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Topic:

The effect of information technology capabilities on green supply chain management in manufacturing firms in Ghana.

By:

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(BSc Communication Design)

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DECLARATION

I hereby declare that this submission is my own work towards a post graduate degree in Master of Business Administration in logistics and Supply Chain Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

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This work is dedicated to the almighty God, my family and beloved friends

ACKNOWLEDGEMENT

First and foremost, I express gratitude to the almighty God for providing protection throughout my life, particularly throughout my years of education. The successful completion of the programmed would have been unattainable without the existence of a divine being.

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ABSTRACT

The implementation of integrated information systems has the potential to improve the operational efficiency and overall commercial performance of supply chain organizations. There exists a dearth of scholarly investigations pertaining to the involvement of information technology (IT) in the domain of green supply chain management (GSCM). The objective of this study is to assess the impact of information technology capabilities on green supply chain management (GSCM). The primary objective of this study is to investigate the mediating influence of business reputation on the association between IT skills and green supply chain management in emerging nations. This study seeks to investigate the influence of IT capabilities and green supply chain management performance on manufacturing enterprises in Ghana, utilizing a quantitative research methodology. The research had a sample size of 193 individuals who were surveyed via a census methodology. The research is centered around the acquisition of data from manufacturing enterprises located in Ghana. The collection of primary data was carried out through the use of a standardized questionnaire. The findings indicate a notable and statistically significant correlation between IT skills and the performance of green supply chain management. The influence of corporate reputation on the performance of green supply chain management is both considerable and statistically supported. Additionally, corporate reputation acts as a partial mediator in the beneficial association between IT capabilities and green supply chain management performance. This suggests that the performance of green supply chain management (GSCM) is influenced by the capabilities of information technology (IT), and the relationship between them is further reinforced by the presence of a strong corporate reputation. In order to enhance the efficiency of their green supply chain operations, it is imperative for

organizations to give equal importance to technology improvements as well as reputation management.

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CHAPTER ONE

INTRODUCTION

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1.1 Background of the Study

It has come to light that supply chain management, also known as SCM, is becoming an increasingly essential management field that may assist businesses in improving supply chain operations (Walker and Jones, 2012). According to Felea and Albăstroiu (2013) and Thoo et al. (2017), supply chain management (SCM) involves the movements of materials, information, and finance within a network that consists of suppliers, producers, distributors, and customers. Over the course of the last ten years, we have seen a change in the nature of interorganizational connections, moving away from the traditional market-based arm's length relationships and toward relationships more akin to strategic partnerships (Matay, 2019; Rutagengwa, 2014; Stocchetti, Trombini, and Zirpoli, 2013). In point of fact, the business competition in a number of different industries is no longer between individual companies but rather between supply chains. This is something that has been recognised in both academic research and in the practitioner literature.

In addition to improving the performance of the supply chain, environmentally responsible business practises also play a crucial role. The implementation of environmentally responsible business practises throughout the supply chain is intended to make the entire supply chain more sustainable (Caniato et al., 2012). In the lack of sustainability, there is a risk of damaging the environment and having a negative impact on all three components of the triple bottom line (people, planet, and profit) (Lucena and Lucena, 2019). The three main logistical drivers—

inventory, transportation, and facilities—are all encompassed by environmentally friendly practises (warehouses, factories, and cross-docking). In today's world, the traditional performance of the supply chain in relation to operations is one critical level of performance; nevertheless, another essential performance factor is sustainability (Yawar and Seuring, 2017). The United Nations' Sustainable Development Goals for 2030 are largely responsible for the current era's incessant emphasis on environmental responsibility (Gabay and Ilcan, 2017). The sustainability goals set forth by the United Nations require every nation on the face of the earth to pass laws and regulations that will lead to greater socioeconomic gains. Customers place a high value on sustainability not only because of governmental laws but also because it can lead to enhanced corporate performance (Khan and Qianli, 2017). Therefore, the demand for sustainability from customers and other stakeholders cleared the path for the implementation of environmentally friendly practises throughout the supply chain (Govindan and Hasanagic, 2018).

In recent years, the implementation of environmentally friendly procedures has shifted from being a voluntary decision to an obligatory one (Mendoza-Fong et al., 2018). According to Diabat et al. (2013), the green supply chain is the business strategy that is used the vast majority of the time. The research that was carried out by Mangla et al. (2014) shows that a green supply chain contributes to the establishment of a balance between the financial, social, and ecological benefits that exist inside an organisation. By actively participating in a wide range of the activities that make up the supply chain, GSC is also able to provide amicable solutions to problems that are related to the environment and the image that has been built. The term "green supply chain" refers to the integration of environmental considerations and supply chain management across the entirety of a product's or process's lifecycle in order to create a final

product that satisfies the requirements of the target market (Scur and Barbosa, 2017; Genovese et al., 2017). When a green supply chain is established within an organisation, it contributes to the enhancement of the company's image as well as its social acceptance among the general populace. As a direct consequence of this, a greater amount of financial income is produced. The importance of having a green supply chain in order to achieve sustainability has been the subject of a great deal of research (Green et al., 2012; Yu et al., 2014; Fahimnia, Sarkis and Davarzani, 2015).

The rise in interest in supply chain management (SCM) can be attributed to the rapid technological advancements that have been made in the field of information technology (IT). This advancement has made it possible to communicate information in a quick and easy manner for the purpose of coordination, which has led to the increased demand for SCM. Information technology (IT) is frequently seen as an essential component in the continued existence and prosperity of a business over the long term (Enagi and Ochoche, 2013). The term "information technology," abbreviated "IT," refers to the practise of employing various pieces of electronic hardware and software in order to process, store, transmit, and display information (Li et al., 2017). According to the findings of a study that was carried out by Amui et al. (2017), the capacity of an organisation to expand its information technology capabilities is one factor that contributes to the organization's ability to maintain a high level of performance over the long run. According to the findings of a study carried out by Cherrafi and colleagues (2018), the incorporation of information technology processes with green supply chain procedures has the potential to improve the efficiency with which the processes are put into action. In a manner analogous to this, Nozari et al. (2021) acknowledged the huge significance of information

technology capabilities in the implementation of green supply chains. The information presented above makes it abundantly evident that improved proficiency in information technology is becoming an increasingly significant factor in the effective application of green supply chain principles and in achieving all of the benefits that this concept has to offer. As a consequence of this, the purpose of this study is to investigate how skills related to information technology affect the efficiency with which green supply chains are managed.

1.2 Statement of the Problem

Powell and Dent-Micallef (1997) analysed how an organization's strategy is impacted by its information technology (IT) capabilities. They contended that the advantages that could be gained through the capabilities of information technology would provide businesses with a competitive advantage over their rivals. According to the Resource-Based theory, organisations that possess strategic resources have important competitive advantages over other organisations that provide them with superior performance. These advantages allow these organisations to outperform their competitors (Barney et al., 2012). Therefore, a company's strategic resources are the foundation upon which a durable advantage in the market can be built. The capabilities of an organization's information technology are a strategic resource that, when optimised, can improve the firm's advantage over its competitors and lead to improved organisational performance.

As a consequence of this, Norek and Pohlen (2001) suggested that supply chain management (SCM) should be included in a variety of other processes in order to offer substantial advantages. As a result, White and Pearson (2001) considered it absolutely necessary to make use of

information technology (IT) in order to achieve effective management of green supply chains. Over the past few years, numerous studies have focused attention on the function of IT in SCM. Integrated information systems, for instance, can contribute to increased business performance for enterprises that are a part of a supply chain (e.g., Gonzálvez-Gallego et al. 2015). On the other hand, there have only been a few studies done on the part that IT plays in green supply chains (GSCM). Because of this, a study is to find out how much IT capabilities affect GSCM.

In addition, research has shown that a company's reputation acts as a mediator between its information technology capabilities and its green supply chain management. For instance, Agyabeng-Mensah, Afum, and Baah (2022) proposed a comprehensive research agenda for the future, which was based on a multilevel view point and focused on the integration of various theoretical foundations and the development of knowledge about the main mechanisms of IT capabilities and green supply chain management. This agenda was based on a multilevel view point and centred on the development of knowledge about the main mechanisms of IT capabilities and green supply chain management. Additionally, clear suggestions for the production, measurement, and analytical methods of data useful for future research in this study are provided by the authors of the study. The goal of this study is to find out how corporate reputation mediates the relationship between IT capabilities and green supply chain management in developing nations.

1.3 Objectives of the Study

The main objective of the study is to analyse the effect of IT capabilities and green supply chain management performance of manufacturing firms in Ghana. The study specifically addressed the following objectives:

1. To examine the effect IT capabilities on green supply chain management performance of manufacturing firms in Ghana.
2. To analyse the impact of corporate reputation on green supply chain management performance of manufacturing firms in Ghana.
3. To investigate the mediating effects of corporate reputation on IT capabilities and green supply chain management performance of manufacturing firms in Ghana.

1.4 Research Questions

1. What is the IT capabilities on green supply chain management performance of manufacturing firms in Ghana?
2. What is the impact of corporate reputation on green supply chain management performance of manufacturing firms in Ghana?
3. What is the mediating effects of corporate reputation on IT capabilities and green supply chain management performance of manufacturing firms in Ghana?

1.5 Significance of the Study

This study is extremely important because it focuses on emerging economies and demonstrates that the study not only contributes to theory building on the concept of information technology capabilities and green supply chain management but also serves as a theoretical reference point

for business scholars and investment experts in a variety of countries. Because of this study, the managers of these companies can also better understand how their information technology skills affect green supply chain activities.

This study is significant for the company because it assist top management in the formulation of policies that enhance green supply chain management and have a ripple effect on the overall performance of the company. In practise, the significance of this study become clear once it is put into action. Because of this, there will be a considerable improvement in client retention, which will, in turn, lead to an increase in the profitability of the organisation. The proposed link may also help businesses learn more about the factors that can help improve environmentally responsible supply chain management.

In principle, the research also contribute to the existing body of literature in terms of the function that IT capabilities play in the management of green supply chains. In addition, the study serves as a foundation for further investigation into the internal factors that influence the relationship between IT skills and the performance of green supply chains in the future. This study will help policymakers formulate strategic plans that drive creativity across diverse organisations within the country and, as a result, improve national development. This study will be important on a national level because it will help policymakers do their jobs.

1.6 Scope of the Study

The bounds, expectations, and limitations of research will all be determined by the scope of an investigation. In other words, it refers to the parameters that were set for the study (Smith, Ward,

and House, 2011). Context, geography, and time frames are the three main categories that make up the scope of the study. In terms of location, the research was conducted on a subset of Ghana's publicly traded companies. The research intended to concentrate on information technology (IT), green supply chain management, and company reputation. The study concentrate on manufacturing businesses located in Kumasi, which is located in the Ashanti region of Ghana. As a result of Kumasi's status as one of the larger cities in Ghana, the surrounding area is home to a significant number of businesses. In addition, the survey takes a cross-sectional approach with regard to the time frame under consideration.

1.7 Summary of Methodology

The purpose of this study was to investigate the impact that IT capabilities have on the management of green supply chains in Ghanaian manufacturing enterprises. This study has utilised the positivist research philosophy in order to evaluate the impact that IT skills have on environmentally conscious supply chain management. According to Morgan (2007), when your research philosophy is positivism, then your research approach will naturally become a quantitative approach. He made this argument in his article. The research employed a quantitative research approach and an explanatory design to determine the nature of the connection between IT and environmentally responsible supply chain management. Primary data will serve as the primary source of information for this investigation. These data will be collected by means of the completion of a pre-designed questionnaire and then analysed quantitatively. At a confidence interval of 95 percent and with an error margin of 5 percent, the number of people in the sample has been estimated to be 200. Both a stratified and a more straightforward random method were used in order to pick the participants. Version 23 of SPSS was utilised in order to

carry out the data analysis. Reliability and validity tests, correlation, and least squares regression have been done in addition to descriptive statistics analyses.

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1.8 Limitations of the Study

The most significant restriction of this study was that it had restricted resources both in terms of time and financing. The study is carried out in spite of its shortcomings, which include a small sample size, a short time horizon, a poorly designed research design, and an inefficient sampling technique. For instance, because this study is a cross-sectional survey, the results cannot be extrapolated to account for any developmental trends that may have taken place before or after the time period being studied. When there is a requirement for an in-depth and all-encompassing investigation, there is another limitation, and that is the amount of time that is available. The time that is at our disposal is not be sufficient. Inadequate money will also limit the study due to the many expenses that is directly and indirectly incurred as a result of the research.

