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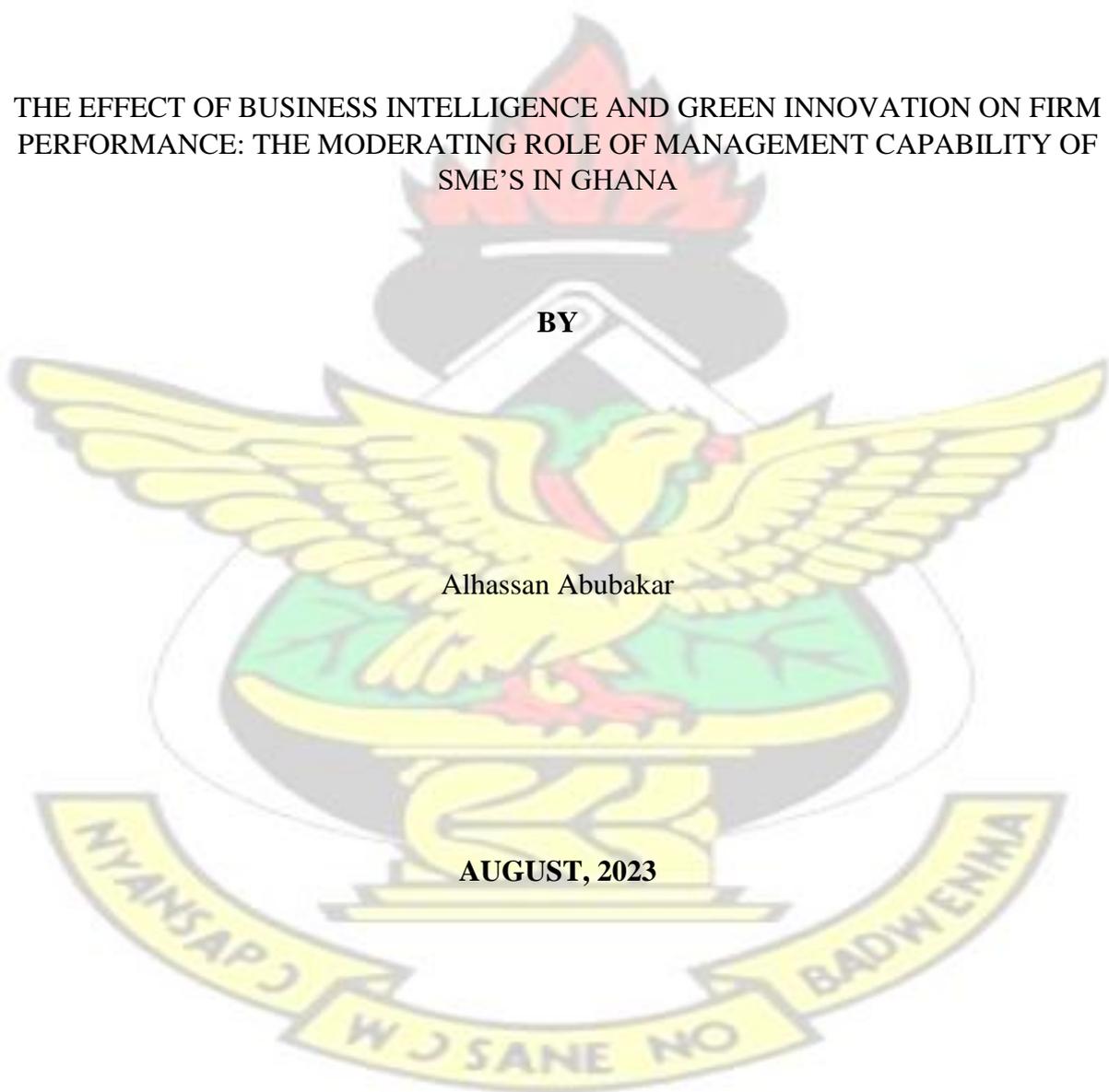
DEPARTMENT OF MARKETING AND CORPORATE STRATEGY

**THE EFFECT OF BUSINESS INTELLIGENCE AND GREEN INNOVATION ON FIRM
PERFORMANCE: THE MODERATING ROLE OF MANAGEMENT CAPABILITY OF
SME'S IN GHANA**

BY

Alhassan Abubakar

AUGUST, 2023



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FIRM PERFORMANCE: THE MODERATING ROLE OF MANAGEMENT
CAPABILITY OF SME'S IN GHANA**

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BSc. Agric Business Management (Hons)

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School of Business, College of Humanities and Social Sciences, KNUST
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MASTER OF BUSINESS ADMINISTRATION IN MARKETING

AUGUST, 2023

DECLARATION

'I hereby declare that this submission is my own work towards the “**Master of Business Administration in Marketing**”. Degree and that, to the best of my knowledge and belief, 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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ABSTRACT

The purpose of this study was to examine the impact of business intelligence and innovation on firm performance, the moderating role of managerial capability among small and medium-sized enterprises (SMEs) in Ghana. The study employed a descriptive research approach, this study was of a quantitative character, and hence the researcher utilized a quantitative research approach to gather data for analysis. The sample sized was 170. The data collected from respondents was analysed through the Statistical Package for Social Science (SPSS) version 25.0. The statistical test run were, frequencies, reliability mean, standard deviation, correlation and linear regression. The first finding highlights that business intelligence (BI) has a significant positive impact on performance, the second finding of the research emphasizes a strong positive association between BI and green innovation. The study further found that green innovation plays a mediating role in the relationship between BI and firm performance. Based on these findings the study recommend that SMEs should prioritize investments in improving their BI capabilities. This includes adopting advanced BI tools, technologies, and data analytics techniques to gather, analyse, and utilize relevant data effectively.

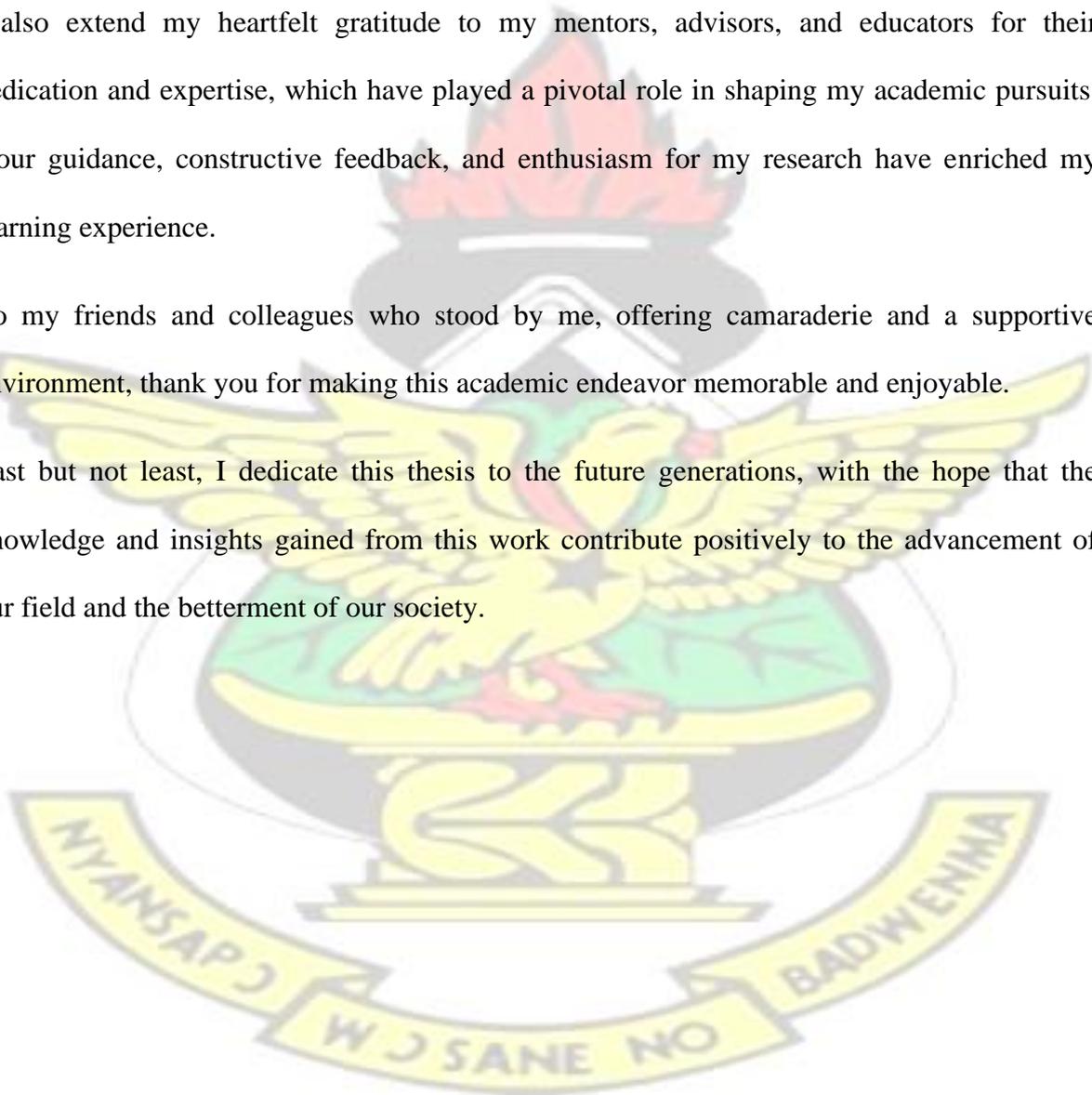
DEDICATION

I dedicate this thesis to the unwavering support and love of my family. Your encouragement, understanding, and belief in my abilities have been my driving force throughout this journey. To my parents, whose sacrifices and guidance have shaped me into the person I am today, and to my siblings, whose unwavering faith in me has been a constant motivation.

I also extend my heartfelt gratitude to my mentors, advisors, and educators for their dedication and expertise, which have played a pivotal role in shaping my academic pursuits. Your guidance, constructive feedback, and enthusiasm for my research have enriched my learning experience.

To my friends and colleagues who stood by me, offering camaraderie and a supportive environment, thank you for making this academic endeavor memorable and enjoyable.

Last but not least, I dedicate this thesis to the future generations, with the hope that the knowledge and insights gained from this work contribute positively to the advancement of our field and the betterment of our society.



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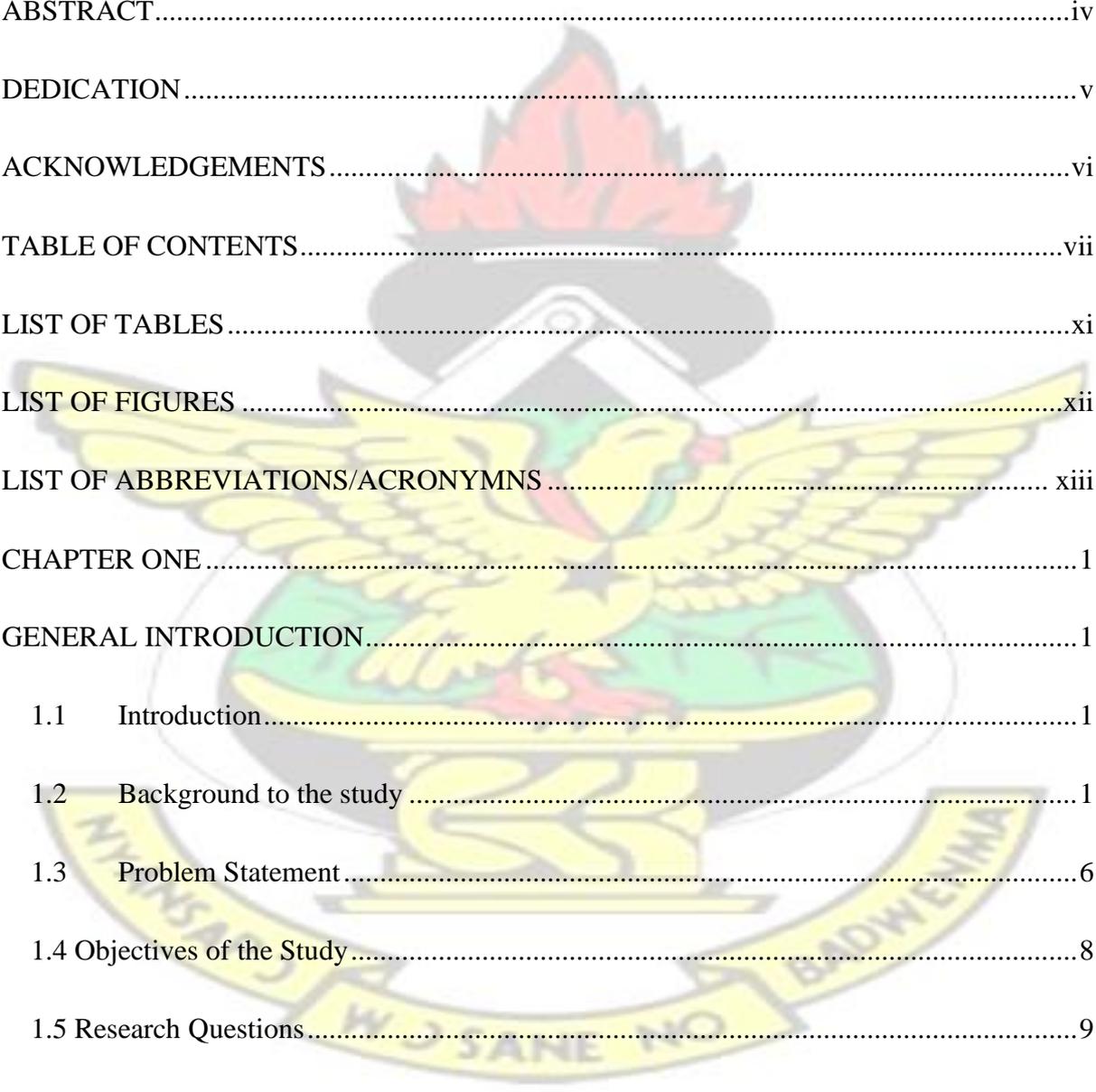
I extend my appreciation to the administrative staff, librarians, and technical support team at the School of Business for their invaluable assistance and the resources they provided, which greatly facilitated my research endeavors.

My heartfelt thanks go out to my family and friends for their unwavering encouragement, patience, and belief in my capabilities. Your constant support has provided me with the strength to overcome challenges and persevere through the demanding phases of this academic pursuit.

