of GS practices were empirically examined in the research phases that followed.

Research phase 2: Measurement scale and item development

In Phase 2, sets of items that tap into the latent constructs of GS, environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty were generated. Multi-item scales were used to measure GS and organizational performance outcomes as they enable discriminating among fine degrees of an attribute and have fewer random measurement errors than the use of single-item scales (Churchill, 1976). Multi-item scales were developed to measure GS based on the conceptualization of GS practices and the results of the content analysis. Content analysis was used to collect and analyze secondary data from 30 corporate reports of Fortune 100 companies to identify real-life GS activities under the conceptualization of GS practices. GS activities that complement their respective GS practices were identified to develop GS measurements. Chapter 6 provided a detailed discussion of the data collection and results of the qualitative content analysis. On the other hand, existing scales were adopted from the environmental management, operations management, and marketing literature to measure environmental performance, revenue growth, cost savings, customer satisfaction, and customer loyalty. Chapter 7 provided a detailed discussion on the development of the scales and items for measuring GS and organizational performance outcomes.

Research phase 3: Measurement scale and item refinement

In Phase 3, the initial measurement scales and items for each construct based on the results of the pre-testing and pilot-testing were refined. The pre-testing and pilot-testing were helpful for improving the content validity of the measurement items and scales by improving the readability and clarity of the questions and removing invalid measures (i.e., those unlikely to be supported in a confirmatory factor analysis) (Froehle and Roth, 2004). Specifically, pre-testing was conducted to improve the readability and clarity of the questions, and wording and seminal meaning of individual measurement items (Froehle and Roth, 2004). In doing so, a convenience sample of operations management experts from the academia and the practitioners in the consumer-product industry was used to review the measurement scales and items, and they were asked to provide qualitative feedback on the measurement scales and items. Based on their feedback, the scales and items for each construct were modified by rewording items that showed promise, but were confusing to the respondents.

The pilot-testing of the measurement scales was conducted by carrying out the actual data collection process on a smaller scale to examine whether the measurement scales are applicable to real life situations. In doing so, a random sample of practitioners from the consumer-product industry was asked to fill out the survey questionnaire. The data collected from the survey were used to assess the reliability estimation. Reliability estimation by using Cronbach's alpha (Cronbach, 1951) and CITC were assessed to purify the measurement scales for each construct. The purifying of the measurement scales helps to ensure that each scale is as homogenous, and measure is as congeneric, as possible, which can enhance the convergent and discriminant validity of the latent constructs (Froehle and Roth, 2004).

Cronbach's alpha was computed by SPSS 21.0, which is one of the most widely used metrics for reliability evaluation (Koufteros, 1999). Cronbach's alpha reliability is positively related to individual item reliability and the number of items that form a particular scale. As the average correlation among items increase and the number of items increase, the value of the alpha increases. A Cronbach's alpha coefficient of construct that is greater than the threshold value of 0.70 suggests a reasonable degree of internal consistency between the corresponding measurement items (Nunally, 1984). Only measurement scales below the threshold value of 0.70 were revised.

Then, CITC analysis was conducted, which is useful for assessing how highly all of the measurement items are correlated if they belong to the same domain of concept (Churchill, 1976). If all the items in a measure are drawn from the domain of a single construct, responses to those items should be highly intercorrelated. Items from a given scale that exhibit CITCs less than 0.50 were eliminated. Since the item that is being eliminated was found to be inconsistent with other meanings associated with any given construct, its retention would reduce the expected level of discriminant validity of the scale (Pedhazur and Schmelkin, 2013). The finalized measurement scales and items were subsequently used in a mass survey research.

Research phase 4: Validation of measurement scales, structural modeling, and hypothesis testing

In Phase 4, a large quantitative survey research was conducted to collect primary data to statistically validate the measurement scales of GS and organizational performance outcomes, and test the hypotheses. Bias issues were also addressed. Specifically, extrapolation method is used and t-test testing is conducted to test for potential non-response bias. Harman's one-factor, chi-square difference, and t-test testing are carried out, within-group interrater reliability is assessed, and the marker variable technique is used to test for potential common method variance. Chapter 7 provided a detailed discussion of the data collection and results of the quantitative survey research. A series of assessments were conducted to examine the structure, reliability, and validity of the measurement scales of GS and organizational performance outcomes prior to testing for a significant relationship in the structural model, which can avoid erroneous conclusions in hypothesis testing with regards to the existence, magnitude, and direction of association between constructs caused by scales that exhibit poor psychometric properties.

Unidimensionality is an essential property of measurement (Segars, 1997), which shows that a single trait or construct underlies a set of measured items. Two methods for assessing the unidimensionality of constructs are: the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Gerbing and Anderson, 1988; O'Leary-Kelly and Vokurka, 1998; Koufteros, 1999). Prior studies have widely discussed the advantages and limitations of using the EFA and CFA to assess the unidimensionality of constructs (Vokurka and Lummus, 2003). In this study, the undimensionality of constructs were assessed by using the CFA as this method has the ability to test measurement scales for evidence of convergent and discriminant validity (O'Leary-Kelly and Vokurka, 1998; Froehle and Roth, 2004; Pedhazur and Schmelkin, 2013) by examining the factor loadings of latent constructs on the indicators. The CFA was performed by using AMOS 21.0. By following the guidelines of Gerbing and Anderson (1988) and suggestion by O'Leary-Kelly and Vokurka (1998), the maximum likelihood (ML) estimation was used with the covariance. The ML estimation assumes that the observed variables follow a multivariate normal distribution (Beauducel and Herzberg, 2006). This procedure allows for a global adjustment of the proposed models over diverse statistics which were corrected for non-normality assumptions (Sarkis et al., 2010). The χ^2 goodness-of-fit statistic was used to assess the undimensionality of constructs (Koufteros, 1999) and test the overall fit of a hypothesized model. This χ^2 measure of fit is a function of how well the model meets both conditions for unidimensionality. The χ^2 with a *p*-value greater than the minimum threshold of 0.05 provides evidence of the adequate fit of the overall model (Bagozzi and Yi, 1988). The ratio of χ^2 to degree of freedom was also used to assess model adequacy (Koufteros, 1999), which provides information on the relative efficiency of competing models in accounting for the data. A ratio less than 2 indicates a good fit of the model (Koufteros, 1999). In addition, increment fit indices (e.g., comparative fit index (CFI), incremental fit index (IFI), and normed fit index (NFI)) and absolute fit indices (e.g., root mean square error of approximation (RMSEA) and root mean square residual (RMR)) were used to evaluate the model fit (Kassinis and Soteriou, 2003). A value of the CFI, IFI and NFI indices greater than 0.90 suggests that the model has adequate fit. These critical values indicate that one expects any model that adequately explain the variances and covariances in the observed data to reflect at least a 90 percent improvement over the null model. The RMSEA is the value of the discrepancy per degree of freedom. A value of about 0.08 or less would indicate a reasonable error of approximation (Steiger, 1990). The RMR is the square root of the average squared amount by which the sample variances and covariance differ from their estimates obtained under the assumption that the model in this study is correct. An RMR value of zero indicates a perfect fit (Hu and Bentler, 1999). Per Hu and Bentler (1999), the criteria of the goodness-of-fit indices used for evaluating the fit of the structure of the CFA in this study are: CFI > 0.90, RMSEA < 0.08, RMR < 0.1, IFI > 0.9, and NFI > 0.9. If all the fit indices are well within acceptable limits, they provide strong evidence of model fit and consequently, internal and external consistency.

Reliability is defined as the extent to which measurements are repeatable and that any random influence which tends to make measurements different from occasion to occasion is a source of measurement error (Nunnally, 1978). Four methods for empirically assessing reliability are (O'Leary-Kelly and Vokurka, 1998): the test-retest, alternative forms, Cronbach's alpha coefficient (Cronbach, 1951), and Werts, Linn and Jöreskog (WLJ) composite reliability (Werts et al., 1974) methods. In this study, the reliability of the scale was assessed by using the Cronbach's alpha coefficient and the WLJ composite reliability methods for two reasons. First, unlike the test-retested and alternative forms methods, both the Cronbach's alpha coefficient and the WLJ composite reliability methods are based on much less restrictive assumptions (Pedhazur and Schmelkin, 2013). Cronbach's alpha coefficient is based on the less restrictive assumption that the true-scores are identical across different indicators (Bollen, 1989). The WLJ composite reliability method is based on the least restrictive assumption that the true scores of the indicators are perfectly correlated, but error variances and true scores may be unequal (O'Leary-Kelly and Vokurka, 1998). Second, both methods require only a single sample. This makes them easier to implement than the test-retest or alternative forms method, and virtually eliminates the possibilities of carry-over effects (Bollen, 1989). Specifically, Cronbach's alpha coefficient computed by SPSS 21.0 is used to assess the degree of internal consistency of scores from a set of indicators (Carmines and Zeller, 1979; Pedhazur and Schmelkin, 2013). Internal consistency refers to the degree of interrelatedness among items (Cortina, 1993). A reasonable degree of internal consistency between corresponding measurement items is suggested if the Cronbach's alpha coefficient of construct is greater than the threshold value of 0.70 as recommended by Nunnally (1978). Composite reliability represents the shared variance among a set of observed variables that measures the reliability of an underlying construct (Fornell and Larcker, 1978). The CFA was used to derive the composite reliability coefficient, which is based on the proportion of variance attributable to only the latent variable (i.e., excluding measurement errors) (Werts et al., 1974; O'Leary-Kelly and Vokurka, 1998). The composite reliability coefficient of a construct that is greater than the recommended threshold value of 0.70 suggests internal consistency for each set of observed variables in its respective latent construct (Fornell and Larcker, 1981; O'Leary-Kelly and Vokurka, 1998).

The validity of a measure is the degree to which the variance in the measure is attributed to variations in the variable and not some other factors (e.g., method variance). While convergent validity pertains to the degree to which multiple methods of measuring a variable provide the same results, discriminant validity pertains to the degree to which measures of different latent variables are unique.

Two methods for assessing convergent and discriminant validity are: the multitrait-multimethod matrix (MTMM) and the CFA (Campbell and Fiske, 1959; Bagozzi et al., 1991; Pedhazur and Schmelkin, 2013). In this study, the CFA is used to assess the convergent and discriminant validity of constructs for three reasons. First, the CFA provides direct means to assess the degree to which convergent and discriminant validity is achieved (Bagozzi and Phillips, 1982; Bagozzi et al., 1991) by examining the size and significance of factor loadings and the χ^2 goodness-of-fit of the overall model (O'Leary-Kelly and Vokurka, 1998). Second, the CFA enables method factors to influence the measures of the traits to varying degrees (Bagozzi and Phillips, 1982; Bagozzi et al., 1991). It does not require the strict assumption that the equal method factor has influence across all variables. It is likely that the method factors influence the measures of constructs to varying degrees. Third, the CFA provides information that allows the variance to be partitioned into construct, method, and error components (squared trait and method factor loading and error variance) (Bagozzi and Phillips, 1982; Bagozzi et al., 1991). Per O'Leary-Kelly and Vokurka (1998), the convergent validity of each measurement scale was evaluated by conducting CFA by using the ML approach. If all of the indicators in their respective constructs have statistically significant ($p < 0.05$) factor loadings, this suggests convergent validity of the theoretical constructs (Anderson and Gerbing, 1992). Per Fornell and Larcker (1981), the average variance extracted (AVE) of each construct was calculated to assess the convergent validity of the theoretical constructs. The AVE measures the amount of variance for specified indicators accounted for by the latent construct. If the AVE of each construct exceeds the recommended minimum value of 0.5, this suggests adequate convergent validity (Fornell and Lacker, 1981). In addition, per Fornell and Larcker (1981), the square root of the AVE of each construct was calculated, and compared with the correlation between that construct and all other constructs. If the square root of the AVE of the construct is greater than the correlation between that construct and all other constructs, this suggests that the relationship between the measurement items of their respective construct is greater than the relationship of the measurement items across all constructs, thus providing evidence of discriminant validity (Fornell and Larcker, 1981).

The GS construct was tested to determine if it should be a more parsimonious measure as a third-order level construct which consists of three dimensions (i.e., PP-GS, P-GS, and LTD-GS practices), and nine sub-dimensions (i.e., store related, logistics, promotion, procurement, product design and development, after-sale, information system-related, human resource, and corporate policy-related activities). By following the suggestion put forth by Tanriverdi (2006), multiple goodness-of fit indices were used to evaluate the fit of the first-order, second-order, and third-order models. The first-order, second-order, and third-model fits were tested to determine if they can be considered as acceptable on the basis of the fit indices, which include the CFI (>0.9), IFI (>0.9), RMSEA (<0.08), RMR (<0.1) and NFI (> 0.9), as recommended by Hu and Bentler (1999). Per Tanriverdi (2006), two tests were also conducted to compare the first-order, second-order, and third-order models. First, the target coefficients T were computed to examine the extent to which the second-order constructs account for the variance of the first-order constructs (Marsh and Hocevar, 1984). The T value was computed by using the following formula: $T = \chi^2$ (first-order model)/ χ^2 (second-order model). If the T value is close to the theoretical upper limit of 1.0, this indicates that the relationships amongst the first-order constructs are sufficiently captured by the second-order constructs (Marsh and Hocevar, 1984). Likewise, the target coefficient T was computed to examine the extent to which the third-order construct (i.e., GS) accounts for the variance of the second-order constructs. If the T value is close to the theoretical upper limit of 1.0, this indicates that the relationships amongst the second-order constructs are sufficiently captured by the third-order construct (Marsh and Hocevar, 1984). Second, the significances of the path coefficients between the measurement items and their respective first-order constructs, between the first- and second-order constructs, and between the second- and third-order construct were also examined. If all of the measurement items significantly load onto the first-order constructs at $p < 0.05$, this provides support for the presence of the first-order model. If all of the first-order constructs significantly load onto the second-order constructs at $p < 0.05$, this provides support for the presence of the second-order model. Likewise, if all of the second-order constructs significantly load onto the third-order constructs at $p < 0.05$, this provides support for the presence of the third-order model.

A model based on structural equation modeling (SEM) which includes the relationships among GS and organizational performance outcomes is established to test the hypotheses developed in this study. SEM (Jöreskog, 1970) is a methodology that enables a series of observable variables or items to be directly or indirectly related to latent variables or factors (Hays et al., 1994) to investigate the plausibility of theoretical models that might explain the interrelationships among a set of variables (Kassinis and Soteriou, 2003). The model based on SEM is tested by using CFA with path analysis by AMOS 21.0 in this study. ML estimation with a sample covariance matrix was used as input in AMOS 21.0. The CFA was used to assess the goodness-of-fit of the model based on SEM. An χ^2 with a *p*-value greater than the minimum threshold of 0.05 (Bagozzi and Yi, 1988; Bentler, 1995) provides evidence of the model fit. A normed chi-square that falls within the recommended value (χ^2/d.f. < 2) (Koufteros, 1999) provides conditional support of model parsimony. Moreover, absolute and incremental fit indices were used to assess the goodness-of-fit of the model. If all of the absolute and incremental fit indices exceed the criteria recommended by Hu and Bentler (1999) (i.e., CFI > 0.90, RMSEA < 0.08, RMR < 0.1, IFI > 0.9, and NFI > 0.9), this lends sufficient support that the results acceptably represent the hypothesized relationships. Path analysis was used to assess the parameter estimates, as well as examine the direct and indirect effects of GS on organizational performance outcomes. If GS is found to be significantly and positively associated with environmental performance, revenue growth, cost savings, and customer satisfaction, these findings lend support to Hypotheses 1 – 4. If customer satisfaction was found to be significantly and positively associated with customer loyalty, and customer loyalty was found to be significantly and positively associated with revenue, these lend support to Hypotheses 5 – 6.

Post hoc testing was also conducted to test the existence of a mediating effect of customer satisfaction on the relationship between GS and customer loyalty, and the existence of a mediating effect of customer loyalty on the relationship between GS and revenue growth. Mediation testing can be conducted by using correlation statistics, various methods of regression, and hierarchical regression (Ho et al., 2001; da Silveria and Arkader, 2007), which can be summarized into three approaches: namely, causal steps, difference in coefficients, and product of coefficients (e.g., Sobel's approach) (MacKinnon et al., 2000; Holbert and Stephenson, 2003). Prior studies have provided an overview of both simple and multiple mediation processes and explicated the similarities and differences between the techniques utilized to assess meditational effects. By following the three-step guidelines as suggested by Baron and Kenny (1986) and MacKinnon et al. (2000), the causal step approach was used to test for the existence of a mediating effect of customer satisfaction on the relationship between GS and customer loyalty. First, it was examined whether GS affects customer satisfaction. Second, it was examined whether GS affects customer loyalty. Third, it was examined whether customer satisfaction affects customer loyalty with the control of the relationship between GS and customer satisfaction, as well as the relationship between customer satisfaction and customer loyalty. If the previously significant relationship between GS and customer loyalty is no longer significant, this lends support to the fact that customer satisfaction mediates the relationship between GS and customer loyalty.

Similarly, the existence of a mediating effect of customer loyalty on the relationship between customer satisfaction and revenue growth was examined in three steps. First, it was examined whether customer satisfaction influences customer loyalty. Second, it was examined whether customer satisfaction affects revenue growth. Third, it was tested whether customer loyalty affects revenue growth with the control of the relationship between customer satisfaction and customer loyalty, as well as the relationship between customer loyalty and revenue growth. If the previously significant relationship of customer satisfaction with revenue growth is no longer significant, this lends support to the fact that customer loyalty mediates the relationship between customer satisfaction and revenue growth.

Appendix II Field reports of interviews in exploratory qualitative research

Field report of interview with manager of Consumer-product Firm A

Table B.1: Characteristics of Firm A	
Position of respondent	Manager of Operations Management Department
Respondent's years of service (years)	10 – 14
Ownership of the firm	Privately-owned
Number of employees	101 – 500
Consumer product type	Radio, television, and consumer electronics
Number of years that the firm has adopted environmental management practices	5 – 9

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

We recognize that vehicles used to transport deliveries to and from our production plants have a huge environmental impact. We minimized the environmental impact caused by these vehicles by optimizing our logistics systems and using low emission transportation modes, such as rail and ship transport. We have also reduced the number of vehicles required to ship our products by eliminating the use of pallets and loading to fill all of the available space during our trailer loading processes to load more cartons onto a trailer. These practices have enabled us to significantly reduce operation costs and conserve natural resources. We have saved over HK$1 million and reduced the miles traveled by more than 20,000 in 2011. In servicing locations, we have included sustainable design features, such as the use of renewable building materials and natural light, and energy-efficient lighting systems, to create a comfortable and productive workplace for employees and improve the appearance our facilities while reducing operation costs. For example, harvesting natural light through a pattern of skylights in our stores enables us to provide light from outside to enhance the shopping experience of our customers while reducing the energy consumption in our stores. The application of energy-efficient lighting systems in our stores, as another example, enables us to use 25 percent less energy than fluorescent lights each year. We have also put efforts into spreading awareness of climate change among our customers and the public, and helping local communities to achieve sustainable development through various promotion activities, such as hands-on environmental seminars and product exchange events. We believe that raising consumer awareness and making energy-smart products are equally important to tackling climate change.