1.9 Organisation of the Study

The study is structured into five chapters. Chapter one is focuse on introducing the study, which is comprised of the study's background, problem statement, research objectives and questions, the study's justification, brief methodology, scope, limitation, and organization. Chapter two will focus on an extensive review of relevant literature pertaining to the subject matter, the modelling of variables used in the study in a conceptual framework, in addition to hypothesis formulation, which guided the analysis for the study. Chapter three focuses on the methodology for the study and highlight the research design, sample and sampling technique, data collection instrument, data analysis, and ethical considerations, among others. Chapter four dwell much on the analysis

of data and presentation of the study findings. Chapter five present a summary of the research findings, conclusions, and recommendations from the study.

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CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the literature review in reference to the topic "The effect of information technology capabilities on green supply chain management in manufacturing firms in Ghana." The chapter is presented in 4 sections, which are as follows: Section 2.1 presents the conceptual literature review, Section 2.2 presents the theoretical literature review, Section 2.3 presents the empirical literature review and hypothesis formulation, and lastly, Section 2.4 reviews the conceptual framework.

2.1 Conceptual Literature Review

2.1.1 Information technology (IT) capabilities

The capacity of an organization to make use of information technology (IT) in order to accomplish its business goals is what is meant by the term "IT capabilities." (Li and Chan, 2019). These capabilities can include a broad variety of technological instruments and resources, such

as specialized applications, computer hardware, computer software, computer networks, and data management systems (Al Nuaimi et al., 2015). Additionally, the concept of IT capabilities was developed as a reaction to the growing significance of technology in the activities of businesses. (Chen et al., 2017; Al Nuaimi et al., 2015). IT capabilities are the organizational knowledge, skills, and resources required to successfully leverage technology to support business objectives. They are also sometimes referred to as IT capacities. (Tzortzaki and Mihiotis, 2014). These characteristics can be broken down into two primary groups: those pertaining to the IT infrastructure and those pertaining to the IT applications. IT applications consist of specialized software and tools that enable particular business functions, while IT infrastructure consists of the necessary hardware and software to support business processes. (e.g., customer relationship management, supply chain management). The capabilities of an organization's information technology have been shown in studies to have a substantial influence on that organization's performance. For instance, a study that was conducted by Tseng and Lee (2014) discovered that IT capabilities have a positive influence on organizational performance. This was determined by determining how well revenue growth and profitability were evaluated. In a similar vein, Lin et al. (2020) discovered that IT capabilities have a positive influence on business agility. Business agility is defined as the capacity of an organization to react rapidly and effectively to shifting market conditions.

The capabilities of an organization's information technology can be a source of competitive advantage in addition to the effect those capabilities have on the organization's performance. IT capabilities have the potential to bestow an organization with one-of-a-kind resources and capabilities that are difficult for rivals to duplicate. (Akter et al., 2016). For instance, a company

that possesses sophisticated data analytics capabilities can utilize these capabilities to gain insights into customer preferences and market trends, which provides the company with a competitive advantage over rival companies that do not possess these capabilities. According to the findings of research that was conducted by Agha, Alrubaiee, and Jamhour (2012), IT capabilities have a positive influence on competitive advantage. This influence was measured by market share and profitability. In a similar vein, Santos-Vijande and colleagues (2012) discovered that IT capabilities have a positive effect on strategic flexibility. This term describes an organization's capacity to rapidly adapt to shifting market conditions and seize new opportunities. The role that IT capabilities play in the management of knowledge is yet another important facet of these capabilities. The procedures and systems that are used within an organization to collect, store, and share information are collectively referred to as "knowledge management." (Dalkir, 2017). The capabilities of information technology can play an important role in the management of knowledge by providing the tools and resources that are necessary for managing knowledge successfully. There have been a number of investigations into the connection that exists between IT capabilities and information management. For instance, Hussain, Konar, and Ali (2016) conducted a study in which they discovered that IT capabilities have a beneficial influence on knowledge management. Knowledge management was evaluated based on knowledge sharing and knowledge utilization. A similar finding was made by Choi, Lee, and Yoo (2010) in their research, where they discovered that IT capabilities have a positive effect on knowledge management, as measured by knowledge creation and knowledge transfer.

When businesses start using IT, they may face big problems that have been studied a lot in the academic literature. Kache and Seuring (2017) say that one of the biggest problems with

adopting IT capabilities is that employees don't have enough IT skills and don't understand how IT works. This can result in resistance to change as well as difficulty incorporating new capabilities related to information technology. According to the findings of several studies, educational and training initiatives have the potential to be effective responses to this challenge. Also, the integration of new information technology capabilities with preexisting systems can be difficult and may cause interoperability problems. This may cause implementation to be delayed and may also result in increased expenses. According to a number of studies, thorough preparation and practice could be an effective strategy for overcoming this obstacle. (e.g., Proctor, Powell, and McMillen, 2013). In addition, the implementation of IT capabilities may necessitate the expenditure of substantial capital, and the limitations imposed by cost and budget may present difficulties for organizations. According to a number of studies, giving IT investments a higher priority based on the potential value and effect they could have is one way to help address this challenge. (Spoth et al., 2013). In addition, the capabilities of information technology can give rise to concerns regarding security and privacy, specifically in light of the growing prevalence of cyber threats. According to the findings of some studies, addressing this challenge may involve putting in place stringent safety precautions and ensuring full compliance with regulations. (Zeng and Mareand Roesner, 2017)

2.1.2 Green Supply Chain Management Performance

GSCM is the process of incorporating ecological concerns into standard SCM procedures. Gawusu et al., 2022). Activities such as product design, material sourcing, manufacturing processes, logistics, and reverse logistics fall under the purview of GSCM. (Bensalem and Kin, 2019; Kumar and Kumar, 2013). Green supply chain management (GSCM) is the process of

incorporating environmental concerns into all phases of the supply chain, from initial ideation to final dumping. (Gaustad et al., 2018). This definition emphasizes the breadth of GSCM and the incorporation of environmental concerns into conventional SCM practices. According to Zaid, Jaaron, and Bon (2018), GSCM is the process of managing supply chain operations in a way that minimizes negative impacts on the environment while maximizing positive social and economic outcomes. This definition emphasizes the economic, social, and environmental elements of sustainability (the "triple bottom line"). In line with this definition, Mishra and Sharma (2019) explain GSCM as a strategy for greening the four-pronged method to supply chain management (purchasing, production, distribution, and logistics). This term emphasizes the need to think about environmental factors at every stage of the supply chain, from sourcing to distribution.

Adoption of GSCM is largely driven by environmental laws. Several reports have stressed the significance of environmental laws in fostering eco-friendly procedures all along the supply chain. Liu et al. (2020) provided evidence that environmental regulations were the main driver of the adoption of GSCM practices by businesses. Regulation is a key factor in the automotive industry's adoption of GSCM, as stated by Niemann, Kotze, and Adamo (2016). Additionally, GSCM techniques are being adopted by companies as part of their CSR efforts. Socially and environmentally responsible company practices are at the heart of corporate social responsibility (CSR). Since it helps businesses lessen their negative effects on the environment and boost their social duty, GSCM is an integral part of corporate social responsibility. According to Bhool and Narwal (2013), CSR is a key factor in the widespread implementation of

GSCM in India's industrial industry. Similarly, Zhu et al. (2018) found that corporate social responsibility (CSR) was a powerful driver of GSCM adoption among Chinese businesses. Additionally, businesses can gain a competitive edge through the implementation of GSCM techniques. Organizations can set themselves apart from rivals in the market by cutting expenses and boosting productivity. Onyinkwa and Ochiri (2016) and Chavez et al. (2016) both found that GSCM practices were crucial in achieving competitive advantage in the food and beverage industry due to the cost savings and improved operational efficiency they provided. Saving money is a major advantage of using GSCM. Organizations can save money by implementing GSCM practices, which help cut down on waste, energy use, and material consumption. Businesses that implemented GSCM practices saw significant savings in their supply chain operations. (Zhu, Sarkis, and Lai, 2013). A company's identity and reputation can benefit from GSCM practices as well. Businesses can strengthen their relationships with key constituents and draw ethically-minded customers by actively pursuing sustainability. Qiao, Li, and Capaldo (2022) found that GSCM practices boosted companies' credibility and credibility among consumers as providers of environmentally friendly goods.

But many businesses may not know how to use GSCM practices well or know how to get the most out of them.(Zhu, Sarkis, and Lai, 2019). Smaller businesses or those in developing nations may find it difficult or too expensive to adopt GSCM practices because of the environmental considerations that must be made throughout the complete supply chain. (Majumdar and Sinha, 2018). Adoption of GSCMs can be spurred by environmental regulations, but they can also be stymied by a dearth of regulatory support. Lack of regulatory support is cited as a major obstacle to GSCM adoption in the automotive sector by Balon, Sharma, and Barua (2016).

Resistance to change within an organization is another factor that can slow down the transition to GSCM. German industrial companies had a hard time adopting GSCM because their employees were resistant to change. Suppliers, customers, and government agencies are just some of the many interested parties that must work together to make GSCM procedures a success. (Zhu, Sarkis, and Lai, 2013).

Eco-design, which incorporates environmental considerations into product design and development, is also a crucial component of GSCM. Eco-design has been shown in multiple studies to have positive effects on both the ecosystem and bottom lines. (e.g., Sarkis et al., 2010; Zhu et al., 2019). Green buying, or the practice of sourcing goods and services from companies that minimize their impact on the environment, is another crucial aspect of GSCM. (Tarigan, Tanuwijaya, and Siagian, 2020). Evidence suggests that green purchasing can boost supplier relationships, cut expenses, and raise profiles. (Zhu et al., 2019; Linton et al., 2007). In addition to these methods, GSCM tactics can be broken down further into either a reactive or proactive orientation. Compliance with environmental laws and reducing negative environmental impacts are examples of reactive strategies, while proactive strategies, such as adopting circular economy practices and investing in renewable energy, take a more strategic approach to sustainability. (Chan, Lai, and Kim, 2022). There are a number of obstacles to implementing GSCM, despite its promise. The challenges of adopting GSCM practices across a global supply chain include a scarcity of knowledge and funding. (e.g., Zhu et al., 2019; Pagell and Wu, 2009). In general, GSCM is a dynamic discipline that holds great promise for enhancing the viability of supply chains and lessening their negative effects on the natural world.

Another big problem with combining GSCM and SCM is that people in the supply chain don't know much about or understand environmental issues. Several studies show that the fact that stakeholders don't know about environmental problems can make integration harder. (Feng, Cummings, and Tweedie, 2017; Hossain et al., 2020). Choosing the best GSCM practices and tactics to incorporate into SCM is another difficulty. To achieve this goal, one must have a thorough knowledge of the supply chain's total environmental effect and know where GSCM practices can be applied. (Sarkis et al., 2010; Pagell and Wu, 2009). Despite the difficulties, there are many upsides to incorporating GSCM into SCM, such as a lower carbon footprint, higher levels of customer satisfaction, and better financial results. GSCM practices have been linked in multiple studies to positive financial outcomes like decreased expenses and increased profits. Furthermore, businesses can gain a competitive edge through the development of GSCM by incorporating it into SCM. Incorporating GSCM into SCM allows businesses to draw eco-conscious customers, as stated by Schmidt, Foerstl, and Schaltenbrand (2017), among others. In sum, GSCM incorporation into SCM is a difficult and time-consuming endeavor that calls for extensive preparation, clear and consistent communication, and the participation of all relevant parties. Effective strategies for integration, as well as evaluations of the performance and effectiveness of GSCM-integrated SCM, should be the subject of future study.

2.1.3 Corporate reputation

As Fombrun (1996) put it, "a collective representation of a firm's past actions and results that describe the firm's ability to deliver valued outcomes to multiple stakeholders" is one of the earliest definitions of corporate reputation. This definition emphasizes the role of stakeholders in forming perceptions of the firm and highlights the significance of prior actions and results in

shaping the firm's image. Another author, Deephouse (2000), put it this way: "the overall assessment of a firm's past actions and its ability to deliver valued outcomes to its stakeholders in the future" is what constitutes a company's reputation. This definition emphasizes the significance of a company's future value creation for its stakeholders and the prospective nature of its corporate image. The various components that make up a company's image have been the subject of other researchers' attention. Financial success, quality of products and services, company culture, and social responsibility are just some of the aspects that Song, Ruan, and Park (2019) say contribute to a company's image. Together, they create the foundation of a company's reputation, which they believe is essential to ensuring continued financial success. One alternative definition of company reputation sees it as an intangible asset that can give businesses an edge in the marketplace. Based on their definition of corporate image as "a strategic asset that can be leveraged to create value," Fombrun and Shanley (1990) advocate for this view. This definition highlights the importance of strategic reputation management and the possible economic benefits of a positive corporate reputation.