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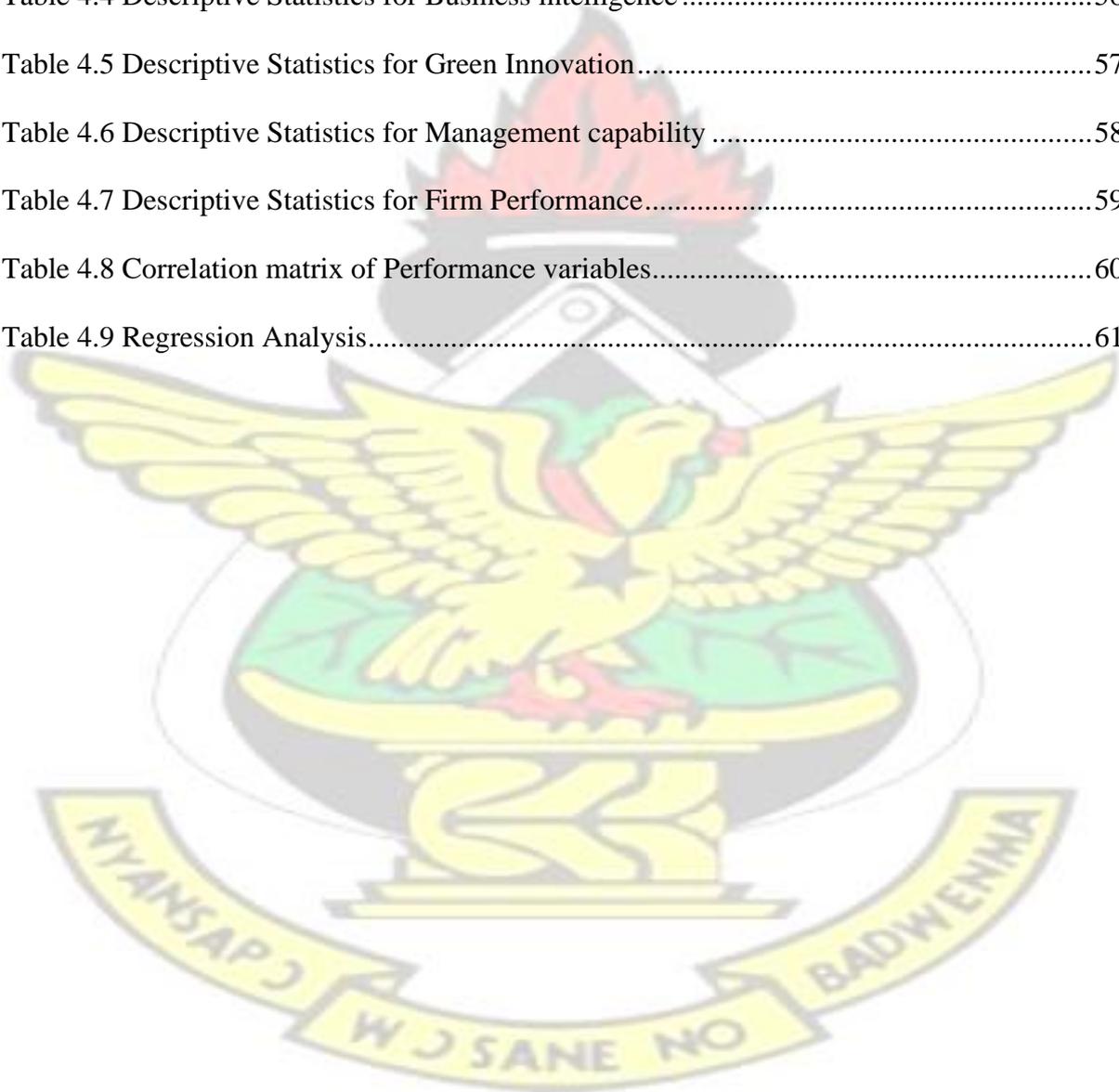
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LIST OF ABBREVIATIONS/ACRONYMNS



AI	Artificial Intelligence
BI&A	Business Intelligence and Analytics
CPM	Critical Path Method
DSS	Decision Support Systems
EIS	Executive Information Systems
GI	Green Innovation
HND	Higher National Diploma.
KPIs	Key Performance Indicators
NBSSI	National Board for Small Scale Industries
OLAP	Online Analytical Processing
OP	Organizational Performance
ROE	return on equity
ROI	Return on Investment
ROI	Return on Investment
SD	Standard deviation
SMEs	Small and medium-sized enterprises
SPSS	Statistical Package for Social Sciences
SSCE	Senior Secondary Certificate Examination
WASSCE	West African Senior School Certificate Examination

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Introduction

The present study aims to investigate the impact of Business Intelligence (BI) and innovation on firm performance, through the moderating role of management capability in Small and Medium-Sized Enterprises (SMEs) in Ghana. This chapter gives a general introduction of this thesis. The chapter outlines the background to the study, problem statement, objectives, and research questions, significance of the study, brief methodology and scope of the study.

1.2 Background to the study

Business intelligence (BI) is considered a crucial methodology for effectively managing relevant company data to facilitate decision-making processes in the contemporary linked and data-abundant global economy (Lahbi, 2018). The ability to conduct a comprehensive and strategic examination of an organisation and its competitive landscape is facilitated by the utilisation of various tools and technologies such as data warehouses, data marts, analytical tools including reporting tools, ad hoc analytics, and online analytical processing (OLAP), as well as in-memory analytics, planning capabilities, alert systems, forecasting techniques, scorecards, and data mining methodologies (Zeki-Suac & Has, 2015; Balan & Rege, 2017). Contemporary enterprises produce substantial quantities of data; however, only a small portion of this data is deemed practical and applicable.

Business intelligence (BI) refers to a comprehensive framework comprising applications, infrastructure, tools, and established methodologies that facilitate the retrieval and analysis of data. The primary objective of BI is to extract valuable information from data, thereby enhancing decision-making processes and organisational performance. This, in turn, enables

organisations to achieve superior performance and gain a competitive edge over their counterparts (Abdul Rahman et al., 2020; Jasim et al., 2020; Abdul Rahman, 2019). The concept of business intelligence encompasses a range of systems and tools that facilitate the gathering, storage, analysis, and presentation of data to individuals in various organisational positions. These resources are designed to provide timely and appropriate information to support the decision-making process, ultimately enhancing performance and competitiveness (Hou & Papamichail, 2010). The concept of "business intelligence" pertains to the amalgamation of data and analysis inside decision-making processes. In a study conducted in 2010, Popvic, Turk, and Jaklic made a discovery. The ultimate objective of business intelligence (BI) is to obtain business-centric and outcome-focused information (Ranjan, 2008). The company Intelligence (BI) system comprises a collection of interconnected operational and decision-based support applications and databases, which facilitate the accessibility of company data (Moss & Atre, 2003; Papdopoulos & Kanellis, 2010). According to the study conducted by Okkonen et al. (2012), Business intelligence refers to the systematic gathering and examination of data pertaining to an organisation. According to Lonqvist and Pirttimaki (2006), the concept of business intelligence (BI) refers to a methodical and structured approach employed by organisations to acquire, assess, and distribute pertinent information from both internal and external sources, with the aim of supporting their business operations and decision-making processes. According to Hari (2007), business intelligence (BI) employs a range of financial and non-financial measures, key performance indicators (KPIs), and technical tools to assess the overall well-being and future direction of an organisation.

In the context of this article, the term "green innovation" (GI) pertains to the development of hardware or software innovations that are applicable to environmentally friendly products or processes. This encompasses technological advancements aimed at energy conservation,

pollution prevention, waste recycling, sustainable product designs, and corporate environmental management (Chen & Liu, 2018; Chen & Chang, 2013). The concept of green innovation entails the integration of environmental management practises with novel technical methodologies. The term "green innovation" refers to the development of novel products or processes by a corporation, with a conscious consideration for environmental sustainability. The objective of this initiative is to enhance the environmental performance of enterprises, thereby providing them with a competitive advantage in the market (Dakup, 2018; Hashim, 2018). According to the definitions provided by Lin and Ho (2008) and Ho et al. (2009), the concept of GI encompasses a company's capabilities. Additionally, Ho et al. (2009) further define GI as the environmental practises adopted by the company. The enhancement of environmental and organisational performance (OP) through management strategies and technical advancements is a key aspect of Green Innovation (GI). Green Innovation refers to the implementation of hardware or software innovations that are associated with environmentally friendly products or processes (Song and Yu, 2018). The term "GI" encompasses systems, processes, products, and practises that are either novel to the market or have undergone enhancements (Xie et al., 2019). In order to maintain the integrity of the natural environment, Green Innovation (GI) encompasses novel or adapted goods and procedures, encompassing technical, managerial, and organisational advancements (Ilvitskaya and Prihodko, 2018). Chen et al. (2006) present an alternative interpretation of GI, defining it as a "creative endeavour that effectively mitigates adverse environmental effects or generates environmental advantages while simultaneously generating market value." Tang et al. (2018) delineate two distinct categories of green innovation, namely green product innovations, which involve the introduction of novel environmentally friendly products to consumers, and "green process inventions," which pertain to the implementation of sustainable practises inside corporate processes. The level of environmental consciousness

exhibited by a firm may be contingent upon the composition and actions of its management team.

Management skills refer to the set of abilities that facilitate the effective integration and use of existing resources within a company. The organisational processes exhibited by companies are distinct and develop gradually over time due to intricate and innovative interactions among the diverse resources at their disposal (Amit and Schoemaker, 1993). According to Grant (1996), the managerial capabilities of a company are demonstrated by its ability to consistently achieve outcomes, which is closely linked to its ability to create value through innovation. According to Nelson and Winter (1982), capabilities can be described as sophisticated routines that provide management with a variety of options for producing different outputs. This suggests that organisational skills encompass not just the concrete methods employed by a corporation to carry out tasks, but also the intangible attributes such as competence and leadership that are inherent in those procedures. The pursuit of entrepreneurship necessitates a disposition characterised by a proclivity for innovative thinking and the ability to capitalise on emerging opportunities.

The performance of an organisation can be characterised as its capacity to optimise output by effectively utilising available resources in order to accomplish its stated objectives. The assessment of organisational performance can encompass various dimensions, including objective, subjective, monetary, non-monetary, or a mix thereof. The measurement of performance can encompass both subjective and objective aspects, with objective performance being mostly reliant on financial data (Hussain et al., 2017). The measurement of financial performance encompasses various indicators such as return on investment, return on sales, profit, cash flow, return on equity, and earnings per share. On the other hand, non-financial performance is evaluated through metrics such as market share, new product introduction, innovation, technological efficiency, marketing efficacy, and product quality

(Bekele, 2018). According to Onyimbo (2018), organisations that strategically monitor both monetary and non-monetary variables likely to achieve superior performance in the marketplace. Corporate intelligence is capable of measuring various types and levels of corporate processes. In order to ensure sustainability in a rapidly changing and competitive environment and maximise financial gains, organisations are required to improve their operational effectiveness (Mesaros et al., 2016; Abdul Rahman et al., 2021).

The utilisation of business intelligence and information technology is of paramount importance in the effective management and oversight of an organization's operations and performance evaluation. Business intelligence enhances decision-making by facilitating the delivery and interpretation of data across various organisational levels, encompassing both internal and external stakeholders. Previous research conducted by Asri et al. (2020) and Abdul Rahman & Hamdan (2017) has indicated that the integration of business data into the process of product development has the potential to enhance demand, sales volume, and profitability. Consequently, this improvement in performance and competitiveness can be observed within an organisation. The utilisation of business information can expedite and streamline decision-making processes by reducing the amount of time allocated to meetings and email correspondence. Another study has indicated that artificial intelligence (AI) possesses the capacity to increase many business processes by providing insights on how to improve efficiency in financial, marketing, administrative, and operational domains. According to Taguimdje et al. (2020), several research have demonstrated the positive impact of artificial intelligence (AI) on business outcomes.

As stated by Williams (2016), the metric of Return on Investment (ROI) holds significant importance in assessing the effectiveness of Business Intelligence (BI) adoption. In their study, Mithas et al. (2011) conducted a qualitative analysis to establish a direct relationship between information competency and financial performance. Mithas et al. (2011) provided a

definition of capability as the ability to furnish users with precise information, ensure accessibility and integration, and effectively address emerging demands. AL-Shubiri (2012) conducted a study on a sample of 50 businesses listed on the Amman Stock Exchange. The findings of this study indicate that business intelligence (BI) has a favourable impact on various aspects, including creativity and learning ability, intellectual capital, and financial performance. Nevertheless, the relationship between business intelligence (BI) and customer complaints, which serves as a proxy for measuring customer satisfaction, has not been substantiated. Furthermore, this study failed to conceptualise certain markers of business intelligence ability. According to the study conducted by Roodposhti and Mahmoodi (2012), organisations that have implemented well-developed business intelligence (BI) systems demonstrated a notable increase in both return on investment (ROI) and return on equity (ROE).

1.3 Problem Statement

The notion of organisational performance holds great importance in the realms of both corporate management and organisational research. Based on the IS capability theory, it is imperative for an organisation to efficiently utilise its resources in order to maintain a competitive edge within its operating environment. Business Intelligence (BI) is considered to be one of the most crucial tools among the options available. Elbashir et al. (2008) argue that the magnitude of ongoing business intelligence (BI) investments serves as a reliable indicator of the strategic significance attributed to BI. A plethora of scholarly investigations have been conducted to ascertain the correlation between business intelligence, environmentally sustainable innovation, managerial acumen, and the achievement of organisational success. Statistically significant differences in turnover and dominant organisational culture between enterprises in Croatia and Slovenia are observed when doing a cross-tabulation analysis of the clusters. The findings presented in the study done by Bach,

Jakli, and Vugec (2018) indicate that... According to a study conducted by Mudzana (2016) on the efficacy of business intelligence information systems in South Africa, there exists a significant and positive correlation between the quality of information and user happiness inside such systems. The results of the study indicate a positive correlation between user and system quality and user happiness and individual effect on business intelligence systems. Chegini, Taleghani, and Gerdvisheh (2013) have reached the conclusion, based on their research, that the utilisation of business intelligence in food sector companies inside Rasht industrial city yields a positive and noteworthy influence on their overall performance. In a study conducted by Kakhki and Palvia (2016), a significant association was discovered between the extent of business intelligence and analytics (BI&A) implementation and the financial performance of American companies. In order to evaluate the degree to which management techniques foster creative innovation within the Nigerian plastics industry, Jonathan, Seun, and James (2016) conducted a study examining the relationship between managerial proficiency and the entrepreneurial capacity for innovation in this sector. The results of the study confirmed the theory that the activities taken by management have a positive impact on fostering innovation, which in turn enhances creativity within the plastics industry. Rehman and Saeed (2015) conducted a study that examined the impact of dynamic skills on the performance of the paper sector in Lahore, Pakistan. The study also considered the role of organisational competences as a moderating variable in this relationship. Additionally, the findings indicate that the abilities possessed by an organisation have a moderating effect on the relationship between organisational performance and dynamism. The study conducted by Tang et al. (2018) aimed to examine the level of managerial interest in environmental issues and its influence on the relationship between green innovation and organisational performance. In the absence of managerial consideration for environmental concerns, it was found that both green process innovation and green product innovation

significantly and positively predicted the attainment of commercial success. According to a study conducted by Driessen et al. (2013), there is a correlation between green product innovation and unfavourable financial outcomes. According to the findings of Aguilera-Caracuel and Ortiz-de-Mandojana (2013), there is no discernible disparity in financial performance between green and non-green innovative enterprises. Previous research, such as the study conducted by Liu et al. (2011), has established a correlation between green innovation and an increase in pricing. The extant body of scholarly research pertaining to the impact of factors such as business intelligence, green innovation, and management skill on firm performance has yielded inconsistent findings. Furthermore, it is worth noting that there exists a dearth of contemporary scholarly works investigating the efficacy of small and medium-sized firms (SMEs), particularly within the context of Ghana. To the researcher's knowledge, there is a lack of past research that has investigated the role of Management capability in affecting the relationship between Business intelligence, innovation, and corporate performance within the context of Ghanaian SMEs. The objective of this study is to investigate the impact of Business Intelligence (BI) and innovation on firm performance, with a specific focus on the moderating function of management capability among Small and Medium Enterprises (SMEs) in Ghana.

1.4 Objectives of the Study

The main aim of this study is to investigate the effect of business intelligence and innovation on firm performance: the moderating role of management capability of SMEs in Ghana. The study has the following specific objectives;

1. To investigate the effect of business intelligence and innovation on firm performance
2. To examine the relationship between business intelligence and green innovation
3. To determine the mediating role of green innovation on the relationship between business intelligence on firm performance

4. To establish moderating role management capability on the relationship between business intelligence and firm performance.