Moreover, we believe that the benefits of sustainable materials will have a global impact. As part of our sustainable materials strategy, we have incorporated sustainable materials where they meet performance requirements into our global materials specifications. For example, recycled material specifications were included into the same document that houses our virgin material specifications. This practice enables us to simplify the monitoring of the use of recycled content in our products, and to ensure that our suppliers are confident in the performance of the recycled materials through a direct comparison with an equivalent virgin material. In addition, we listened to our customers and developed innovative products for energy-efficiency. We are actively working with our suppliers to bring more energy-efficient products into the market, and helping customers to save energy and money. We also provide product repair, refurbishment and recycling services to extend the life-cycle of our products, and reduce the environmental impacts associated with product disposal and new product production. For example, our electronic products will be refurbished and returned for use when possible, or will be recycled if reuse of the electronic products is not feasible.

Q: What organizational infrastructures are important to supporting GS provision?

We believe that progress with the environmental protection activities of the company is only possible if all of the employees contribute to the effort. This is why we organize training programs, which focus on the practical application of environmental protection activities at the company and address questions that concern environmental responsibility, for all levels of employees, from front line to management. Every individual employee is obligated to ensure that his or her daily behavior on the job complies with the corporate environmental standards. We have also cultivated a culture that promotes employee pride and well-being, fosters integrity, and supports social and environmental responsibility. We also believe that corporate environmental policies are important to reinforcing our commitment to environmental protection, and providing us with a standardized and streamlined approach to maintain compliance with all environmental regulations. Furthermore, information systems used to track the progress of environmental protection practices are important for our senior management team in reviewing corporate environmental protection performance, approving corporate environmental policies, and reviewing the effectiveness of our environmental protection initiatives and results.

Field report of interview with manager of Consumer-product Firm B

Table B.2: Characteristics of Firm B	
Position of respondent	Manager of Operations Management Department
Respondent's years of service (years)	15 – 19
Ownership of the firm	Privately-owned
Number of employees	51 – 100
Consumer product type	Building materials, hardware, and garden supplies
Number of years that the firm has adopted environmental management practices	10 – 14

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

We feel that the most significant way that we can positively impact the environment is by offering conservation-minded and environmentally friendly products that are readily available to our customers. To do so, we innovate our products and packaging to enable more efficient consumer product use and resource consumption. We consult with customers to make sure that our products are developed in line with their usage, and to deepen our understanding on the different ways of using products which can affect people and the environment. Apart from consulting with customers, we work with our suppliers to shift more than 90 percent of our lauan wood to wood certified by the Forest-Stewardship Council or other sustainable sources for producing wood products. We have also established an evaluation process for suppliers who make environmental marketing claims on product labels. Moreover, all of our end-of-life products are refurbished, broken down and recycled, and marketed for reuse to reduce waste. We hope to make it easy for our customers to recycle end-of-life products in our community. Therefore, we often offer rechargeable battery, cardboard, and compact fluorescent lamp recycling events at our stores. In 2011, 60,000 lbs of rechargeable batteries and 5,000 tons of cardboard were collected from our customers for recycling, thus reducing waste and landfill problems in Hong Kong.

The reduction of greenhouse gas emissions in the transporting of products is one of our goals. We seek ways to plan routes more efficiently, create multi-commodity deliveries, and eliminate multi-stops to reduce emissions. For example, a logistics optimization program is implemented to more seamlessly manage the movement of our raw and packed materials, as well as finished products, through the supply chain. We are also concerned about the waste from activities in store operations. We seek opportunities to reduce resource consumption, improve the efficiency of our store operations, and conserve natural resources by using energy and water wisely. For example, energy-saving technologies, such as advanced control of air compressors, and high-efficiency lights, and variable-drive electric motors, have been installed in our servicing locations to conserve energy. In addition, we have undertaken activities to raise internal and external awareness of the importance of conserving natural resources and how the company is addressing this issue. For example, we have launched exhibitions and seminars to raise the awareness of water-related issues with our consumers with the aim of sustainability in the use of water. We have also promoted environmental responsibility by educating consumers on ways to save water and energy at home.

Q: What organizational infrastructures are important to support the GS provision?

Workshops and training are necessary to support the different aspects of our sustainability goals. We provide employees with various workshops and training, including ISO14001, workplace standards, and training on our corporate vision and values. We also produce and distribute leaflets and banners to educate employees on the corporate environmental sustainability goals and the importance of recycling, generate excitement, and explain the recycling program of our firm. Environmental policies are also developed that require all employees to comply with environmental laws, corporate environmental standards, and other corporate commitments related to environmental protection. Last but not least, database, metrics, and key performance indicators are important to us in auditing and monitoring the progress and performance of our environmental protection initiatives.

Field report of interview with manager of Consumer-product Firm C

Table B.3: Characteristics of Firm C	
Position of respondent	Chairman
Respondent's years of service (years)	≥ 20
Ownership of the firm	Privately-owned
Number of employees	51 – 100
Consumer product type	Radio, television, and consumer electronics
Number of years that the firm has adopted environmental management practices	5 – 9

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: We are concerned about reducing pollution, emissions, and effluents induced in our operations. Therefore, we have incorporated green design features and installed solar water heating systems in our servicing locations. Our energy management program, which includes the installation of solar water heating systems, also helps to reduce energy consumption by 4.4 percent each year. We have different programs to raise customer awareness of the importance of reducing plastic shopping bag consumption to reduce waste in our operations. In our logistics operations, we have improved the fuel efficiency of product transport and reduced emissions by moving shipping containers from manufacturing plants by trucks, and then transferring to more efficient and cost effective rail or barge transport for longer distances, and finally shifting back to trucks for the final delivery. The use of low-emission transportation modes, such as rail transport, enables our firm to reduce greenhouse gas emissions and costs from improvements in fuel efficiency.

Moreover, we are concerned about the environmental impact of our products. We have environmental guidelines to procure raw materials and products to reduce environmental impacts, while maintaining continuity of supply and managing costs. More than 30 green criteria are incorporated into our purchasing guidelines, which provide our procurement department with a framework to evaluate the sustainability initiatives of suppliers. We have also made significant investments in developing products with minimum environmental impacts. Our product development teams work to improve the environmental performance of our products by using life-cycle management. Attributes across the product's entire lifecycle, from raw materials, manufacturing, product design, customer use, to disposal, will be considered. The products included in our catalog are able to help customers to reduce their environmental footprint, reduce waste via reuse, recyclability and compostability, and reduce their energy use. We also address the environmental impacts of our end-of-life products. When our customers return products that contain batteries to us, we send the batteries to a recycler whenever feasible or provide services for environmentally responsible disposal.

Q: What organizational infrastructures are important to support the GS provision?

A: We would say information systems are the most important infrastructure to supporting our GS provision as they allow us to measure progress and record the performance of the implementation of environmental management practices and communicate improvement in our environmental performances to our stakeholders. For example, we have implemented a product stewardship software application to manage environmental and other information related to new and existing products. This includes information about product material content, which enables us to evaluate compliance to environmental regulations. Moreover, this system is interfaced with our information systems of our suppliers, which allows us to better understand, manage, and optimize product environmental performances and meet customer needs. Moreover, corporate environmental policies are also important in supporting our GS provision. For example, the environmental policies in our warehouses encourage employees to use zero-emission material handling equipment, and reuse, reduce, and recycle material handling equipment or resources whenever possible. We also seek to earn the public's trust and to be recognized as the leader in environmental performance through our corporate environmental policies. In addition, human resource management efforts in cultivating a corporate culture of environmental protection are also important in supporting our GS provision. Training is provided to help our employees understand their responsibilities in environmental protection, and the resources available to them for implementing environmental protection initiatives. The provision of education on environmental issues enables us to achieve corporate sustainability goals. We also foster and encourage passionate employees to create "Green Teams", and integrate sustainability into their work and their workplace. In sum, target-setting, data collection, training, employee appraisals and surveys are important to ensure that our firm lives up to our guiding principles of environmental protection.

Field report of interview with manager of Consumer-product Firm D

Table B.4: Characteristics of Firm D	
Position of respondent	CEO
Respondent's years of service (years)	10 – 14
Ownership of the firm	Privately-owned
Number of employees	11 – 50
Consumer product type	Sporting goods
Number of years that the firm has adopted environmental management practices	2 – 4

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: We have allocated funds and resources for environmental conservation projects and efficiency improvement projects aimed to reduce the environmental impacts of our operations in the past few years. These projects include the promotion of a wide range of environmental conservation activities, such as desertification prevention, reforestation, and protection of rare species. These projects also include the installation of more efficient lighting and smart system controls, and ventilation, air conditioning and heat recovery improvements in our stores. We introduced a retrofit solution for existing stores that converts three-bulb or four-bulb fixtures into two-bulb fixtures in 2010 to conserve energy. The application of energy-efficient light fixtures on the sales floor enables us to reduce energy costs by approximately 10 percent each year. We believe that our approach to energy management through energy efficiency and efficient green store designs has built a strong and sustainable approach in using energy in an economical and environmentally conscious manner. Today, we are concentrating our efforts to green our supply chain on minimizing transportation-related emissions. In transport, efficiency efforts could have big impacts. We believe that advanced biofuels combined with several promising vehicles, combustion engines, and power-train technologies, including hybridization, offer the quickest and most effective pathway to a secure, low-carbon future. Therefore, we are now piloting electric-diesel hybrid trucks in our fleets to assess the economic impact and potential emissions reductions. We also aim to reduce the number of empty miles driven each year through a combination of network reengineering and increasing backhauls and fronthauls. For example, we load trailers that are travelling back to our distribution centers with salvaged store returns and products to reduce empty miles.

Our packaging programs also help to reduce transportation-related emissions by reducing the volume and weight of our product shipments through innovative packaging design. Our packaging engineers design solutions that minimize packaging waste by keep packaging to a minimum, while continuing to provide protection to the product being shipped to our stores. Moreover, we are also working with suppliers to reuse recycled and recyclable materials and promote reuse and recycling. Product packaging recycling programs are also offered to our customers. Product packaging materials received through our recycling program are broken down for recycling.

Q: What organizational infrastructures are important to support the GS provision?

A: We have reduced energy use by 49 percent and greenhouse gas emissions by 49 percent. Achieving our new goal of a 50 percent reduction in both our energy use and greenhouse gas emissions will require the participation of all employees and a continued focused on innovation. Employee education therefore is important for us to raise awareness of our sustainability commitment and expectations of employees. Employee education is also important for us to reinforce the concept of environmental sustainability. Information technology is important for us to track and expand our efficiency projects with the goals of energy consumption and greenhouse gas emissions reductions. Corporate policy is important for us to appropriately respond to our environmental responsibilities and the public interest in the conduct of our business, including activities related to the improvement of the environment and community relations.

Field report of interview with manager of Consumer-product Firm E

Table B.5: Characteristics of Firm E	
Position of respondent	Director
Respondent's years of service (years)	10 – 14
Ownership of the firm	Privately-owned
Number of employees	101 – 500
Consumer product type	Apparel and other finished products made from fabric and similar products
Number of years that the firm has adopted environmental management practices	5 – 9

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: Operating our own facilities in a green manner is important. We strive to deliver products and services efficiently, while minimizing our environmental footprint. To do so, our stores are using LED lighting, energy-efficiency cold chests, and motion sensors in many of our service departments to reduce energy consumption. These sensors turn lights on when a customer approaches an aisle, while shutting them off when the aisle is empty. We also have initiatives to ensure sustainable water use in our operations. This commitment includes water reduction goals and the use of water-efficient technologies. We also seek innovative ways to reduce water use by our consumers as well as educate them about the opportunities to save water. These will positively impact the cost of water to our firm, our consumers, and the communities in which we operate. The application of energy- and water-saving technologies enables us to reduce energy consumption by 10 percent and water consumption by 20 percent. Moreover, we are working to reduce greenhouse gases and other emissions from our facilities and vehicles by developing cleaner and more energy-efficient product distribution processes, improving the efficiency of our packaging and transportation logistics, and applying cleaner and more fuel-efficient vehicles for product distribution.

Besides those, we are helping our customers to save energy, water, and money by providing them with product choices that can reduce impacts on the natural environment. To do so, we are increasingly integrating sustainability considerations into our product development, from product planning throughout the product life-cycle. Our research and product development operations work with environmental specialists to ensure that new products meet robust environmental design principles, comply with environmental regulations, and satisfy customer requirements. For example, we avoid hazardous substances whenever possible, minimize resource use, and enhance opportunities for product recovery, reuse, and recycling when appropriate. As part of our product end-of-life management, we have begun to offer product take-back and recycling programs to facilitate end-of-life products to be reused and recycled, while reducing waste going to landfills. For example, we have recycling stations in all of our stores for consumers to join in on our product end-of-life management. Meanwhile, we look for opportunities to partner with recycling firms to test the economic and logistical feasibilities of more efficient management of waste generated from our products.

Q: What organizational infrastructures are important to support the GS provision?

A: To achieve the goal of environmental sustainability, managers and employees need to understand what both the law and the company require of them, as well as have the knowledge and tools to succeed. Our competency standard for employees with environmental responsibilities outlines the competencies needed at our operations. Relevant and measurable sustainability goals are also included in all business plans and communicated to employees. Information systems are also important for us to communicate our goals of environmental sustainability and share information about the sustainability programs of the firm with our employees.

Field report of interview with manager of Consumer-product Firm F

Table B.6: Characteristics of Firm F	
Position of respondent	Manager of Operations Management Department
Respondent's years of service (years)	2 – 4
Ownership of the firm	Privately-owned
Number of employees	101 – 500
Consumer product type	General merchandise
Number of years that the firm has adopted environmental management practices	10 – 14

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: We have optimized our efficiency in the logistics stage of the supply chain by making changes to rates, routes, modes and methods of transport. Specifically, we have implemented network enhancements, used modes of transport with low emissions, and optimized routes to reduce greenhouse gas emissions from product transport. Where possible, we source products from local suppliers to reduce impacts on the environment by reducing transportation and minimizing handling. These initiatives enable us to achieve a reduction of 10,000 tons of emissions each year. We are now striving to design our facilities and conduct our store operations to avoid adverse impacts to human health and operate in an environmentally sound, reliable, and efficient manner by streamlining operations, consolidating space and facilities, and installing solar water heating systems in our stores. Besides that, we believe that community based environmental education is essential to helping people understand environmental issues and making informed choices. Therefore, we have different projects and marketing activities to inspire behaviors of environmental citizenship and stewardship, educate communities on environmental issues, and provide environmental education programs for teachers and students that develop critical thinking skills and improve environmental literacy.

Moreover, consumers are increasingly seeking out products with a positive environmental benefit, or avoiding those perceived as having a negative impact on the natural environment. One of our ultimate goals is to procure all raw materials and products from sustainable sources. To do so, we have implemented a number of sustainable purchasing initiatives, such as the establishment of clear environmental expectations for our suppliers to catalyze improved environmental performance. Full materials declarations are used to improve our eco-design processes by enabling us to select substances and components that have lower impacts on the environment or are easier to recycle. We have also introduced innovative materials that reduce our footprint and greenhouse gas emissions by reducing the size of the packaging, allowing more shipping with fewer materials and smaller boxes. In addition, we continue to increase the number of partnerships with customers in which we recover and recycle packaging, and reduce landfill waste generated from our operations.

We have long recognized that initiatives beneficial to the environment are beneficial to our business, as well. Eliminating waste, conserving energy, water and other natural resources, and driving operating efficiencies have reduced our operation costs and improved our bottom line. At the same time, these initiatives help reduce emissions into the air, land and water, and contribute to a cleaner environment.

Q: What organizational infrastructures are important to support the GS provision?

A: The provision of employee education is important for us to ensure employees have the awareness, skills, and knowledge to achieve our sustainability goal. Therefore, we offer more than 100 online-learning programs that cover topics such as environmentally responsible products and services, eco-labeling and environmental protection initiatives, to our employees. Across businesses, teams have embraced the targets and integrated sustainability into their daily work. For example, the chief designer sets target and achievement scenarios for each aspect of environmental performance in the product planning and development stage, and track the status of the target attainment throughout the development process, thus enabling progress toward achieving the targets. Corporate environmental policies are also important to provide direction to our long-term environmental sustainability programs. The provision of incentives to engage all employees in our sustainability initiatives is useful to carrying out our corporate environmental policies. We have a variety of monetary and non-monetary awards to show appreciation for exceptional sustainable contributions to our firm. As we commit to continuous improvement in environment, information systems are important to us to measure progress and communicate results. Our trained auditors utilize information systems and databases to track our environmental performance progress and assess our environmental performance to ensure that we comply with environmental regulations and conduct operations responsibly.

Field report of interview with manager of Consumer-product Firm G

Table B.7: Characteristics of Firm G	
Position of respondent	Manager of Operations Management Department
Respondent's years of service (years)	5 – 9
Ownership of the firm	Privately-owned
Number of employees	101 – 500
Consumer product type	Apparel and other finished products made from fabric and similar products
Number of years that the firm has adopted environmental management practices	10 – 14

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: We go green by addressing energy and water conservation, resource conservation, sustainable food and product choices, and recycling and reducing waste. Specifically, we have upgraded to energy-efficient lighting and more efficient heating and cooling systems in our stores. For example, LED systems that use less power than conventional lighting systems have been installed in our stores. Likewise, we have upgraded to specialized water systems, improved our cleaning processes, used steam in place of water, and improved controls on building process equipment to reduce water consumption. In logistics operations, we have worked with logistics service providers to ensure that trucks are at maximum load capacity to reduce the number of trucks and fuel consumption. We have also reduced the environmental impacts of our packaging through redesign, reuse, increased recyclability and use of recycled content, and increasing the use of cube utilization. These enable us to reduce the energy used in processing packaging materials, costs and emissions from transport, and storage and disposal space requirements. One of our ultimate goals is to reduce waste at the source through consumer education. To do so, we have consumer education programs to educate consumers on how they can make informed environmental choices, and activities to promote sustainable consumption. In addition, we include in each of our weekly circulars, products that are better for the environment, which help us to remind our customers that they can make sustainable purchasing decisions in daily life. In the future, we will proactively develop more activities to assist our customers in addressing environmental issues related to their use of our products.