Asking stakeholders to rate the company on different dimensions of reputation is one of the most common ways to gauge corporate reputation (Rashid and Mustafa, 2020). Questionnaires, interviews, and focus groups are just some of the methods that can be used in survey research. Harris Interactive's image quotient (RQ) is a popular survey used to gauge how various parties view a company's image. (Esa et al., 2020). Social responsibility, emotional appeal, financial performance, goods, vision and leadership, workplace environment, and management quality are the seven factors that make up the RQ. (Vig, Dumii, and Klopotan, 2017). Media research is another tool for assessing an organization's public standing. The methodology relies on

monitoring and evaluating how the press presents the business. (Cohen et al., 2017). A media study can provide insight into the company's reputation and how it is portrayed in the media. As a subset of media analysis, social media analysis looks at how different groups of people are talking about a business online. Consider the company's financial success as another yardstick for measuring business reputation. (Pires and Trez, 2018). When stakeholders view a business favorably, that company may be seen as more financially stable and trustworthy, which can have a positive effect on the company's bottom line. The effect of a company's image on its bottom line can be measured through stock price, return on investment, and profits per share (EPS) (Kopecká, 2018).

Business social responsibility is shown to be a major predictor of business reputation by Almeida and Coelho (2019). (CSR). Corporate social responsibility (CSR) refers to the initiatives undertaken by businesses to voluntarily better society, the ecosystem, and the bottom line. By showing that it is dedicated to ethical and sustainable practices, a company's image can benefit from corporate social responsibility (CSR). According to Yadav et al. (2018), CSR has a beneficial effect on company credibility. Corporate reputation is also influenced by an organization's ethos. Culture in the workplace is the set of norms and expectations that employees are expected to follow because of their common values, beliefs, and assumptions. (Shaari, 2019). When workers feel invested in the company's mission and proud of their contributions, it shows in their work, and customers see it in the results. Organizations with strong cultures have higher levels of employee happiness, customer satisfaction, and financial success, according to research by Al-Shammari and Al-Am (2018). Company prestige can also

be influenced by how well a brand is perceived. Stakeholders' impressions of a company's brand and the value it represents are what we call its "brand image." (Cottan-Nir, 2019).

When consumers have favorable impressions of a business and its goods or services, the company's standing in the market can increase. According to research conducted by Mohammad (2017), there is a favorable correlation between brand image and such factors as customer loyalty, perceived quality, and brand equity. One more factor that contributes to a company's good name is its internal communications. Building trust, encouraging transparency, and showing a commitment to ethical behavior are all outcomes of effective communication with stakeholders that can boost a company's image. According to research conducted by Cornelissen (2008), corporate communication is instrumental in molding how various groups view a company and its image. Company actions, communication methods, and the competitive landscape are just a few of the variables that can affect an organization's reputation. Studies have shown that companies with CSR programs have a better public image. (Brammer and Millington, 2005; Du et al., 2010). Companies in sectors subject to heightened public scrutiny or having a significant effect on the environment may be at a higher risk of suffering reputational damage (Bednárová, Klimko, & Rievajová, 2019).

2.2 Theoretical Literature Review

2.2.1 Resource-Based View (RBV)

The work of Penrose (1959), who focused on how a firm's unique resources influence its growth and performance, is the foundation for what is now known as the resource-based view (RBV) of the firm. The RBV, on the other hand, did not become widely recognized as a strategic

management theory until the 1980s and 1990s. In the 1980s, academics such as Wernerfelt (1984) and Rumelt (1984) built on Penrose's theories and stated that a company's resources and capabilities are the primary sources of a sustained competitive advantage. Wernerfelt and Rumelt both cited Penrose as their primary source. According to what they said, having resources and abilities that are valuable, rare, one of a kind, and irreplaceable can lead to improved performance and success over the long term. In the 1990s, academics such as Barney (1991) and Prahalad and Hamel (1990) contributed to the RBV by emphasizing the significance of a company's distinctive resources and skills that are difficult for its rivals to replicate. They believed that if they had access to the aforementioned resources and abilities, it would provide them with a competitive advantage that would remain stable over time.

Since that time, RBV has developed into a theory that is generally accepted in the field of strategic management, and many studies that have taken place in the real world have shown that the theory's core concepts are accurate. In addition, the RBV has undergone a variety of expansion and improvement projects. For instance, Kabongo and Boiral (2017) established the dynamic capability's perspective, which demonstrates how essential it is for a business to be able to adapt to changing circumstances and generate innovative concepts over the course of time. In general, the RBV has made a significant contribution to the ways in which companies can establish and maintain a competitive advantage in the modern business world, which is undergoing rapid change. (Mufudza, 2018). In addition, Mahdi, O.R., and Nassar (2021) contend that RBV is a theoretical perspective in strategic management that focuses on a company's internal resources and capabilities as sources of sustained competitive advantage. They say this is because RBV considers a company's internal resources and capabilities to be more important

than its external resources and capabilities. The research conducted by Boi and Kneevi Cvelbar (2016) showed that when using RBV, resources and capabilities can be divided into two categories: physical and intangible. Physical assets such as equipment, property, and financial resources are examples of tangible resources, whereas examples of intangible resources include expertise, reputation, and the culture of an organization. (Kumar, 2017). According to RBV, the most important factor in achieving a prolonged competitive advantage is to develop and capitalize on resources and capabilities that are distinctive and difficult to replicate by others. (Delery and Roumpi, 2017). In order to accomplish this, businesses need to have a comprehensive understanding not only of their own resources and capabilities but also of those of their rival companies.

Also, according to this point of view, the IT skills of a business can be a very important tool for improving general supply chain management practices. (Samad et al., 2021). The company's ability to leverage information technology to manage and optimize its supply chain activities is what we mean when we talk about its IT capabilities. (Rai, Patnayakuni, and Seth, 2006). The relationship between IT competencies and GSCM practices from an RBV point of view has been the subject of investigation in a number of studies. For example, Zhang et al. (2019) discovered that a company's IT capabilities have a beneficial influence on its GSCM practices. These practices include eco-design, green procurement, and green logistics. The authors argue that businesses can improve their information technology capabilities by making investments in IT infrastructure and training IT employees. This can help businesses improve their capacity to collect, evaluate, and act upon environmental data. According to Tarigan, Siagian, and Jie (2021), a company's IT capabilities can enable it to integrate environmental concerns into its

supply chain management procedures, which can lead to improved GSCM performance. They argue that this can lead to improved GSCM performance. According to the findings of the research, businesses are able to improve their IT capabilities for GSCM by implementing advanced IT systems such as environmental management information systems (EMIS). These systems are able to provide real-time data on environmental performance and enable businesses to make decisions based on accurate information.

Choi and Hwang (2015) also say that IT capabilities can make it easier for a company to work with its supply chain partners on GSCM projects. This is an important finding. Businesses can improve their ability to work together by investing in collaborative IT systems like collaborative planning, forecasting, and replenishment (CPFR) systems, which make it easier for people in the supply chain to talk to each other and coordinate their work. In conclusion, the RBV perspective is a good way to see how IT capabilities affect GSCM practices because it looks at the value chain. Businesses are able to improve their general supply chain management (GSCM) practices and achieve a sustained competitive advantage when they establish and leverage their IT capabilities.

2.2.2 Institutional Theory

Institutional theory represents a theoretical perspective on organizational sociology and management. It began in the 1970s and grew in popularity throughout the 1980s and 1990s. Sociology is the foundation of this theory, which emphasizes the significance of social institutions, norms, and values in determining how an organization behaves. (Geels, 2020). Institutional theory has its origins in the writings of Durkheim, who in 1895 described how social norms and values have a significant impact on how individuals behave. Scholars did not begin to

examine organizational behavior from this perspective until the 1970s. Selznick (1949) was among the earliest authors on institutional theory. According to him, organizations are shaped by the norms and values of their larger institutional environment. In the 1970s, DiMaggio and Powell (1983) expanded on this concept by asserting that organizations are influenced by the institutional logics of their larger social and cultural context. Institutional logics are the most prevalent cultural beliefs and values that influence how people behave and how businesses plan and operate. In the 1980s and 1990s, researchers examined the application of institutional theory to various categories of organizations, including corporate social responsibility, environmental management, and organizational change. These studies examined how institutional pressures such as regulatory, normative, and cognitive pressures influence organizational behavior.

Welter and Smallbone (2011) also say that institutional theory can shed light on how organizations respond to outside pressures, such as those related to environmental sustainability, and how these responses are shaped by the institutional context in which they operate.Institutional theory has been used in a number of studies to look into the relationship between IT skills and green supply chain management.Zhu, Sarkis, and Lai (2013), for example, looked at the role of institutional pressures in driving green supply chain management practices in Chinese manufacturing firms. They found that both coercive and normative pressures, such as environmental regulations and customer expectations, were important drivers of green supply chain management practices.They also found that businesses with better information technology were better able to deal with pressure from institutions and use green supply chain management practices.

In the same way, Li et al. (2017) looked at how information technology capabilities and green supply chain management are related in the Chinese automotive industry. Researchers found that companies with better IT skills were more likely to use green supply chain management techniques like eco-design and green logistics. They also found that these companies were more responsive to outside pressures, like environmental regulations and consumer demands for products that are better for the environment. Fornasier and Rinallo (2018) used institutional theory to look at the role of information technology in getting green supply chain management practices adopted in the European food and beverage industry. They found that information technology was a big part of how green supply chain management practices spread from one company to another in the same industry. These studies show that IT skills can make a big difference in a business's ability to use green supply chain management practices and respond to institutional pressures from the outside. Still, the effectiveness of these capabilities may depend on the specific institutional context in which firms operate. This includes the nature and intensity of institutional pressures as well as the larger institutional logics and cultural beliefs that affect organizational behavior.

2.3 Empirical Literature Review and Hypothesis Formulation

2.3.1 IT Capabilities and Green Supply Chain Management Performance

Green supply chain comprises of a network of providers, producers, storage facilities and distributors who collaborate to turn plans and raw materials in final product whiles considering environmental outlook across all phases (Marinagi et al., 2014). The implementation of IT technologies facilitates information exchange, however, in recent times, IT plays a significant role in our day-to-day life as humans (Pattinson, 2017). With the implementation of green supply chain, IT capabilities is crucial as it improves the sustainability of the company's

communication, and transport systems. This allows the client and other stakeholder involvement. There is a growing body of literature exploring the relationship between IT capabilities and green supply chain management (GSCM) performance. For instance A study by Zhu and Sarkis (2016) found that higher levels of IT capabilities can enhance a firm's ability to implement green supply chain management practices, leading to better environmental performance. Through a survey of 155 manufacturing firms in China and found that firms with higher levels of IT capabilities were more likely to adopt green supply chain management practices, such as green procurement, eco-design, and green logistics. They also found that these practices were positively related to environmental performance.

This means that, there will be improvements in procedures and communication whiles reducing the environmental and financial cost (Mendoza-Fong et al., 2018). According to Mishra et al. (2007), IT capabilities contributes significantly to the appropriate implementation of green supply chain as cost are reduced at a more environmentally friendly outlook across the entire supply chain. Furthermore, in the implementation of green supply chain, IT capabilities are crucial in improving the organization’s reverse logistics for design of ecological products and procedures. Uygin and Dede (2016) indicated that, by implementing green supply chain, firms can reduce or eliminate the adverse effects that supply chain may have on the environment. It will also aid in improving the technological and innovative capabilities of the firm. In the same vain, IT should positively improve the environment as well as design of eco-products. Investment in IT aids organizations in becoming innovative in green supply chain technologically (Lee et al., 2014). Generally, investment in IT is linked to business growth as

well as growth of the economy (Jorgenson and Vu, 2016). However, (26), opined that, IT capabilities is regarded as one of the main forces that improves the implementation of green supply chain. A study conducted by de Camargo Fiorini and Jabbour (2017), indicated that, updating a firm's IT capabilities has seen as a major contributor to the achievement of environmental sustainability. This is because, it aids in information collection and planning to improve the capacity for attaining effective environmental compliance.