1.5 Research Questions

The study will seek answers to the following research questions;

1. What effect does business intelligence and innovation on firm performance?
2. What relationship exist between business intelligence and green innovation?
3. What mediating role does innovation play on the relationship between green entrepreneurial orientations on firm performance?
4. What is the moderating role management capability on the relationship between business intelligence and firm performance?

1.6 Significance of the Study

The results of this study will have implications for two specific groups: academics and small and medium-sized enterprise (SME) managers. The findings of this study can be utilised by researchers to advance their exploration of the influence of business intelligence and green innovation on the performance of small and medium-sized enterprises (SMEs) in Ghana. This study will function as a scholarly resource for future research in the subject of business intelligence, green innovation, management competency, and firm performance among small and medium-sized enterprises (SMEs) in Ghana. The discoveries of this investigation will additionally assist the researcher in proposing avenues for future research that may be investigated by other scholars.

This study will provide valuable insights for SME management by examining the influence of business intelligence, green innovation, and management capability on their performance as SMEs. The results of this study will provide valuable insights for management in formulating effective policies informed by industry best practises, hence facilitating the

successful implementation of their strategic objectives and long-term vision. Furthermore, this research endeavour would provide valuable insights for university administrators seeking to integrate business intelligence and green innovation practises, with the ultimate goal of improving overall organisational performance.

1.7 Overview of the Research Methodology

The study employed a descriptive research approach to examine the impact of business intelligence and innovation on firm performance, specifically focusing on the moderating function of managerial capability among small and medium-sized enterprises (SMEs) in Ghana. The research conducted in this study was of a quantitative character, and hence the researcher utilised a quantitative research approach to gather data for analysis. This study relied exclusively on primary data, which was acquired through the use of a questionnaire. The study's sample consisted of individuals employed in small and medium-sized enterprises (SMEs) within the Ashanti region. A cohort of 250 employees was chosen to participate in the survey. The research included purposive and convenience sampling methodologies. The data acquired during the fieldwork were assessed and analysed using statistical software tools such as Excel and SPSS version 25.0. Regression analysis was employed to examine the relationship between the independent variables of business intelligence, green innovation, and managerial capability, and the dependent variable of company performance in the study. The utilisation of tables was employed as a means to effectively show and report descriptive statistics, encompassing percentages and frequencies, as well as measures of central tendency such as mean values and measures of variability such as standard deviations.

1.8 Scope of the Study

The present study focused on examining the impact of business intelligence on the recovery of small and medium-sized enterprises (SMEs) from supply chain disruptions. This

investigation also explored the mediating role of supply chain learning in this relationship. This study is constrained to small and medium-sized enterprises (SMEs) located in Ghana, with a specific emphasis on SMEs situated in the city of Kumasi. The study examined the interplay between business intelligence, supply chain learning, and the recovery of small and medium-sized enterprises (SMEs) from disruptions in their supply chains. The study was theoretically underpinned by the Organisational Learning Theory and the Resource-Based View Theory.

1.9 Organization of the Thesis

The present study is organised into five distinct components. Chapter One of this thesis presents the introduction, background, problem statement, objective, research questions, significance, overview of methodology, scope, and organisation of the study. Chapter Two of this study encompasses a comprehensive examination of pertinent literature, encompassing both theoretical and empirical sources. Additionally, a conceptual framework is provided to guide the subsequent analysis and interpretation of the research findings. Chapter Three provides a comprehensive discussion on research technique, encompassing several aspects such as research design, study population, sampling strategies and sample size, data collection procedures, data validity and reliability, data analysis methodologies, and ethical considerations. Chapter Four of the document encompasses the presentation and subsequent discussion of the outcomes and interpretation derived from the analysis of the collected data. The present chapter was formulated based on data collected via questionnaires administered to a sample of participants. Chapter Five consists of three key components: summary, analysis, and guidance. The study's findings were succinctly summarised, conclusions were drawn, and recommendations for further research were provided.

1.10 Summary of the Chapter

In conclusion, this chapter took into account the background to the study, problem statement, objectives, and research questions, significance of the study, overview of the methodology, scope and the organization of the thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an in-depth examination of the literature pertaining to previous research studies that are pertinent to the subject matter of the current investigation. The text encompasses a comprehensive examination of pertinent scholarly works in the field of conceptual review, specifically focusing on topics such as business intelligence, green innovation, management capability, and firm performance. Additionally, it includes an empirical review that explores the connections between business intelligence and firm performance, green innovation and firm performance, management capability and firm performance, as well as the relationships between business intelligence.

2.2 Conceptual Review

This section of the chapter presents scholarly definitions of the main variables of the study. These includes; business intelligence, green innovation, management capability and firm performance

2.2.1 The Concept of Business Intelligence

The term "business intelligence" gained widespread usage after Dresner, an analyst at Gartner, utilised it to advocate for the utilisation of data within particular firms' IT systems (Shollo, 2013). Various definitions of business intelligence have been put forth by both

practitioners and academics (Işk, Jones, & Sidorova, 2013). According to AL-Shubiri (2012), one definition of business intelligence (BI) is the integration of operational data with analytical tools to offer valuable information to important stakeholders. Business informatics (BI), as described by Olszak (2014) and Jourdan et al. (2008), encompasses a combination of human and technology components. According to Olszak (2014), business intelligence can be defined as a comprehensive set of tools, technologies, and software applications that are employed to gather data from various sources, do data analysis, and disseminate the findings to relevant stakeholders. According to Isik et al. (2013), business intelligence (BI) is a comprehensive and sophisticated methodology that facilitates decision-making throughout the entire organisation. The semantic understanding of the aforementioned expression has been influenced by the software and consultancy sectors. The adoption of business intelligence (BI) has become widely acknowledged and is now considered a crucial factor for achieving success in contemporary corporate operations, particularly in the context of globalisation (Sebanescu, 2012; Işk, Jones, & Sidorova, 2013). The field of business intelligence is centred around the conversion of data into actionable knowledge that can be effectively utilised. According to LaValle et al. (2011), stakeholders can enhance their decision-making capabilities and adopt a more strategic approach due to the availability of newly generated information.

According to Wixom and Watson (2010), business intelligence (BI) refers to the utilisation of computerised methodologies and techniques to gather, store, and analyse data with the aim of enhancing organisational decision-making processes. In a similar vein, Negash (2004) argued that business intelligence (BI) systems provide decision-makers with valuable information and insights derived from operational processes. To facilitate the process of decision-making, business intelligence (BI) programmes empower users to transform data into valuable information and gain valuable insights using analytical techniques (Martin et al., 2011).

Moreover, Business Intelligence (BI) can be defined as the systematic procedure of distributing relevant information to the right stakeholders with the aim of augmenting their decision-making capabilities, hence contributing to the overall performance of a company (Martin et al., 2011). As per the definition proposed by Wang, Fan, and Xu (2012), business intelligence (BI) refers to the methodical storage and administration of operational data within a data warehouse (DWH). Additionally, it involves the utilisation of an extensive array of statistical and analytical tools, along with data mining techniques, to analyse the data. The ultimate objective is to produce analytical reports and furnish decision-supporting information that can be employed in various business endeavours. According to Negash (2004), the term "business intelligence" (BI) is purportedly used as a replacement for decision support, executive information systems (EIS), and management information systems (MIS). Nevertheless, Rouhani, Asgari, and Mirhosseini (2012) argue that there is a tendency to use the terms Business Intelligence (BI) and Executive Information Systems (EIS) interchangeably. Rouhani et al. (2012) suggest that business intelligence (BI) systems can be classified as Decision Support Systems (DSS) that provide periodic reports derived from historical data. According to Eckerson (2003), Business Intelligence (BI) can be characterised as a system that leverages data to facilitate decision-making processes. According to Okkonen et al. (2012), the concept of business intelligence (BI) encompasses the systematic gathering and examination of data from both internal and external sources within an organisation.

Business intelligence enables the execution of many comparison analyses, including evaluations of historical performance, assessments of particular items' worth, analysis of distribution network efficiency, and the examination of the viability of assumptions-based projections for future performance. Decisions pertaining to operational areas like as marketing, sales, and finance may be influenced by the utilisation of business intelligence

(BI) techniques. The operational level use business intelligence (BI) systems to conduct ad hoc assessments and inquiries into the current operations and financial positions of certain departments.

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2.2.2 The Concept of Green Innovation

Consistently allocating resources towards the advancement of state-of-the-art environmentally friendly technologies is imperative in expediting the pace at which we can effectively diminish emissions. According to Porter and Van der Linde (1995), the implementation of green innovation results in improvements in both environmental performance and the competitive advantage of a company, in order to meet stringent environmental regulations. Multiple studies (Dangelico & Pujari, 2010; Cai & Li, 2018; Xie et al., 2019) concur that green innovation yields numerous favourable consequences, such as reduced operational expenses, enhanced resource utilisation, fortified supplier relationships, improved product quality, a competitive edge, an enhanced corporate reputation, and increased customer loyalty.

The terms "eco/ecological innovation," "environmental innovation," and "sustainable innovation" are considered synonymous with the term "green innovation" according to Tietze et al. (2011) and Küçükolu et al. (2015). In the context of this article, the term "green innovation" (GI) will be defined as the development of hardware or software innovations that pertain to environmentally friendly products or processes. This encompasses advancements in energy conservation, pollution mitigation, waste recycling, sustainable product designs, and corporate initiatives for environmental stewardship (Chen & Liu, 2018; Chen & Chang,

2013). "Green innovation" refers to the practise of incorporating environmental sustainability into product and process innovation, as described by Chen et al. (2006). According to a recent study conducted by Ilvitskaya and Prihodko (2018), the term "Green Innovation" (GI) refers to the development or alteration of products and processes, encompassing technological, managerial, and organisational advancements that contribute to the preservation and maintenance of the natural environment. Furthermore, the term GI can also refer to a novel concept that contributes to environmental sustainability and simultaneously yields economic benefits (Chen et al., 2006).

Green technology innovations encompass a range of advancements that contribute to the conservation of resources, mitigation of pollution, and optimisation of operational processes. This sort of innovation possesses the capacity to enhance a company's financial, social, and environmental outcomes, hence facilitating the advancement of organisations towards sustainability. Rennings (2000) suggests that green innovation (GI) encompasses managerial practises and technical breakthroughs that enhance both environmental and organisational performance (OP), hence conferring a competitive advantage to enterprises. The term "GI" refers to the technological advancements in hardware or software that are associated with environmentally friendly products or processes (Song & Yu, 2018). According to Xie et al. (2019), the concept of green innovation encompasses several elements such as novel or modified systems, processes, items, and practises that contribute to environmental well-being and enhance the long-term viability of organisations.

Green innovation (GI) refers to the strategic approach adopted by companies that actively engage in the pursuit of innovation while simultaneously ensuring the prevention of environmental harm. The objectives of environmental innovation encompass enhancing corporate performance and gaining a competitive advantage (Dakup, 2018; Hashim, 2018).

2.3 Empirical Review

This section of the chapter presents empirical studies that have been conducted in relation to the study. These includes the relationships between the study variables.

2.3.1 The Effect of Business Intelligence on Firm Performance

In the contemporary and dynamic landscape of the corporate realm, the attribute of agility holds paramount significance, and business intelligence (BI) assumes a pivotal function in facilitating organisations in acquiring the requisite competencies for achieving success. Prior empirical research has demonstrated that the implementation of Business Intelligence (BI) can have a positive impact on a company's financial performance. The study conducted by Fink et al. (2017) in Israel demonstrates that there is a clear relationship between business intelligence (BI) skills and organisational value, encompassing both operational and strategic dimensions. The authors classified the capabilities into two main categories: business intelligence (BI) infrastructure and the BI team. This study focuses on five variables, namely reliability, flexibility, interactivity, data source quality, and ease of access, which are handled by the selected elements for the business intelligence (BI) infrastructure. The Business Intelligence (BI) group possessed a diverse array of specialised knowledge and skills. The impact is demonstrated through reduced operational expenses, improved product quality, and enhanced organisational procedures. The concept of strategic value refers to an organization's ability to accomplish its objectives beyond mere financial expansion. The study conducted in this context employed a quantitative research methodology. Data was gathered from a sample of 159 individuals through a cross-sectional survey. Nevertheless, the investigation did not assess the impact on human capital or customer contentment. Furthermore, the researchers employed self-reported data pertaining to the adoption of business intelligence (BI) and the effectiveness of business operations in order to derive their findings. Finally, it should be noted that the inclusion of a broad sample group in this study suggests that the processes

involved in value creation through the use of business intelligence remain consistent across different sectors. According to the research conducted by Williams (2016), return on investment (ROI) emerges as the primary criterion for assessing the effectiveness of business intelligence (BI) adoption.

Bett, Rop, and Chepkwony (2019) conducted a study utilising a descriptive research approach to investigate the influence of business intelligence (BI) analytical tools on the performance of firms in the financial services industry. The study selected commercial banks located in Bomet, Kericho, and Narok counties through a random sampling method. The study aimed to gather data from a predetermined sample size of 820 individuals, and a random selection of 246 workers was chosen to complete the questionnaires for the study. The utilisation of data visualisation techniques has facilitated the assessment of efficiency among various financial organisations. Similarly, the application of data mining technologies has enabled the acquisition of previously unattainable information from databases. In their study, Mithas et al. (2011) conducted a qualitative analysis to establish a direct relationship between information competency and financial performance. Mithas et al. (2011) provided a definition of capability, which encompasses the provision of accurate information to users, ensuring accessibility and integration, and meeting emerging demands. According to Al-Shubiri's (2012) research, which examined a sample of 50 businesses listed on the Amman Stock Exchange, it was determined that business intelligence (BI) had a favourable impact on various aspects including innovation and learning capabilities, intellectual capital, and financial performance. Nevertheless, the relationship between business intelligence (BI) and customer complaints, which serves as a proxy for measuring customer satisfaction, has not been empirically established. Furthermore, this study failed to conceptualise certain markers of business intelligence ability. The study conducted by Bach, Jakli, and Vugec (2018) examined the influence of business intelligence maturity on the performance of firms. A

survey was conducted. The data obtained from questionnaires provided by a randomly selected sample of 177 enterprises in Croatia and Slovenia was subjected to cluster analysis. The study of the data unveiled two separate groupings. The examination of cross-tabulation reveals statistically significant differences in terms of company turnover and prevailing organisational culture among the clusters. Chegini, Taleghani, and Gerdvisheh (2013) conducted a study to examine the relationship between managerial business acumen and the performance of food manufacturing enterprises in Rasht's industrial city. The present study employs a sample size determined using the Krejcie and Morgan formula, consisting of 32 enterprises operating in the food industry inside the Rasht industrial city, serving as the statistical population. A sample of thirty firms was selected in a random manner, as depicted in the table provided below. The process of data collection entailed the utilisation of a questionnaire that was developed by the researcher, specifically designed for implementation with individuals in managerial positions. The data collected was analysed using SPSS software, revealing that business intelligence had a statistically significant and favourable impact on productivity. The relationship between company performance and organisational learning is found to be highly significant, indicating a strong connection. Additionally, the implementation of continuous improvement plans emerges as the second most influential factor in this relationship. The study conducted by Daneshvar-Kakhki and Palvia (2016) examined the relationship between business success and the extent of deployment of business information and analytics (BI&A). The examination of the mediating influence of technology in this connection is also being conducted. The present study utilises data derived from secondary sources pertaining to a total of 116 publicly traded corporations inside the United States. The information is examined using methods derived from structural equation modelling. Our study provides empirical evidence supporting a causal relationship between the extent of Business Intelligence and Analytics (BI&A) implementation inside a business

and its financial performance. Furthermore, it is observed that the relationship between the deployment of Business Intelligence and Analytics (BI&A) and performance is subject to significant moderation based on the specific type of BI&A utilised. The study conducted by Nyabuti (2018) examined the use of business intelligence and its impact on corporate performance management, focusing only on the case of Equity Bank Kenya. This study employed a descriptive survey research methodology. The study aimed to include a total of 1,750 participants from within Equity Bank Limited. All of these managers are categorised within the overarching concept of "business level" in their organisational structure. In this study, a stratified sampling technique was employed to choose a total of 104 participants from three distinct management levels: high management, middle management, and lower management. To streamline the data analysis process, the questionnaire data underwent cleaning, editing, coding, and subsequent entry into the Statistical Package for the Social Sciences (SPSS). Research findings indicate that employees perceive business intelligence as a valuable tool in terms of its impact on the effectiveness of strategic planning. Additionally, the study revealed that the organization's highest-ranking officials held a designated position in the process of formulating strategic business plans. Strategic planning is a regularly conducted and highly prioritised practise. The findings of the study indicate that the introduction of a novel product has the potential to enhance sales performance and expand the customer base. According to the report, the utilisation of business information in product development has contributed to enhanced order velocity and accuracy throughout the industry. The study revealed that the implementation of a business intelligence system resulted in enhanced decision-making capabilities, decreased expenses, and heightened interdepartmental collaboration. Strategic business planning is a recurring event that entails the active participation of senior executives and is widely regarded as a crucial concern. A comprehensive survey was conducted, with the participation of 337 high-level executives.