Besides that, we also encourage the development of new products that help our customers to address environmental challenges. We use life-cycle assessment to evaluate hundreds of material and process flows, across life-cycle stages from material extraction, manufacturing, and transport to product use, and end-of-life management. This enables us to understand the complexity of product environmental impacts and consider extensive environmental issues, such as potential greenhouse gas emissions and natural resource depletion. The life-cycle assessment analyses used to improve our product designs and processes are helpful to improving the material yield and lowering the energy and water use over time in our manufacturing processes. We also have material specifications for recycled content textiles and are working on specifications for renewable materials. These specifications make it easier for our designers to choose sustainable material options. Moreover, we continue to promote recycling as a preferred alternative to disposal. We have take-back programs to provide channels for obsolete apparel products and hangers to be reused and recycled. Consumers can return obsolete apparel products and hangers to us in our stores for recycling. We also collect plastic bags and recycle them into other products such as plastic landscape bricks, plastic lumber and other plastic bags.

Q: What organizational infrastructures are important to support the GS provision?

A: Employee awareness and training are at the core of our corporate goal to become a leader in environmental management. We provide guidelines and training to both new and experienced employees. Employees are required to complete at least 20 hours of annual environmental protection training. The manager of each division is responsible for ensuring that employees have sufficient training and resources to carry out their environmental responsibilities and achieve specific sustainability goals. Information systems are important for managers to conduct routine environmental performance assessments to identify resource saving opportunities and track environmental protection progress quarterly against the firm's sustainability goals. Corporate environmental policies are also important to us to ensure that our programs and procedures comply with environmental laws.

Field report of interview with manager of Consumer-product Firm H

Table B.8: Characteristics of Firm H:	
Position of respondent	CEO
Respondent's years of service (years)	5 – 9
Ownership of the firm	Privately-owned
Number of employees	51 – 100
Consumer product type	General merchandise
Number of years that the firm has adopted environmental management practices	5 – 9

Q: What are the practices involved in your GS provision? Why are these GS practices conducted?

A: We are dedicated to helping consumers to reduce their environmental footprint by designing eco-products that genuinely meet their needs relative to value and performance, and in addition, allow them to conserve resources. Before establishing a project for a new eco-product or improving a product's environmental performance, we research consumer needs in depth to identify and understand the needs that are not adequately met today. On the other hand, we work with our suppliers to develop new and greener alterative materials that will make our products more environmentally friendly, and promote the use of environmentally friendly manufacturing and cleaning practices that help to reduce the impacts of our operations on the environment. Moreover, we also help consumers to reduce their environmental footprint by offering a wide variety of return, reuse, and recycling programs, which ensure that consumers can easily and responsibly return their end-of-life products to usefulness. We have recycled over 5 million pounds of aluminum, refurbished and recycled another 4 million pounds of product components, and reused more than 10,000 pieces of packaging since 2006.

Furthermore, we provided our customers with an incentive to use renewable bags with a 5-cent discount for each bag used during purchase, which helps to defer the equivalent of 1 million plastic bags to landfills. In store operations, we are shifting from plastic packaging to paper, or packaging that contains recycled content or has been certified according to a sustainable forest management standard in order to reduce waste. We are also taking steps to reduce our impact by enhancing our energy-efficiency store design, using new lighting technologies, and experimenting with renewable energy. Moreover, we continue to reduce our carbon footprint of transporting products to our stores and customers. We achieve this by determining the best delivery routes for our products, improving the loading practices and efficiencies at distribution centers, reducing the number of transportation miles needed to ship our freight, consolidating distribution centers and deliveries, using lower emission vehicles, and employing alternative modes of transport such as by rail or ship. Our efficient loading practices enable us to significantly eliminate

50,000 trailer loads and save millions of gallons of diesel fuel each year, which amounts to about $10 million in yearly transportation-cost savings.

Q: What organizational infrastructures are important to support the GS provision?

A: First, employee training and leadership are important to reinforcing our corporate culture of environmental protection. We train our employees accordingly to enhance understanding of environmental issues, policies, and eco-products offered in our stores. The leaders are responsible for ensuring that environmental management practices are aligned with operational systems and function to achieve compliance and company expectations. Second, information technology is important for us to track our performance against our corporate environmental goals, and report to the public on our progress, whether negative or positive. Information technology also enables us to work closely with suppliers to assess and audit their programs and performance of environmental sustainability without business travel, which is time consuming and incurs consumption of fuel and resources. Third, being good stewards of the environment include setting environment standards. Therefore, we have set standards for waste management, minimization, and decommissioning, and periodically review and revise our standards.

Appendix III Measurement items of GS constructs and supporting literature

Store-related activities of PP-GS practices are concerned with process design and innovation, application of tools and facilities (e.g., recyclable fixtures and energy-efficient equipment), and application of sustainable design features (e.g., the use of low volatile organic compound interior paint) in servicing locations (e.g., stores and customer service centers) to provide eco-friendly servicing environments to facilitate interaction with customers (Ogle et al., 2004; Chung and Tsai, 2007; Callaway and Dobrzykowski, 2009, Lai et al., 2010). These efforts improve service quality by providing an environmentally responsible, convenient, and interactive servicing environment (Lai et al., 2010).

Measurement items	Supporting literature
We use energy-saving technologies in our servicing location(s) [c]	Grove et al. (1996); Enz and Siguaw (1999); Schrader (1999); Foster Jr et al. (2000); Halme (2001); Kassinis and Soteriou (2003); Hume and Gallagher (2010); Rueda-Manzanares et al. (2008)
We use water-saving technologies in our servicing location(s) [c]	Schrader (1999); Halme (2001); Schendler (2001); Bartolomeo et al. (2003); Kassinis and Soteriou (2003); Rueda-Manzanares et al. (2008)
We design service delivery processes with maximized efficiency to avoid resources used in work duplication [c]	Enz and Siguaw (1999)
We take sustainable design features into consideration when designing our servicing location(s) [c]	Foster Jr et al. (2000); Halme (2001)
We reuse/recycle/ reduce resources used in servicing location(s) [c]	Grove et al. (1996); Enz and Siguaw (1999); Goodman (2000); Schendler (2001); Banerjee et al. (2003); Foster Jr et al. (2000); Halme (2001); Kassinis and Soteriou (2003); Manaktola and Jauhari (2007); Rueda-Manzanares et al. (2008); Hume and Gallagher (2010)
We repair and maintain equipment to prolong the usable life of equipment used in servicing location(s) [a]	Burja and Burja (2009)
We install waste treatment system to reduce waste in our servicing location(s) [a]	Foster Jr et al. (2000); Halme (2001)
We use renewable energy to support store operations [b]	Halme (2001); Rueda-Manzanares et al. (2008)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Logistics activities of PP-GS practices are concerned with environmental protection acts in logistics services (Lai et al., 2010), including optimizing shipping routes and capacity, using standardized reusable containers, and adopting fuel-efficient transport and modes of transport (Wu and Dunn, 1994; Kam et al., 2006; Wheeland, 2011), to make products available to consumers with minimum environmental impacts.

Measurement items	Supporting literature
We optimize shipping routes [c]	Schrader (1999); Burja and Burja (2009)
We maximize shipping capacity [c]	Schrader (1999); Burja and Burja (2009);
We deploy transportation vehicles with environmental technologies or designs [c]	Enz and Siguaw (1999); Schrader (1999); Manzini and Vezzoli (2003)
We use low emission transportation modes [c]	Schrader (1999)
We reuse/recycle/ reduce resources used in distribution [c]	Schrader (1999); Goodman (2000); Bartolomeo et al. (2003); Manzini and Vezzoli (2003); Manaktola and Jauhari (2007); Burja and Burja (2009)
We use alternative fuels in transportation [a]	Wheeland (2011)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Promotion activities of PP-GS practices are concerned with the implementation of promotion activities to provide customers with platforms and information to participate in environmental protection initiatives, such as recycling and reducing the consumption of plastic shopping bag (Ginsberg and Bloom, 2004; Leire and Thidell, 2005). This effort not only enhances the legitimacy, reputation, and image of firms (Gilley et al., 2000), but also improves the reliability of service quality by making the practices of firms more visible and transparent for their customers to evaluate if they have utilized their capabilities and resources to reduce environmental impacts as promised or professed in organizational disclosures and environmental claims (Tang et al., 2012). Such efforts also increase customer awareness of environmental issues, and educate and motivate customers to select environmentally responsible options, which are important to mitigate environmental impacts (Ginsberg and Bloom, 2004; Leire and Thidell, 2005).

Measurement items	Supporting literature
We implement activities that raise customer awareness on environmental issues [c]	Foster Jr et al. (2000); Hume and Gallagher (2010)
We educate customers on environmental protection and sustainable consumption practices [c]	Enz and Siguaw (1999); Halme (2001); Callaway and Dobrzykowski (2009)
We motivate customers to engage in our environmental protection programs [c]	Foster Jr et al. (2000); Manzini and Vezzoli (2003); Rueda-Manzanares et al. (2008); Manaktola and Jauhari (2007); Callaway and Dobrzykowski (2009); Hume and Gallagher (2010)
We reduce/ recycle/ reduce resources used in promotion activities [a]	Halme (2001)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Procurement activities of P-GS practices are concerned with the adoption of environmentally responsible procurement practices to ensure materials and products sourced for consumers have minimum environmental impacts to ensure that the materials and products sourced for consumers have minimum environmental impacts (Rothenberg et al., 2001; Handfield et al., 2005; Bai and Sarkis, 2010).

Measurement items	Supporting literature
We follow corporate environmentally responsible purchasing guidelines in sourcing [c]	Halme (2001)
We make purchase decisions based on the total cost of purchasing, use, and waste management [c]	Hume and Gallagher (2010)
We source products from environmentally responsible suppliers [c]	Manaktola and Jauhari (2007)
We collaborate with our suppliers to minimize environmental impacts [c]	Halme (2001); Banerjee et al. (2003); Manaktola and Jauhari (2007)
We collaborate with our customers to improve environmentally responsible purchasing criteria [c]	Manaktola and Jauhari (2007)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Product design and development activities of P-GS practices are concerned with the adoption of eco-design activities, also known as design for the environment, to provide customers with environmentally friendly products.

Measurement items	Supporting literature
We design manufacturing processes with minimum environmental impacts [c]	Grove et al. (1996); Schrader (1999); Álvarez Gil et al. (2001)
We design products and packaging with minimum environmental impacts [c]	Meijkamp (1999); Schrader (1999); Álvarez Gil et al. (2001); Banerjee et al. (2003); Brezet et al. (2001); Manzini and Vezzoli (2003); Cook et al. (2006); Manaktola and Jauhari (2007); Montabon et al. (2007); Callaway and Dobrzykowski (2009); Yang et al. (2009)
We evaluate environmental performance of our products [c]	Montabon et al. (2007)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

After-sale activities of P-GS practices are concerned with the provision of after-sale services to extend product life-cycle and manage end-of-life products (Bartolomeo et al., 2003). After-sale activities of P-GS practices improve service quality by providing solutions to assist customers to maintain their products and take-back their end-of-life products for recycling.

Measurement items	Supporting literature
We provide maintenance services to prolong usable life of our products [c]	Hockerts (1995); Schrader (1999); Bartolomeo et al. (2003); Callaway and Dobrzykowski (2009)
We collect end-of-life products from customers [c]	Enz and Siguaw (1999); Callaway and Dobrzykowski (2009); Nunes and Bennett (2010)
We recycle end-of-life products [c]	Enz and Siguaw (1999); Callaway and Dobrzykowski (2009); Nunes and Bennett (2010)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Information system related activities of LTD-GS practices are concerned with the adoption of information systems to track information related to environmental management practices and performances (Melynk et al., 2003; Sroufe, 2003) and provide web-based support services to customers with minimum consumption of physical resources (Melville, 2010; Wong et al., 2013), which are important to organizational sustainable development (Melville, 2010; Solér et al., 2010; Green et al., 2012).

Measurement items	Supporting literature
We implement information systems to monitor and manage our environmental management practices and performances [c]	Enz and Siguaw (1999); Goodman (2000); Álvarez Gil et al. (2001); Halme (2001)
We report and share up-to-date information about our environmental management practices and performances with stakeholders [c]	Goodman (2000); Bartolomeo et al. (2003); Halme (2001); Manaktola and Jauhari (2007); Nunes and Bennett (2010)
We use environmentally friendly media to share information about our environmental management practices and performances with stakeholders [c]	Grove et al. (1996); Bartolomeo et al. (2003); Jaruwach-irathanakul and Fink (2005); Nunes and Bennett (2010); Wong et al. (2013)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Human resource management activities of LTD-GS practices are concerned with human resource management efforts that cultivate a corporate culture of environmental protection (Daily and Huang, 2001; Sarkis, 2003; Jabbour et al., 2008; Sammalisto and Brorson, 2008). These efforts are important not only for the success of the initial implementation of GS practices (Ahmad and Schroeder, 2003), but also for their maintenance and continuation of environmentally responsible operations (Balzarova and Castka, 2008). These efforts improve service quality in terms of better interaction among employees and customers as well-trained and motivated employees are able to assist customers in identifying and accessing environmentally responsible products and services that they need (Goodman, 2000).

Measurement items	Supporting literature
We provide training programs to educate employees about our environmental management practices [c]	Foster Jr et al. (2000); Álvarez Gil et al. (2001); Goodman (2000); Halme (2001); Rueda-Manzanares et al. (2008)
We establish measureable environmental performance targets for our employees [c]	Foster Jr et al. (2000); Schendler (2001)
We evaluate the environmental performance of our employees [c]	Foster Jr et al. (2000)
We motivate employees to participate in our environmental management practices [c]	Foster Jr et al. (2000); Goodman (2000)
We develop a green team committee that comprises employees who represent each department to implement environmental management initiatives [b]	Enz and Siguaw (1999); Foster Jr et al. (2000)
We create an environmental-program manager position to implement and monitor environmental management initiatives and performance [b]	Enz and Siguaw (1999); Álvarez Gil et al. (2001)
Create a recycling department [a]	Enz and Siguaw (1999)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Corporate policy related activities of LTD-GS practices are concerned with the development of corporate environmental policies to guide and direct the long-term environmental management development of firms (Barrieu and Sinclair-Desgagné, 2006; Subramanian et al., 2009). From the service quality perspective, the establishment of corporate environmental policies responds to the needs of customers for environmental protection by governing corporate practices and business routines (Jacobs et al., 2010; Tang et al., 2012).

Measurement items	Supporting literature
We formulate corporate environmental policies to comply with environmental regulations [c]	Halme (2001); Manaktola and Jauhari (2007)
We formulate corporate environmental policies that are beyond compliance [c]	Grove et al. (1996); Goodman (2000)
We review and modify our corporate environmental policies regularly [c]	Halme (2001)

[a] These items were generated from literature and eliminated at the exploratory research phase
[b] These items were eliminated at the content analysis
[c] These items were retained after confirmatory factor analysis

Appendix IV Questionnaire used to collect firm-level data in the quantitative survey research

Environmental management practices survey

**_Environmental management practices_* are referred to the initiatives, policies, and procedures a retail company uses to mitigate its operations impacts on the natural environment (e.g., sells products that can be recycled, reduces using plastic bags, or establishes environmental policies).

Part I: Please indicate the extent to which your company implements the following environmental management practices.

Q1: Pollution prevention-related practices **We**		**0-20%**	**21-40%**	**41-60%**	**61-80%**	**81-100%**
e.g., use energy-saving light bulbs to reduce energy consumption in servicing location(s).		1	2	3	4	5
a	use energy-saving technologies (e.g., light bulbs) in servicing location(s).	1	2	3	4	5
b	use water-saving technologies (e.g., hand washing devices) in servicing location(s).	1	2	3	4	5
c	design service delivery processes with maximized efficiency to avoid resources used in work duplication.	1	2	3	4	5
d	take sustainable design features into consideration when designing our servicing location(s).	1	2	3	4	5
e	reuse/recycle/reduce* resources (e.g., plastic bags) used in servicing location(s).	1	2	3	4	5
f	implement activities that raise customer awareness on environmental issues (e.g., design plastic bags with environmental protection message).	1	2	3	4	5
g	educate customers on environmental protection and sustainable consumption practices (e.g., design booklet about home energy-saving tips).	1	2	3	4	5
h	motivate customers to engage in our environmental protection programs (e.g., launch reward programs).	1	2	3	4	5
i	optimize shipping routes.	1	2	3	4	5
j	maximize shipping capacity (e.g., freight consolidation).	1	2	3	4	5
k	deploy transportation technologies with environmental technologies and designs (e.g., electric hybrid vehicles).	1	2	3	4	5
l	use low emissions transportation modes (e.g., rail or ship).	1	2	3	4	5
m	reuse/recycle/ reduce* resources (e.g., containers) used in distribution.	1	2	3	4	5

*** _To Reuse_ is to use discarded items again for the same or different function; _To Recycle_ is to break down discarded items into raw materials for making new items; and _To Reduce_ is to minimize the amount of resources consumption.**

Q2. Product-related practices We	0–20%	21–40%	41–60%	61–80%	81–100%
a follow corporate environmentally responsible purchasing guidelines in sourcing (e.g., source products with high recycled content).	1	2	3	4	5
b make purchase decisions based on the total cost of purchasing, use, and waste management.	1	2	3	4	5
c source products from environmentally responsible suppliers.	1	2	3	4	5
d collaborate with our suppliers to minimize environmental impacts (e.g., request suppliers to reduce product packaging).	1	2	3	4	5
e collaborate with our customers to improve environmentally responsible purchasing criteria (e.g., revise our purchasing criteria based on customer feedback).	1	2	3	4	5
f design manufacturing processes with minimum environmental impacts.	1	2	3	4	5
g design products and packaging with minimum environmental impacts (e.g., design products with reduced packaging).	1	2	3	4	5
h evaluate environmental performance of our products (e.g., life-cycle assessment).	1	2	3	4	5
i provide maintenance services to prolong usable life of our products (e.g., repair or refurbishing).	1	2	3	4	5
j collect end-of-life products from customers (e.g., clothing and empty bottles).	1	2	3	4	5
k recycle end-of-life products.	1	2	3	4	5

Q3. Long-term development-related practices We	0–20%	21–40%	41–60%	61–80%	81–100%
a implement information system to monitor and manage our environmental management practices and performance.	1	2	3	4	5
b report and share up-to-date information about our environmental management practices and performance with stakeholders.	1	2	3	4	5
c use environmentally friendly media to share information about our environmental management practices and performances with stakeholders.	1	2	3	4	5
d have training programs to educate employees about our environmental management practices.	1	2	3	4	5
e establish measurable environmental performance targets for our employees (e.g., reduce paper usage by 20%).	1	2	3	4	5
f evaluate the environmental performance of our employees.	1	2	3	4	5
g motivate employees to participate in our environmental management practices (e.g., giving awards).	1	2	3	4	5
h formulate corporate environmental policies to comply with environmental regulations (e.g., charge customers for plastic bag levy).	1	2	3	4	5
i Formulate corporate environmental policies that are beyond compliance (e.g., collect empty bottles for recycling).	1	2	3	4	5
j review and modify our environmental policies regularly.	1	2	3	4	5

Part II: Please indicate the extent to which your company improves the following performances in the past two years.