Furthermore, Li et al. (2017) examines 296 manufacturing firms in China and found that firms with higher levels of IT capabilities were more likely to adopt green supply chain management practices, such as eco-design, green procurement, and green logistics. They also found that these practices were positively related to both environmental and economic performance. Also, Ahmad et al. (2018) conducted a survey of 139 manufacturing firms in Pakistan and found that IT capabilities have a positive effect on green supply chain management performance. The authors found that firms with higher levels of IT capabilities were more likely to adopt green supply chain management practices, such as green procurement and eco-design, leading to improved environmental performance. In Mohr et al. (2018) survey of 198 firms in Germany and found that higher levels of IT capabilities were positively related to green supply chain management performance. The study established that firms with higher levels of IT capabilities were more likely to adopt green supply chain management practices, such as green procurement, green logistics, and environmental reporting, leading to improved environmental performance.

Khan et al. (2018) investigated the relationship between IT capabilities and GSCM performance in the context of Pakistani manufacturing firms. The study proposed a hypothesis that IT

capabilities positively affect GSCM performance. The findings of the study provided evidence to support this hypothesis. Govindan et al. (2019) examined the effect of IT capabilities on GSCM performance in the Indian automotive industry. The study proposed a hypothesis that IT capabilities positively influence GSCM performance. The results of the study supported this hypothesis, indicating that firms with higher IT capabilities tend to have better GSCM performance. Das and Dutta (2019) explored the relationship between IT capabilities and GSCM performance in the Indian pharmaceutical industry. The study proposed a hypothesis that IT capabilities have a positive impact on GSCM performance. The results of the study provided support for this hypothesis, suggesting that firms with higher IT capabilities tend to have better GSCM performance. Wang and Li (2020) investigated the impact of IT capabilities on GSCM performance in the Chinese electronics industry. The study proposed a hypothesis that IT capabilities positively affect GSCM performance. The findings of the study supported this hypothesis, indicating that firms with higher IT capabilities tend to have better GSCM performance. These articles provide empirical evidence for the hypothesis that IT capabilities have a positive impact on GSCM performance. In the light of the evidences the study proposes as follow:

H1: There is a positive relationship between IT capabilities and financial performance

2.4.2.2 Corporate Reputation and Green Supply Chain Management Performance

Corporate reputation and green supply chain management (GSCM) have been subjects of growing interest in the business world and academia. While corporate reputation has been linked to a range of organizational outcomes, including financial performance and stakeholder trust, the relationship between corporate reputation and GSCM performance is less clear. However,

several studies have investigated the relationship between corporate reputation and environmental performance, including GSCM performance. Some studies suggest that a good corporate reputation can enhance a company's commitment to environmental management and, consequently, its GSCM performance. For example, Lai et al. (2010) found that firms with better reputations for corporate social responsibility (CSR) were more likely to adopt GSCM practices. Similarly, Zhu and Sarkis (2006) found that firms with strong reputations for environmental performance had better GSCM performance.

other studies suggest that the relationship between corporate reputation and GSCM performance is more complex. For example, Chen et al. (2018) found that while a good corporate reputation can enhance a company's adoption of GSCM practices, the relationship between reputation and GSCM performance is moderated by the level of stakeholder pressure. Similarly, Gunasekaran et al. (2015) found that the effect of a good corporate reputation on GSCM performance is stronger for firms in industries with high environmental risk. Also, several studies have investigated the relationship between corporate reputation and GSCM performance. Lai et al. (2010) found that firms with better reputations for corporate social responsibility (CSR) were more likely to adopt GSCM practices. Zhu and Sarkis (2006) also found that firms with strong reputations for environmental performance had better GSCM performance.

However, some studies have suggested that the relationship between corporate reputation and GSCM performance may not always be positive. For example, Gunasekaran et al. (2015) found that the effect of a good corporate reputation on GSCM performance is stronger for firms in industries with high environmental risk. In contrast, in industries with low environmental risk,

corporate reputation may not have a significant impact on GSCM performance. Other studies have highlighted the role of stakeholder pressure in moderating the relationship between corporate reputation and GSCM performance. Chen et al. (2018) found that while a good corporate reputation can enhance a company's adoption of GSCM practices, the relationship between reputation and GSCM performance is moderated by the level of stakeholder pressure. Furthermore, some studies have investigated the mechanisms through which corporate reputation affects GSCM performance. For example, Lin et al. (2016) found that the effect of corporate reputation on GSCM performance is mediated by a firm's environmental strategy, which in turn influences the adoption of GSCM practices. Overall, the literature suggests that:

H2: corporate reputation can have a positive effect on GSCM performance

2.4.2.3 Corporate Reputation, IT Capabilities and Green Supply Chain Management Performance

Shahzad et al. (2020), examine the role of organisational compatibilities in green supply chain management (GSCM) activities was explored, and the influence of organisational compatibilities on organisational performance was assessed. Also the study investigated the mediating role played by information technology (IT) skills in the relationship between GSMC initiatives and organisational effectiveness (operational and environmental performance). Based on the data acquired over the internet, 370 effective replies were evaluated. According to the findings, GSCM activities are favourably influenced by organisational compatibilities (technological, operational, and cultural), which also contribute to the growth of dynamic capacity theory in the context of information and communication technologies. The findings also indicate that information technology skills have a significant influence on the relationship between GSCM

activities and organisational effectiveness. Also, Khan, Golpîra, and Zhang (2018) investigate the influence of sophisticated technology and environmentally friendly automobiles on supply chain performance from the perspective of Mexican manufacturing enterprises. The simultaneous regression statistical approach was used in this investigation. As a result of more information sharing between supply chain partners, the findings show that sophisticated information technology can improve the performance of the supply chain by eliminating inconsistencies and mistakes at many different levels, such as forecasting and scheduling.

Bag et al. (2020) explored the aspects of green supply chain management (GSCM) as part of a comprehensive system of management. In particular, it seeks to comprehend the unique characteristics of the GSCM system when the moderating impacts of product complexity and purchasing structure are taken into consideration. The findings suggest that the technical components of GSCM (AI-based) have a favourable impact on the GSCM approach. In addition, it was discovered that the GSCM method had a favourable impact on the GSCM process overall. The GSCM procedures have major impacts on the environmental performance, social performance, and financial performance of the organisation. Product complexity has a strong moderating impact on the GSCM strategy and process routes.

Asymmetric duopoly models comprising two competing supply chains with differing carbon emission methods were investigated by Wu, T., and Kung, C.C. in 2020. Information on the financial risk of a supply chain's carbon emission technology investment might be exposed to a rival, whether whole or in part. When all of the information is available, the finding demonstrates that the financial risk associated with carbon emission technology upgrading has no effect on

either chain's choice of equilibrium quantities and prices. Finance risks play a big role in how many items to buy and how much money to charge for them if this information is not available through the usual supply chain.

Moreover, several studies have investigated the relationship between IT capabilities and GSCM performance. For example, Sarkis and Dhavale (2015) found that IT capabilities, such as information sharing and collaboration, can improve a company's GSCM performance. Similarly, Xu et al. (2018) found that IT capabilities, such as data analytics, can enhance a company's environmental performance. However, the mediating role of corporate reputation in the relationship between IT capabilities and GSCM performance has received less attention. One study by Cheng et al. (2020) found that corporate reputation mediates the relationship between IT capabilities and GSCM performance. Specifically, the study found that IT capabilities have a positive effect on corporate reputation, which in turn has a positive effect on GSCM performance. Furthermore, the study found that the effect of IT capabilities on GSCM performance is stronger for firms with stronger corporate reputations. This suggests that a good corporate reputation can enhance the positive effects of IT capabilities on GSCM performance. Therefore, the study proposed that

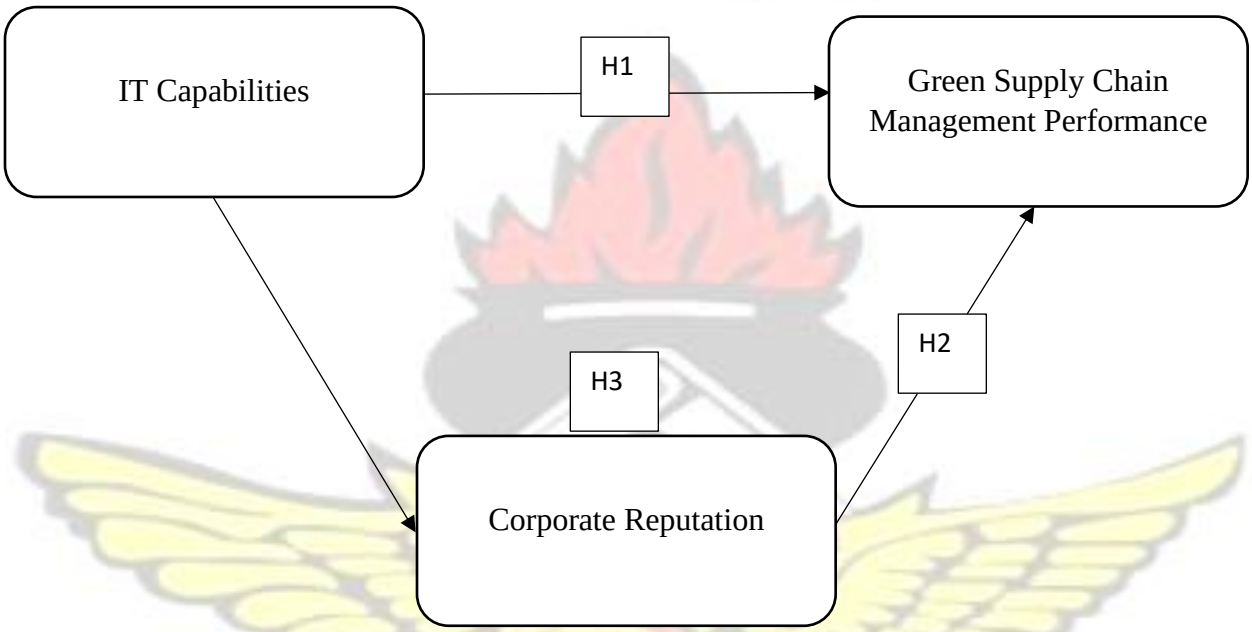
H3: corporate reputation will significantly mediate the relationship between IT capabilities and GSCM performance

2.4 Conceptual Framework

The conceptual framework is a graphical presentation of relationships among constructs. The study is set to examine the effect of information technology capabilities on green supply chain

management in manufacturing firms in Ghana. The conceptual framework view the effect of IT capabilities and green supply chain management performance and the mediating effects of corporate reputation on IT capabilities and green supply chain management performance Based on this assumption the figure 2.1 is presented.

Figure 2.1 Conceptual Framework



Source: Author's Construct based on existing literature

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the research methodology of the study "The effect of information technology capabilities on green supply chain management in manufacturing firms in Ghana". The section of the chapter is presented as follows: Section 3.1 presents the research design, Section 3.2 presents the population of the study, Section 3.3 presents samples and sampling techniques, Section 3.4 presents data

and data collection, Section 3.5 presents the validity and reliability of constructs and variables, and Section 3.6 presents ethical considerations.

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3.1 Research Design

According to Doody and Bailey (2016), a research design is an all-encompassing method that a researcher uses to answer the study questions in a manner that is both objective and brief. The researcher needs to examine the purpose of the study in addition to the data collection method that will be used (Thompson, Burdine, Thorne, and Sandhu, 2021). This is necessary in order for the researcher to select the most appropriate research design for the study. As a result, with regard to the strategy for conducting research, the current investigation utilized a quantitative research method. This is due to the fact that the research is predicated on the gathering and examination of numerical data, in addition to the testing of statistical hypotheses in a manner that is consistent with the quantitative method. In addition, the current research makes use of explanatory research methods on the grounds that the study wants to examine the relationships between the constructs in terms of their causes and consequences. Research is carried out with the intention of accomplishing three primary goals: the investigation of a previously unknown subject, the elaboration of an existing occurrence, and the formulation of an explanation for why something takes place.

Park et al. (2018) demonstrated that, the aims of research can be broken down into three categories: exploratory, descriptive, and explanatory. According to Casula, Rangarajan, and Shields (2021), the exploratory research design is centered on the process of gaining new ideas and understandings regarding a certain phenomenon or issue. On the other hand, descriptive studies concentrate on providing condensed accounts of occurrences, circumstances, individuals, or the relationships between variables (Queirós, Faria, and Almeida, 2017; Burns and Grove, 2010). There are a variety of study designs available, some examples of which include: cross-sectional design, survey design, case-study design, action research, experimental study design, historical study design, and historical study design, to name just a few (Tight,

2010). The purpose of this study is to acquire a comprehensive understanding of the capabilities of information technology as well as how the practices associated with these capabilities affect green supply chain management in manufacturing companies. For the purpose of this study, a survey methodology will be utilized. To achieve the goals of the study in a timely and efficient manner, the use of the survey technique allowed for the collection of a substantial quantity of information from the members of the study population.