The outcomes of this poll were then analysed and documented by Richards, Yeoh, Chong, and Popovic in 2014. The survey responses were analysed using the partial least squares approach. The findings suggest that there is a positive correlation between the level of business intelligence (BI) deployment and the effectiveness of planning and analytical practises associated with critical path method (CPM). The connections between CPM and BI efficiency exhibit robustness across various company sizes and industries. Amini et al. (2021) did an empirical study to demonstrate the effectiveness of business intelligence (BI) in risk management for policymakers involved in Iranian agriculture insurance. Based on the findings, the use of business intelligence has the potential to significantly reduce the occurrence of inaccurate estimations that may arise due to uncertainties. Richard et al. (2014) assert that there is a scarcity of studies that particularly examine the impact of business intelligence (BI) on corporate performance. The field of knowledge in question continues to be underdeveloped and lacking coherence due to the persistent confusion among scholars regarding the contribution of information technology (IT) to the achievement of corporate success, as highlighted by Melville et al. (2004). Hence, the objective of this study is to ascertain the impact of business intelligence (BI) competency on organisational performance.. To explore this relationship, it is hypothesized that:

H1: Business intelligence has a significant positive effect on firm performance.

2.3.2 The Effect of Green Innovation on Firm Performance

The existing body of empirical research investigating the relationship between environmental performance and corporate profitability has produced inconsistent findings (Lee and Min, 2015). Driessen et al. (2013) identified a negative association between the innovation of green products and their financial performance. Aguilera and Ortiz (2013) found no

discernible disparity in financial performance between environmentally conscious and conventional innovative firms. Previous research has demonstrated a positive correlation between the implementation of green innovation and an increase in costs (Liu et al., 2011). In light of China's position as a rapidly expanding global economy and its significant environmental impact, it is noteworthy that hardly three out of the 63 research examined in a recent meta-analysis have indicated a positive correlation between green product innovation and corporate performance (Dangelico, 2016).

A comprehensive analysis, published in the journal *Business Strategy and the Environment*, revealed that corporate performance was positively influenced by only two out of nine categories of green process innovation. This finding highlights a more intricate and nuanced understanding of the subject matter. The aforementioned studies provide evidence that aligns with the prevailing economic perspective, suggesting that the implementation of green innovation is typically accompanied by high costs and, hence, has no impact on firm performance (Palmer et al., 1995; Lee et al., 2016). Nevertheless, it is important to acknowledge that numerous research have reported a positive impact (Lee and Min, 2015). In their study, Charlo et al. (2015) investigate the Spanish FTSE4 Good IBEX index and observe that enterprises adhering to socially responsible practises demonstrate superior profitability, while assuming an equivalent level of risk.

In a similar vein, the study conducted by Fujii et al. (2013) revealed a positive correlation between the reduction of carbon dioxide (CO₂) emissions and enhanced financial performance within the context of Japanese industries. The analysis conducted by Dangelico and Pontrandolfo (2015) places significant focus on the role of management in environmental actions pertaining to products and processes. Their study ultimately reveals a favourable association between these actions and corporate performance.

The integration of environmental sustainability considerations into the processes of product creation and business operations offers numerous benefits (Dangelico & Pujari, 2010). The aforementioned factors encompass several key benefits, namely enhanced resource utilisation efficiency, higher return on investment, increased sales figures, expansion into new markets, improved company reputation, product differentiation, and a strengthened competitive edge (p. 480). The theoretical framework that acknowledges this association is based on the notion proposed by Porter and Van der Linde (1995). The Porter Hypothesis posits a correlation between the implementation of environmental regulations and the rate and efficacy of technological advancement and economic growth. The study conducted by Porter and van der Linde (1995) suggests that the expenses associated with complying with environmental regulations can be substantially or totally mitigated through the implementation of technological advancements and innovations (p. 98).

The study conducted by Alhadid et al. (2014) aimed to examine the impact of green innovation, specifically green product innovation and green process innovation, on organisational performance. The study was conducted at Nuqul Group, an industrial corporation based in Jordan. A set of 143 questionnaires was generated and distributed to individuals occupying various managerial positions within the organisation, including the General Manager, Assistant General Manager, department heads, assistant department heads, and supervisors. This study aimed to investigate the influence of Green Innovation on organisational performance, taking into account the moderating role of Environmental Management behaviour. The analysis employed Simple Regression and Stepwise Analysis techniques. The research findings revealed a noteworthy conclusion, namely that the implementation of moral green innovation has a substantial impact on both the performance of organisations and the consequences pertaining to the environment.

The equilibrium between economic development and environmental sustainability is being influenced by factors such as resource management, customer emphasis, societal pressures, and regulatory legislation. Consequently, extensive research has been conducted to examine the relationship between corporate governance mechanisms and firm performance, with the results indicating a favourable association (Birkner & Máhr, 2016; Leitner, Nwachukwu, Chladkova, & Fadeyi, 2018; Naidoo & Hoque, 2018).

Additionally, Küçükolu and Pnar (2015) conducted a study examining the benefits of green innovation in relation to the operational efficiency of environmentally conscious enterprises. In this particular scenario, the concept of "green innovation" encompasses both "green products" and "green processes," and the notion of "environmentally efficient company performance" encompasses both "environmental performance" and the "competitive advantage of the company through green facilities." A survey was conducted among the companies listed in the top 500 by income, as documented by the Istanbul Chamber of Industry, in order to examine the relationship between green innovation and ecologically responsible business practises. The survey data was utilised to conduct correlation and regression analysis. This study demonstrates that organisations have the potential to enhance their ecological performance and gain a competitive edge by engaging in green innovation endeavours. The correlation between green process innovation and the subsequent shifts in environmental performance and economic advantage has been well-documented. The implementation of environmentally-friendly practises inside the company's fundamental operations yields two-fold advantages: reducing the company's environmental footprint and providing it with a competitive advantage over its competitors.

Tang et al. (2018) conducted a study examining the relationship between green innovation and corporate performance, and identified managerial concern for green concerns as a moderating factor in this interaction. When not considering the environmental concerns of

managers, it is seen that both green process innovation and green product innovation have a considerable positive impact on corporate performance. After accounting for managerial concerns, the researchers see that green process innovation exhibits a stronger positive impact on company performance compared to its previous effect. However, the influence of product innovation on firm performance is no longer statistically significant.

Zhang et al. (2019) conducted a study to examine the impact of green patenting on subsequent business performance. Upon examining the publicly traded Chinese manufacturers during the period of 2000 to 2010, a noteworthy finding emerged: a positive and statistically significant relationship was observed between the pursuit of green patenting and the overall commercial performance of these companies. Additionally, their research indicates that the expansion of environmentally sustainable economic growth is predominantly influenced by the presence of green utility-model patents. Furthermore, this favourable correlation is observed exclusively inside state-owned enterprises (SOEs), since they possess a distinct advantage in harnessing green innovation owing to their close affiliation with the government. The government's formal legislative endorsement of the green business sector did not commence until 2006, at which point the presence of an appositive association was identified.

Additionally, a study conducted by Karabulut and Hatipolu (2020) examined the impact of green product and green process innovation on the achievement of organisational objectives. The sample size of this study consisted of 435 production enterprises that were publicly traded on the Indonesia Stock Exchange throughout the period from 2014 to 2016. The present study used a random sampling technique to pick a sample size of 125 firms. The study hypotheses are examined by employing multiple linear regression analysis using SPSS 20.0 software. The results of this study indicate that the introduction of green product innovation has a little negative impact on business performance, albeit not statistically

significant. Conversely, the implementation of green process innovation is found to have a favourable influence on business success.

Furthermore, enterprises who utilise GI and demonstrate superior resource management relative to their competitors possess a competitive advantage inside the market. According to several scholarly sources (Bekele, 2018; Makadok & Ross, 2013; Porter, 1991; Onyimbo, 2018), it can be observed that an increase in a company's competitive edge leads to an improvement in its overall performance. Tariq, Badir, and Chonglertham (2019) as well as Fernando, Chiappetta Jabbour, and Wah (2019) employ diverse mediating variables to establish a comparable positive association between GI (Product and Process) and organisational success across different industry settings. This exemplifies the indirect correlation between GI (geographic information) and the achievement of company prosperity through the use of a competitive advantage. Several scholars have examined the relationship between GI and company success, and their studies indicate a positive association between the two variables (Juniati et al., 2019; Suryanto & Komalasari, 2019; Tariq et al., 2019). Previous studies (Hügel, Kreutzer, & Rottke, 2019; Tang et al., 2018; Zhang, Rong, & Ji, 2019) have undertaken similar investigations, all of which have identified a positive association between GPDI and GPSI and the performance of firms. It is hypothesized that:

H2: green innovation has a significant positive impact on firm performance.

2.3.3 The Effect of Management Capability on Firm's Performance

In their study, Lee and Klassen (2008) examined the impact of managerial skills on the participation of small and medium-sized firms (SMEs) in public procurement within the Kenyan context. The present investigation employed a cross-sectional survey methodology. The research sample comprised all four mobile service providers operating in Kenya. The collection of primary data for this inquiry was conducted through the use of self-

administered, structured questionnaires. The findings of the study indicate a significant relationship between the innovation strategy and various factors such as the availability of resources, the corporate strategy, the marketing function, and the information technology functions. Additionally, it suggests that the business should possess or be able to swiftly acquire the essential managerial capabilities and skills to create a favourable environment for innovation. Furthermore, the study emphasises the importance of an organised, systematic, and continuous exploration of new opportunities in order to enhance the innovation environment.

Chengecha (2016) conducted a study to investigate the relationship between firms' competitiveness in Kenya's banking industry and their knowledge management capabilities. The primary objective of the study was to investigate the knowledge production, management, and sharing practises employed by banks operating in Kenya. The researchers employed a descriptive survey method in order to achieve the stated objectives. The sample utilised in this study encompassed the entirety of commercial banks operating within the Kenyan context. The primary data for the study was obtained by the administration of a semi-structured questionnaire by the researcher. This method of data collection facilitated the analysis of the banks' informational capabilities and the influence of their technological infrastructure on their interactions with clients. Based on the findings of the research, a significant proportion of banks in Kenya prioritise knowledge management capabilities over other factors. The evidence presented indicates that the aforementioned institutions possess the requisite infrastructure and protocols to effectively manage knowledge. The study's findings indicate that the utilisation of technology by these banks to enhance customer service directly influences the quality of their client relationships.

Sinkeet (2015) conducted a study in Kajiado County to assess the challenges associated with strategic resource management, specifically focusing on management competences, within

the context of a devolved form of government. The research methodology employed in this study was a descriptive survey. The researchers employed a descriptive survey methodology to gather data from the participants. The study encompassed a comprehensive sample of respondents, consisting of thirty-six (36) department heads and their respective assistants, so representing the entire population under investigation. Questionnaires were employed as a means of collecting primary data for the study. The findings indicated that the decentralised approach to governance in Kajiado County had significant advantages through the effective use of resources, including the application of managerial expertise.

Another study conducted by Onyango (2016) examined the impact of Knowledge Management skills on the operational effectiveness of international aid organisations in Kenya. The study employed a descriptive survey methodology. As a result of limited presence of foreign humanitarian agencies in Kenya, this research study employed a census methodology for data collection instead of utilising random sampling techniques. The management team was surveyed through the utilisation of a semi-structured questionnaire in an independent manner. The study's findings indicate that the competencies related to knowledge management (KM) significantly influence the operational effectiveness of foreign aid organisations in Kenya.

The study conducted by Yin (2012) examined the correlation between a hotel's financial performance and customer satisfaction via the lens of two resource-based constructs: managerial capability and organisational culture. The information was provided by the top executives of hotels located in two regions in the north-eastern part of China. Census sampling was carried out in both locations utilising data obtained from the local bureaus of tourism in each separate location. A total of 411 hotels were included in the sample, and an equivalent number of surveys were distributed. The study revealed that there was a statistically insignificant link between managerial skill and financial outcomes.

Musuva, Ogutu, Awino, and Yabs (2013) conducted a thorough investigation on the influence of innovation intensity, knowledge competency, and adaptive capability on an organization's level of internationalisation and performance. The sample size of the study, which was n=50, was deemed to be modest yet adequate. The proposed methodology was tested using data obtained from a sample of publicly traded companies in Kenya that have expanded their operations internationally. The results suggest that the amount of internationalisation and performance of a corporation are positively influenced by its knowledge capabilities.

Furthermore, the study conducted by Ahmed (2017) sought to examine the influence of both organisational size and ownership on the relationship between development, management skills, and managerial performance. The sample consisted of companies from both the manufacturing and service sectors, and was picked by a random selection procedure. To facilitate the acquisition of data for statistical analysis, a standardised questionnaire was employed. For the objective of this study, in-person interviews and surveys were utilised. The findings indicated a significant correlation between managerial skills, managerial effectiveness, and company outcomes.

Mararo (2013) conducted a study that centred on the utilisation of knowledge management practises as a means of gaining a competitive advantage within the insurance industry in Kenya. The objective of this study was to ascertain whether Kenyan insurance firms were employing knowledge management practises as a means to attain a competitive edge in the market. The quantitative data was subjected to analysis using a descriptive statistics approach. The Statistical Package for the Social Sciences (SPSS) was employed for the purpose of coding and analysis. In order to analyse the qualitative data, a thematic analysis technique was adopted. The study revealed a favourable and significant relationship between knowledge management practises and competitive advantage.