Q4. Our operational, financial, and environmental performances improvement **In the past two years, we**		**0–20%**	**21–40%**	**41–60%**	**61–80%**	**81–100%**
e.g., have increased our market share by 85%.		1	2	3	4	5
a	have increased our market share.	1	2	3	4	5
b	have marked up our products.	1	2	3	4	5
c	have increased our productivity.	1	2	3	4	5
d	have improved economies of scale.	1	2	3	4	5
e	have reduced the material or resource consumption.	1	2	3	4	5
f	have reduced our environmental fines and liabilities.	1	2	3	4	5
g	have reduced our total energy consumption.	1	2	3	4	5
h	have reduced our virgin materials consumption.	1	2	3	4	5
i	have reduced our fresh water consumption.	1	2	3	4	5
j	have reduced the amount of greenhouse gas emissions.	1	2	3	4	5
k	have reduced total waste disposal (e.g., packaging waste).	1	2	3	4	5

Part III: Please indicate the frequency of which your customer engage in the following practices

Q5: Our customers …		**Rarely**				**Very often**
a	repurchase products at our store(s).	1	2	3	4	5
b	consider our store(s) as their choice.	1	2	3	4	5
c	spend more at our store(s) than other stores.	1	2	3	4	5
d	recommend our store(s) to their friends and/or relatives.	1	2	3	4	5

Part IV: General information

Q6 – 14: Please indicate the degree or the extent to which ...		0-20%	21-40%	41-60%	61-80%	81-100%
Q6.	our customers are satisfied with our eco-friendly products and environmental protection programs.	1	2	3	4	5
Q7.	our performance in environmental protection exceeds the expectations of our customers.	1	2	3	4	5
Q8.	our performance is close to the ideal provider of eco-friendly products and environmental protection programs of our customers.	1	2	3	4	5
Q9.	our customers demand eco-friendly products.	1	2	3	4	5
Q10.	the public demands environmental protection.	1	2	3	4	5
Q11.	our shareholders avoid any environmental risks in our operations.	1	2	3	4	5
Q12.	the environmental regulations in Hong Kong are stringent towards consumer-product firms.	1	2	3	4	5
Q13.	the enforcement of the environmental regulations in Hong Kong is stringent towards consumer-product firms.	1	2	3	4	5
Q14.	the environmental liabilities and fines in Hong Kong are excessive for consumer-product firms.	1	2	3	4	5

For questions 15-20, please check (☑) the appropriate box.

15. Please indicate the title of your position in your company: (Please mark the highest one)

☐ Director ☐ Chairman ☐ Manager of Supply Chain Management ☐ Manager of Environmental Management Department
☐ COO ☐ CEO ☐ Manager of Operations Management Department

16. Please indicate the number of years that you have been with this company:

☐< 2 years ☐ 2 – 4 years ☐ 5 – 9 years ☐ 10 – 14 years ☐ 15 – 19 years ☐ ≥ 20 years

17. Please indicate the type of ownership of your company:

☐ State-owned ☐ Privately-owned ☐ Collectively-owned (Subsidized by government)
☐ Listed ☐ International joint venture ☐ Other (Please specify):_______________

18. Please indicate the number of employees in your company:

☐ 1 – 10 ☐ 11 – 50 ☐ 51 – 100 ☐ 101 – 500 ☐ > 500

19. Please indicate the number of years that your company has adopted environmental management practices:

☐< 2 years ☐ 2 – 4 years ☐ 5 – 9 years ☐ 10 – 14 years ☐ 15 – 19 years ☐ ≥ 20 years

20. Please indicate the *primary product* of your company *(Please mark one only)*:

☐ Jewelry ☐ Apparel & other finished products made from fabric and similar products
☐ Used merchandise ☐ Building materials, hardware, & garden supplies ☐ Luggage & leather goods
☐ Books & magazines ☐ Radio, television, & consumer electronics ☐ Needlework & piece goods
☐ Tobacco products ☐ Toy and game products ☐ Sporting goods ☐ General merchandise
☐ Liquor ☐ Gasoline ☐ Accessories ☐ Gifts, novelties and souvenirs
☐ Drugs & proprietary ☐ Food ☐ Other (Please specify): ________

Dr Christina Wong, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

Tel: 2766-6415. Fax: 2773-1432. **Email**: tcchris@

Ms Winslet Chan, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

Tel: 9090- . Email: brbwins@

<End of questionnaire>

*<u>***環境管理措施***</u> 是指零售商為減輕對自然環境造成影響所推出的各項措施、方針及操作程序（如出售可循環再造的產品、減少使用膠袋、或向顧客收取膠袋徵費）。

第一部分：請圈出貴公司採取以下環境管理措施的程度。

問題 1：減少污染相關的環境管理措施 **我們**	0-20%	21-40%	41-60%	61-80%	81-100%
例如: 在店內 95%使用節能燈泡以減少消耗能源。	1	2	3	4	5
a　在店內使用節能裝置及設備（如節能燈泡）。	1	2	3	4	5
b　在店內使用節水裝置及設備（如節水沖洗設備）。	1	2	3	4	5
c　策劃店鋪操作流程（如從收貨到上架）至最高效率避免重複工序而消耗資源。	1	2	3	4	5
d　設計店面佈置以減少浪費資源（如使用可循環再造的標牌）。	1	2	3	4	5
e　在店內重用/循環再造/減少使用*資源（如膠袋）。	1	2	3	4	5
f　舉辦活動以提高顧客的環保意識（如設計具環保訊息的膠袋）。	1	2	3	4	5
g　培養顧客以行動實踐環保（如派發有關家居節能秘笈的小冊子）。	1	2	3	4	5
h　鼓勵顧客參與公司的環保計劃（如推出獎勵計劃）。	1	2	3	4	5
i　優化運輸路線。	1	2	3	4	5
j　將貨運容量擴至最大（如合併貨運）。	1	2	3	4	5
k　採用先進的運輸科技（如油電混合動力車輛）。	1	2	3	4	5
l　顧用採用低排放量運輸公具（如鐵路或船舶）的物流服務供應商。	1	2	3	4	5
m　運輸過程中，重用/ 循環再造/減少使用*資源（如貨櫃）。	1	2	3	4	5
<u>重用</u>** 是廢物品再用，而再途可能與之前相同或不同; ***<u>循環再造</u> 是指把廢物分解再造成新產品; ***<u>減少使用</u>*** 是指盡量減少消耗資源。					

問題 2：產品相關的環境管理措施 **我們**	0-20%	21-40%	41-60%	61-80%	81-100%
a　根據環保採購指引入貨（如購入可循環再造/ 再生成份高的產品）。	1	2	3	4	5
b　考慮採購成本、使用成本及廢物管理成本作出採購決定。	1	2	3	4	5
c　選用來自環保供應商的產品。	1	2	3	4	5
d　與供應商合作，將產品對環境所造成的影響降至最低。	1	2	3	4	5
e　與顧客合作，以改善環保採購標準（如根據顧客反饋修改採購標準）。	1	2	3	4	5
f　根據環保績效標準研發新產品（如研發可循環再造的產品）。	1	2	3	4	5
g　設計能減少浪費資源的產品（如減少產品包裝）。	1	2	3	4	5
h　評估並改善產品的環保績效（如評估產品的壽命週期）。	1	2	3	4	5
i　為產品提供維修服務以延長產品壽命（如修理或翻新）。	1	2	3	4	5
j　收集顧客退回的產品（如衣物及空瓶）。	1	2	3	4	5
k　循環再造顧客退回的產品。	1	2	3	4	5

問題 3：公司長遠發展相關的環境管理措施 我們		0-20%	21-40%	41-60%	61-80%	81-100%
a	設有資訊系統以收集公司環保發展進度的數據。	1	2	3	4	5
b	設立資訊系統用作通知利益相關者（如客戶及供應商）有關公司的環保措施、計劃（如回收日）及產品的最新信息。	1	2	3	4	5
c	使用電子媒體（如電郵），通知利益相關者有關公司的環保措施、計劃及產品的信息。	1	2	3	4	5
d	有培訓計劃教育員工實踐環境管理的措施。	1	2	3	4	5
e	給員工訂立環保績效指標（如紙張使用量降低20%）。	1	2	3	4	5
f	評估員工的環保績效。	1	2	3	4	5
g	鼓勵員工實踐環境管理措施（如給予獎勵）。	1	2	3	4	5
h	遵從香港環保條例的要求，制定公司環保方針（如向客戶收取膠袋附加費）。	1	2	3	4	5
i	超越香港環保條例的要求，制定額外的公司環保方針（如回收再造空瓶)。	1	2	3	4	5
j	定期檢討並修訂公司環保方針。	1	2	3	4	5

第二部分：請圈出貴公司過去兩年在以下表現的改善程度。

問題 4：公司業務、財務及環境績效的改善 過去兩年，我們		0-20%	21-40%	41-60%	61-80%	81-100%
例如：市場佔有率增加85%。		1	2	3	4	5
a	的市場佔有率有所增加。	1	2	3	4	5
b	的毛利有增長。	1	2	3	4	5
c	的生產力有所提高。	1	2	3	4	5
d	的經濟效益得到提高。	1	2	3	4	5
e	的能源或材料消耗量得以減低。	1	2	3	4	5
f	的環保罰款和債務有所減少。	1	2	3	4	5
g	的能源總消耗量得以減低。	1	2	3	4	5
h	的原材料消耗量有所減少。	1	2	3	4	5
i	的淡水消耗量有所減低。	1	2	3	4	5
j	的溫室氣體排放量有所減少。	1	2	3	4	5
k	處置廢物（如由包裝所引至的廢物）的總數量有所減少。	1	2	3	4	5

第三部分：顧客對店鋪的忠誠程度

問題 5：顧客…		甚少				經常
a	再次到我們店舖購買產品。	1	2	3	4	5
b	選擇到我們店舖購物。	1	2	3	4	5
c	在我們店舖的花費比競爭對手店舖的花費多。	1	2	3	4	5
d	向親友推薦我們的店舖。	1	2	3	4	5

第四部分：顧客的滿意程度

問題 6-14：請圈出貴公司對下列陳述的同意程度		0-20%	21-40%	41-60%	61-80%	81-100%
6.	顧客滿意公司的環保產品及環保活動。	1	2	3	4	5
7.	公司的環保表現超出顧客預期。	1	2	3	4	5
8.	公司的環保產品及活動接近顧客理想中的環保產品及活動。	1	2	3	4	5
9.	顧客對環保產品有需求。	1	2	3	4	5
10.	公眾要求保護環境。	1	2	3	4	5
11.	公司股東期望避免一切因環境破壞造成的風險(如環保罰款和債務)。	1	2	3	4	5
12.	對零售商而言，香港的環保條例屬嚴厲。	1	2	3	4	5
13.	香港政府對零售商嚴格執行環保條例。	1	2	3	4	5
14.	香港政府對零售商的環境責任及罰款屬嚴厲。	1	2	3	4	5

問題 15-20，請在適當方格內標上（☑）號。

問題 15：請選擇您在貴公司的職位名稱：

☐ 董事	☐主席/總裁	☐營運經理
☐首席營運經理	☐首席執行官	☐環境管理經理

問題 16：請選擇您在貴公司任職的年數：

☐<2 年	☐2 － 4 年	☐5 － 9 年
☐10 － 14 年	☐15 － 19 年	☐≥ 20 年

問題 17：請選擇貴公司的企業類型：

☐ 國營企業	☐ 私營企業	☐ 國際合資企業
☐ 上市企業	☐ 由政府資助補貼	☐ 其他（請註明):__________

問題 18：請選擇貴公司的員工人數：

☐1 － 10　☐11 － 50　☐51 － 100　☐101 － 500　☐> 500

問題 19：請選擇貴公司已採用環境管理措施的年數：

☐<2 年	☐2 － 4 年	☐5 － 9 年
☐10 － 14 年	☐15 － 19 年	☐≥ 20 年

問題 20：請選擇貴公司的<u>主要產品類別</u>（<u>請只標記一項</u>）：

☐ 珠寶	☐ 服裝及布料製衣品	☐ 二手商品	☐ 建築材料，五金，花園用品
☐書籍和雜誌	☐ 百貨	☐刺繡和布疋	☐ 行李箱和皮革製品
☐ 煙草製品	☐玩具及遊戲產品	☐體育用品	☐收音機，電視，消費類電子產品
☐汽油	☐酒精飲品	☐飾品	☐禮品、精品和紀念品
☐藥品及專利藥品	☐食品	☐其他:（請註明）: _______________	

Dr Christina Wong 香港理工大學 電話: 2766-6415 傳真: 2773-1432 電郵: tcchris@
Ms Winslet Chan 香港理工大學 電話: 9090- 電郵: brbwins@

<問卷完>

Appendix V Questionnaire used to collect customer-level data for testing the potential of common method variance in the quantitative survey research

Retail Firm's Practices for Environmental Protection Survey

Q1: Please indicate ***the retail firm*** that has implemented practices for environmental protection (e.g., sells products that are organic, reduces using plastic bags, or collects empty bottles for recycling): ____________________

****Please refer to the retail store that you indicated in Q1 when answering the following questions***

Q2: Please indicate the level to which you agree with the following statements	**Strongly disagree**				**Strongly agree**
a I am satisfied with the firm's eco-friendly products and environmental protection activities.	1	2	3	4	5
b The performance of this store in environmental protection exceeds my expectations.	1	2	3	4	5
c The performance of this store is close to my ideal provider of eco-friendly products and environmental protection activities.	1	2	3	4	5

Q3: Please indicate the frequency to which you engage in the following practices	**Rare**				**Very often**
a I repurchase products at the store.	1	2	3	4	5
b I consider the store as my choice.	1	2	3	4	5
c I spend more at the store compared with its competitors.	1	2	3	4	5
d I recommend the store to my friends and/or relatives.	1	2	3	4	5

For questions 4 – 7, please check (☑) the appropriate box.

Q4. Please indicate your gender:

☐ Male ☐ Female

Q5. Please indicate your age group:

☐ <16 ☐ 16-25 ☐ 26-35
☐ 36-45 ☐ 46-55 ☐ >55

Q6. Please indicate your education level:

☐ Primary or below ☐ Secondary ☐ Diploma
☐ Higher diploma ☐ Bachelor degree ☐ Postgraduate or above

Q7. Your monthly income level is approximately (HK$):

☐ <$7,500 ☐ $7,500-9,999 ☐ $10,000-14,999
☐ $15,000-19,999 ☐ $20,000-24,999 ☐ ≥$25,000

Dr Christina Wong, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Tel: 2766-6415 Fax: 2773-1432. Email. tcchris@

Ms Winslet Chan, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Tel: 9090- Email: hzbwins@

ID code:

Note: This ID is for research purpose only.

<**End of questionnaire**>

顧客問卷調查

問題 1：請列出一間已實施環保措施的<u>零售商店</u>（如出售有機產品、減少使用膠袋或回收並再用空瓶）：

____

** 請以上列的零售商店，回答下列問題*

問題 2：請圈出您對下列陳述的同意程度	0-20%	21-40%	41-60%	61-80%	81-100%
a 我滿意該商店的環保產品及環保活動。	1	2	3	4	5
b 該商店的環保表現超出我的預期。	1	2	3	4	5
c 該商店的環保產品及活動接近我理想中的環保產品及活動。	1	2	3	4	5

問題 3：請圈出您參與下列陳述活動的次數	甚少				經常
a 我再次到該商店購買產品。	1	2	3	4	5
b 我選擇到該商店購物。	1	2	3	4	5
c 我在該商店的花費比其競爭對手店舖的花費多。	1	2	3	4	5
d 我向親友推薦該商店。	1	2	3	4	5

問題 4-4：請在適當的方格標上（☑）號。

Q4. 請選擇您的性別：

☐ Male 男性　　☐ Female 女性

Q5. 請選擇您的年齡組別：

☐ < 16　　☐ 16 - 25　　☐ 26 - 35
☐ 36-45　　☐ 46 - 55　　☐ > 55

Q6. 請選擇您的教育水平：

☐ 小學或以下　　☐ 中學　　☐ 文憑
☐ 高級文憑　　☐ 學士學位　　☐ 研究生或以上

Q7. 你每月的收入水平大約為（港幣）：

☐ < $ 7,500　　☐ $ 7,500 - 9,999　　☐ $10,000 - 14,999
☐ $ 15,000 - 19,999　　☐ $ 20,000 - 24,999　　☐ ≥ $ 25,000

Dr Christina Wong 香港九龍紅磡香港理工大學香港理工大學

電話: 2766-6415　**傳真**: 2773-1432　**電郵**: tcchris@

Ms Winslet Chan 香港九龍紅磡香港理工大學香港理工大學

電話: 9090-　**電郵**: brbwins@

编碼:

註釋: 這编碼只用作研究用途

<問卷完>

REFERENCES

Adams, C.A. (2004), "The ethical, social, and environmental reporting-performance portrayal gap", *Accounting, Auditing and Accountability Journal*, Vol. 17, No. 5, pp. 731 – 757.

Agriculture and Agri-Food Canada. (2009), "Going green: the future of the retail food industry – opportunities for Canadian agri-food exporters in the United States", available at: http://www.docstoc.com/docs/6489360/Going-Green-The-Future-of-the-Retail-Food-Industry (accessed 10 October 2010).

Ahmad, S. and Schroeder, R.G. (2003), "The impact of human resource management practice on operational performance: recognizing country and industry differences", *Journal of Operations Management*, Vol. 21, No. 1, pp. 19 – 43.

Aldy, J.E., Barrett, S. and Stavins, R.N. (2003), "Thirteen plus one: a comparison of global climate policy architectures", *Climate Policy*, Vol. 3, No. 4, pp. 373 – 397.

Allmendinger, G. and Lombreglia, R. (2005), “Four strategies for the age of smart services”, *Harvard Business Review*, Vol. 83, No. 10, pp. 131 – 145.

Álvarez Gil, M.J., Burgos Jiménez, J. and Céspedes Lorente, J.J. (2001), “An analysis of environmental management, organizational context and performance of Spanish hotels”, *Omega,* Vol. 29, No. 6, pp. 457 – 471.

Amato, A., Moreno, A. and Swindells, N. (2008), “DEPUIS project: design of environmentally-friendly products using information standards”, in Cascini, G. (Ed.), *Computer-Aided Innovation*, Springer, US, pp. 135 – 143.

Ammenberg, J. and Sundin, E. (2005), “Products in environmental management systems: drivers, barriers and experiences”, Journal of Cleaner Production, Vol. 13, No. 4, pp. 405 – 415.