3.2 Population of the Study

According to Fraenkel, Wallen, and Hyun (2012), population refers to a collective of individuals, objects, or occurrences that share at least one common attribute. Pyrczak and Tcherni-Buzzeo (2018) have illustrated that the population refers to the extensive group that the researcher aims to generalize the sample to. The researcher may find the population to be a significant group of interest. While it is uncommon for a research study to include the entire population, the findings are typically extrapolated to the broader population. The study's target population comprised the entire manufacturing industry situated in Kumasi, situated in the Ashanti region of Ghana. The study's focus was on the staff members belonging to the procurement, finance, human resources, and marketing departments of manufacturing enterprises.

3.3 Sample and Sampling Techniques

Due to the limited accessibility of information regarding the IT capabilities and green supply chain management practices of manufacturing firms, the researcher has opted to utilize a purposive sampling or judgmental technique. This approach involves selectively gathering data from officials and management members who possess the necessary knowledge and expertise in executing various aspects of supply chain management. The study utilized a purposeful sampling or judgmental sampling technique in selecting the sample. Etikan, Musa, and Alkassim (2016) explicate that purposive sampling is a non-probability sampling method that involves the selection of sample members based on the judgment of an

experienced individual regarding certain desirable characteristics. According to Ritchie, Lewis, and Elam (2003), researchers who employ purposive sampling typically choose samples that align with their particular research objectives, even if such samples do not fully represent the population under study. The aforementioned sampling methodology facilitated the acquisition of essential data, which was then systematically processed to obtain information for analysis. The importance of obtaining a representative sample of the larger population arises from the inability to gather data from the entire population. The determination of sample size is based on the selection of a few participants from a population under investigation and is contingent upon the required level of precision, the size of the population, the degree of population heterogeneity, and the available resources (Glasow, 2005; Afrin, Islam, and Ahmed, 2010). The research will encompass a cohort of 200 individuals who are employed.

3.4 Data and Data Collection

The two predominant categories of data utilized in research are primary and secondary data. According to Sharma and Kumar (2022), the process of collecting primary data entails getting information directly from the study participants themselves. Various techniques are employed to collect primary data, such as administering questionnaires, conducting interviews, and organizing focus group discussions. According to Cauvin (2016), the term "secondary" pertains to the compilation of data that has been previously obtained, archived, and conserved by an external entity, such as an autonomous corporation, establishment, or governing body. Secondary data can be sourced from various repositories, such as online databases of organizations and institutions, scholarly literature, textbooks, historical archives, and other similar resources. The present study's empirical analysis was exclusively carried out using primary data. The primary data was collected using a questionnaire. The utilization of primary data enhances the reliability and validity of research findings as the data is sourced from a credible and trustworthy source (Kwon, Lee, and Shin, 2014).

3.4.1 Variables Description and Measurement (data and variables)

The data collection measures employed to address the research objectives were derived from pre-existing literature. The survey instrument employed in the study was of a closed-ended nature and was utilized to elicit feedback from the participants. The questionnaire was designed with a structured format to facilitate comprehension by participants, thereby promoting the provision of dependable responses. The survey instrument was designed with a standardized five-point Likert scale, wherein the responses will be rated on a continuum from strongly disagree to strongly agree. The measurement scale will comprise the following values: "1 = strongly disagree", "2 = disagree", "3 = neutral", "4 = agree, and "5 = strongly agree".

Table 3.1 Research Instrument and Sources and Measures

Constructs	Sub-constructs	Items	References
IT Capabilities	IT infrastructure capabilities	4	Lin, (2022)
	IT human capabilities	4	
	IT relationship capabilities	4	
Green Supply Chain Management	Green information systems	4	Green et al., (2012) and Zhu et al., (2008)
	Green purchasing	4	
	Eco-design	3	
Corporate Reputation		4	Agyabeng-Mensah, Afum and Baah, 2022

3.4.2 Data Collection Instruments

According to Ragab and Arisha (2018), a questionnaire is a tool utilized to gather data from a randomly selected subset of a population through a predetermined series of inquiries. A survey instrument may be classified as either open-ended or closed-ended. According to Baburajan, e Silva, and Pereira (2020), an open-ended questionnaire can be distinguished from a closed-ended questionnaire in that it does not necessitate the utilization of a Likert scale. According to Leggett (2017), closed-ended questionnaires are characterized by structured questions that are presented in the form of multiple-choice questions or generated through the use of a Likert scale. The adaptability of this questionnaire lies in its design, wherein respondents are required to indicate their response by checking a box corresponding to a statement provided. In an open-ended questionnaire, respondents are instructed to provide their answers within a designated area on the survey form.

The study's primary data was collected via a closed-ended questionnaire. With the research questions and objectives at the forefront, a questionnaire was developed for the participants of the study. The questionnaire was selected as the primary data collection tool due to its widespread usage in primary research, particularly in the literature on supply chain management. Moreover, given that the investigation is a quantitative research endeavor aimed at establishing the association among various factors, the employment of a questionnaire was a suitable means of collecting information. The survey instrument was segmented into four distinct elements. The initial segment of the study presented the demographic data of the participants, whereas the subsequent three sections consisted of construct items pertaining to the study variables, namely IT capabilities and practices, green supply chain management, and corporate reputation. All of the items were derived from prior research following a comprehensive review of the relevant literature. The survey instrument was transformed into a digital format using Google Forms and subsequently disbursed to the personnel of designated manufacturing enterprises via the internet.

3.5 Validity and Reliability of Constructs/Variables

In the context of a PLS-SEM study, it is imperative for researchers to initially assess the measurement model to ascertain the dependability and soundness of the latent variables. This is supported by the works of F. Hair Jr. et al. (2014) and Purwanto and Sudargini (2021). In the context of PLS-SEM research, certain standards must be satisfied in order to assess the dependability and authenticity of unobservable variables. The aforementioned criteria encompass Average Variance Extracted (AVE), Composite Reliability (CR), Factor loading, Cronbach Alpha, Rho_A, and the Heterotrait-Monotrait (HTMT) ratio, as noted by Van Nguyen and Habók in 2021. To evaluate the internal consistency and reliability of latent variables, Lo and Sugiarto (2021) conducted CR, Cronbach alpha, and Rho_A tests. According to Supriyanto et al. (2022), it is anticipated that the factor loadings will exhibit a minimum value of 0.70, while the CR and rho_A are also expected to demonstrate a minimum value of 0.70. According to Naik et al. (2016), it is anticipated that Cronbach's alpha will be equal to or greater than 0.70. The assessment of convergent validity of latent variables is commonly carried out using the AVE, as suggested by Supriyanto et al. (2022). On the other hand, the evaluation of discriminant validity of latent variables is typically based on the HTMT ratio, as recommended by Supriyanto et al. (2022). According to Lo and Sugiarto (2021), it is anticipated that AVE will attain a value of 0.50 or higher. According to Lo and Sugiarto (2021) and Gold et al. (2001), it is anticipated that the HTMT ratio will be equal to or greater than 0.85 and 0.90, respectively.

3.6 Ethical Consideration

During the course of this study, the researcher was mindful of several ethical considerations. The researcher's supervisor granted approval for the topic of the investigation prior to its commencement. The researcher meticulously adhered to all instructions and thesis guidelines provided. Subsequently, prior to gathering the primary data, the researcher obtained informed consent from the participants by submitting a letter to the human resources director at Stellar Logistics. The research participants were provided with

an initial disclosure of the study's objective to enable them to make an informed decision regarding their participation. The confidentiality of both personal information and survey responses was ensured for all participants. Ultimately, the researcher duly recognized the valuable contributions of other researchers whose work was integrated into the present study. The achievement was attained through the incorporation of citations to assertions that were not original to the researcher, along with the incorporation of a bibliography of previously cited works.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter provides results and discussions on the topic of the effect of information technology capabilities on green supply chain performance. The chapter is presented in eight sections, as follows: Section 4.1 presents the preliminary analyses of data; Section 4.2 presents the

descriptive statistics results; Section 4.3 presents the reliability and validity test; Section 4.4 presents the correlation matrix; Section 4.5 presents the effect of corporate reputation on green supply chain management performance; Section 4.6 presents the impact of corporate reputation on green supply chain management performance; Section 4.7 presents the mediating effects of corporate reputation on IT capabilities and green supply chain management performance; and finally, Section 4.8 presents the result discussion of the study.

4.1 Preliminary Analyses of Data

Table 4.1 displays the demographic data of the participants. Regarding gender The male respondents accounted for 64.8% of the total participants, while the female respondents constituted 35.2%, representing nearly half the number of male respondents. The data reveals a notable gender imbalance among the participants, with males being significantly overrepresented. The largest proportion of respondents (43.0%) belong to the age group of 30-39 years. The subsequent group, comprising individuals under the age of 30, accounts for 35.8% of the respondents. The proportion of respondents in the age group of 40 to 49 years old is 19.2% of the total sample. Individuals aged over 50 years old constitute a mere 2.1% of the overall respondents, indicating their underrepresentation in the sample. The findings indicate that a significant proportion of the study participants are young, particularly within the age range of 30 to 39 years. The majority of respondents (42.0%) possess a bachelor's degree, indicating a high level of education. The proportion of respondents holding a Master's degree is 37.3%. The percentage of respondents with qualifications beyond a Master's degree is only 8.3%, indicating a relatively low prevalence of higher educational qualifications in this group. 12.4% of the respondents have an educational level below a bachelor's degree, suggesting a higher proportion

of respondents with at least a bachelor's degree. The study found that a significant proportion of respondents (36.8%) held positions as operational managers, suggesting their potential influence or interest in the study's subject matter. Procurement officers constitute the second-largest cohort, accounting for 30.6% of the total. The representation of warehouse managers and risk managers is nearly equal, with warehouse managers accounting for 11.4% and risk managers accounting for 12.4%. Supply chain managers comprise a relatively small proportion of the total respondents, accounting for only 8.8%. In general, The study primarily attracted male participants, particularly those aged 30 to 39. The majority of individuals in the sample possess a bachelor's degree or higher in terms of education. In terms of professional roles, the sample is predominantly composed of operational managers and procurement officers. The demographic composition of the respondents is important for understanding their background and perspective, which is essential for interpreting the study's findings and conclusions. Skewness within demographic sectors, such as gender and position, may suggest biases or areas of focus in the study's findings.

Table 4.1 Respondent's Demographic Information

	Frequency	Percent
Gender		
Female	68	35.2
Male	125	64.8
Age		
30 to 39 years old	83	43.0
40 to 49 years old	37	19.2
Less than 30 years old	69	35.8
More than 50 years old	4	2.1
Level of Education		

Above master's degrees	16	8.3
Bachelor’s degrees	81	42.0
Below bachelor's degrees	24	12.4
Master’s degrees	72	37.3
Position		
Operational Manager	71	36.8
Procurement Officer	59	30.6
Risk Manager	24	12.4
Supply Chain Manager	17	8.8
Warehouse Manager	22	11.4

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4.2 Descriptive Statistics Results

This section presents the descriptive result for the study variable. The main variables used in this study include IT capabilities, green supply chain management performance, and corporate reputation.