The primary objective of Aduloju's (2014) research was to investigate whether variations in customer service performance among insurance companies in Nigeria might be attributable to disparities in IT investments and IT managerial characteristics. A survey study design was employed to gather data from 402 managerial level personnel in chosen insurance businesses in Nigeria. These companies are known for their significant investments in IT and the strategic importance placed on customer service. The purpose of the survey was to test three hypotheses. The data was subjected to linear regression analysis. One of the primary findings of the study is that the presence of information technology (IT) is necessary, yet insufficient, for the preservation of a competitive advantage in the realm of customer service. The findings of the study indicate that variations in customer service performance can be sufficiently accounted for by the interaction of IT investments and implicit, history-dependent, and organization-specific IT managerial capabilities.

Furthermore, Azubuike (2013) conducted a study investigating the relationship between a company's technological innovation capacity and its performance in the development of new products. A random sample of businesses was taken from the database of the Nigerian chamber of commerce. The implementation of a survey strategy was undertaken. The sample consisted of manufacturers representing six of the most significant industrial subsectors in Lagos State. A sample of ten businesses was selected by a random sampling method, and data collection was conducted using a combination of online surveys and face-to-face interviews with participants who were also randomly chosen. The findings of the survey substantiated a correlation between advancements in technology and the efficacy of enterprises in generating novel items.

The research conducted by Margarida et al. (2016) examined the impact of technical capabilities on organisational innovation and the subsequent influence of innovation on export performance. The statistical analysis involved examining the relationships between the

variables by utilising survey data obtained from a sample of 471 industrial businesses in Portugal that engage in the exportation of their products. These factories were selected in a random manner from a pool of 3,000 options. The evaluation of the model was conducted using data that was gathered using an online questionnaire developed with the assistance of the Lime Survey programme, which is a free and open-source software. Based on the findings, it can be observed that the level of technological expertise has a substantial impact on the degree of innovation exhibited by firms. This, in turn, has a favourable influence on their export performance. This therefore hypothesized that:

H3: Management Capability has a significant positive effect on Firma Performance.

2.3.4 The Mediating Effect of Green Innovation on the Relationship between Business Intelligence and Firm Performance

The authors employed absorptive capacity theory in their analysis of the relationship between Business Analytics and creative thinking in a particular study. The model incorporated elements such as business analytics, environmental scanning, the cultivation of a data-driven culture, the assessment of innovation in terms of the originality and relevance of new goods, and the attainment of a competitive advantage. A study conducted on a sample of 218 organisations in the United Kingdom revealed that the utilisation of Business Analytics has a significant influence on the process of environmental scanning, hence fostering increased levels of innovation within these enterprises. Furthermore, the introduction of this technology had an instantaneous impact on the establishment of a culture centred around data analysis, subsequently influencing the standard of environmental monitoring. The study showcased the favourable influence of Business Analytics on innovation, highlighting the significance of

environmental scanning and fostering a data-driven culture inside organisations to successfully harness the potential of Business Analytics in creating valuable novel products.

In addition, the study conducted by Novitasari and Tarigan (2022) utilised a sample of PROPER firms spanning the years 2015 to 2019 in order to examine the relationship between corporate social responsibility (CSR), green innovation, and company performance. The study revealed that corporations that have demonstrated a persistent commitment to utilising environmentally friendly products, reducing emissions, and implementing energy-saving practises have had positive outcomes from the influence of corporate social responsibility (CSR) on the development of sustainable innovations. Furthermore, corporate social responsibility (CSR) has been shown to enhance business performance by fostering positive relationships between corporations and their local communities. The implementation of green innovation has significantly enhanced productivity by reducing expenses through the use of energy-efficient methods and the adoption of sustainable materials.

The objective of Seman et al. (2019) was to provide empirical data about the potential of Green Supply Chain Management (GSCM) and green innovation practises in enhancing environmental performance. The investigation encompassed a total of 123 manufacturing enterprises that possessed ISO 14001 accreditation. The study undertaken by the researchers indicated a positive and statistically significant relationship between Green Supply Chain Management (GSCM) and both green innovation and environmental performance. Furthermore, the relationship between Green Supply Chain Management (GSCM) and environmental performance was found to be influenced in a positive manner by the presence of green innovation.

The primary objective of the study conducted by Yu et al. (2022) was to establish a comprehensive definition of "green innovation adoption" within the specific context of low-

income nations. The study, which utilised dynamic capability and stakeholder theory, shed light on the importance of green dynamic capability in driving the adoption of green technologies. The research also examined the influence of environmental change and the ability to evaluate substantial volumes of data on the association between green dynamic capability and the adoption of green innovation.

The researchers employed a two-wave research methodology to collect data from a representative sample of small and medium-sized enterprises (SMEs) in Pakistan and Malaysia. A total of 220 small and medium-sized enterprises (SMEs) were included in the study, with 105 originating from Pakistan and 115 from Malaysia. The researchers employed AMOS 23 software to conduct an analysis of the causal relationships within the model, which was initially constructed using covariance-based structural equation modelling. The research findings indicate that the presence of green dynamic capability enhances the probability of green innovation adoption in emerging economies. This finding underscores the significance of green dynamic capability in fostering and driving the adoption of green innovative practises among small and medium-sized enterprises (SMEs) in these locations. The study revealed a favourable correlation between green dynamic capabilities and green innovation uptake. However, it was determined that environmental dynamism did not have a significant impact on this relationship. In other words, the relationship between a company's green dynamic capability and its propensity to embrace green innovation remained largely untouched by variables such as market volatility or regulatory changes. Furthermore, the effectiveness of green dynamic capability, as assessed through the adoption of innovative practises, is enhanced by the presence of a robust big data analytics capability. Therefore this study also hypothesized that: *H4: Green innovation mediates the relationship between business intelligence and firm performance.*

2.3.5 The Moderating Effect of Management Capability on the Relationship between Business Intelligence and Firm Performance

According to the research conducted by Kohli and Grover (2008), it can be inferred that the presence of IT-enabled management capability (IMC) enhances the operational abilities of businesses and positively impacts overall firm performance. Leveraging information technology enables firms to expedite the advancement of their optimal capabilities. The two-stage model presented by Mithas et al. (2011) serves as a bridge connecting operational performance and business intelligence. The model being presented places information management capability as the central construct, while also acknowledging the presence of higher-order skills such as process management, performance management, and customer management capabilities, which collectively create the organization's overall capabilities. The researchers utilised longitudinal data obtained from an organisation that is a constituent of a consortium comprising approximately 80 enterprises. The results of the study indicate that there is a relationship between information capability and company performance, which is influenced by the level of organisational competence. Furthermore, the findings of this study indicate that project management (PM) capabilities are primarily influenced by the project manager's competence (MC), with PM process management being the second most influential factor, and PM customer management being the least influential one. Nevertheless, it is important to note that the findings of this research cannot be generalised to encompass the entirety of the 31 companies worldwide. Given that the data set was limited to member organisations, the researchers had a greater capacity to manage potential confounding variables such as company culture.

The impact of IT capabilities on process-oriented dynamic capability and subsequent company success was examined in a study conducted in South Korea by Kim et al. (2011). In relation to enhancing operational efficiency and reducing expenditures, this approach confers

a competitive advantage to managers by enabling them to enhance, modify, or reorganise their organisational procedures. The study did not take into consideration additional factors such as customer and performance management capability.

According to the empirical study conducted by Oliveira and Maçada (2017), there is evidence to suggest that the capacity of information technology (IT) has a positive impact on the performance of processes within an organisation. This, in turn, has implications for the overall performance of the firm. The study was carried out on a representative sample of 150 prominent Brazilian corporations. The operationalization of IT capabilities, encompassing hardware, software, personnel, and administration and configuration, was achieved. The use of skills in operational and manufacturing processes yielded a positive impact on the profitability of the organisation. However, due to the quantitative character of the study, it is unable to comprehensively consider the complexities of human behaviour. Mithas et al. (2011) posit in their IS capability theory that the capabilities of an organisation are significantly influenced by the presence of information systems (IS) capabilities. Consequently, these aforementioned strengths exert a favourable influence on the efficacy of the company's relationships with its clientele, financial matters, human capital, and operational processes. This study seeks to contribute to the scholarly discourse by examining the influence of organisational competency as a moderating factor. It is hypothesized that:

H5: Management capability moderates the relationship between business intelligence and firm performance.

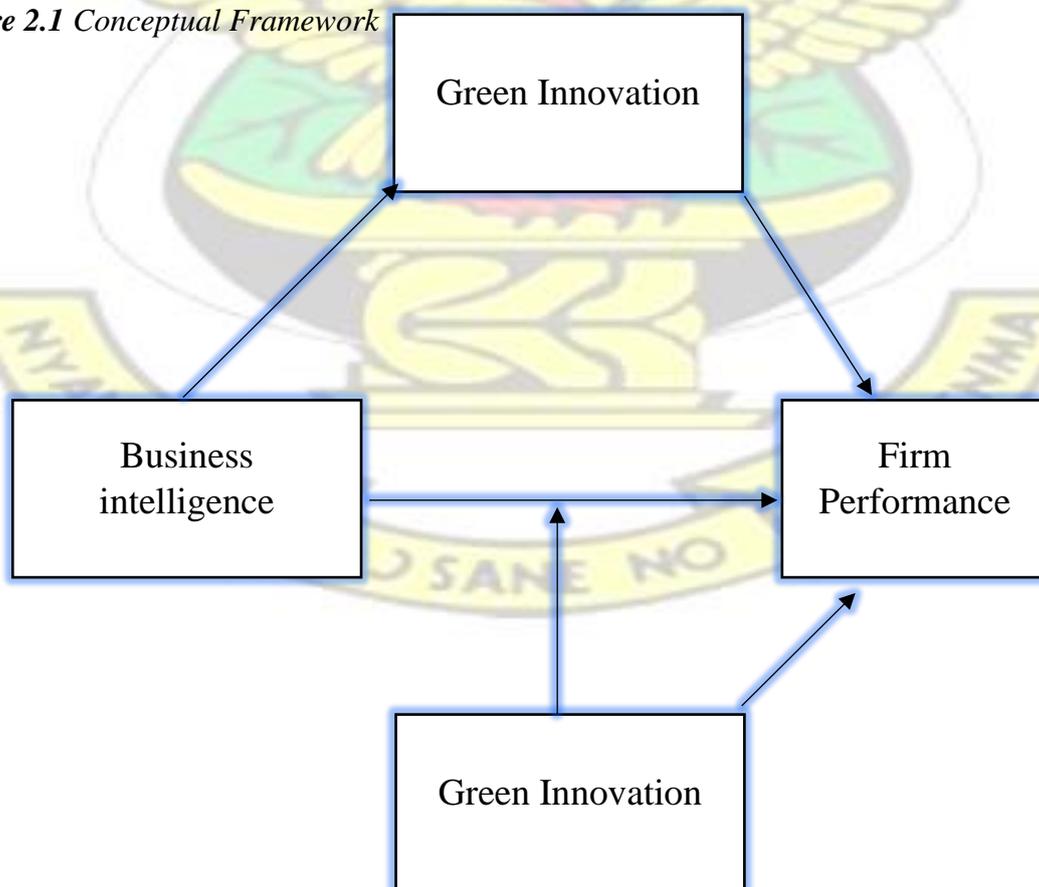
2.5 Conceptual framework

A conceptual framework organizes and structures your entire study. That's why you need a conceptual framework, which includes your research topic, questions to ask, literature to review, theories to apply, methodology, procedures, instruments, data analysis, interpretation

of findings, recommendations, and conclusions (Ravitch and Riggan, 2017). The conceptual framework represents your research logically. The conceptual framework diagrams the study's variables. The framework shows how variables interact. According to Thomas (2010), a conceptual framework uses ideas and principles from relevant disciplines. Its purpose is to help a researcher understand and communicate the situation under investigation. It focuses on studied variables and underlying connections (Thomas, 2010).

The researcher has conceptualized the effect of business intelligence on SMEs performance, effect of green innovation of SMEs performance, the effect of management capability on SMEs performance, the mediating role of green innovation on the relationship between business intelligence and SMEs performance and the moderating role of management capability on the relationship business intelligence and SMEs performance, as shown in the figure below.

Figure 2.1 Conceptual Framework



Source: Researcher's own construct, (2022)

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter has the following sections: Research philosophy, purpose of the study, and the next section detail the study's population and sample size. The next section details the sampling techniques used for the study. Next is the data collection section, which includes the data source, instrument, and procedure. Data analysis method, research quality and ethical considerations.

3.2 Research Philosophy

The philosophical defence stands for a worldview that informs the method. The researcher's choice of research design is informed by an underlying philosophical argument. Scholars have talked about research paradigms as a set of beliefs or assumptions that indicate a

consensus on reality and how to study any social event (Rolfe, 2006; Yilmaz, 2013). What knowledge is (ontology), how we know it (epistemology), and the processes for knowing (methodology) are all described by research paradigms (Creswell, 2009).

Research that takes ontological factors into account takes into account our worldview. There are two primary schools of thought when it comes to how scholars should think about the world. The positivist and constructivist approaches are most compatible with quantitative and qualitative research methods, respectively (Neuman, 2003). Constructivists argue that reality is created by social interaction, while positivists assert the presence of an objective reality. The researcher in quantitative studies assumes that there is an objective world out there that may be uncovered via the application of scientific methods (Bassey, 1995).

Researchers that adhere to positivism are emotionally removed from their work and, as a result, do not consider themselves to be significant factors in their studies. Researchers who adhere to the positivist tenet that the world exists and can be known or discovered by scientifically sound quantitative methods are known as positivists (Cohen, Manion, & Morrison, 2000). In contrast, constructivists don't believe that there's an objective world existing "out there" beyond human control. According to this theory, people create their own social realities and then try to make sense of them (Bassey, 1995). As a result, constructionists are committed to investigating and making sense of social reality through qualitative research methods.

Whether or not the social world may be explored using natural science concepts is one of the central epistemological concerns in social research (Bryman, 2001). How we know what we know, the nature of the knower's relationship to the known, and the criteria for what qualifies as knowledge are the focus of epistemology (Tuli, 2011). Both quantitative and qualitative approaches are compatible with these types of inquiries. Positivists are responsible for the

development of quantitative research, whereas interpretivists have pushed the boundaries of qualitative study.

It is the belief of positivists that one can separate the phenomena under study and that the findings can be replicated (Lewin, 1988). Creswell (2014) explains that positivism is appropriate when the researcher is removed from the research topic and able to see it from an unbiased, outside perspective. According to positivists, there is a single, independent reality behind all social phenomena (Yilmaz, 2013). That is to say, the researcher (the knower) and the subjects (the known) are considered to be separate entities. The rules of cause and effect regulate both individual beliefs and empirical facts, according to positivists (Tuli, 2011). This suggests that the researcher, in order to investigate reality, must remove themselves from the phenomenon. Research and science, according to this paradigm, should seek to create the most objective means of approaching reality (Ulin, Robinson, and Tolley, 2004).

Therefore, the goal of quantitative research is to provide numerical explanations for the interplay, shaping, and generation of results among studied factors. Thus, quantitative study is founded on the idea that one can learn about the world by interacting with or observing it in some way. The positivist worldview was used in this study, which holds that reality is fixed and can be defined objectively without introducing bias into the investigation.

3.3 Purpose of the Study

Study design is an important decision that must be made by every researcher. It provides a reliable basis for comparisons, analyses, and conclusions (Ranjit Kumar, 2014). Helping the researcher decide how to answer research questions is the fundamental responsibility of the researcher (Ranjit Kumar, 2014). It outlines a plan for information gathering and analysis. The study design process includes everything from formulating a hypothesis and considering its practical consequences to analysing the collected data. So, in that light (Kothari, 2004).

Kothari (2004) contends that all aspects of a study's design—from the research problem to the data collection methods and techniques to the study's participants and analysis techniques—must be made transparent to the reader.