Anderson, E.W., Fornell, C. and Lehmann, D.R. (1994), “Customer satisfaction, market share, and profitability: findings from Sweden”. *The Journal of Marketing*, Vol. 58, No. 3, pp. 56 – 66.

Anderson, E.W., Fornell, C. and Mazvancheryl, S.K. (2004), “Customer satisfaction and shareholder value”, *Journal of Marketing*, Vol. 68, No. 4, pp. 172 – 185.

Anderson, E.W., Fornell, C. and Rust, R.T. (1997), “Customer satisfaction, productivity, and profitability: differences between goods and services”, *Marketing Science,* Vol. 16, No. 2, pp. 129 – 145.

Anderson, J.C. and Gerbing, D.W. (1982), “Some methods for respecifying measurement models to obtain unidimensional construct measurement”, *Journal of Marketing Research,* Vol. 19, No. 4, pp. 453 –460.

Anderson, E.W. and Sullivan, M.W. (1993), “The antecedents and consequences of customer satisfaction for firms”, *Marketing Science,* Vol. 12, No. 2, pp. 125 – 143.

Andreassen, T.W. and 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,* Vol. 9, No.1, pp. 7 – 23.

Angell, L.C. and Klassen, R.D. (1999), “Integrating environmental issues into the mainstream: an agenda for research in operations management”, *Journal of Operations Management*, Vol. 17, No. 5, pp. 575 – 598.

Armstrong, J.S. and Overton, T.S. (1977), “Estimating nonresponse bias in mail surveys”, Journal of Marketing Research, Vol. 14, No. 4, pp. 396 – 402.

Aronsson, H. and Brodin, M.H. (2006), “The environmental impact of changing logistics structure”, *International Journal of Logistics Management,* Vol. 1, No. 3, pp. 394 – 415.

Ashcroft, P. and Murphy Smith, L. (2008), “Impact of environmental regulation on financial reporting of pollution activity: a comparative study of U.S. and Canadian firms”, *Research in Accounting Regulation,* Vol. 20, pp. 127 – 153.

Babbie, E. (1992), *The Practice of Social Research*, Macmillan Press, New York.

Bagozzi, R.P. and Phillips, L.W. (1982), “Representing and testing organizational theories: a holistic construal”, *Administrative Science Quarterly,* Vol. 2, No. 3, pp. 459 – 489.

Bagozzi, R.P. and Yi, Y. (1988), “On the evaluation of structural equation models”, *Journal of the Academy of Marketing Science*, Vol. 1, No.1, pp. 74 – 94.

Bagozzi, R.P., Yi, Y. and Phillips, L.W. (1991), “Assessing construct validity in organizational research”, *Administrative Science Quarterly,* Vol. 36, No. 3, pp. 421– 458.

Bai, C. and Sarkis, J. (2010), “Integrating sustainability into supplier selection with grey system and rough set methodologies”, *International Journal of Production Economics,* Vol. 124, No.1, pp. 252 – 264.

Balakrishnan, A. and Geunes, J. (2004), “Collaboration and coordination in supply chain management and e-commerce”, *Production and Operations Management*, Vol. 13, No.1, pp. 1 – 2.

Balzarova, M.A. and Castka, P. (2008), “Underlying mechanisms in the maintenance of ISO 14001 environmental management system”, *Journal of Cleaner Production,* Vol. 16, No.18, pp. 1949 – 1957.

Bansal, P. and Roth, K. (2000), “Why companies go green: a model of ecological responsiveness”, *Academy of Management Journal,* Vol. 43, No. 3, pp. 717 – 736.

Barnett, S.L. and Salomon, R.M. (2006), “Beyond dichotomy: the curvilinear relationship between social responsibility and financial performance”, *Strategic Management Journal*, Vol. 27, No. 11, pp. 1101 – 1122.

Baron, S. and Harris, K. (1995), *Services Marketing*: *Text and Cases*. Macmillan Press, Basingstoke.

Baron, R.M. and Kenny, D.A. (1986), “The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations”, *Journal of Personality and Social Psychology,* Vol. 51, No. 6, pp. 1173 – 1182.

Baroulaki, E. and Veshagh, A. (2007), “Eco-innovation: product design and innovation for the environment”, in Takata, S. and Umeda, Y. (Eds.), *Advances in Life Cycle Engineering for Sustainable Manufacturing Businesses*, Spring, London, pp. 17 – 22.

Barrieu, P. and Sinclair-Desgagné, B. (2006), “On precautionary policies”, *Management Science*, Vol. 52, No. 8, pp. 1145 – 1154.

Bartolomeo, M., dal Maso, D., de Jong, P., Eder, P., Groenewegen, P., Hopkinson, P., James, P., Nijhuis, L., Örninge, M., Scholl, G., Slob, A. and Zaring, O. (2003), “Eco-efficient producer services – What are they, how do they benefit customers and the environment and how likely are they to develop and be extensively utilized?”, *Journal of Cleaner Production*, Vol. 11, No. 8, pp. 829 – 837.

Basdeo, D.K., Smith, K.G., Grimm, C.M., Rindova, V.P. and Derfus. P.J. (2006), “The impact of market actions on firm reputation”, *Strategic Management Journal*, Vol. 27, No. 12, pp. 1205 – 1219.

Bates, K., Bates, H. and Johnston, R. (2003), “Linking service to profit: the business case for service excellence”, *International Journal of Service Management,* Vol. 14, No. 2, pp. 173 – 183.

Beauducel, A. and Herzberg, P.Y. (2006), “On the performance of maximum likelihood versus means and variance adjusted weighted least squares estimation”, *Structural Equation Modeling,* Vol. 13, No. 2, pp. 186 – 203.

Bebbington, J. (2001), “Sustainable development: a review of the international development, business and accounting literature”, in *Accounting Forum,* Blackwell Publishers Ltd, Vol. 25, No. 2, pp. 128 – 157.

Bentler, P.M. (1995), *EQS: Structural Equations Program Manual*, Multivariate Software Inc., Encino, CA.

Berrone, P. and Gomez-Mejia, L.R. (2009), “Environmental performance and executive compensation: an integrated agency-institutional perspective”, *Academy of Management Journal,* Vol. 52, No. 1, pp. 103 – 126.

Berry, M.A. and Rondinelli, D.A. (1998), “Proactive corporate environmental management: a new industrial revolution”, *Academy of Management Executive,* Vol. 12, No. 2, pp. 38 – 50.

Bhattacherjee, A. and Premkumar, G. (2004), “Understanding changes in belief and attitude towards information technology usage: a theoretical model and longitudinal test”, *MIS Quarterly,* Vol. 28, No. 2, pp. 229 – 254.

Binkley, C. (2007), “Green fashion: beyond T-shirts”, *The Wall Street Journal*, p.18.

Blight, M.C., Kohles, J.C. and Meindl, J.R. (2004), “Charting the language of leadership: a methodological investigation of President Bush and the crisis of 9/11”, *Journal of Applied Psychology,* Vol. 89, No. 3, pp. 562 – 574.

Bodur, M. and Sarigöllü, E. (2005), “Environmental sensitivity in a developing country: consumer classification and Implications”, *Environmental and behavior,* Vol. 37, No. 4, pp. 487 – 510.

Bohdanowicz, P. (2006), “Environmental awareness and initiatives in the Swedish and Polish hotel industries – survey results”, *International Journal of Hospitability Management*, Vol. 25, No. 4, pp. 662 – 682.

Bollen, K.A., (1989), *Structural Equations with Latent Variables*, Wiley, New York.

Boulding, W., Staelin, R., Kalra, A. and Zeithaml, V. (1993), “A dynamic process model of service quality: from expectations to behavioral intentions”, *Journal of Marketing Research,* Vol. 30, No. 1, pp. 7 – 27.

Bovea, M.D. and Wang, B. (2007), “Redesign methodology for developing environmentally conscious products”, *International Journal of Production Research*, Vol. 45, No.18-19, pp. 4057 – 4072.

Boyer, K.K. and Swink, M.L. (2008), “Empirical elephants – why multiple methods are essential to quality research in operations and supply chain management”, *Journal of Operations Management,* Vol. 26, No. 3, pp. 337 – 348.

BP p.l.c. (2014), "BP at a glance", available at: http://www.bp.com/en/global/corporate/about-bp/bp-at-a-glance.html (accessed 18 April 2014).

Brezet, J.C., Bijma, A.S., Ehrenfeld, J. and Silvester, S. (2001), "The design of eco-efficient services: methods, tools and review of the case study based "designing eco-efficient services" project", available at: http://www.score-network.org/files/806_1.pdf (accessed 15 December 2012).

Bryman, A. (2006), "Integrating quantitative and qualitative research: how is it done?", *Qualitative Research,* Vol. 6, No.1, No. 97 – 113.

Burchill, G. and Fine, C. (1997), "Time versus market orientation in product concept development: empirically-based theory generation", *Management Science,* Vol. 43, No.4, pp. 465 – 479.

Burja, V. and Burja, C. (2009), "Increasing service quality through environmental performance management", *Annales Universitatis Apulensis Series Oeconomica,* Vol. 11, No. 2, pp. 938 – 944.

Bushway, S., Johnson, B.D. and Slocum, L.A. (2007), "Is the magic still there? The use of the Heckman two-step correction for selection bias in criminology", *Journal of Quantitative Criminology*, Vol. 23, No. 2, pp. 151 – 178.

Buysse, K. and Verbeke, A. (2003), "Proactive environmental strategies: a stakeholder management perspective", *Strategic Management Journal*, Vol. 24, No. 5, pp. 453 – 470.

Cai, S., Jun, M. and Yang, Z. (2010), "Implementing supply chain information integration in China: the role of institutional forces and trust", *Journal of Operations Management*, Vol. 28, No. 3, pp. 257 – 268.

Callaway, S.K. and Dobrzykowski, D.D. (2009), "Service-oriented entrepreneurship: service-dominant logic in green design and healthcare", *Service Science*, Vol. 1, No. 4, pp. 225 – 240.

Campell, D.T. and Fiske, D.W. (1959), "Convergent and discriminant validation by the multitrait-multimethod matrix", *Psychological Bulletin*, Vol. 56, No. 2, pp. 81 – 105.

Carmeli, A. and Tishler, A. (2004), “The relationship between intangible organizational elements and organizational performance”, *Strategic Management Journal*, Vol. 25, No.13, pp. 1257 – 1278.

Carmines, E.G. and Zeller, R.A. (1979), *Reliability and Validity Assessment*, Sage Publications, Beverly Hills, CA.

Carpenter, G.S. and Lehmann, D.R. (1985), “A model of marketing mix, brand switching, and competition”, *Journal of Marketing Research*, Vol. 22, No. 3, pp. 318 – 329.

Carter, C.R., Ellram, L.M. and Tate, W. (2007), “The use of social network analysis in logistics research”, *Journal of Business Logistics*, Vol. 28, No.1, pp. 137 – 168.

Castka, P., Balzarova, M.A., Bamber, C.J. and Sharp, J.M. (2004), “How can SMEs effectively implement the CSR agenda? A UK case study perspective”, *Corporate Social Responsibility and Environmental Management*, Vol. 11, No. 3, pp. 140 – 149.

Census and Statistics Department. (2013), “Import/export, wholesale and retail trades, and accommodation and food services sector”, available at: http://www.censtatd.gov.hk/hkstat/sub/so320.jsp. (accessed 2 January 2013).

Cetindamar, D. (2007), “Corporate social responsibility practices and environmentally responsible behavior: the case of the United Nations Global Compact”, *Journal of Business Ethics*, Vol. 76, No. 2, pp. 163 – 176.

Chan, H. (2012), “Hong Kong economy – welcome message”, available at: http://www.hkeconomy.gov.hk/en/home/index.htm (accessed 3 January 2013).

Chase, R.B. and Apte, U.M. (2007), “A history of research in service operations: what’s the big idea?”, *Journal of Operations Management*, Vol. 25, No. 2, pp. 375 – 386.

Chen, Y.S. (2010), “The drivers of green brand equity: green brand image, green satisfaction, and green trust”, *Journal of Business Ethics*, Vol. 93, No. 2, pp. 307 – 319.

Choi, T.Y. and Eboch, K. (1998), “The TQM paradox: relations among TQM practices, plant performance, and customer satisfaction”, *Journal of Operations Management,* Vol. 17, No.1, pp. 59 – 75.

Christmann, P. (2000), “Effects of “best practices” of environmental management on cost advantage: the role of complementary assets”, *Academy of Management Journal*, Vol. 43, No. 4, pp. 663 – 680.

Christopher, M. and Towill, D.R. (2000), “Supply chain migration from lean and functional to agile and customized”, *Supply Chain Management: An International Journal,* Vol. 5, No. 4, pp. 206 – 213.

Chung, Y. and Tsai, C. (2007), “The effect of green design activities on new product strategies and performance: an empirical study among high-tech companies”, *International Journal of Management,* Vol. 24, No. 2, pp. 276 – 288.

Churchill, G.A. (1976), *Marketing Research: Methodological Foundations,* Dryden Press, Hinsdale, Illinois.

Clift, R. and Wright, L. (2000), “Relationships between environmental impacts and added value along the supply chain”, *Technological Forecasting and Social Change*, Vol. 65, No. 3, pp. 281 – 295.

Coleman, J.S. (1986), “Social theory, social research, and a theory of action”, *American Journal of Sociology,* Vol. 91, No. 6, pp. 1309 – 1335.

Cook, M.B., Bhamra, T.A. and Lemon, M. (2006), “The transfer and application of Product Service Systems: from academic to UK manufacturing firms”, *Journal of Cleaner Production,* Vol. 14, No. 17, pp. 1455 – 1465.

Cooper, J., Browne, M. and Peters, M. (1991), *European Logistics: Markets, Management and Strategy*, Blackwell Business, Oxford.

Cordano, M. and Frieze, I.H. (2000), “Pollution reduction preferences of U.S. environmental managers: applying Ajzen’s theory of planned behavior”, *Academy of Management Journal,* Vol. 43, No. 4, pp. 627 – 641.

Cortina, J.M. (1993), “What is coefficient alpha? An examination of theory and applications”, *Journal of Applied Psychology,* Vol. 78, No.1, pp. 98 – 104.

Crespi, J.M. and Marette, S. (2005), “Eco-labelling economics: is public involvement necessary”, in Krarup, S. and Russell, C.S. (Eds.), *Environment, information and consumer behavior* Edward Elgar Publishing, Cheltenham, pp. 93 – 109.

Cronbach, L.J. (1951), “Coefficients alpha and the internal structure of tests”, *Psychometrika,* Vol. 16, No. 3, pp. 297 – 334.

Cronin, J.J., Brady, M.K. and Hult, G.T.M. (2000), “Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments”, *Journal of Retailing,* Vol. 76, No. 2, pp. 193 – 218.

Cronin, J.J. and Taylor, S.A. (1992), “Measuring service quality: a reexamination and extension”, *Journal of Marketing,* Vol. 56, No. 3, pp. 56 – 68.

Dabholkar, P.A., Thorpe, D.I. and Rentz, J.O. (1996), “A measure of service quality for retail stores: scale development and validation”, *Journal of Academy of Marketing Science,* Vol. 24, No.1, pp. 3 – 16.

Daily, B.F. and S.C. Huang. (2001), “Achieving sustainability through attention to human resource factors in environmental management”, *International Journal of Operations and Production Management*, Vol. 21, No. 12, pp. 1539 – 1552.

Darnell, N., Jolley, G.J. and Handfield, R. (2008), “Environmental management systems and green supply chain management: complements for sustainability?”, *Business Strategy and the Environment*, Vol. 17, No. 1, pp. 30 – 45.

Daugherty, P.J., Autry, C.W. and Ellinger, A.E. (2001), “Reverse logistics: the relationship between resource commitment and program performance”, *Journal of Business Logistics,* Vol. 22, No. 1, pp. 107 – 123.

Daugherty, P.J., Myers, M.B. and Richey, R.G. (2002), "Information support for reverse logistics: the influence of relationship commitment", *Journal of Business Logistics*, Vol. 23, No.1, pp. 85 – 106.

da Silveira, G.J. and Arkader, R. (2007), "The direct and mediated relationships between supply chain coordination investments and delivery performance", *International Journal of Operations and Production Management*, Vol. 27, No. 2, pp. 140 – 158.

De Brito, M.P., Carbone, V. and Blanquart, C.M. (2008), "Towards a sustainable fashion retail supply chain in Europe: organization and performance", *International Journal of Production Economics*, Vol. 114, No. 20, pp. 534 – 553.

Dekimpe, M.G., Steenkamp, J.B.E., Mellens, M. and Vanden Abeele, P. (1997), "Decline and variability in brand loyalty", *International Journal of Research in Marketing*, Vol. 14, No.5, pp. 405 – 420.

Delmas, M. (2001), "Stakeholders and competitive advantage: the case for ISO 14001", *Production and Operations Management,* Vol. 10, No. 3, pp. 343 – 358.

De Waart, D. and Kemper, S. (2004), "Five steps to service supply chain excellence", *Supply Chain Management*, Vol. 8, No. 1, pp. 28 – 35.

Dick, A.S. and Basu, K. (1994), "Customer loyalty: toward an integrated conceptual framework", *Journal of the Academy of Marketing Science,* Vol. 22, No. 2, pp. 99 – 113.

Douglas, S.P. and Craig, C.S. (2007), "Collaborative and Iterative Translation: an alternative approach to back translation", *Journal of International Marketing,* Vol. 15, No.1, pp. 30 – 43.

Dowell, G.A., Hart, S.L. and Yeung, B. (2000), "Do corporate global environmental standard create or destroy market value?", *Management Science,* Vol. 46, No. 8, pp. 1059 – 1074.

Druskat, V.U. and Wheeler, J.V. (2003), " Managing from the boundary: the effective leadership of self-managing work teams", *Academy of Management Review,* Vol. 46, No. 2, pp. 436 – 457.

Duriau, V.J., Reger, R.K. and Pfarrer, M.D. (2007), "A content analysis of the content analysis literature in organizational studies: research themes, data sources, and methodological refinements", *Organizational Research Methods,* Vol. 10, No. 1, pp. 5 – 34.

Eesley, C. and Lenox, M.J. (2006), "Firm responses to secondary stakeholder action", *Strategic Management Journal,* Vol. 27, No. 8, pp. 765 – 781.

Eggert, A. and Ulaga, W. (2002), "Customer perceived value: a substitute for satisfaction in business markets?", *Journal of Business & Industrial Marketing,* Vol. 17, No. 2/3, pp. 107 – 118.

Egri, C.P. and Herman, S. (2000), "Leadership in the North American environmental sector: Values, leadership styles, and contexts of environmental leaders and their organizations", *Academy of Management Journal,* Vol. 43, No. 4, pp. 571 – 604.