4.2.1 Descriptive Statistics Results for IT Capabilities

Table 4.2 Descriptive Result for IT Capabilities

Items	Min	Max	Mean	Std. Dev
Our company has an extensive digital infrastructure to back up e-GSCM.	1	5	4.07	0.941
Our company facilitates e-GSCM through a variety of entry points (e.g., mobile apps, web access).	1	5	4.04	0.991
With e-GSCM, our company's software applications are portable and usable across different platforms.	1	5	4.01	0.960
Our organization has embraced the widely-used eGSCM software component known as "reusable software modules."	1	5	3.74	1.059

Our IT staff is highly knowledgeable and proficient in e-GSCM.	1	5	3.94	1.129
The IT staff at our company can pick up and use cutting-edge, environmentally friendly tools with ease.	1	5	4.01	0.885
Our IT staff can analyze business issues and come up with tailor-made e-GSCM strategies to fix them.	1	5	4.10	0.971
Our IT staff is proficient in using e-GSCM and working in multi-disciplinary groups.	1	5	3.97	1.106
Both our IT staff and our supply chain partners gain and lose from e-GSCM.	1	5	3.94	0.972
Our IT staff and our supply chain partners have complete faith in e-GSCM.	1	5	3.96	0.949
Goals and strategies for e-GSCM are defined in collaboration with IT and supply chain partners	1	5	4.15	0.930
Using e-GSCM, we have experienced minimal friction between the IT department and our supply chain partners.	1	5	3.91	0.888

Table 4.2 provides valuable insights into the IT capabilities of the company under study. The items are ranked on a 5-point scale, with 1 indicating the lowest value and 5 indicating the highest value. The respondents generally believe that the company's digital infrastructure is strong enough to support e-GSCM, as indicated by the average score of 4.07. A standard deviation of 0.941 suggests that the responses were relatively close to the mean, indicating a smaller number of extreme viewpoints. The topic of discussion is e-GSCM access points. The company offers various access options for electronic Green Supply Chain Management (e-GSCM), such as mobile applications and web access. The mean score of 4.04 and standard deviation of 0.991 indicate a general consensus, albeit with slightly greater variability compared to the digital infrastructure item. The e-GSCM applications developed by the company

demonstrate a high level of software portability, as evidenced by the mean score of 4.01 across different platforms. A standard deviation of 0.960 indicates a high level of agreement among respondents. The firm's adoption of widely accepted "reusable software modules" has a slightly lower mean of 3.74 in the context of Reusable Software Modules. A higher standard deviation of 1.059 indicates a greater dispersion of opinions regarding this matter. In terms of IT Staff Proficiency, the average score for knowledge and proficiency in e-GSCM is 3.94, with a standard deviation of 1.129, suggesting some variation in the responses. The mean rating for the company's IT staff's ability to adopt environmentally friendly tools in Environmentally Friendly Tools was 4.01, indicating a positive perception. A standard deviation of 0.885 indicates a high level of agreement or consistency among the views. The IT staff demonstrates a strong capacity in devising e-GSCM strategies based on unique business problems, as indicated by a high mean score of 4.10 in Custom e-GSCM Strategies. The mean proficiency of IT staff in working with multidisciplinary teams while using e-GSCM in multidisciplinary collaboration is 3.97. The mean score for the concept of shared gains and losses in e-GSCM, indicating that both IT staff and supply chain partners experience the benefits and drawbacks together, is 3.94. Both IT staff and supply chain partners express confidence in e-GSCM, as indicated by a mean score of 3.96. The e-GSCM goals and strategies, in collaboration with IT and supply chain partners, achieved a high mean score of 4.15, indicating significant collaborative efforts. In the context of Minimal Friction, the utilisation of e-GSCM appears to result in minimal tension between the IT department and supply chain partners, as indicated by a mean score of 3.91. The descriptive findings indicate a predominantly favourable perception of the company's IT capabilities within the realm of e-GSCM. The majority of mean scores indicate that respondents perceive the company to be adequately equipped and proficient in this area. There is variability in responses,

particularly regarding the adoption of reusable software modules and the proficiency of the IT staff. The findings emphasise the significance of IT capabilities in enabling efficient e-GSCM processes.

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4.2.2 Descriptive Statistics Results for Green Supply Chain Management Performance

Table 4.3 Descriptive Result for Green Supply Chain Management Performance

Items	Min	Max	Mean	Std. Dev
Our company actively promotes the use of video conferencing and in-person meetings to reduce the need for business-related air travel.	1	5	4.24	0.940
Our company keeps tabs on emissions and trash generation in addition to monitoring environmental data (such as toxicity, energy use, water use, and air pollution).	1	5	3.96	1.010
We aid in executive decision-making by drawing attention to sustainability concerns	1	5	4.08	0.841
Reduced emissions of carbon and other gases	1	5	4.04	0.923
Our business verifies that goods are properly eco-labeled.	1	5	3.87	0.918
Our business works with its vendors to achieve shared environmental goals.	1	5	4.22	0.888
Our firm conducts environmental management system audits of external vendors.	1	5	4.02	0.995
Our company only deals with ISO 14000-approved vendors	1	5	3.83	1.112
Our company only deals with ISO 14000-approved vendors	1	5	3.72	1.139
The design specifications that our company provides to suppliers include the environmental requirements for purchased items	1	5	4.08	0.926

Products developed by our company are energy and material efficient	1	5	3.93	0.916
Our company creates items with recycling, material recovery, and reuse in mind	1	5	3.92	1.067
Our company develops items to limit or eliminate exposure to harmful materials and procedures	1	5	3.96	1.077

Based on the information presented in Table 4.3, which provides descriptive statistics for various practises and policies related to the performance of green supply chain management, the following interpretations can be derived: To promote the use of videoconferencing, most respondents recognise their companies' efforts in promoting video conferencing as a means to reduce air travel for business purposes. This is evidenced by an average score of 4.24 on a scale of 1 to 5. The standard deviation of 0.940 suggests a low dispersion around the mean, indicating consistency in the opinions of the respondents. The average score for companies monitoring their environmental footprint is 3.96. Although the score is relatively high, the standard deviation of 1.010 suggests a greater dispersion in responses, which may be attributed to differences in practises or levels of awareness among various companies. A mean score of 4.08 suggests that companies tend to prioritise sustainability concerns in executive decision-making. The standard deviation of 0.841 indicates a high level of consistency in the feedback provided by the respondents. The average score of 4.04 indicates that the majority of companies are actively working towards reducing their emissions. There appears to be a relatively low emphasis on eco-labelling goods, as indicated by a mean score of 3.87. Companies are actively collaborating with vendors to achieve environmental objectives, as indicated by a mean score of 4.22 and a low standard deviation. Companies appear to be actively engaged in conducting environmental management system audits of their external vendors, as indicated by a mean score of 4.02 in

vendor audits. The data reveals inconsistencies in the responses regarding interactions with ISO 14000-approved vendors. The item is observed to have two distinct means, specifically 3.83 and 3.72. The standard deviations exceed 1, suggesting a greater diversity of responses. Design specifications refer to the detailed requirements and criteria that guide the development and creation of a product, system, or process. These specifications outline the incorporation of environmental prerequisites, This practise is commonly observed among companies, with a mean score of 4.08. The average score of 3.93 in Efficient Product Development indicates that the majority of developed products exhibit energy and material efficiency. However, there remains potential for further enhancement. Recycling and reuse: The higher standard deviation of 3.92 suggests variability in the approaches of different companies towards recycling, material recovery, and reuse. The companies consistently develop items that minimise exposure to harmful materials and procedures, as indicated by the mean score of 3.96 and standard deviation of 1.077. The analysis indicates that most companies are adopting green supply chain management practises. Video conferencing promotion, collaboration with vendors on environmental goals, and sustainability in executive decision-making were rated highly. Some areas, such as eco-labelling and working with ISO 14000-approved vendors, could be improved. The higher standard deviations observed in the responses for certain items indicate potential variations in practises or perceptions among the participating companies.

4.2.3 Descriptive Statistics Results for Corporate Reputation

Table 4.4 Descriptive Result for Corporate Reputation

Items	Min	Max	Mean	Std. Dev
Our company has strengthened its reputation among domestic consumers, both near and far	2	5	4.31	0.725

Our company's reputation among regional and nationwide domestic suppliers has strengthened	2	5	4.19	0.829
Our company has a long history of dedication to environmental protection	2	5	4.06	0.902
Our company is trusted by environmentally conscious consumers	1	5	4.18	0.896

Table 4.4 displays the descriptive statistics for statements pertaining to a company's reputation, specifically regarding its environmental consciousness. The following is a comprehensive analysis of the findings. In terms of domestic consumer perception, reputation plays a significant role. Most respondents perceive their company to have a favourable reputation among domestic consumers, regardless of their proximity. This is evidenced by a mean score of 4.31 out of 5. The SD of 0.725 suggests a moderate level of agreement among respondents regarding this sentiment, with some degree of variability. The company has a strong reputation among both regional and nationwide domestic suppliers, as indicated by the mean score of 4.19. The standard deviation of 0.829 indicates moderate variability in perceptions among respondents, while the overall sentiment remains positive. The data indicates that the company has a recognised history of environmental dedication, as evidenced by a mean score of 4.06, which suggests majority agreement among respondents. The standard deviation of 0.902 suggests a moderate dispersion of responses, which may indicate differing levels of knowledge or perspectives regarding the company's past engagement in environmental conservation among the participants. The data indicates that environmentally conscious consumers exhibit a strong level of trust in the company. The average score of 4.18 supports this viewpoint. The standard deviation of 0.896, like the other items in the table, indicates a moderate level of response dispersion. The analysis of Table 4.4 reveals that the company being examined possesses a positive reputation,

particularly in relation to its commitment to environmental sustainability. The high mean scores indicate that consumers and suppliers acknowledge and value the company's commitment and reliability in environmental protection and sustainability. The presence of standard deviations indicates variability in perceptions, but the general sentiment towards the company's corporate reputation in terms of environmental dedication is predominantly positive.

4.3 Reliability and Validity Test

4.3.1 Reliability and Validity Test for IT Capabilities

Table 4.5 EFA for IT Capabilities

Items	Loading
Our company has an extensive digital infrastructure to back up e-GSCM.	0.814
Our company facilitates e-GSCM through a variety of entry points (e.g., mobile apps, web access).	0.830
With e-GSCM, our company's software applications are portable and usable across different platforms.	0.858
Our organization has embraced the widely-used eGSCM software component known as "reusable software modules."	0.793
Our IT staff is highly knowledgeable and proficient in e-GSCM.	0.802
The IT staff at our company can pick up and use cutting-edge, environmentally friendly tools with ease.	0.851
Our IT staff can analyze business issues and come up with tailor-made e-GSCM strategies to fix them.	0.882
Our IT staff is proficient in using e-GSCM and working in multi-disciplinary groups.	0.832
Both our IT staff and our supply chain partners gain and lose from e-GSCM.	0.696
Our IT staff and our supply chain partners have complete faith in e-GSCM	0.752

Goals and strategies for e-GSCM are defined in collaboration with IT and supply chain partners	0.807
Using e-GSCM, we have experienced minimal friction between the IT department and our supply chain partners	0.750
Cronbach Alpha	**0.950**
Eigenvalue	**7.821**
% of Variance	**65.179**
KMO=0.901; χ^2=2013.773; df=66; p-value=0.000	

Table 4.5 represents the exploratory factor analysis (EFA) for IT capabilities, especially regarding electronic green supply chain management (e-GSCM). Here's a detailed interpretation: Factor Loadings: Factor loadings represent the strength of the relationship between an observed variable and the underlying factor. In this table, all items have factor loadings above the commonly accepted threshold of 0.7, indicating that each item strongly correlates with the underlying construct of IT capabilities. Cronbach Alpha At 0.950, an alpha value above 0.7 is considered acceptable, and anything above 0.9 denotes excellent reliability. An eigenvalue represents the amount of variance explained by each factor in the analysis. In this table, the eigenvalue is 7.821, which means this single factor (IT capabilities) explains a significant portion of the variance in the observed variables. % of variance explains 65.179% of the variance in the observed variables, which is quite high. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.901, which is very close to 1, indicating that the sample is adequate for factor analysis. The $\chi 2$ value is 13.773 with a p-value of 0.000 for Bartlett's Test of Sphericity, signifying that the observed variables are intercorrelated.

4.3.2 Reliability and Validity Test for Green Supply Chain Management Performance

Table 4.6 EFA for Green Supply Chain Management Performance

Items	Loading
Our company actively promotes the use of video conferencing and in-person meetings to reduce the need for business-related air travel.	0.830
Our company keeps tabs on emissions and trash generation in addition to monitoring environmental data (such as toxicity, energy use, water use, and air pollution).	0.797
We aid in executive decision-making by drawing attention to sustainability concerns	0.892
Reduced emissions of carbon and other gases	0.843
Our business verifies that goods are properly eco-labeled.	0.687
Our business works with its vendors to achieve shared environmental goals.	0.861
Our firm conducts environmental management system audits of external vendors.	0.883
Our company only deals with ISO 14000-approved vendors	0.792
Our company only deals with ISO 14000-approved vendors	0.820
The design specifications that our company provides to suppliers include the environmental requirements for purchased items	0.829
Products developed by our company are energy and material efficient	0.831
Our company creates items with recycling, material recovery, and reuse in mind	0.817
Our company develops items to limit or eliminate exposure to harmful materials and procedures	0.836
Cronbach Alpha	**0.960**
Eigenvalue	**8.866**
% of Variance	**68.197**
KMO=0.912; χ^2=2403.343; df=78; p-value=0.000	

Table 4.6 offers insights into the exploratory factor analysis (EFA) for green supply chain management (GSCM) performance. Let's delve into the interpretation of the results: Factor loadings are correlations between the observed variables and the underlying factor. A higher factor loading indicates a stronger relationship. Every item on the list has factor loadings above the commonly recommended threshold of 0.7, confirming that each item is aptly associated with GSCM performance. Cronbach Alpha = 0.960 signifies outstanding internal consistency among the items. A value above 0.9 is indicative of excellent reliability. The eigenvalue, at 8.866, indicates the variance in the observed variables that this factor (GSCM performance) accounts for. The variance of GSCM performance explains 68.197% of the variance in the observed variables. The Kaiser-Meyer-Olkin (KMO) measure stands at 0.912, which is near 1, denoting that the sampled data is well-suited for an EFA. Bartlett's Test of Sphericity further confirms the suitability of the data for EFA, with a $\chi 2$ value of 2403.343 and a p-value of 0.000, showing that the observed variables are sufficiently intercorrelated.