Knowing the many types of research procedures and helping with data gathering beforehand is also important. Design can be broken down into three distinct categories: explanatory, descriptive, and exploratory. Exploratory research, often known as a formulative research design, seeks to identify a topic for further study. Descriptive design is an approach that aims to convey the essence of a product visually (Saunders et al., 2012). Diagnostic studies are conducted to establish a connection or frequency of occurrence. To succeed, you must be able to precisely articulate your objectives. The connection between variables can be uncovered through explanatory study. This is the target in an effort to lessen bias and boost trustworthiness. The study's kind dictates some aspects of the research plan's execution.

Research methods include, but are not limited to, the following (Saunders et al., 2012): ethnography, action research, experimental, archival research, case studies, surveys, and grounded theory. The research in this study was quantitative (both explanatory and descriptive designs were used). In management and business studies, surveys are frequently used as a means of collecting structured data from a sizable sample of the target population. Those who met the researcher's criteria were given questionnaires for self-administration (Neuman, 2006). Bell's (2005) survey method was utilised to collect data rapidly and readily for the purposes of establishing trends and making comparisons. Questionnaires are a cheap and efficient technique to collect data that can then be compared across studies. Researchers, on the whole, trust survey data because it is straightforward (Saunders et al., 2012).

3.4 Sampling Procedures

This section of the chapter presents; the population, sample size and sampling technique

3.4.1 The Population and Sample

The population of a study consists of the things or people the researcher has selected to examine in order to draw conclusions (Nurhayati, 2018). A research population is a clearly defined group of persons who share enough traits to be included in the study (Gravetter & Forano, 2018). People in the broader public who are studied together because of their similarity in some way (e.g., age, gender, or employment) are said to be a population (Graue, 2015). Researchers in the field of consumer behaviour have determined that everybody who buys or makes use of a given product or service constitutes a population.

Alternatively, the population can be thought of as the sample from which the study's findings will be drawn (Polit & Beck, 2004). Small- and medium-sized enterprises were the focus of this research.

The size of the sample is based on the characteristics of the population and the goals of the research. Selecting a portion of a larger population for study is called taking a sample (Graue, 2015). (Creswell & Creswell, 2017) Put simply, a sample is a selection made at random from a larger population for analysis. There are two main justifications for conducting sample selection and analysis. It is often impossible or impractical to conduct a comprehensive study of a population, especially in the field of social science (Creswell & Creswell, 2017).

Second, it is conceivable to analyse a sample of the population and extrapolate information about the entire population from that sample alone (Graue, 2015). Therefore, selecting a sufficient sample for analysis is crucial. The results will be indicative of the total population if a representative sample is used. According to Nardi (2018), the results of research that are either under- or over-sampled are useless, wasting both time and money. Therefore, it is crucial to determine a sufficient sample size before conducting any surveys. Therefore, the population is used as a whole to determine how large of a sample to take. However, the

sample size of the study needs to be large enough for generalisation to the population at large (Graue, 2015). Two hundred employees from the selected SMEs was deemed sufficient for this study's sample size.

3.4.2 The Sampling Technique

Sampling methodology is the process by which a representative sample is drawn from a larger population. Sampling is a method for selecting a representative subset of a population from which to draw conclusions (Bryman & Bell, 2015). The fundamental purpose of sampling is to collect a smaller group of units (a "sample") from a much larger group (the "population") such that the evaluation of the smaller group can be made with accurate generalizability about the larger group. Random sampling and purposive sampling are the two main types of sampling methods. Among these methods are both probability and non-probability sampling (Creswell & Creswell, 2017). If the study uses probability sampling, then every member of the population has an equal shot at being included. Researchers can use this technique to identify or target representative cross sections or specific groups with limited influence over who is selected.

Simple random sampling is the most elementary form of probability sampling. Selecting samples at random from a population is known as probability sampling, while selecting samples at random is known as non-probability sampling (Gravetter & Forzano, 2018). The likelihood or proportion of the population that will be sampled varies significantly between the two sampling techniques. Non-probability sampling employs a wide range of techniques for picking samples. Quota sampling, convenience sampling, snowball sampling, and many more fall under this category (Bryman & Bell, 2015).

Non-probability sampling was utilised in this inquiry. The internet shoppers were chosen using a convenience sampling strategy. Convenience sampling is a reliable approach of

selecting respondents (Patten & Newhart, 2017) so long as people are willing and able to take part in the study.

3.5 Data Collection Methods

To ensure that the analysis yields credible and reasonable results, data gathering must be carried out with the utmost precision and accuracy (Sapsford & Jupp, 2010). In this section, the researcher talk about where and how we got our data for the study. As defined by Polit and Hungler (1999), data is the information amassed during the course of a study.

3.5.1 Sources of Data

The two main sources of data in research are primary data and secondary data.

The term "primary data" is used to describe information gathered by researchers directly from the source. Surveys, interviews, focus groups, and experiments are all examples of primary data collection procedures. Primary data is "original data collected specifically for the research study" (Cresswell, 2014, p. 185). This information is collected in a way that is specific to the researcher's goals for the study.

In contrast, secondary data is information that has previously been gathered, but for a different reason. Secondary data can be found in places like governmental documents, scholarly journals, and electronic databases. Secondary data, as defined by Saunders, Lewis, and Thornhill (2019), "refers to data that has been collected by someone else for some other purpose but that has relevance to the research question being investigated" (p. 184). Researchers should take into account the possible biases and restrictions related with the data source, however this form of data might give a cost-effective and efficient way of getting data. Secondary data can be found in previously collected information, such as that found in books, journals, and newspapers (Sakaran, 2003). In this investigation, no tertiary sources

were consulted. The literature review is written using sources such as publications, the internet, libraries, and books.

The research problem and methodology dictate the type and location of data collection. When a study issue calls for details that can't be gleaned from secondary sources, primary data collecting may be the better option. If the researcher's query is more open-ended and they want a more holistic grasp of the topic at hand, secondary data may be a better fit.

Therefore, the primary source was the most suitable for this study in light of the research questions. Primary data was used in this investigation. Information received through primary sources, such as questionnaires, is called "primary data" (Sakaran, 2003).

3.5.2 Data Collection Tools

The researcher gathered primary data through the use of a questionnaire. A structured questionnaire was used to collect the bulk of the data from field respondents. Information for this study was gathered through the use of a structured questionnaire that was both comprehensive and straightforward in order to prevent the manipulation of responses. The questionnaires were developed keeping in mind the varied research goals. When doing research, questionnaires typically take the shape of a series of questions or other forms of prompts designed to elicit answers. Questions on the questionnaires were either multiple-choice or closed-ended. Because this instrument allows respondents to answer with a simple yes/no, a checkbox, or a multiple-choice option, it was used. However, open-ended questions encourage participants to provide more nuanced responses that help researchers get to the heart of the matter.

(Kumar, 1996) A questionnaire is a set of questions from which a respondent choose one to answer. An efficient questionnaire is one that can be relied upon to yield valid and trustworthy results. Questionnaires are used more frequently than any other method of data

collecting (Cooper and Schindler, 1998). The research instrument was developed with input from the study's constructs, which included measures of entrepreneurial mindset, opportunity recognition, and self-employment purpose.

Participants in the survey were given a questionnaire and instructed to read the questions, think about how they would react, and then record or write down their thoughts independently (Kumar, 1996). A likert scale was used in the study since it is generally seen as a reliable method of measuring people's opinions on a certain topic. The use of a likert scale has been shown to reduce the chances of misunderstandings occurring (Myers, 1999).

There were 52 questions on the survey. There were five main parts of the questionnaire. Section A consisted of 6 questions requesting basic demographic information about respondents. The 12 items used to collect data for Section B were taken directly from Gaardboe, Sandalgaard, and Nyvang (2017) and pertain to business intelligence. Eight items from Tjahjadi, et al. (2020)'s Section C were also used to collect data on green innovation. Ten questions from Okwemba's (2019) Section D were also utilised to gather data on respondents' managerial abilities. Eighteen elements taken from Sadiku-Dushi, Dana, and Ramadani (2019)'s Section E were utilised to evaluate company performance.

3.6 Data Analysis

According to (James 2004), data analysis entails categorising and subdividing information into manageable chunks based on its topics of interest. The goal of every data analysis project should be to answer the research question posed by the study. The quantitative nature of the research necessitated a quantitative approach to analysis. To make sense of the mountain of data obtained, researchers turned to statistical methods (Mugenda & Mugenda, 2003). In terms of statistical methods, descriptive and inferential statistics were best suited to our investigation.

Missing values, unusual response patterns, and outliers were all weeded out of the data before it was analysed (Hair et al., 2017). Data from each survey was also coded and cleaned. After that, version 25.0 of the Statistical Package for the Social Sciences (SPSS) was used to conduct analyses. This study used a descriptive method to analyse its data. The descriptive analytical strategy involved the use of frequency, percentage, mean, and standard deviation. The information was displayed using tables. Moreover, regression and correlation analysis were used to examine the connection between BI, the capacity for managing green innovations, and firm performance. Regression analysis was used to look at how business intelligence and the ability to manage green innovations affect firm performance. Regression analysis describes the extent to which an independent variable affects a dependent variable. The correlation analysis, on the other hand, clarifies the connection between the two sets of data.

3.7 Quality of the Research

In the context of this discourse, the term "quality research" shall be defined as the comprehensive scientific process that encompasses all elements of study design (Boaz & Ashby, 2003; Lohr, 2004; Shavelson & Towne, 2002). This encompasses the evaluation of the alignment between the chosen methodologies and research inquiries, the process of subject selection, the assessment of outcome measures, and the implementation of safeguards against systematic bias, nonsystematic bias, and inferential error. The design of the study was influenced by the objectives of the investigation, and the selection of methodology was guided by the study's objectives. The researcher did not exert any form of coercion on the participants to compel them to complete the survey. The authors of the study refrained from

soliciting or including any personal information from the participants. The data for the study were gathered, meticulously examined for any potential flaws, and objectively analysed by the researcher.

There is a well-defined research issue or hypothesis at the heart of this investigation. There was a good fit between the study's research design and its research topic, and the study used valid and reliable measures. The method used to gather information was thorough, precise, and relevant to the study's aims. The study employed reliable sampling methods to guarantee that the sample accurately reflects the target population. Appropriate statistical methods and tools were used to analyse the research data. The statistical significance of the results was also presented. The results were reported in an easy-to-understand format. Appropriate tables, figures, and other visual aids were included to present the study's findings. The results of this research add to what is already known about the relationships between business intelligence, green innovation, and company success. The study also shed light on how management competence moderates the connection between commercial savvy, environmental innovation, and company success.

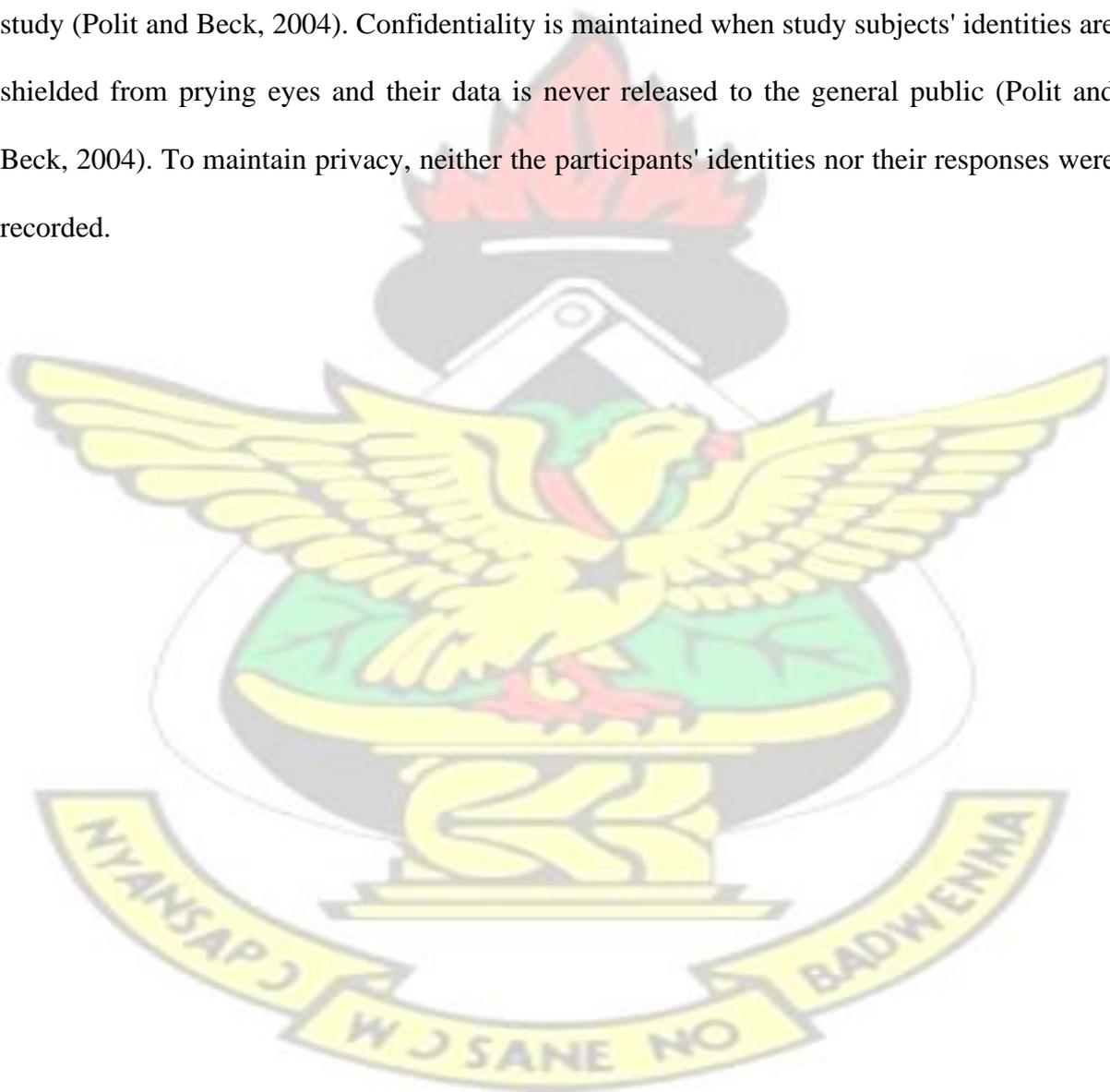
Equally important, the researcher took precautions to guarantee authenticity and trustworthiness. According to Babbie and Mouton (2008), validity is "the extent to which an instrument measures in practise what it claims to measure." A questionnaire was developed in light of the research objectives. The research questions have all been resolved. The questionnaire's face and content validity, conceptual clarity, and investigative bias were evaluated by an independent specialist and a statistician. Individual responses were used, not aggregate scores, in the analysis of the questionnaire data. Pre-testing, as defined by Polit and Hungler (2007), is a practise run of an instrument to see whether or not it will yield the

expected results. Whether or not a measurement tool actually measures the variables it promises to (Golafshani, 2013). The willingness of respondents to supply necessary information is crucial to the validity of instruments (Sekaran & Bougie, 2009). Checking the reliability of the survey beforehand (Oppenheim, 2010). We relied on content validity. Each measurement item's content or meaning is what constitutes its content validity (Golafshani, 2013). By pinpointing and fixing flaws, experts' opinions can boost content authenticity (Best & Kahn, 2011).