Ehret, M. and Wirtz, J. (2010), "Division of labor between firms: business services, non-ownership-value and the rise of the service economy", *Service Science,* Vol. 2, No.3, pp. 136 – 145.

Eisenhardt, K. and Martin, J.A. (2000), "Dynamic capabilities: What they are?", *Strategic Management Journal,* Vol. 21, No.10-11, pp. 1105 – 1121.

Elleger, C. and Scheiner, J. (1997), “After industrial society: service society as clean society? Environmental consequences of increasing service interaction”, *Service Industries Journal,* Vol. 17, No. 4, pp. 564 – 579.

Ellram, L.M., Tate, W.L. and Billington, C. (2004), “Understanding and managing the services supply chain”, *Journal of Supply Chain Management*, Vol. 40, No.4, pp. 17 – 32.

Ellram, L.M., Tate, W. and Carter, C.R. (2008), “Applying 3DCE to environmentally responsible manufacturing practices”, *Journal of Cleaner Production*, Vol. 15, No.15, pp.1620 – 1631.

Environmental Leader. (2008), “Tesco saves 2 billion plastic bags”, available at: www.environmental leader.com/2008/08/18/tesco-shoppers-save-2-billion-plastic-bags/ (accessed 19 October 2012).

Environmental Protection Department. (2012), “Environmental levy scheme on plastic shopping bags, available at: http://www.epd.gov.hk/epd/psb/en/intro.html (accessed 15 January 2012).

Enz, C.A. and Siguaw, J.A. (1999), “Best hotel environmental practices”, *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 40, No. 5, pp. 72 – 77.

Erdem, O., Oumlil, A.B. and Tuncalp, S. (1999), “Consumer values and the importance of store attributes”, *Journal of Retail and Distribution Management*, Vol. 27, No. 4, pp. 137 – 144.

Etzion, D. (2007), “Research on organizations and the natural environment, 1992 - present: a review”, *Journal of Management*, Vol. 33, No. 4, pp. 637 – 664.

Fernández, E., Junquera, B. and Ordiz, M. (2003), “Organizational culture and human resources in the environmental issue: a review of the literature”, *International Journal of Human Resource Management*, Vol. 14, No. 4, pp. 634 – 656.

First, I. and Khertriwal, D.S. (2010), “Exploring the relationship between environmental orientation and brand value: is there fire or only smoke?”, *Business Strategy and Environment*, Vol. 19, No. 2, pp. 90 – 103.

Fitzsimmons, J.A. and Fitzsimmons, M.J. (2000), *Service Management* (4th Edition), McGraw Hill Irwin, Boston, MA.

Flynn, B.B., Sakakibara, S., Schroeder, R.G., Bates, K.A. and Flynn, E.J. (1990), “Empirical research method in operations management”, *Journal of Operations Management*, Vol. 9, No. 2, pp. 250 – 284.

Fornell, C. (1992), “A national customer satisfaction barometer: the Swedish experience”, *Journal of Marketing*, Vol. 6, No. 1, pp. 1 – 21.

Fornell, C., Johnson, M.D., Anderson, E.W., Cha, J. and Bryant, B.E. (1996), “The American customer satisfaction index: nature, purpose, and findings”, *Journal of Marketing*, Vol. 60, No. 4, pp. 7 – 18.

Fornell, C. and Larcker, D.F. (1981), “Evaluating structural equation models with unobservable variables and measurement error”, *Journal of Marketing Research*, Vol. 18, No. 1, pp. 39 – 50.

Forza, C. (2002), “Survey research in operations management: a process-based perspective”, *International Journal of Operations and Production Management*, Vol. 22, No. 2, pp. 152 – 194.

Foster Jr, S.T., Sampson, S.E. and Dunn, S.C. (2000), “The impact of customer contact on environmental initiatives for services firms”, *International Journal of Operations and Production Management*, Vol. 20, No. 2, pp. 187 – 203.

Froehle, C.M. and Roth, A.V. (2004), “New measurement scales for evaluating perceptions of the technology-mediated customer service experience”, *Journal of Operations Management*, Vol. 22, No. 1, pp. 1 – 21.

Fullerton, R.R., McWatters, C.S. and Fawson, C. (2003), "An examination of the relationships between JIT and financial performance", *Journal of Operations Management,* Vol. 21, No. 4, pp. 383 – 404.

Fullerton, R.R. and Wempe, W. (2009), "Lean manufacturing, non-financial performance measures, and financial performance", *International Journal of Operations and Production Management,* Vol. 29, No. 3, pp. 214 – 240.

Gadenne, D.L., Kennedy, J. and McKeiver, C. (2009), "An empirical study of environmental awareness and practices in SMEs", *Journal of Business Ethics*, Vol. 84, No.1, pp. 45 – 63.

Gao, J., Yao, Y., Zhu, V.C., Sun, L. and Lin, L. (2011), "Service-oriented manufacturing: a new product pattern and manufacturing paradigm", *Journal of Intelligent Manufacturing,* Vol. 22, No. 3, pp. 435 – 446.

Garvin, D.A. (1988), *Managing Quality,* Free Press, New York.

Gattiker, T.F. and Parente, D.H. (2007), "Introduction to the special issue on innovative data sources for empirically building and validating theories in operations management", *Journal of Operations Management,* Vol. 25, No. 5, pp. 957 – 961.

Gatzweiler, F.W. (2006), "Organizing a public ecosystem service economy for sustaining biodiversity", *Ecological Economics*, Vol. 59, No. 3, pp. 296 – 304.

Geffen, C.A. and Rothenberg, S. (2000), "Suppliers and environmental innovation: the automotive paint process", *International Journal of Operations and Production Management,* Vol. 20, No. 2, pp. 166 – 186.

Gerbing, D.W. and Anderson, J.C. (1988), "An updated paradigm for scale development incorporating unidimensionality and its assessment", *Journal of Marketing Research,* Vol. 25, No. 2, pp. 196 – 192.

Germain, R. and Iyer, K.N. (2006), "The interaction of internal and downstream integration and its association with performance", *Journal of Business Logistics,* Vol. 27, No. 2, pp. 29 – 52.

Ghosh, P., Tripathi, V. and Kumar, A. (2010), "Customer expectations of store attributes: a study if organized retail outlets in India", *Journal of Retail and Leisure Property,* Vol. 9, No.1, pp. 75 – 87.

Gilley, K.M., Worrel, D.L., Davidson, W.N. and EI-Jelly, A. (2000), "Corporate environmental initiatives and anticipated firm performance: the differential effects of process-drive versus product-driven greening initiatives", *Journal of Management*, Vol. 76, No. 6, pp. 1199 – 1216.

Ginsberg, J.M. and Bloom, P.N. (2004), "Choosing the right green marketing strategy", *MIT Sloan*, Vol. 46, No. 1, pp. 79 – 84.

Glaser, B. and Strauss, A. (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine, New York.

Global Reporting Initiative. (2004), "Global Reporting Initiative", avaiable at: http://www.global reporting.org (accessed 3 May 2012).

Goedkoop, M., van Halen, C., Te Riele, H. and Rommens, P. (1999), *Product Service systems, ecological and economic basics*, Dutch Ministries of Environment (VROM) and Economic Affairs (EZ), Hague, Netherlands.

Goldstein, S.M., Johnston, R., Duffy, J. and Rao, J. (2002), "The service concept: The missing link in service design research?", *Journal of Operations Management*, Vol. 20, No. 2, pp. 121 – 134.

Golhar, D.Y. and Stamm, C.L. (1991), “The just-in-time philosophy: a literature review”, *International Journal of Production Research,* Vol. 29, No. 4, pp. 657 – 676.

Goodman, A. (2000), “Implementing sustainability in services operations at Scandic Hotels”, *Interface,* Vol. 30, No. 3, pp. 202 – 214.

Govindarajulu, N. and Daily, B.F. (2004), “Motivating employees for environmental improvement”, *Industrial Management and Data Systems*, Vol. 104, No. 4, pp. 364 – 372.

Gray, R., Kouhy, R. and Lavers, S. (1995), “Methodological themes: Constructing a research database of social and environmental reporting”, *Accounting, Auditing and Accountability,* Vol. 8, No. 2, pp. 78 – 101.

Green Jr, K.W., Zelbst, P.J., Meacham, J. and Bhadauria, V.S. (2012), “Green supply chain management practices: impact on performance”, *Supply Chain Management: An International Journal*, Vol. 17, No. 3, pp. 290 – 305.

Greenan, K., Humphreys, P. and Mclvor, R. (1997), “The green initiative: improving quality and competitiveness for European SMEs”, *European Business Review,* Vol. 97, No. 5, pp. 208 – 214.

Gronholdt, L., Martensen, A. and Kristensen, K. (2000), “The relationship between customer satisfaction and loyalty: cross-industry differences”, *Total Quality Management*, Vol. 11, No. 4-6, pp. 509 – 514.

Grove, S.J., Fisk, R.P., Pickett, G.M. and Kangun, N. (1996), “Going green in the service sector: social responsibility issues, implications and implementation”, *European Journal of Marketing*, Vol. 30, No. 5, pp. 56 – 66.

Grundey, D. (2009), “Eco-marketing and eco-labeling: does it ensure customer loyalty for eco-products in Lithuania”, *Transformation in Business & Economics*, Vol. 8, No. 1, pp. 153 – 179.

Gummesson, E. (1994), “Service management: an evaluation and the future”, *International Journal of Service Industry Management*, Vol. 5, No.1, pp. 77 – 96.

Gustafsson, A., Johnson, M.D. and Roos, I. (2005), “The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention”, *Journal of Marketing*, Vol. 69, No. 4, pp. 210 – 218.

Hackston, D. and Milne, M.J. (1996), “Some determinants of social and environmental disclosures in New Zealand companies”, *Accounting, Auditing, and Accountability Journal*, Vol. 9, No.1, pp. 77 – 108.

Hallowell, R. (1996), “The relationships of customer satisfaction, customer loyalty and profitability: an empirical study”, *International Journal of Service Industries Management*, Vol. 7, No. 4, pp. 27 – 42.

Halme, M. (2001), “Learning for sustainable development in tourism networks”, *Business Strategy and the Environment,* Vol. 10, No. 2, pp. 100 – 114.

Halme, M., Jasch, C. and Scharp, M. (2004)., “Sustainable homeservices? Toward household services that enhance ecological, social and economic sustainability”, *Ecological Economics,* Vol. 51, No. 1, pp. 125 – 138.

Hammond, C. (2005), “The wider benefits of adult learning: an illustration of the advantages of multi-method research”, *International of Social Research Methodology,* Vol. 8, No. 3, pp. 239 – 255.

Handfield, R.S., Sroufe, R. and Walton, S. (2005), “Integrating environmental management and supply chain strategies”, *Business Strategy and the Environment,* Vol. 14, No. 1, pp. 1 – 19.

Hanna, M.D., Newman, W.R. and Johnson, P. (2000), “Linking operational and environmental improvement through employee involvement”, *International Journal of Operations and Production Management*, Vol. 20, No. 2, pp. 148 – 165.

Hart, S.L. (1995), “A natural-resource based view of the firm”, *Academy of Management Review,* Vol. 20, No. 4, pp. 986 – 1014.

Hart, S.L. and Ahuja, G. (1996), “Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance”, *Business Strategy and the Environment*, Vol. 5, No. 1, pp. 30 – 37.

Hart, S.L. and Dowell, G. (2011), “A natural-resource-based view of the firm: fifteen years after”, *Journal of Management*, Vol. 37, No. 5, pp. 1446 – 1479.

Hartmann, P. and Ibáñez, V.A. (2006), “Green value added”, *Marketing Intelligence and Planning*, Vol. *24, No.* 7, pp. 673 – 680.

Harwood, T.G. and Garry, T. (2003), “An overview of content analysis”, *The Marketing Review*, Vol. 3, No. 4, pp. 479 – 498.

Hassan, A. E. and Ibrahim, E. (2012), “Corporate environmental information disclosure: factors influencing companies’ success in attaining environmental awards”, *Corporate Social Responsibility and Environmental Management*, Vol. 19, No. 1, pp. 32 – 46.

Hays, R.D., Marshall, G.N., Wang, E.Y. and Sherbourne, C.D. (1994), “Four-year cross-lagged associations between physical and mental health in the medical outcomes study”, *Journal of Consulting and Clinical Psychology,* Vol. 62, No. 30, pp. 441 – 449.

Heiskanen, E. and Jalas, M. (2000), *Dematerialization Through Services – A Review and Evaluation of the Debate,* The Ministry of the Environment.

Heng, M.S. and De Moor, A. (2003), “From Habermas’s communicative Theory to practice on the internet”, *Information Systems Journal*, Vol. 13, No. 4, pp. 331 – 352.

Henriques, S.T. and Kander, A. (2010), “The modest environmental relief resulting from the transition to a service economy”, *Ecological Economics,* Vol. 70, No. 2, pp. 271 – 282.

Herbig, P., Milewicz, J. and Golden, J. (1994), “A model of reputation building and destruction”, *Journal of Business Research*, Vol. 30, No. 1, pp. 23 – 31.

Heskett, J.L., Sasser, W.E. and Schlesinger, L.A. (1997), *Service Profit Chain*, Free Press, New York.

Heskett, J.L. and Schlesinger, L.A. (1994), “Putting the service profit chain to work”, *Harvard Business Review*, Vol. 72, No. 2, pp. 164 – 174.

Hillary, R. (2004), “Environmental management systems and the smaller enterprise”, *Journal of Cleaner Production*, Vol. 12, No. 6, pp. 561 – 569.

Hines, F. and Johns, R. (2001), “Environmental supply chain management: evaluating the use of environmental mentoring through supply chains”, in *Sustainability at the Millennium: Globalization, Competitiveness and the Public Trust proceedings of the Ninth International Conference of Greening of Industry Network, Bangkok,2001,* confex.com, pp. 1 – 14.

Hinkin, T.R. (1998), “A brief tutorial on the development of measures for use in survey questionnaires”, *Organizational Research Methods*, Vol. 1, No. 1, pp. 104 – 121.

Ho, D.C.K., Duffy, V.G. and Shih, H.M. (2001), “Total quality management: an empirical test for mediation effect”, *International Journal of Production Research*, Vol. 39, No. 3, pp. 529 – 548.

Hockerts, K. (1999), “Eco-efficient service innovation: increasing business ecological efficiency of products and services”, in Charter, M. (Ed.), *Greener Marketing: A Global Perspective on Greener Marketing Practice,* Greenleaf Publishing, Sheffield, UK, pp. 95 – 108.

Hofer, C., Cantor, D.E. and Dai, J. (2012), "The competitive determinants of a firm's environmental management activities: evidence from US manufacturing industries", *Journal of Operations Management*, Vol. 30, No. 1, pp. 69 – 84.

Hoffman, K.D., Turley, L.W., Kelley, S.W. (2002), "Pricing retail services", *Journal of Business Research*, Vol. 55, No. 12, pp. 1015 – 1023.

Holbert, R.L. and Stephenson, M.T. (2003), "The importance of indirect effects in media effects research: testing for mediation in structural equation modeling", *Journal of Broadcasting and Electronic Media*, Vol. 47, No. 4, pp. 556 – 572.

Hong Kong Retail Management Association. (2013), "Library/ Research section overview", available at: http://www.hkrma.org/en/library/index.html (accessed 15 May 2013).

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling*, Vol. 6, No. 1, pp. 1 – 55.

Hume, S.R. and Gallagher, L. (2010), "The value for service industry firms of environmental initiatives", *Management Research Review*, Vol. 33, No. 1, pp. 1054 – 1063.

Hyllegard, K.H., Ogle, J.P. and Dunbar, B.H. (2006), "The influence of consumer identity on perceptions of store atmospherics and store patronage at a spectacular and sustainable retail site", *Clothing and Textiles Research Journal*, Vol. 24, No. 4, pp. 316 – 334.

International Business Machines Co. (IBM Co.) (2012), "2011 Corporate Responsibility Report", available at: http://www.ibm.com/ibm/responsibility/2011/ceos-letter/index.html (accessed 1 June 2013).

Information Services Department. (2013), "Hong Kong: the facts", available at: http://www.gov.hk/en/about/abouthk/factsheets/docs/service_economy.pdf. (accessed 15 June 2013).

Ittner, C.D. and Larcker, D.F. (1998), "Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction", *Journal of Accounting Research*, Vol. 36, No. 3, pp. 1 – 35.

Jabbour, C.J.C., Santos, F.C.A. and Nagano, M.S. (2008), "Environmental management system and human resource practices: is there a link between them in four Brazilian companies?", *Journal of Cleaner Production*, Vol. 16, No. 17, pp. 1922 – 1925.

Jacobs, B.W., Singhal, V.R. and Subramanian, R. (2010), “An empirical investigation of environmental performance and the market value of the firm”, *Journal of Operations Management*, Vol. 28, No. 5, pp. 430 – 441.

James, L.R., Demaree, R.G. and Wolf, G. (1984), “Estimating within-group interrater reliability with and without response bias”, *Journal of Applied Psychology,* Vol. 69, No. 1, pp. 85 – 98.

Jaruwachirathanakul, B. and Fink, D. (2005), “Internet banking adoption strategies for a developing countries: the case of Thailand”, *Internet Research,* Vol. 15, No. 3, pp. 295 – 311.

Jayaraman, V. and Luo, Y. (2007), “Creating competitive advantages through new value creation: a reverse logistics perspective”, *Academy of Management Perspectives,* Vol. 21, No. 2, pp. 56 – 73.

Jick, T.D. (1979), “Mixing qualitative and quantitative methods: triangulation in action”, *Administrative Science Quarterly,* Vol. 24, No. 4, pp. 602 – 611.

Johnson, M.D. and Fornell, C. (1991), “A framework for comparing customer satisfaction across individuals and product categories”, *Journal of Economics Psychology,* Vol. 12, No. 2, pp. 267 – 286.

Johnson, R.B., Onwuebguzie, A.J. and Turner, L.A. (2007), “Towards a definition of mixed methods research”, *Journal of Mixed Method Research,* Vol. 1, No. 2, pp. 112 – 133.

Jones, K. and Walton, J. (1999), “Internet-based environmental reporting”, *Sustainable Measures: Evaluation and Social Performance,* Vol. 1, No. 90, pp. 412 – 474.

Jöreskog, K.G. (1970), “A general method for analysis of covariance structures”, *Biometrika*, Vol. 57, No. 2, pp. 239 – 251.

Kam, B., Christopherson, G., Smyrnios, K.X. and Walker, RH. (2006), “Strategic business operations, freight transportation and eco-efficiency: a conceptual model”, in Sarkis, J. (Ed.), *Greening the supply chain,* Springer, London, pp. 103 – 115).