4.3.3 Reliability and Validity Test for Corporate Reputation

Table 4.7 EFA for Corporate Reputation

Items	Loading
Our company has strengthened its reputation among domestic consumers, both near and far	0.900
Our company's reputation among regional and nationwide domestic suppliers has strengthened	0.834
Our company has a long history of dedication to environmental protection	0.823
Our company is trusted by environmentally conscious consumers	0.904
Cronbach Alpha	**0.884**
Eigenvalue	**2.999**

% of Variance	**74.968**
KMO=.819; χ^2=446.770; df=6; p-value=0.000	

Table 4.7 provides the results of the exploratory factor analysis (EFA) for corporate reputation. Below is a comprehensive interpretation of the findings: Factor Loadings: Factor loadings are a measure of how much each variable is associated with the underlying factor. All the items listed have high factor loadings, which are well above the commonly accepted threshold of 0.7. This indicates that each item robustly correlates with the construct of corporate reputation. The Cronbach's alpha value is 0.884, denoting good internal consistency among the items. An eigenvalue describes the variance explained by the factor in the observed variables. An eigenvalue of 2.999 implies this factor (corporate reputation) captures a substantial proportion of the variance in the items. % of Variance of Corporate Reputation explains an impressive 74.968% of the variance in the observed variables, indicating that the majority of the variation in responses can be attributed to this singular underlying factor. The Kaiser-Meyer-Olkin (KMO) measure is 0.819, suggesting the sample is fairly adequate for factor analysis. Bartlett's Test of Sphericity has a χ2 value of 446.770 with a p-value of 0.000, signifying that the observed variables are significantly intercorrelated, making the dataset suitable for EFA.

4.4 Correlation Matrix

Table 4.8 Correlation Matrix

	ITC	GSCM	COR
IT Capabilities	1		

Green Supply Chain Management Performance	0.897**	1	
	0.000		
Corporate Reputation	0.819**	0.797**	1
	0.000	0.000	

Note: Correlation is significant at the 0.01 level (2-tailed). ITC = IT Capabilities, GSCM = Green Supply Chain Management Performance, COR = Corporate Reputation.

Table 4.8 presents the correlation matrix showing the relationships among IT capabilities (ITC), green supply chain management performance (GSCM), and corporate reputation (COR). Between IT capabilities and GSCM, there is a strong positive correlation (0.897) that is statistically significant at the 0.01 level: Between IT capabilities and corporate reputation, there is a positive correlation of 0.819 that is statistically significant at the 0.01 level with a p-value of 0.000. Between GSCM and corporate reputation, there's a strong positive correlation of 0.797 that is statistically significant at the 0.01 level with a p-value of 0.000. The diagonal values in a correlation matrix are always 1 because any variable is perfectly correlated with itself. The strong and statistically significant correlations between these variables suggest that investments in one domain (like IT) can have ripple effects, positively influencing other areas (like supply chain sustainability and corporate standing).

4.5 The Effect It Capabilities on Green Supply Chain Management Performance

Table 4.9 Effect IT Capabilities on Green Supply Chain Management Performance

Items	**Green Supply Chain Management Performance**		**Sig.**	**VIF**
	Beta-value	(T-value)		
IT Capabilities	0.897	(26.703)	0.000	1.000
Model Summary				
R	0.897			

R Square	0.804
F-statistics	713.062

Note: Significant Level = P-value < 0.05.

Based on the results presented in "Table 4.9: The beta value of 0.897 for IT capabilities indicates a strong positive relationship between IT capabilities and the performance of green supply chain management. This suggests that as IT capabilities improve or increase, there is a corresponding significant improvement in green supply chain management performance. A T-value of 26.703 shows that the relationship between IT capabilities and green supply chain management performance is statistically significant. The significance value (P-value) of 0.000 is less than the threshold level of 0.05. This indicates that the observed relationship between IT capabilities and green supply chain management performance is statistically significant at the 95% confidence level. The R-value of 0.897, the R-square value of 0.804, and the F-statistic of 713.062 suggest that the regression model as a whole (with IT capabilities as the predictor) is statistically significant and fits the data well.

4.6 The Impact of Corporate Reputation on Green Supply Chain Management Performance

Table 4.10 Impact of Corporate Reputation on Green Supply Chain Management Performance

Items	**Green Supply Chain Management Performance**		**Sig.**	**VIF**
	Beta-value	(T-value)		
Corporate Reputation	0.797	17.811	0.000	1.000
Model Summary				

R	0.797
R Square	0.635
F-statistics	317.217

Note: Significant Level = P-value < 0.05.

Based on "Table 4.10", the key insights are: The beta-value of 0.797 indicates a strong positive impact of corporate reputation on green supply chain management performance. A T-value of 17.811 confirms this relationship is statistically significant. The P-value of 0.000, being below the 0.05 threshold, further attests to this significance. The R-value of 0.797, R-square value of 0.635 and F-statistic of 317.217 indicates the model's overall fit is statistically significant. In summary, corporate reputation has a substantial and statistically significant positive impact on green supply chain management performance.

4.7 The Mediating Effects of Corporate Reputation on IT Capabilities and Green Supply Chain Management Performance

Table 4.11 Mediating Effects of Corporate Reputation on IT Capabilities and Green Supply Chain Management Performance

Items	**GSCM**	**COR**	**GSCM**	**GSCM**	**Sig.**	**VIF**
	Step 1	Step 2	Step 3	Step 4		
	Beta (T-value)	Beta (T-value)	Beta (T-value)	Beta(T-value)		
IT Capabilities	0.897 (26.703)				0.000	1.000
IT Capabilities		0.819 (19.275)			0.000	1.000
Corporate Reputation			0.797 (17.811)			1.000
IT Capabilities				0.633(12.054)	0.000	2.966
Corporate Reputation				0.324(6.171)	0.000	2.966

Model Summary				
R	0.897	0.819	0.797	.916
R Square	0.804	0.670	0.635	0.839
F-statistics	713.062	371.538	317.217	451.542
ΔR Square	0.804	0.670	.635	0.839
ΔF	713.062	371.538	317.217	451.542

Note: Significant Level = P-value < 0.05. ITC = IT Capabilities, GSCM = Green Supply Chain Management Performance, COR = Corporate Reputation.

Based on "Table 4.11", the insights derived are: IT capabilities have a strong positive direct effect on GSCM with a beta-value of 0.897 (T-value: 26.703), significant at P = 0.000. Also, IT capabilities positively influence corporate reputation, with a beta-value of 0.819 (T-value: 19.275). Corporate reputation has a strong positive direct effect on GSCM, with a beta-value of 0.797 (T-value: 17.811). In the mediating effect, when both IT capabilities and corporate reputation are considered together, their respective beta-values on GSCM are 0.633 (T-value: 12.054) and 0.324 (T-value: 6.171), both significant at P = 0.000. The VIF values of 2.966 for both suggest no serious multicollinearity concerns. The R-values across the steps range from 0.797 to 0.916. The R-square values (ranging from 0.635 to 0.839) show the proportion of GSCM's variability explained by the model. Approximately 83.9% of GSCM variability is explained, suggesting the combined effect of IT capabilities and corporate reputation is profound. F-statistics signify the significance of the model's fit. In summary, while IT capabilities directly influence green supply chain management performance (GSCM), the presence of corporate reputation as a mediator showcases its amplifying role in this relationship. Both IT capabilities and corporate reputation together have a compounded positive impact on GSCM. Therefore, corporate reputation partially positively mediates the relationship between IT capabilities and green supply chain management performance.

Hypotheses Testing

H1: There is a positive relationship between IT capabilities and GSCM performance

H2: corporate reputation can have a positive effect on GSCM performance

H3: corporate reputation will significantly mediate the relationship between IT capabilities and GSCM performance

Table 4.19: Summary of Hypotheses Testing

Hypothesized Path	Beta Values	T-value Values	P-values	Decisions
H1	0.897	26.703	0.000	Supported
H2	0.797	17.811	0.000	Supported
H3	0.324	6.171	0.000	Partially Supported

4.8 Discussions of Findings

4.8.1 The Effect IT Capabilities on Green Supply Chain Management Performance

This study found a significant correlation between IT capabilities and the performance of green supply chain management (GSCM). The positive impact of IT capabilities on GSCM performance suggests that technological advancements can greatly assist businesses in attaining sustainability goals in their supply chain operations. This finding aligns with previous empirical research. Zhu, Sarkis, and Lai (2013) discovered that IT integration has a direct positive impact on environmental management practises, enabling more effective and sustainable operations throughout the supply chain. Rao and Holt (2005) highlighted the potential of IT-driven solutions to enhance environmental monitoring, analysis, and improvement of supply chain processes. The incorporation of information technology enables companies to monitor their carbon footprint,

evaluate the environmental consequences of their suppliers, and promptly respond to potential sustainability concerns. The analytical capability demonstrated in our study supports the enhancement of GSCM performance. The literature has extensively discussed the importance of IT in improving transparency and traceability in supply chains. Dubey et al. (2015) highlighted the role of IT solutions in facilitating real-time data sharing and collaboration among stakeholders, thereby promoting transparency and sustainability in the supply chain ecosystem. Transparency is crucial, particularly in the current business landscape, as both consumers and regulatory bodies are placing greater emphasis on accountability regarding sustainability issues. Integrating IT capabilities into supply chain processes enhances operational efficiency and ensures compliance with environmental standards, resulting in a dual advantage (Gold et al., 2010). The findings of this study support Wolf's (2011) claim that future supply chains will be both technologically advanced and environmentally conscious. Bing, Akcali, Suresh, and Schrage (2012) assert that IT capabilities have transitioned from operational tools to strategic assets that companies can utilise for competitive advantage. Organisations that adopt IT for managing their green supply chain operations are likely to gain advantages in terms of sustainable performance, competitiveness, and brand reputation.

4.8.2 The Impact of Corporate Reputation on Green Supply Chain Management Performance

Our study shows that corporate reputation has a significant and positive impact on the performance of green supply chain management (GSCM). These findings are supported by previous empirical research. According to Fombrun et al. (2000), a positive corporate reputation enhances trust among stakeholders, which in turn helps a company establish advantageous

partnerships. These relationships are especially beneficial for Green Supply Chain Management (GSCM) initiatives, as collaboration plays a crucial role. Contemporary stakeholders, including consumers, investors, and businesses, exhibit an increasing level of environmental awareness. Firms with strong reputations for sustainability efforts are frequently rewarded, which further demonstrates their commitment to environmentally friendly practises (Carter & Jennings, 2002). This suggests that companies with favourable reputations may feel a stronger motivation to enhance their GSCM performance in order to meet the expectations of stakeholders. A positive corporate reputation can enhance a firm's ability to attract and retain environmentally conscious talent. These employees play a crucial role in promoting and implementing innovative green supply chain practises. Greening and Turban (2000) found that companies with a positive reputation for environmental stewardship are more likely to attract employees who are dedicated to sustainability. This, in turn, leads to enhanced performance in green supply chain management. A strong reputation can aid in risk management by fostering trust and promoting transparent communication across the supply chain. This is especially important when dealing with environmental hazards. According to Mani et al. (2016), established companies are more capable of addressing environmental issues due to their strong relationships with supply chain partners. GSCM practises typically result in cost reduction, waste minimization, and efficient resource utilisation, thereby enhancing performance. Zhou et al. (2012) emphasised that firms with robust reputations, when combined with GSCM initiatives, can attain sustainable competitive advantages and consequently experience improved financial performance. However, it is important to note that relying solely on corporate reputation as a solution for GSCM issues may have its drawbacks. Certain companies may engage in "greenwashing," a practise where they falsely present themselves as being more environmentally responsible than they actually

are. Future research could explore the specific role of corporate reputation in distinguishing authentic green supply chain management (GSCM) initiatives from superficial reputation management strategies.