Also, Orodho (2004) claims that the consistency with which a given measurement method yields findings is the best indicator of the device's reliability in a research setting. Consistency in testing is what Kombo and Tromp (2006) mean by reliability. According to Mugenda & Mugenda (2003), dependability is the consistency with which a research instrument yields findings. Orodho (2014) states that the dependability of scientific instruments is based on the reproducibility of measurement outcomes. Consistency in testing is what Kombo and Tromp (2006) mean by reliability. According to Mugenda & Mugenda (2003), dependability is the consistency with which a research instrument yields findings. Cronbach's alpha was used to evaluate the reliability of the questionnaires in this study. The study's reliability was determined to be >0.7 for each data set. No reliable estimate of Cronbach's alpha exists. A cutoff of 0.60 was proposed by Hair, Black, Balin, and Anderson (2010). Cronbach's alpha below 0.50 was not considered suitable by Nunnally (1970), however values between 0.50 and 0.69 were regarded to be satisfactory. Cronbach's alpha, as noted by Sekaran and Bougie (2010), is a measure of item correlation. Scale reliability is defined as an alpha value of 0.7 or above (Santana, Mengod, & Artigas, 2009) for a given variable. Construct reliability is defined as a value of 0.70 or above (Rasoolimanesh & Ali, 2018).

3.8 Research Ethics

Research ethics refers to the moral consideration given to the methods used in conducting a study, especially in regards to the collection and analysis of data, and the people and things used in the study. Bryman is an imaginary person who was created in 2007. Two ethical concerns were taken into account in the study: confidentiality and anonymity. Anonymity occurs when no one, not even the researcher, knows who someone is who is taking part in the study (Polit and Beck, 2004). Confidentiality is maintained when study subjects' identities are shielded from prying eyes and their data is never released to the general public (Polit and Beck, 2004). To maintain privacy, neither the participants' identities nor their responses were recorded.



CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

Analysis and presentation of results are covered in this section. Analyses based on the study's goals make up this section. The study assessed Business intelligence, green innovation and firm performance: the moderating role of management capability.

4.2 Demographic Characteristics of Respondents

This section looks at the demographic characteristics of the respondents under study.

It can be observed from table 4.1 96 that 56.5 percent of the respondents were males, while 74 percent of the respondents were females, making up 43.5 percent of the total participants.

The analysis of the respondent's age distribution reveals that the majority, accounting for 44.1 percent, fell within the 31 to 40 years age range. Comparatively, there were 41 respondents, representing 24.1 percent, in the 41-50 age range. Furthermore, 34 respondents, comprising 20 percent, belonged to the 20 to 30 years age bracket. Lastly, 20 individuals, amounting to 11.8 percent of the total respondents, were aged above 50. These findings highlight the varying age demographics within the sample, suggesting the need for considering age-related factors and their potential impact on the research findings.

Out of the total respondents, the largest group consisted of 65 individuals (38.2%) holding undergraduate degree certificates. Following closely were 38 respondents (22.4%) who held diplomas, while 43 respondents (25.3%) held postgraduate degrees. Additionally, there were 24 respondents (14.1%) who were classified as SSCE/WASSCE leavers.

The study examined the distribution of work experience among its participants. The majority of the participants, comprising 41.8% (71) respondents had a work experience ranging from 6 to 10 years. Additionally, a significant proportion of the participants, accounting for 36.4% (62) respondents, possessed more than 10 years of work experience. Furthermore, a subset of the participants, making up 21.8% (37) respondents, had a work experience of 1 to 5 years. The study thus captured a diverse range of participants with varying levels of professional experience, allowing for a comprehensive analysis of the data.

Table 4.1: Demographic Characteristics of Respondents

Category		Frequency	Percentage
Gender	Male	96	56.5
	Female	74	43.5
Age Range	20-30	34	20
	31-40	75	44.1
	41-50	41	24.1
	Above50	20	11.8
Level of Education	SSCE/WASSCE	24	14.1
	Diploma/HND	38	22.4
	Undergraduate	65	38.2
	Postgraduate	43	25.3
Work Experience	1-5 years	37	21.8
	6-10 years	71	41.8
	10 years and Above	62	36.4
Total		170	100

Source: Field Survey, 2023.

4.3 Reliability and Validity Test

Reliability Test is a method used to assess the consistency, stability, and reproducibility of measurements or observations over multiple trials or across different conditions (Byers-Heinlein, et al., 2022). It measures the extent to which a measurement instrument or procedure produces consistent and dependable results (Sürücü & Maslakçi, 2020). Validity Test refers to a procedure or analysis conducted to assess the extent to which a test or measurement accurately measures what it is intended to measure (Clark & Watson, 2019). It aims to determine whether the test provides valid and reliable results, meaning it effectively measures the specific construct or concept of interest. Validity tests often involve comparing the test scores or results with an established criterion or standard to evaluate the accuracy and appropriateness of the measurement (Sürücü & Maslakçi, 2020).

4.3.1 Reliability Test

Cronbach Alpha of Business intelligence is 0.796 which is high and this means that all the elements of Business intelligence are internally consistent Green innovation has an alpha of 0.821, which indicates that all of the aspects of green innovation are in sync. The study also recorded a Cronbach Alpha of 0.805 for management capability which indicates that all the items are internally consistent. The overall Cronbach Alpha for firm performance is 0.842 which is also high and it means high internal consistency among the elements of firm performance.

Table 4.2 Reliability analysis on Scale of Measures

	Number of Items	Alpha Value
BI	12	0.796
GI	8	0.821
MC	10	0.805
Firm Performance	10	0.842

Source: Field Study, 2023

4.3.2 Validity Test

The factor loading of the items in each research variable is indicated in the table above. Consequently, Business intelligence, green Innovation, management capability, and firm performance are the most important variables in this study. Every newly developed item should have a factor loading of larger than 0.5, according to Awang (2014). To be safe, the factor loading should be at least 0.6 for well-established items (Awang, 2014). Because this study employed a previously published questionnaire from the literature, all items with a score of less than 0.6 were deleted before the data was evaluated further. Only items with a Factor Loading greater than 0.6 were used in the study. As a consequence, all of the items listed in table 4.3 were valid for data analysis.

Table 4.3 validity Test

Variable	Item	Loading
Business intelligence	BI1	.710
	BI2	.635
	BI3	.735
	BI4	.632
	BI5	.741
	BI6	.623
	BI7	.758
	BI8	.675
	BI9	.763
	BI10	.661
	BI11	.766
	BI12	.644
Green Innovation	GI1	.711
	GI2	.642
	GI3	.746
	GI4	.622

	GI5	.754
	GI6	.687
	GI7	.738
	GI8	.652
Management capability	MC1	.713
	MC2	.635
	MC3	.744
	MC4	.705
	MC5	.727
	MC6	.686
	MC7	.763
	MC8	.667
	MC9	.718
	MC10	.702
Firm Performance	FP1	.693
	FP2	.784
	FP3	.760
	FP4	.668
	FP5	.762
	FP6	.683
	FP7	.684
	FP8	.703
	FP9	.729
	FP10	.674

Source: Field Study, 2023.

4.4 Descriptive Statistics

In this section of the chapter, we present a descriptive analysis of the items related to the study construct. The content is divided into four sections, each focusing on the variables of the study: Business intelligence, green innovation, management capability, and firm performance. Within these sections, we provide detailed descriptive statistics.

4.4.1 Descriptive Statistics for Business intelligence

Table 4.4 presents a comprehensive list of 12 distinct business intelligence practices. These practices were evaluated and assigned scores on a scale of 1 to 7. The data analysis reveals that all 10 items measuring these business intelligence practices obtained a mean score above 4.0, indicating a consensus among the respondents regarding their significance and effectiveness. The overall average score for the 12 business intelligence practices was calculated to be 5.94, suggesting a relatively high level of agreement among the participants. This indicates that, on average, the respondents rated these practices positively, highlighting their perceived value in the realm of business intelligence. Furthermore, the standard deviation of 0.748 provides insight into the dispersion of scores around the mean. A lower standard deviation implies that the responses were relatively clustered around the mean, indicating a higher level of agreement and consistency in the ratings. These findings demonstrate that the participants generally agreed upon the importance and effectiveness of the business intelligence practices assessed in the study. The results suggest that these practices are considered valuable and reliable for enhancing business intelligence capabilities within their firms.

Table 4.4 Descriptive Statistics for Business intelligence

Item	N	Min	Max	Mean	Std. Deviation
BI1	170	1	7	5.45	0.837
BI2	170	1	7	4.98	0.702
BI3	170	1	7	6.21	0.642
BI4	170	1	7	5.86	0.749
BI5	170	1	7	6.62	0.823
BI6	170	1	7	4.32	0.774
BI7	170	1	7	6.08	0.688
BI8	170	1	7	5.12	0.719
BI9	170	1	7	6.37	0.681
BI10	170	1	7	4.79	0.828
BI11	170	1	7	5.93	0.712
BI12	170	1	7	6.45	0.795
Composite				5.68	0.748

Source: Field Study 2023

4.4.2 Descriptive Statistics for Green Innovation

Table 4.5 displays the descriptive statistics for the variable "green innovation," which comprises 8 items. The study involved assessing these items and obtaining key statistical measures. The mean score for the variable was calculated to be 5.73, indicating a relatively high average rating. The standard deviation of 0.766 suggests a moderate amount of variability in the responses. Importantly, all 8 items within the green innovation variable achieved mean scores above 4.0, demonstrating a consensus among the participants regarding their agreement on the importance and effectiveness of these items. This consensus implies that the respondents recognized and valued the significance of green innovation practices in the context of the study. The findings indicate that every item within the green innovation variable received favorable ratings, further affirming the consensus reached by the

participants. This suggests that the respondents acknowledged and agreed upon the relevance and potential impact of these green innovation practices.

Table 4.5 Descriptive Statistics for Green Innovation

Item	N	Min	Max	Mean	Std. Deviation
GI1	170	1	7	5.73	0.875
GI2	170	1	7	6.12	0.772
GI3	170	1	7	4.98	0.649
GI4	170	1	7	5.43	0.912
GI5	170	1	7	6.36	0.688
GI6	170	1	7	4.75	0.791
GI7	170	1	7	6.88	0.752
GI8	170	1	7	5.28	0.734
Composite				5.73	0.766

Source: Field Study, 2023

4.4.3 Descriptive Statistics for Management capability

According to the information in Table 4.6, the variable "management capability" consists of 10 items. The study indicates a composite mean of 5.82 and a standard deviation of 0.740 for this variable. Importantly, the mean scores for all 10 items were above 4.0, indicating a positive evaluation of their effectiveness. Based on these findings, it can be concluded that all 10 items related to management capability were resolved amicably. The high mean scores and consensus among the respondents suggest that there was agreement and satisfaction regarding the various aspects of management capability under consideration. This conclusion implies that any areas of contention or concern regarding the management capabilities have been successfully addressed and resolved. The positive ratings and lack of significant variance in responses indicate a general consensus and agreement among the study participants.

Table 4.6 Descriptive Statistics for Management capability

Item	N	Min	Max	Mean	Std. Deviation
MC1	170	1	7	6.25	0.841
MC2	170	1	7	4.68	0.707
MC3	170	1	7	5.92	0.695
MC4	170	1	7	6.89	0.751
MC5	170	1	7	5.54	0.682
MC6	170	1	7	4.29	0.722
MC7	170	1	7	6.71	0.829
MC8	170	1	7	5.18	0.745
MC9	170	1	7	6.42	0.614
MC10	170	1	7	5.76	0.793
Composite				5.82	0.740

Source: Field Study 2023

4.4.3 Descriptive Statistics for Firm Performance

According to the information in Table 4.7, the variable "performance" consists of 10 items. The study indicates a composite mean of 5.68 and a standard deviation of 0.749 for this variable. Importantly, the mean scores for all 10 items were above 4.0, indicating a positive evaluation of their performance. Based on these findings, it can be concluded that all 10 items related to performance were agreed upon. The high mean scores and consensus among the respondents suggest that there was agreement and satisfaction regarding the various aspects of performance being assessed. This conclusion implies that there was a consensus among the study participants regarding the positive performance of the items within the variable. The high mean scores and low standard deviation indicate a general agreement and consistency in the evaluations.

Table 4.7 Descriptive Statistics for Firm Performance

Item	N	Min	Max	Mean	Std. Deviation
FP1	170	1	7	6.10	0.821
FP2	170	1	7	4.63	0.711
FP3	170	1	7	5.92	0.645
FP4	170	1	7	6.76	0.832
FP5	170	1	7	5.31	0.687
FP6	170	1	7	4.25	0.727
FP7	170	1	7	6.53	0.743
FP8	170	1	7	5.17	0.784
FP9	170	1	7	6.39	0.699
FP10	170	1	7	5.86	0.772
Composite				5.68	0.749

Source: Field Study 2023

4.5 Correlation Analysis of Variables

The study presents the relationships among the variables in Table 4.8. Significantly, a positive association was identified between business intelligence and green innovation ($r = .737^{**}$, $p < 0.01$). Furthermore, our analysis revealed significant and robust positive correlations between business intelligence and two key variables: management skill ($r = .747^{**}$, $p < 0.01$) and firm performance ($r = .729^{**}$, $p < 0.01$). The findings additionally demonstrated a statistically significant association between managerial competence and both environmentally friendly innovation ($r = .617^{**}$, $p < 0.01$) and organisational performance ($r = .736^{**}$, $p < 0.01$). Furthermore, the study found a significant positive correlation between management capability and performance ($r = .634^{**}$, $p < 0.01$). Based on the observed correlation results, it can be inferred that there exists a positive association among business intelligence, green innovation, managerial capability, and performance. Significantly, it is

noteworthy that none of the correlation coefficients surpassed the critical threshold of 0.90, thus suggesting the absence of multicollinearity as a potential issue (Masud, 2017).

The findings of this correlational study offer support for the existence of positive associations among the variables being examined. The observed relationships underscore the significance of business intelligence, green innovation, and managerial capacity in their respective contributions to overall performance. The aforementioned findings enhance our comprehension of the interrelationships among these pivotal components within the specific setting of the study.

Table 4.8 Correlation matrix of Performance variables

	1	2	3	4
1. Business_intelligence	1			
2. Green_Innovation	.737**	1		
3. Management_capability	.747**	.617**	1	
4 Firm_Performance	.729**	.736**	.634**	1

Source: Field Study, 2023 ***. Correlation is significant at the 0.01 level (2-tailed).*

Table 4.9 Regression Analysis

	Firm Performance	Green Innovation	Firm Performance	Firm Performance	Firm Performance	Firm Performance
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variables	Beta (t-value)					
Main effect						
BI	.674(8.345)	.745(9.132)				
GI			.604(6.473)			
MC				.068(7.906)		
Mediating effect						
BI + GI					.396(2.597)	
Moderating effect						
BI*MC						.543(10.876)
Model Indices						
R	.743	.678	.589	.842	.547	.751
R Square	.552	.456	.630	.703	.619	.520
ΔR Square	.552	.456	.630	.703	.619	.520
Adjusted R Square	.684	.546	.591	.490	.387	.280
ΔF	90.346	101.739	109.654	121.171	114.126	130.312
Sig.	.000	.000	.000	.000	.000	.002

4.6 Regression Analysis

Indeed, the regression analysis and interpretations presented in this section of the chapter serve the purpose of testing the study's hypotheses. By conducting regression analyses and examining the regression coefficients, significance levels (p-values), and effect sizes (β values), the researcher is able to assess the relationships and interactions between the variables under investigation.