Kamakura, W.A., Mittal, V., De Rosa, F. and Mazzon, J.A. (2002), “Assessing the service-profit chain*”, Marketing Science,* Vol. 21, No. 3, pp. 294 – 317.

Kannan, V.R. and Tan, K.C. (2002), “Supplier selection and assessment: the impact on business performance”, *Journal of Supply Chain Management*, Vol. 38, No. 4, pp. 11 – 21.

Karpoff, J.M., Lott, J.R. and Wehrly, E.W. (2005), "The reputational penalties for environmental violations: empirical evidence", *Journal of Law and Economics*, Vol. 48, No. 2, pp. 653 – 675.

Kassinis, G.I, and Soteriou, A.C. (2003), "Greening the service profit chain: the impact of environmental management practices", *Production and Operations Management,* Vol. 12, No. 3, pp. 386 – 402.

Kassinis, G. and Vafeas, N. (2006), "Stakeholder pressures and environmental performance", *Academy of Management Journal,* Vol. 49, No. 1, pp. 145 – 159.

Kaynak, H. (2003), "The relationship between total quality management practices and their effects on firm performance", *Journal of Operations Management,* Vol. 21, No. 4, pp. 405 – 435.

Kinney, M.R. and Wempe, W.E. (2002), "Future evidence on the extent and origins of JIT's profitability effects", *The Accounting Review,* Vol. 77, No. 1, pp. 203 – 225.

Klassen, R.D. and McLaughlin, C.P. (1996), "The impact of environmental management on firm performance", *Management Science,* Vol. 42, No. 8, pp. 599 – 615.

Kleindorfer, P.R., Singhal, K. and Wassenhove, L.N. (2005), "Sustainable operations management", *Production and Operations Management*, Vol. 14, No. 4, pp. 482 – 492.

Kobayashi, H. (2005), "Strategic evolution of eco-products: a product life cycle planning methodology", *Research in Engineering Design,* Vol. 16, No. 1-2, pp. 1 – 16.

Koufteros, X.A. (1999), "Testing a model of pull production: a paradigm for manufacturing research using structural equation modeling", *Journal of Operations Management*, Vol. 17, No. 4, pp. 467 – 488.

Kotler, P. (2009), *Marketing Management*, Pearson Education, India.

Kotler, P. and Armstrong, G.M. (2010), *Principles of Marketing,* Pearson Education, New Jersey.

Koys, D. (2001), "The effects of employee satisfaction, organizational citizenship behavior and turnover on organizational effectiveness: a unit-level, longitudinal study", *Personnel Psychology*, Vol. 54, No. 1, pp. 101 – 114.

Krippendorff, K. (2004a), *Content Analysis: An introduction to Its Methodology*, Thousand Oaks, California.

Krippendorff, K. (2004b), “Reliability in content analysis: some common misconceptions and recommendations”, *Human Communication Research*, Vol. 30, No. 3, pp. 411 – 433.

Kumar, V., Bohling, T.R. and Ladda, R.N. (2003), “Antecedents and consequences of relationship intention: implications for translation and relationship marketing”, *Industrial Marketing Management,* Vol. 32, No. (8), pp. 667 – 676.

Kurk, F. and Eagan, P. (2008), “The value of adding design-for-the-environment to pollution prevention assistance options”, *Journal of Cleaner Production,* Vol. 16, No. 6, pp. 722 – 726.

Lai, K.H., Cheng, T.C.E. and Tang, A.K. (2010), “Green retailing: factors for success”, *California Management Review,* Vol. 52, No. 2, pp. 6 – 31.

Laroche, M., Bergeron, J. and Barbaro-Forleo, G. (2001), “Targeting consumers who are willing to pay more for environmentally friendly products”, *Journal of Consumer Marketing,* Vol. 18, No. 6, pp. 503 – 520.

Leahey, E. (2007), “Convergence and confidentiality? Limits to the implementation of mixed methodology”, *Social Science Research,* Vol. 36, No. 1, pp. 149 – 158.

LeBreton, J.M. and Senter, J.L. (2008), “Answers to 20 questions about interrater reliability and interrater agreement”, *Organizational Research Methods*, Vol. 11, No. 4, pp. 815 – 852.

Lee, J. (2013), “Retail prospects to remain high”, available at: http://www.thestandard.com.hk/news_detail.asp?pp_cat=48&art_id=132725&sid=39445601&con_type=1&d_str=20130411 (accessed 8 May 2013).

Lee, S.Y. and Klassen, R.D. (2008), “Drivers and enablers that foster environmental management capabilities in small- and medium-sized suppliers in supply chains”, *Production and Operations Management*, Vol. 17, No. 6, pp. 573 – 586.

Lee, G.G. and Lin, H.F. (2005), “Customer perceptions of e-service quality in online shopping”, *International Journal of Retail and Distribution Management,* Vol. 33, No. 2, pp. 161 – 176.

Lehman, G. (2002), “Global accountability and sustainability: research prospects”, in *Accounting Forum*, Blackwell Publishers Ltd., Vol. 26, No. 3-4: pp. 219 – 232.

Leire, C. and Thidell, A. (2005), "Product related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers", *Journal of Cleaner Production,* Vol. 13, No. 10, pp. 1061 – 1070.

Leung, T.K.P., Chan, R.Y.K., Lai, K.H. and Ngai, E.W. (2011), "An examination of the influence of guanxi and xinyong (utilization of personal trust) on negotiation outcome in China: an old friend approach", *Industrial Marketing Management*, Vol. 40, No. 7, pp. 1193 – 1205.

Lin, C., Chow, W.S., Madu, C.N., Kuei, C.H. and Pei Yu, P. (2005), "A structural equation model of supply chain quality management and organizational performance", *International Journal of Production Economics*, Vol. 96, No. 3, pp. 335 – 365.

Lin, B., Jones, C.A. and Hsieh, C.T. (2001), "Environmental practices and assessment: A process perspective", *Industrial Management and Data Systems*, *Vol. 101, No.* 2, pp. 71 – 79.

Lin, H.H. and Wang, Y.S. (2006), "An examination of the determinants of customer loyalty in mobile commerce contexts", *Information and Management,* Vol. 43, No. 3, pp. 271 – 282.

Lindell, M.K. and Whitney, D.J. (2001), "Accounting for common method variance in cross-sectional designs", *Journal of Applied Psychology,* Vol. 86, No. 1, pp. 114 – 121.

Linton, J.D. and Jayaraman, V. (2005), "A framework for identifying differences and similarities in the managerial competencies associated with different modes of product life extension", *International Journal of Production Research,* Vol. 43, No. 9, pp. 1807 – 1829.

LOHAS. (2007), "LOHAS 11 Forum Reveals "Green" Consumer Marketplace Could Quadruple, Reaching $845 Million by 2015", available at: www.csrwire.com/press/press_release/20489-Lohas-11-Forum-Reveals-Green-Consumer-Marketplace-Could-Quadruple-Reaching-845-Million-by-2015 (accessed 15 January 2012).

Loveman, G.W. (1998), "Employee satisfaction, customer loyalty, and financial performance as empirical examination of the service profit chain in retail banking", *Journal of Service Research,* Vol. 1, No. 1, pp. 18 – 31.

Lozada, H. and Mintu-Wimsatt, M. (1995), “Green based Innovation: sustainable development in production management”, in Polonsky, M.J. and Mintu-Wimsatt, A. (Eds.), *Advances in Environmental Marketing: New Development in Practice, Theory and Research*, Haworth Press, New York, pp. 179 – 196.

Lusch, R.F., Vargo, S.L. and Tanniru, M. (2010), “Service, value networks and learning”, *Journal of the Academy of Marketing Science,* Vol. 38, No. 1, pp. 19 – 31.

MacKinnon, D. P., Krull, J. L. and Lockwood, C. M. (2000), “Equivalence of the mediation, confounding, and suppression effect”, *Prevention Science,* Vol. 1, No. 4, pp. 173 – 181.

Malhorta, N.K., Kim, S.S. and Patil, A. (2006), “Common method variance in IS research: a comparison of alternative approaches and a reanalysis of past research”, *Management Science,* Vol. 52, No. 12, pp. 1865 – 1883.

Manaktola, K. and Jauhari, V. (2007), “Exploring consumer attitude and behavior towards green practices in the lodging industry in India”, *International Journal of Contemporary Hospitality Management,* Vol. 19, No. 5, pp. 364 – 377.

Manzini, E. and Vezzoli, C. (2002), *Product-service systems and sustainability: Opportunities for Solutions,* United Nations Environment Program (UNEP), Division of Technology Industry and Economics (DTIE), Production and Consumption Branch, Milan, Paris.

Manzini, E. and Vezzoli, C. (2003), "A strategic design approach to develop sustainable product service systems: examples taken from the environmentally friendly Italian prize", *Journal of Cleaner Production,* Vol. 11, No. 8, pp. 851 – 857.

Marsh, H.W. and Hocevar, D. (1984), "Application of confirmatory factor analysis to the study of self-concept: first and higher order factor models and their invariance across groups", *Psychological Bulletin,* Vol. 97, No. 3, pp. 562 – 582.

Maslennikova, I. and Foley, D. (2000), "Xerox's approach to sustainability", *Interfaces,* Vol. 30, No. 3, pp. 226 – 233.

Maxwell, D. and Van der Vorst, R. (2003), "Developing sustainable products and services", *Journal of Cleaner Production,* Vol. 11, No, 8, pp. 883 – 895.

McMurrian, R.C. and Matulich, E. (2011), “Building customer value and profitability with business ethics”, *Journal of Business and Economics Research,* Vol. 4, No. 11, pp. 11 –18.

McWilliams, A. and Siegel, D.S. (2001), “Corporate social responsibility: a theory of the firm perspective”, *Academy of Management Review,* Vol. 26, No. 1, pp. 117 – 127.

Meijkamp, R. (1998), “Changing consumer behavior through “Eco-efficient Services”: an empirical study on car-sharing in the Netherlands”, *Business Strategy and the Environment*, Vol. 7, No. 4, pp. 234 – 244.

Melville, N.P. (2010), “Information systems innovation for environmental sustainability”, *MIS Quarterly,* Vol. 34, No. 1, pp. 1 – 21.

Melynk, S.A., Sroufe, R.P. and Calantone, R. (2003), “Assessing the impact of environmental management systems on corporate and environmental performance”, *Journal of Operations Management*, Vol. 21, No. 3, pp. 329 – 351.

Mentzer, J.T., Min, S. and Zacharia, Z.G. (2000), “The nature of interim partnering in supply chain management”, *Journal of Retailing,* Vol. 76, No. 4, pp. 549 – 568.

Menor, L.J. and Roth, A.V. (2007), “New service development competence in retail banking: construct development and measurement validation”, *Journal of Operations Management,* Vol. 25. No. 4, pp. 825 – 846.

Michelsen, O., Fet, A.M. and Dahlsrud, A. (2006), “Eco-efficiency in extended supply chains: a case study of furniture production”, *Journal of Environmental Management,* Vol. 79, No. 3, pp. 290 – 297.

Min, H. and Galle, W.P. (2001), “Green purchasing practices of US firms”, *International Journal of Operations and Production Management*, Vol. 21, No. 9, pp. 1222 – 1238.

Mont, O. (2003), “Editorial for the special issue of the Journal of Cleaner Production on Product Service Systems”, *Journal of Cleaner Production,* Vol. 11, No. 8, pp. 815 – 817.

Montabon, F., Sroufe, R. and Narasimhan, R. (2007), “An examination of corporate reporting, environmental management practices and firm performance”, *Journal of Operations Management,* Vol. 25, No. 5, pp. 998 – 1014.

Morrow, D. and Rondinelli, D. (2002), “Adopting corporate environmental management systems: motivations and results of ISO 14001 and EMAS Certification”, *European Management Journal*, Vol. 20, No. 2, pp. 159 – 171.

Narasimhan, R. and Kim, S.W. (2002), “Effect of supply chain integration on the relationship between diversification and performance: evidence from Japanese and Korean firms”, *Journal of Operations Management*, Vol. 20, No. 3, pp. 303 – 323.

Narayandas, N. (1996), *The Link Between Customer Satisfaction and Customer Loyalty: An Empirical Investigation,* Division of Research, Harvard Business School.

Neely, A. (2008), “Exploring the financial consequences of the servitization of manufacturing”, *Operations Management Research,* Vol. 1, No. 2, pp. 103 – 118.

Neuendorf, K.A. (2002), *The Content Analysis Guidebook*, Sage Publications, Thousand Oaks, CA.

Nordås, H.K. (2008), “Gatekeepers to consumer markets: the role of retailers in international trade”, *The International Review of Retail, Distribution and Consumer Research*, Vol. 18, No. 5, pp. 449 – 472.

Nunes, B. and Bennett, D. (2010), “Green operations initiatives in the automotive industry: an environmental reports analysis and benchmarking study”, *Benchmarking: An International Journal,* Vol. 17, No. 3, pp. 396 – 420.

Nunnally, J.C. (1978), *Psychometric Theory* (2nd ed.), McGraw-Hill, New York.

Nunnally, J. C.(1984), *Psychometric Theory* (3rd ed.), McGraw-Hill, New York.

Ogle, J.P., Hyllegard, K.H. and Dunbar, B.H. (2004), "Predicting patronage behaviors in a sustainable retail environment adding retail characteristics and consumer lifecycle orientation to the belied-attitude-behavior intention", *Environment and Behavior,* Vol. 36, No. 5, pp. 717 – 741.

O'Leary-Kelly, S.W. and Vokurka, R.J. (1998), "The empirical assessment of construct validity", *Journal of Operations Management,* Vol. 16, No. 4, pp.387 – 405.

Oliva, R. and Kallenberg, R. (2003), "Managing the transition from products to services", *International Journal of Service Industry Management,* Vol. 14, No. 2, pp. 160 – 172.

Oliver, R.L. (1993), "Cognitive, affective, and attribute bases of the satisfaction response", *Journal of Consumer Research,* Vol. 20, No. 3, pp. 418 – 430.

Oliver, R.L. (1997), *Satisfaction: A Behavioral Perspective On the Consumer*, McGraw-Hill, New York.

Oliver, R.L. (1999), "Whence consumer loyalty?", *Journal of Marketing,* Vol. 63, pp. 33 – 44.

O'Sullivan, A., Sheffrin, S.M. and Perez, S.J. (2008), *Microeconomics: Principles, Applications, and Tools,* Pearson Prentice Hall, Upper Saddle River, NJ.

Overdevest, C. (2004), "Codes of conduct and standard setting in the forest sector: constructing markets for democracy?", *Relations Industries,* Vol. 59, No. 1, pp. 172 – 197.

Park, H. and Lennon, S.L. (2006), "The organizational factors influencing socially responsible apparel buying/sourcing", *Clothing and Textiles Research Journal,* Vol. 24, No. 3, pp. 229 – 247.

Pedhazur, E.J. and Schmelkin, L.P. (2013), *Measurement, Design, and Analysis: An Integrated Approach,* Psychology Press.

Perez-Sanchez, D., Barton, J.R. and Bower, D. (2003), "Implementing environmental management in SMEs", *Corporate Social Responsibility and Environmental Management,* Vol. 10, No. 2, pp. 67 – 77.

Perron, G.N., Côté, R.P. and Duffy, J.F. (2006), "Improving environmental awareness training in business", *Journal of Cleaner Production,* Vol. 14, No. 6-7, pp. 551 – 562.

Perry, P. (2001), "New Millennium may Usher in New Day for ISO 14001", available at: http://www.businessstandards.com/content/16ftr3.asp (accessed 18 April 2014).

Pickett-Baker, J. and Ozaki, R. (2008), "Pro-environmental products: marketing influence on consumer purchase decision", *Journal of Consumer Marketing,* Vol. 25, No. 5, pp. 281 – 293.

Piell, A.B. (2009), "A closer look at green retailing facilities", *Buildings*, Vol. 103, No. 6, pp. 88.

Plambeck, E.L. (2007), "The greening of Wal-Mart's supply chain", *Supply Chain Management Review,* Vol. 11, No. 5, pp. 18 – 25.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology,* Vol. 88, No. 5, pp. 879 – 903.

Poksinska, B., Dalgaard, J.J. and Eklund, J.A. (2003), “Implementing ISO 14000 in Sweden: motives, benefits and comparisons with ISO 9000”, *International Journal of Quality and Reliability Management,* Vol. 20, No.5, pp. 585 – 606.

Porter, M.E. and Millar, V.E. (1985), “How information gives you competitive advantage”, *Harvard Business Review,* Vol. 63, No. 4, pp. 149 – 160.

Porter, M.E. and Van der Linde, C. (1995), “Green and competitive: ending the stalemate”, *Harvard Business Review,* Vol. 7, No. 5, pp. 120 – 134.

Price, E.E. and Coy, D.R. (2001), “Life cycle management at 3M: a practical approach”, *Environmental Management and Health Journal*, Vol. 12, No. 3, pp. 254 – 259.

Pujari, D. (2006), “Eco-innovation and new product development: understanding the influences on market performance”, *Technovation,* Vol. 26, No. 1, pp. 76 – 85.

Pun, K.F. (2006), “Determinants of environmentally responsible operations: a review”, *International Journal of Quality and Reliability Management,* Vol. 23, No. 3, pp. 279 – 297.

Pun, K.F., Hui, I.K., Lau, H.C., Law, H.W. and Lewis, W.G. (2002), "Development of an EMS planning framework for environmental management practices", *International Journal of Quality and Reliability Management,* Vol. 19, No. 6, pp. 688 – 709.

Quinn, J.B. (1992), "The intelligent enterprise a new paradigm", *The Executive,* Vol. 6, No. 4, pp. 48 – 63.

Rao, P. and Holt, D. (2005), "Do green supply chains lead to competitiveness and economic performance?", *International Journal of Operations and Production Management*, Vol. 25, No. 9, pp. 898 – 916.

Ramus C.A. *and* Steger*, U. (*2000)*, "*The roles of supervisory support behaviors and environmental policy in employee "ecoinitiatives" at leading-edge European companies", *Academy of Management Journal*, *Vol.* **43, No.** 4, pp. 605 – 626*.*

Ray, G., Barney, J.B. and Muhanna, W.A. (2004), "Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of resource-based view", *Strategic Management Journal,* Vol. 25, No. 1, pp. 23 – 37.

Ray, G., Muhanna, W.A. and Barney, J.B. (2005), "Information technology and the performance of the customer service process: a resource-based analysis", *MIS Quarterly*, Vol. 29, No. 4, pp. 625 – 652.

Reichheld, F.F. and Sasser, W.E. (1990), "Zero defections: quality comes to services", *Harvard Business Review*, Vol. 68, No. 5, pp. 105 – 111.

Reichheld, F.F. and Teal, T. (2001), *The Loyalty Effect: The Hidden Force Behind Growths, Profits, and Lasting Value*, Harvard Business Press.