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4.8.3 The Mediating Effects of Corporate Reputation on IT Capabilities and Green Supply Chain Management Performance

Our research findings suggest that corporate reputation has a dual role in the relationship between IT capabilities and green supply chain management (GSCM) performance. It not only influences this relationship but also acts as a partial mediator, positively impacting it. The existing empirical literature provides support for these findings. Corporate reputation is regarded as a representation of trustworthiness and dependability (Roberts & Dowling, 2002). Trust within the supply chain can foster deeper collaboration. The integration of reputation-induced trust and IT capabilities can foster an environment conducive to data sharing and cooperative green practises among supply chain partners. This, in turn, leads to enhanced performance in green supply chain management (GSCM). The use of IT capabilities to promote transparency and provide stakeholders with access to information can improve a firm's reputation (Bharadwaj, 2000). When stakeholders perceive a company's utilisation of IT for sustainability and transparency, it improves the firm's reputation for being environmentally friendly. IT capabilities enhance the implementation of GSCM strategies, while a strong corporate reputation increases their visibility and marketability. Barney (1991) highlights that IT capabilities and corporate reputation are valuable resources that can provide a competitive advantage. This advantage is enhanced when these resources are combined synergistically. Fombrun et al. (2000) found that companies with a strong corporate reputation are more likely to attract stakeholders who are

committed to sustainability. When integrated with strong IT capabilities, this enables the use of data to make informed decisions and establish feedback mechanisms with stakeholders, thereby enhancing the performance of GSCM. A strong corporate reputation, when combined with robust IT capabilities, enhances the positive effects of IT on GSCM. Saraf et al. (2007) argue that integrating internal IT capabilities with external resources, such as reputation, can result in enhanced process performance. Further research could explore the factors that influence the strength of the mediating effect of corporate reputation. In industries or markets where green practises are a significant differentiating factor, reputation may have a stronger mediating effect.

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CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of findings, conclusion, and recommendations for the study topic, The Effect of Information Technology Capabilities on Green Supply Chain Management. The chapter is presented in four sections, as follows: Section 5.1 presents the Summary of Findings; Section 5.2 presents the Conclusion; Section 5.3 presents the Policy Implications and Recommendations; and Section 5.4 presents the Suggestions for Further Research.

5.1 Summary of Findings

Integrated information systems can enhance business performance for supply chain enterprises. Limited research has been conducted on the role of information technology (IT) in green supply chain management (GSCM). This study aims to determine the extent to which IT capabilities affect GSCM. This study aims to examine the mediating role of corporate reputation in the relationship between IT capabilities and green supply chain management in developing countries. The study aims to examine the impact of IT capabilities and green supply chain management performance on manufacturing firms in Ghana through a quantitative research methodology. The study involved 193 participants who were surveyed using a census approach.

The study focuses on collecting data from manufacturing firms in Ghana. The primary data was collected using a structured questionnaire. The study utilised structural equation modelling to analyse the data and assess the research hypotheses. The study's main findings are summarised in sections 5.1.1 to 5.1.3.

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5.1.1 The Effect IT Capabilities on Green Supply Chain Management Performance

The study reveals that a beta value of 0.897 for IT capabilities indicates a strong positive relationship between IT capabilities and the performance of green supply chain management. This suggests that as IT capabilities improve or increase, there is a corresponding significant improvement in green supply chain management performance. A T-value of 26.703 and a significance value (P-value) of 0.000 indicate that the observed relationship between IT capabilities and green supply chain management performance is statistically significant.

5.1.2 The Impact of Corporate Reputation on Green Supply Chain Management Performance

The study reveals that a beta-value of 0.797 indicates a strong positive impact of corporate reputation on green supply chain management performance. A T-value of 17.811 and a P-value of 0.000 attest that corporate reputation has a substantial and statistically significant positive impact on green supply chain management performance.

5.1.3 The Mediating Effects of Corporate Reputation on IT Capabilities and Green Supply Chain Management Performance

The study reveals that in the mediating effect, when both IT capabilities and corporate reputation are considered together, their respective beta-values on GSCM are 0.633 (T-value: 12.054) and 0.324 (T-value: 6.171), both significant at P = 0.000, which shows that corporate reputation partially positively mediates the relationship between IT capabilities and green supply chain management performance.

5.2 Conclusion

The study's findings support the importance of IT capabilities and corporate reputation in improving green supply chain management (GSCM) performance. There is a strong and positive correlation between IT capabilities and GSCM performance. The data suggests that enhancements or upgrades in IT capabilities have a significant positive effect on GSCM. Corporate reputation has been found to have a significant positive relationship with GSCM performance, highlighting the significance of organisations maintaining a favourable reputation to enhance environmental supply chain outcomes. Additionally, the analysis of the joint impact of IT capabilities and corporate reputation on GSCM performance reveals that corporate reputation serves as a partially positive mediator. This implies that IT capabilities have a direct impact on GSCM performance, and corporate reputation plays a role in strengthening this association. Organisations should prioritise both technological advancements and reputation management to optimise the performance of their green supply chain operations.

5.3. Policy Implications and Recommendations

The correlation between IT capabilities and corporate reputation with the performance of green supply chain management (GSCM) underscores the need for holistic organisational strategies. Considering the vital role of sustainable supply chains in modern business contexts and the broader environmental landscape, policy implications become increasingly relevant.

Policy Implications: The strong relationship between IT capabilities and GSCM performance highlights the importance of implementing policies that promote technological advancements in the supply chain. Additionally, it is recommended to incentivize, provide grants, or offer subsidies to promote the adoption and enhancement of information technology tools and systems within the realm of supply chain management. Introduce educational initiatives aimed at improving the technological proficiency of supply chain personnel, enabling them to effectively utilise IT solutions. The significance of a positive public image should be emphasised in organisational policy due to the influential role corporate reputation plays in the performance of green supply chain management (GSCM). Develop guidelines for transparent and ethical business practises that promote and strengthen corporate reputation. The study highlights the importance of integrated strategies in considering the mediating role of corporate reputation between IT capabilities and GSCM performance. Promote the creation of holistic frameworks that combine IT capabilities with reputation management to optimise green supply chain management (GSCM).

Recommendations: It is recommended to allocate resources towards continuous IT training for supply chain professionals. Regular workshops and training sessions will ensure that staff

members remain informed about current technological trends and best practises. Engage in collaboration with technology vendors and developers to tailor IT solutions that are specifically designed to meet the organisation's Green Supply Chain Management (GSCM) requirements. Promote a transparent culture that emphasises corporate ethics and sustainability objectives for all stakeholders. Conduct regular audits and assessments of environmentally sustainable supply chain operations. Assessments provide valuable feedback that can inform decisions regarding IT investments and reputation-building endeavours. Develop awareness campaigns to educate employees, suppliers, and customers about the organisation's Green Supply Chain Management (GSCM) initiatives. This not only improves reputation but also promotes collective engagement in sustainable practises.

5.4 Suggestions for further research

The present study has illuminated the strong interplay between IT capabilities and corporate reputation in enhancing green supply chain management (GSCM) performance. However, like all research, the depth and scope of this study have their boundaries. Consequently, the following areas are proposed for further exploration:

Diverse IT Capabilities: The current study emphasises a positive relationship between IT capabilities and GSCM performance. However, additional research is needed to determine which specific IT tools or capabilities have the greatest positive effects. Gaining a comprehensive understanding of the subtle distinctions can assist organisations in making more focused investments in information technology.

Organizational Culture and GSCM: This study examines the influence of organisational culture on the adoption of IT capabilities and the subsequent impact on corporate reputation. Can a culture that promotes innovation or environmental sustainability enhance the observed positive impacts?

Geographical and Sectoral Variations: Examine the consistency of the observed relationships across various geographic regions and industries. Different regions or sectors may have varying levels of emphasis on green initiatives, which in turn affects the role of IT and corporate reputation.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

MSC LOGISTICS AND SUPPLY CHAIN MANAGEMNENT

I am a Postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi. This questionnaire seeks to solicit your views on the topic ***"The effect of information technology capabilities on green supply chain management in manufacturing firms in Ghana.*.** It will take 5-10 minutes to respond to this questionnaire. Any information provided will ONLY be used for academic purposes, and it will be treated as HIGHLY CONFIDENTIAL. Thank you for participating in this survey.

SECTION A: DEMOGRAPHICS OF RESPONDENTS

Please write in ink by choosing the option which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (✓) all that apply.

1. Gender of Respondent

   a. Male ( ) b. Female ( )

2. Age of Respondent

   a. Less than 30 years old ( ) b. 30 to 39 years old ( ) c. 40 to 49 years old ( )
   d. More than 50 years old ( )

3. Education level of the respondent

   a. Below bachelor's degrees ( ) b. Bachelor's degrees ( ) c. Master's degrees ( )
   d. Above master's degrees ()

4. Position

   a. Operations Manager ( ) b. Supply chain manager ( ) c. Warehouse Manager ( )
   d. Procurement Officer ( ) e. Risk Manager ( )

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SECTION B: IT Capabilities

Following statements in relation to the IT Capabilities as practice by your firm. Please indicate with a (√) or a tick on the scale below which of the following statement apply your firm.

Scale	**1= strongly disagree**	**2= disagree**	**3= neutral**	**4= agree**	**5= strongly agree**

	Items	**1**	**2**	**3**	**4**	**5**
	IT infrastructure capabilities					
1	Our company has an extensive digital infrastructure to back up e-GSCM.					
2	Our company facilitates e-GSCM through a variety of entry points (e.g., mobile apps, web access).					
3	With e-GSCM, our company's software applications are portable and usable across different platforms.					

4	Our organization has embraced the widely-used eGSCM software component known as "reusable software modules."					
	IT human capabilities					
1	Our IT staff is highly knowledgeable and proficient in e-GSCM.					
2	The IT staff at our company can pick up and use cutting-edge, environmentally friendly tools with ease.					
3	Our IT staff can analyze business issues and come up with tailor-made e-GSCM strategies to fix them.					
4	Our IT staff is proficient in using e-GSCM and working in multi-disciplinary groups.					
	IT relationship capabilities					
1	Both our IT staff and our supply chain partners gain and lose from e-GSCM.					
2	Our IT staff and our supply chain partners have complete faith in e-GSCM.					
3	Goals and strategies for e-GSCM are defined in collaboration with IT and supply chain partners.					
4	Using e-GSCM, we have experienced minimal friction between the IT department and our supply chain partners.					

SECTION C: Green Supply Chain Management

Following statements in relation to the Green Supply Chain Management as practice by your firm. Please indicate with a (√) or a tick on the scale below which of the following statement apply your firm.

Scale	1= strongly disagree	2= disagree	3= neutral	4= agree	5= strongly agree

	Items	1	2	3	4	5
	Green Information Systems					
1	Our company actively promotes the use of video conferencing and in-person meetings to reduce the need for business-related air travel.					
2	Our company keeps tabs on emissions and trash generation in addition to monitoring environmental data (such as toxicity, energy use, water use, and air pollution).					
3	We aid in executive decision-making by drawing attention to sustainability concerns.					
4	Reduced emissions of carbon and other gases.					
	Green Purchasing					
1	Our business verifies that goods are properly eco-labeled.					
2	Our business works with its vendors to achieve shared environmental goals.					
3	Our firm conducts environmental management system audits of external vendors.					
4	Our company only deals with ISO 14000-approved vendors.					
5	The design specifications that our company provides to suppliers include the environmental requirements for purchased items.					
	Eco-Design					
1	Products developed by our company are energy and material efficient.					
2	Our company creates items with recycling, material recovery, and reuse in mind.					
3	Our company develops items to limit or eliminate exposure to harmful materials and procedures.					

SECTION D: Corporate Reputation

Please indicate with a (√) or a tick on the scale below which of the following items apply to firm's information technology.

Scale	1= strongly disagree	2= disagree	3= neutral	4= agree	5= strongly agree

	Items	1	2	3	4	5
1	Our company has strengthened its reputation among domestic consumers, both near and far.					
2	Our company's reputation among regional and nationwide domestic suppliers has strengthened.					
3	Our company has a long history of dedication to environmental protection.					
4	Our company is trusted by environmentally conscious consumers.					

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