Reputation Institute. (2008), "The most respected U.S. companies 2008", available at:http://www.reputationcapital.org/files/uploaded/Free_CSRI_Report_2008.pdf (Accessed 15 June 2012).

Revkin, A.C. (2009), *Obama Speaks On climate at UN*, The New York Times, New York.

Robinot, E. and Giannelloni, J.L. (2010), "Do hotel "green" attributes contribute to customer satisfaction?", *Journal of Services Marketing*, Vol. 24, No. 2, pp. 157 – 169.

Rogers, D.S. and Tibben-Lembke, R. (2001), "An examination of reverse logistics practices", *Journal of Business Logistics*, Vol. 22, No. 2, pp. 129 – 148.

Rondinelli, D.A. and Berry, M.A. (2000), "Environmental citizenship in multinational corporations: social responsibility and sustainable development", *European Management Journal*, Vol. 18, No. 1, pp. 70 –84.

Rondinelli, D.A. and Vastag, G. (1996), "International environmental standards and corporate policies: an integrative framework", *California Management Review*, Vol. 39, No. 1, pp. 106 – 122.

Rosenthal, E. (2009), "Biggest obstacle to global climate deal may be how to pay for it", *The New York Times*, 15 October, pp. 1 –3.

Rosenzweig, E.D. and Roth, A.V. (2004), "Towards a theory of competitive progression: evidence from high-tech manufacturing", *Production and Operations Management*, Vol. 13, No. 4, pp. 354 – 368.

Ross, S. and Evans, D. (2002), "Use of life cycle assessment in environmental management", *Environmental Management*, Vol. 29, No. 1, pp. 132 – 142.

Roth, A.V. (2007), "Applications of empirical science in manufacturing and service operations", *Manufacturing and Service Operations Management*, Vol. 9, No. 4, pp. 353 – 367.

Roth, A.V. and Menor, L.J. (2003), "Insights into service operations management: a research agenda", *Production and Operations Management,* Vol. 12, No. 3, pp. 145 – 164.

Rothenberg, S., Pil, F.K. and Maxwell, J. (2001), "Lean, green, and the quest for superior environmental performance", *Production and Operations Management,* Vol. 10, No. 3, pp. 228 – 243.

Roy, R. (2000), "Sustainable product-service systems", Futures, Vol. 32, No. 3, pp. 289 – 299.

Rueda-Manzanares, A., Aragón-Correa, J.A. and Sharma, S. (2008), "The influence of stakeholders on the environmental strategy of service firms: the moderating effects of complexity, uncertainty, and munificence", *British Journal of Management,* Vol. 19, No. 2, pp.185 – 203.

Rugman, A.M. and Verbeke, A. (2002), "Edith Penrose's contribution to the resource-based view of strategic management", *Strategic Management Journal,* Vol. 23, No. 8, pp. 769 – 780.

Russo, M.V. and Fouts, P.A. (1997), "A resource-based perspective on corporate environmental performance and profitability", *Academy of Management Journal,* Vol. 40, No. 3, pp. 534 – 539.

Saeed, K.A., Malhorta, M.K. and Grover, V. (2005), “Examining the impact of interorganizational systems on process efficiency and sourcing leverage in buyer-supplier dyads”, *Decision Sciences,* Vol. 36, No. 3, pp. 365 – 396.

Salzman, J. (2000), “Environmental protection beyond the smokestack: addressing the impact of the service economy”, *Corporate Environmental Strategy,* Vol. 7, No. 1, pp. 20 – 37.

Sammalisto, K. and Brorson, T. (2008), “Traning and communication in the implementation of environmental management systems (ISO 14001): a case study at the University of Gävle, Sweden”, *Journal of Cleaner production,* Vol. 16, No. 3, pp. 299 – 309.

Sammer, K. and Wüstenhagen, R. (2006), “The influence of eco-labelling on consumer behavior – results of a discrete choice analysis for washing machines”, *Business Strategy and the Environment,* Vol. 15, No. 3, pp. 185 – 199.

Sarkis, J. (2003). A strategic decision framework for green supply chain management. *Journal of Cleaner Production, 11*(4): 397 – 409.

Sarkis, J., Gonzalez-Torre, P. and Adenso-Diaz, B. (2010), "Stakeholder pressure and the adoption of environmental practices: the mediating effect of training", *Journal of Operations Management*, Vol. 28, No. 2, pp. 163 – 176.

Sarkis, J., Zhu, Q. and Lai, K.H. (2011), "An organizational theoretic review of green supply chain management literature", *International Journal of Production Economics,* Vol. 130, No. 1, pp. 1 –15.

Savaskan, R.C., Bhattacharya, S. and Van Wassenhove, L.N. (2004), "Closed-loop supply chain models with product manufacturing", *Management Science,* Vol. 50, No. 2, pp. 239 – 252.

Sawhney, M., Balasubramanian, S. and Krishnan, V.V. (2003), "Creating growth with services", *MIT Sloan Management Review,* Vol. 45, No. 2, pp. 34 – 43.

Schendler, A. (2001), "Trouble in paradise: the rough road to sustainability in Aspen", *Corporate Environmental Strategy,* Vol. 8, No. 4, pp. 293 – 299.

Schmenner, R.W. (2009), "Manufacturing, service, and their integration: some history and theory", *International Journal of Operations and Production Management,* Vol. 29, No.5, pp. 431 – 443.

Schrader, U. (1999), “Consumer acceptance of eco-efficient service: a German perspective”, *Greener Management International*, pp. 105-121.

Science and Technology Policy Research. (2011), “Measuring the environmental performance of industry (MEPI)”, available at: http://www.sussex.ac.uk/Units/spru/mepi/outputs/AppendicesII.PDF (accessed 2 June 2012).

Segars, A.H. (1997), “Assessing the unidimensionality of measurement: a paradigm and illustration within the context of information system research”, *Omega,* Vol. 25, No.1, pp. 107 – 121.

Seifert, B., Morris, S.A. and Bartkus, B.R. (2003), “Comparing big givers and small givers: financial correlated of corporate philanthropy”, *Journal of Business Ethics,* Vol. 45, No.3, pp. 195 – 211.

Seuring S. (2001), “Green supply chain costing”, *Greener Management International,* Vol. 2001, No. 33, pp. 71 – 80.

Seuring, S. and Müller, M. (2008), “From a literature review to a conceptual framework for sustainable supply chain management”, *Journal of Cleaner Production,* Vol. 16, No. 15, pp. 1699 – 1710.

Sharma, S. (2000), "Managerial interpretations and organizational context as predictors of corporate choice environmental strategy", Academy of Management Journal, Vol. 43, No. 4, pp. 681 – 697.

Shrivastava, P. (1995), "The role of corporations in achieving ecological sustainability", *Academy of Management Review*, Vol. 20, No. 4, pp. 936 – 960.

Simpson, M., Taylor, N. and Barker, K. (2004), "Environmental responsibility in SMEs: does it deliver competitive advantage?", *Business Strategy and the Environment*, Vol. 13, No. 3, pp. 156 – 171.

Singhal, K. and Singhal, J. (2012a), "Imperatives of the science of operations and supply-chain management", *Journal of Operations Management*, Vol. 30, No. 3, pp. 237 – 244.

Singhal, K. and Singhal, J. (2012b), "Opportunities for developing the science of operations and supply-chain management", *Journal of Operations Management*, Vol. 30, No. 3, pp. 245 – 252.

Sirohi, N., McLaughlin, E.W. and Wittink, D.R. (1998), "A model of consumer perceptions and store loyalty intentions for a supermarket retailer", *Journal of Retailing*, Vol. 74, No. 2, pp. 223 – 245.

Smith, K.T. (2010), “An examination of marketing techniques that influence Millennials’ perceptions of whether a product is environmentally friendly”, *Journal of Strategic Marketing*, Vol. 18, No. 6, pp. 437 – 450.

Solér**, C.,** Bergström, K. and Shanahan, H. (2010), “Green supply chains and the missing link between environmental information and practice”, *Business Strategy and the Environment*, Vol. 19, No. 1, pp. 14 – 25.

Sparks, B.A. and McColl-Kennedy, J.R. (2001), “Justice strategy options for increased customer satisfaction in a services recovery setting”, *Journal of Business Research,* Vol. 54, No. 3, pp. 209 – 218.

Srivastava, S.K. (2007), “Green supply-chain management: a state-of-the-art literature review”, *International Journal of Management Reviews,* Vol. 9, No. 1, pp. 53 – 80.

Srinivasan, S.S., Anderson, R. and Ponnavolu, K. (2002), “Customer loyalty in e-commerce: an exploration of its antecedents and consequences”, *Journal of Retailing,* Vol. 78, No. 1, pp. 41 – 50.

Sroufe, R. (2003), “Effects of environmental management systems on environmental management practices and operations”, *Production and Operations Management,* Vol. *12,* No. 3, pp. 416 – 431.

Stafford, E.R., Polonsky, M.J. and Hartman, C.L. (2000), “Environmental NGO-business collaboration and strategic bridging: a case analysis of the Greenpeace-Foron Alliance”, *Business Strategy and the Environment,* Vol. 9, No. 2, pp. 122 – 135.

Stanwick, P.A. and Stanwick, S.D. (1998), “The relationship between corporate social performance, and organizational size, financial performance, and environmental performance: an empirical examination”, *Journal of Business Ethics,* Vol. 17, No. 2, pp. 195 – 204.

Steiger, J.H. (1990), “Structural model evaluation and modifications: An internet estimation approach”, *Multivariate Behavioral Research,* Vol. 25, No. 2, pp. 134 – 144.

Stone, D. (1995), “No longer at the end of the pipe, but still a long way from sustainability: a look at management accounting for the environment and sustainable development in the United States”, *Accounting Forum,* Vol. 19, No. 2/3, pp. 95 – 110.

Subramanian, R., Gupta, S. and Talbot, B. (2009), “Product design and supply chain management under extended procedure responsibility”, *Production and Operations Management,* Vol. 18, No. 3, pp. 259 – 277.

Suh, S. (2006), "Are services better for climate change?", *Environmental Science and Technology,* Vol. 40, No. 21, pp. 6555 – 6560.

Surroca, J., Tribó, J.A. and Waddock. S. (2010), "Corporate responsibility and financial performance: the role of intangible resources", *Strategic Management Journal,* Vol. 31, No. 5, pp. 463 – 490.

Sweeney, J.C. and Soutar, G.N. (2001), "Consumer perceived value: the development of a multiple item scale", *Journal of Retailing,* Vol. 77, No. 2, pp. 203 – 220.

Tang, A.K., Lai, K.H. and Cheng, T.C.E. (2012), "Environmental governance of enterprises and their economic upshot through corporate reputation and customer satisfaction", *Business Strategy and the Environment,* Vol. 21, No. 6, pp. 401 – 411.

Tangpong, C. (2011), "Content analytic approach to measuring constructs in operations and supply china management", *Journal of Operations Management,* Vol. 29, No. 6, pp. 627 – 638.

Tanrivrdi, H. (2006), "Performance effects of information technology synergies in multibusiness firms", *MIS Quarterly,* Vol. 30, No. 1, pp. 57 – 77.

Target Corporation. (2012), “2011 Corporate responsibility report”, available at: https://corporate.target.com/_media/TargetCorp/csr/pdf/2011-Target-Corporate-Responsibility-Report.pdf (accessed 1 June 2013).

Tate, W.L., Ellram, L.M. and Kirchoff, J.F. (2010), “Corporate social responsibility reports: a thematic analysis related to supply chain management”, *Journal of Supply Chain Management,* Vol. 46, No. 1, pp. 19 – 44.

Tibben-Lembke, R.S. and Rogers, D.S. (2002), “Differences between forward and reverse logistics in a retail environment”, *Supply Chain Management: An International Journal*, Vol. 7, No. 5, pp. 271 – 282.

Tomiyama, T., Medland, A.J. and Vergeest, J.S.M. (2000), “Knowledge intensive engineering towards sustainable products with high knowledge and service contents”, in *TMCE*, pp. 55 – 67.

Tsoulfas, G.T. and Pappis, C.P. (2006), “Environmental principles applicable to supply chains design and operation”, *Journal of Cleaner Production,* Vol. 14, No. 18, pp. 1593 – 1602.

van Berkel, R. (2007), “Cleaner production and eco-efficiency initiatives in Western Australia 1996-2004”, *Journal of Cleaner Production,* Vol. 15, No. 8, pp. 741 – 755.

Vargo, S.L., Maglio, P.P. and Akaka, M.A. (2008), "On value and value co-creation: a service systems and service logic perspective", *European Management Journal,* Vol. 26, No. 3, pp. 145 – 152.

Verfaillie, H.A. and Bidwell, R. (2000), *Measuring Eco-efficiency: A Guide to Reporting Company Performance,* World Business Council for Sustainable Development.

Vermeir, I. and Verbeke, W. (2006), "Sustainable food consumption: exploring the consumer "attitude-behavioral intention" gap", *Journal of Agricultural and Environmental Ethics,* Vol. 19, No. 2, pp. 169 – 194.

Vickery, S.K., Jayaram, J., Droge, C.M. and Calantone, R. (2003), "The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships", *Journal of Operations Management,* Vol. 21, No. 5, pp. 523 – 539.

Vokurka, R. and Lummus, R.R. (2003), "Better supply chain with baldrige", *Quality Progress,* Vol. 36, No. 4, pp. 51 – 57.

von Paumgartten, P. (2003), "The business case for high-performance green buildings: sustainability and its financial impact", *Journal of Facilitates Management,* Vol. 2, No. 1, pp. 26 – 34.

Waddock, S.A. and Graves, S.B. (1997), "The corporate social performance-financial performance link", *Strategy Management Journal*, Vol. 18, No. 4, pp. 303 – 319.

Wang, Y.S., Tang, T.I. and Tang, J.T.D. (2001), "An instrument for measuring customer satisfaction toward web sites that market digital products and services", *Journal of Electronic Commerce Research*, Vol. 2, No. 3, pp. 89 – 102.

Watson, R.T., Boudreau, M.C., Chen, A. and Huber, M. (2008), "Green IS: Building Sustainable Business Practices, in Watson, R.T. (Ed.), *Information Systems, Global Text Project*, Athens, GA, USA, pp. 1 – 15.

World Business Council for Sustainable Development. (2006), "Eco-efficiency in practices", available at: www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDetObjecttId=MTc5OTI (accessed 14 June 2012).

World Commission on Environment and Development. (1987). *Our Common Future*, Oxford University Press, New York.

Weber, R.P. (1990), *Basic Content Analysis*, Sage Publications, Newbury Park, London.

Werts, C.E., Linn, R.L. and Jo¨reskog, K.G., (1974), “Interclass reliability estimates: testing structural assumptions”, *Educational and Psychological Measurement,* Vol. 34, No. 1, pp. 25 – 33.

Wheeland, M. (2011), “Postal service touts efficient fleets, alt-fuel adoption in green update”, available at: http://www.greenbiz.com/news/2011/08/19/postal-service-touts-efficient-fleets-alt-fuel-adoption-green-update (accessed 20 May 2012).

Willis, A. (2003), “The role of the Global Reporting Initiative’s sustainability reporting guidelines in the social screening of investments”, *Journal of Business Ethics*, Vol. 43, No. 3, pp. 233 – 237.

Wilmshurst, T.D. and Frost, G.R. (2000), “Corporate environmental reporting: a test of legitimacy theory”, *Accounting, Auditing and Accountability,* Vol. 13, No. 1, pp. 10 – 26.

Wolfe, R.A. Gephart, R.P. and Johnson, T.E. (1993), “Computer-facilitated qualitative data analysis: potential contributions to management research”, *Journal of Management,* Vol. 19, No. 3, pp. 637 – 660.

Wolfson, A., Tavor, D., Mark, S. Schermann, M. and Krcmar, H. (2010), “S^3-Sustainability and service science: novel perspective and challenge”, *Service Science,* Vol. 2, No. 4, pp. 216 – 224.

Wong, C.W.Y., Wong, C.Y. and Boon-itt, S. (2013), "Green service practices: performance implications and the role of environmental management systems", *Service Science,* Vol. 5, No. 1, pp. 69 – 84.

Wu, H.J. and Dunn. S.C. (1994), "Environmentally responsible logistics systems", *International Journal of Physical Distribution and Logistics,* Vol. 25, No. 2, pp. 20 – 38.

Yang, M.G.M., Hong, P. and Modi, S.B. (2011), "Impact of lean manufacturing and environmental management on business performance: an empirical study of manufacturing firms", *International Journal of Production Economics*, Vol. 129, No. 2, pp. 251 – 261.

Yang, X., Moore, P., Pu, J.S. and Wong, C.B. (2009), "A practical methodology for realizing product service systems", *Computer and Industrial Engineering,* Vol. 56, No. 1, pp. 224 – 235.

Yee, R.W.Y., Yeung, A.C.L. and Cheng, T.C.E. (2010), "An empirical study of employee loyalty, service quality and firm performance in the service industry", *International Journal of Production Economics,* Vol. 124, No. 1, pp. 109 – 120.

Yee, R.W.Y., Yeung, A.C.L., Cheng, T.C.E. and Lai, K.H. (2009), "The service-profit chains: a review and extension", *Total Quality management and Business Excellence,* Vol. 20, No. 6, pp. 617 – 632.

Yi. Y. (1990), "A critical review of customer satisfaction", *Review of Marketing,* Vol. 4, No.1, pp. 68 – 123.

Yi, Y. and La, S. (2004), "What influences the relationship between customer satisfaction and repurchase intention? Investigating the effects of adjusted expectations and customer loyalty", *Psychology and Marketing,* Vol. 21, No. 5, pp. 351 – 373.

Yin, R.K. (2009), *Case study research: Design and methods*, Sage Publications, Thousand Oaks, CA.

Zadrozny, B. (2004, July), "Learning and evaluating classifiers under sample selection bias", In *Proceedings of the twenty-first international conference on Machine learning* (p. 114). ACM.

Zeghal, D. and Ahmed, S.A. (1990), "Comparison of social responsibility information disclosure media used by Canadian firms", *Accounting, Auditing and Accountability Journal,* Vol. 3, No. 1, pp. 38 – 53.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1996), "The behavioral consequences of service quality", *Journal of Marketing,* Vol. 60, No. 2, pp. 31 – 46.

Zhu, Q. and Sarkis, J. (2004), "Relationships between operational practices and performance among early adopters of green supply chain management in Chinese manufacturing enterprise", *Journal of Operations Management,* Vol. 22, No. 3, pp. 265 – 289.

Zhu, Q. and Sarkis, J. (2007), "The moderating effects of institutional pressures on emergent green supply chain practices and performance", *International Journal of Production Research,* Vol. 45, No, 18-19, pp. 4333 – 4355.