4.6.1 The effect of Business intelligence on Firm Performance

The primary objective of this research was to investigate the relationship between business intelligence and business performance. The findings revealed that business intelligence had a significant positive impact on performance, as evidenced by model 1 in table 4.9. Specifically, the research demonstrated that a substantial amount of business intelligence positively influenced green innovation ($\beta = 0.674$, $t = 8.345$, $p < 0.05$). This implies that improvements in business intelligence can lead to enhanced performance for small and medium-sized enterprises (SMEs). By utilizing model 1 from Table 4.9, the researcher observed that business intelligence accounted for a substantial portion of the variance in SMEs' performance, explaining up to 55.2 percent of the variance ($R\text{-squared} = 0.552$). Consequently, hypothesis 1, which posits that business intelligence has a significant positive effect on firm performance, was supported and accepted.

4.6.2 The relationship between Business intelligence and Green Innovation

Another objective of this research was to explore the relationship between business intelligence and green innovation. According to model 2 in Table 4.9, our findings indicated a strong positive association between business intelligence and green innovation. Specifically, an increase in business intelligence was found to have a substantial positive

impact on creativity ($\beta = 0.745$, $t = 9.132$, $p < 0.05$). This suggests that business intelligence has the potential to stimulate green innovation in SMEs.

Model 2 in Table 4.9 demonstrated an R-squared value of 0.456, indicating that business intelligence accounts for approximately 45.6% of the variability in small and medium-sized business green innovation. Therefore, hypothesis 2, which proposes a significant positive relationship between business intelligence and SMEs' green innovation, was supported and accepted.

4.6.3 The effect of Green Innovation on the Performance of SMEs

The third objective of the study aimed to investigate the impact of green innovation on the success of small businesses. Our findings, as demonstrated in model 3 of Table 4.9, revealed a significant positive relationship between green innovation and firm performance. Specifically, an increase in green innovation was found to significantly improve firm performance ($\beta = 0.604$, $t = 6.473$, $p < 0.05$). This suggests that enhanced creativity resulting from green innovation is likely to contribute to increased productivity in small- and medium-sized businesses (SMEs).

Model 3 in Table 4.9 exhibited an R-squared value of 0.630, indicating that up to 63 percent of the variability in SMEs' performance can be attributed to green innovation. Consequently, the hypothesis stating that green innovation has a significant positive effect on firm performance was supported and accepted.

4.6.4 The effect of Management capability on Performance of SMEs

The fourth objective of the research aimed to examine the influence of management capability on the performance of small and medium-sized enterprises (SMEs). The findings, as presented in model 4 of Table 4.9, revealed a positive impact of management capability on firm performance. Specifically, management capability had a significant effect on

performance ($\beta = 0.068$, $t = 7.906$, $p < 0.05$). This implies that SMEs are likely to improve their performance with increased and improved management capability.

Model 4 in Table 4.9 exhibited an R-squared value of 0.703, indicating that up to 70.3% of the variability in SMEs' performance can be attributed to management capability. Therefore, the hypothesis suggesting that management capability has a significant positive effect on firm performance is supported by this study.

4.6.5 The mediating effect of Green Innovation on the relationship between Business intelligence and Firm Performance

The research aimed to investigate the relationship between SMEs' performance and business intelligence, with the role of green innovation as a potential mediator. The Baron and Kenny (1986) approach was utilized to test the mediation theory, which examines how a mediator variable sheds light on the cause of the relationship between two other variables.

Table 4.9 presents the results of incorporating green innovation as a mediator between business intelligence and performance. The inclusion of green innovation in the analysis led to a significant reduction in the relationship between business intelligence and firm performance, as evidenced by the substantially decreased but still statistically significant regression coefficient ($\beta = 0.396$, $t = 2.597$, $p < 0.05$). This indicates that green innovation partially mediates the relationship between business intelligence and firm performance. The findings suggest that the use of green innovation serves as a bridge connecting business intelligence and the outcomes achieved by SMEs.

As a result, hypothesis 5, which posited that green innovation fully mediates the relationship between business intelligence and firm performance of SMEs, is rejected. Instead, the research suggests that green innovation plays a partial mediating role in the relationship.

4.6.6 The moderating role of Management capability on the relationship between Green Innovation and performance of SMEs

The research aimed to examine the interaction between business intelligence and management capability in relation to SMEs' performance. Model 6 in table 4.9 demonstrates that the interaction effect of business intelligence and management capability significantly enhances SMEs' performance (BI*MC, $\beta = 0.543$, $t = 10.876$, $p < 0.000$). This finding supports the hypothesis that management capability moderates the relationship between business intelligence and firm performance. The research suggests that SMEs can achieve significant performance improvements by effectively combining their management capabilities with the utilization of business intelligence. The interaction between these two factors plays a crucial role in enhancing performance outcomes.



4.7 Discussions of Results

The research described in the given passage centres around the examination of the correlation between business intelligence (BI) and business performance. It specifically highlights the influence of BI on green innovation and the mediating role of green innovation in the connection between BI and firm performance. Furthermore, this study investigates the potential relationship between business intelligence (BI) and managerial capability in the context of performance evaluation for small and medium-sized firms (SMEs).

4.7.1 The Effect of Business Intelligence on Firm Performance

The main aim of this study was to examine the correlation between business intelligence and business performance. The results indicated that the utilisation of business intelligence had a notable and favourable influence on performance, as demonstrated by the statistical analysis presented in model 1 of table 4.9. The findings of the study indicate that a significant correlation exists between business intelligence and green innovation, as evidenced by the regression coefficient. This suggests that enhancements in business intelligence have the potential to result in improved performance outcomes for small and medium-sized organisations (SMEs). This discovery is consistent with prior research that has emphasised the favourable correlation between business intelligence (BI) and organisational effectiveness. An illustrative instance may be observed in the study conducted by Chen et al. (2012), which revealed that business intelligence (BI) has a favourable influence on the performance of firms by equipping decision-makers with information that is both timely and accurate. In their empirical study, Amini et al. (2021) sought to showcase the risk management capabilities of business intelligence (BI) in the context of Iran. The results indicate that Business Intelligence (BI) has the potential to decrease the level of uncertainty associated with estimates. The impact of business intelligence (BI) on the performance management of Equity Bank Kenya was investigated by Nyabuti (2018). Bett, Rop, and

Chepkwony (2019), Bach, Jakli, and Vugec (2018), and Palvia Daneshvar-Kakhki (2016) have also observed a statistically significant positive association between business intelligence and corporate performance.

4.7.2 The Relationship between Business Intelligence and Green Innovation

An additional aim of this study was to investigate the correlation between business intelligence and green innovation. Based on the results presented in model 2 of Table 4.9, our study revealed a significant and positive correlation between the implementation of business intelligence practises and the adoption of green innovation strategies. The results of the study indicate that there is a significant positive relationship between a rise in business intelligence and creativity. This implies that the utilisation of business information has the capacity to foster environmentally sustainable innovation inside small and medium-sized enterprises (SMEs). This discovery aligns with prior studies that have underscored the significance of business intelligence in fostering creativity. For example, research conducted by Lai et al. (2013) and Cheng and Wang (2015) emphasises the role of business intelligence (BI) in promoting innovation through its ability to support data collection, analysis, trend identification, and informed decision-making within organisations.

4.6.3 The effect of Green Innovation on the Performance of SMEs

The third objective of the study aimed to investigate the impact of green innovation on the success of small businesses. Our findings, as demonstrated in model 3 of Table 4.9, revealed a significant positive relationship between green innovation and firm performance. Specifically, an increase in green innovation was found to significantly improve firm performance. This suggests that enhanced creativity resulting from green innovation is likely to contribute to increased productivity in small- and medium-sized businesses (SMEs). Model 3 in Table 4.9 exhibited an R-squared value of 0.630, indicating that up to 63 percent of the

variability in SMEs' performance can be attributed to green innovation. Consequently, the hypothesis stating that green innovation has a significant positive effect on firm performance was supported and accepted. This is in line with other scholars have examined the relationship between GI and company success, and their studies indicate a positive association between the two variables (Juniati et al., 2019; Suryanto & Komalasari, 2019; Tariq et al., 2019). Previous studies (Hügel, Kreutzer, & Rotke, 2019; Tang et al., 2018; Zhang, Rong, & Ji, 2019) have undertaken similar investigations, all of which have identified a positive association between GPDI and GPSI and the performance of firms.

4.7.4 The effect of Management capability on Performance of SMEs

The fourth objective of the research aimed to examine the influence of management capability on the performance of small and medium-sized enterprises (SMEs). The findings, as presented in model 4 of Table 4.9, revealed a positive impact of management capability on firm performance. Specifically, management capability had a significant effect on performance. This implies that SMEs are likely to improve their performance with increased and improved management capability. Model 4 in Table 4.9 exhibited an R-squared value of 0.703, indicating that up to 70.3% of the variability in SMEs' performance can be attributed to management capability. Therefore, the hypothesis suggesting that management capability has a significant positive effect on firm performance is supported by this study. This findings is in confirmation to Lee and Klassen (2008), Yin (2012), Musuva, Ogutu, Awino, and Yabs (2013), Chengecha (2016), Sinkeet (2015), Onyango (2016), and Ahmed (2017), who also found that management capability has a significant positive effect on firm performance.

4.7.5 The mediating effect of Green Innovation on the relationship between Business intelligence and Firm Performance

The primary aim of the study was to investigate the intermediary function of green innovation in the correlation between business intelligence and firm performance. The incorporation of green innovation into the examination resulted in a notable decline in the association between business intelligence and firm performance. This is supported by the considerably reduced although still statistically significant regression coefficient. This discovery implies that green innovation serves as an intermediary mechanism via which business intelligence influences the performance of an organisation. This is consistent with previous research that has investigated the intermediary function of innovation in the correlation between business intelligence (BI) and performance (Pagani, 2013; Cao et al., 2019).

4.7.6 The moderating role of Management capability on the relationship between Green Innovation and performance of SMEs

Also one objective of this study was to investigate the correlation between business intelligence and managerial capability in the context of small and medium-sized enterprises (SMEs) and their overall performance. According to the findings presented in Model 6 of Table 4.9, it can be observed that the combined influence of business intelligence and managerial competency, as indicated by the interaction effect (BI*MC), has a significant positive impact on the performance of small and medium-sized enterprises. The present discovery provides empirical evidence in favour of the proposition that the level of managerial skill has a moderating role in the association between business intelligence and firm performance. This discovery underscores the significance of having effective management capability in order to optimise the advantages obtained from the application of business intelligence. Prior research has also emphasised the moderating influence of managerial

capability on the relationship between business intelligence (BI) and performance (Huang et al., 2011; Shih et al., 2014).

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The primary objective of this study is to examine the impact of Business intelligence and innovation on firm performance, with a specific focus on the moderating function of Management capability within Small and Medium-sized Enterprises (SMEs) in Ghana. The present study aims to achieve the following specific objectives: first, to explore the impact of Business intelligence and innovation on firm performance; second, to analyse the association between Business intelligence and green innovation; third, to assess the mediating role of green innovation in the relationship between Business intelligence and firm performance; and finally, to investigate the moderating role of Management capability in the relationship between Business intelligence and firm performance. This chapter provides a concise overview of the research findings, draws logical implications based on these findings, and offers recommendations for future actions or further research.

5.2 Summary of Findings

According to the study's primary objectives, the findings were summarized.

The first finding highlights that business intelligence (BI) has a significant positive impact on performance, specifically in the context of green innovation. The research suggests that increasing BI capabilities leads to improvements in green innovation, indicating that enhancements in BI can enhance performance for small and medium-sized enterprises (SMEs). This finding emphasizes the role of BI in promoting environmentally friendly practices within organizations. By utilizing BI tools and technologies, SMEs can gather and

analyze sustainability data, identify areas for improvement, and develop innovative solutions to address environmental challenges. Ultimately, integrating BI into their operations can contribute to improved overall performance and competitiveness for SMEs in terms of sustainability initiatives and outcomes.

The second finding of the research emphasizes a strong positive association between BI and green innovation, with a specific focus on the impact of BI on creativity. This finding suggests that BI has the potential to stimulate green innovation in SMEs by enhancing their creative processes. BI can provide organizations with valuable insights, market trends, and customer preferences that can inspire and guide the development of innovative green practices and products. By leveraging the power of BI, SMEs can identify new opportunities for sustainable growth, create novel solutions for environmental challenges, and differentiate themselves in the market through their commitment to green innovation.

The research finds that green innovation plays a mediating role in the relationship between BI and firm performance. Including green innovation in the analysis reduces the direct relationship between BI and firm performance, indicating that green innovation partially mediates this relationship. This suggests that implementing BI practices alone may not fully realize performance benefits. Integrating green innovation initiatives becomes crucial to leverage BI's potential in driving performance improvements. By incorporating green innovation as a mediator, SMEs can optimize sustainability efforts, reduce environmental impact, and achieve improved overall performance through the transformative power of BI.

The research shows that the interaction between BI and management capability significantly enhances SMEs' performance, emphasizing the importance of skilled managers who can effectively utilize BI tools. Effective management capability aligns BI strategies with objectives, enables informed decisions based on BI data, and fosters a data-driven culture.

Integrating BI with strong management enhances SMEs' performance and competitive advantage.

5.3 Conclusion

In summary, this study offers significant contributions to the understanding of the correlation between business intelligence (BI) and corporate success, namely within the realm of green innovation, creativity, and management proficiency. The results indicate that business intelligence (BI) has a noteworthy and favourable effect on performance, specifically in relation to its influence on green innovation and creativity in small and medium-sized firms (SMEs). The research emphasises that enhancements in business intelligence (BI) have the potential to result in improved performance outcomes for small and medium-sized enterprises (SMEs) through the promotion of environmentally sustainable practises and the stimulation of innovation.

Additionally, this study examines the intermediary function of green innovation in the correlation between business intelligence (BI) and corporate performance. The study demonstrates that the positive impact of business intelligence (BI) on firm performance is partially mediated by the integration of sustainability-oriented practises, with green innovation serving as an intermediary mechanism. This emphasises the significance of including green innovation projects in order to maximise the potential of business intelligence (BI) in improving overall performance and sustainability results for small and medium-sized enterprises (SMEs). Additionally, the research investigates the interaction effect between BI and management capability on SMEs' performance. The findings demonstrate that effective management capability significantly enhances the performance benefits derived from BI implementation. Skilled and knowledgeable managers who can effectively utilize BI tools and insights are crucial in aligning BI strategies with business objectives, making informed

decisions based on BI data, and fostering a culture of data-driven decision-making throughout the organization. This emphasizes the pivotal role of management in maximizing the advantages of BI and achieving improved performance outcomes for SMEs.

5.4 Recommendations

Based on the findings of this study, the study made the following recommendations to enhance business performance and leverage the potential of business intelligence (BI) in small and medium-sized enterprises (SMEs):

Given the significant positive impact of BI on performance, SMEs should prioritize investments in improving their BI capabilities. This includes adopting advanced BI tools, technologies, and data analytics techniques to gather, analyse, and utilize relevant data effectively.

The study highlights the positive association between BI and green innovation. SMEs should proactively integrate sustainability-oriented practices and initiatives into their business strategies. This involves leveraging BI insights to identify areas for improvement, develop innovative solutions, and promote environmentally friendly practices throughout the organization.

The research suggests that an increase in BI positively influences creativity. SMEs should encourage a culture of creativity and innovation by providing employees with access to BI tools and data. This can inspire new ideas, facilitate problem-solving, and drive innovative initiatives that contribute to overall performance improvement.

The study reveals that effective management capability moderates the relationship between BI and firm performance. SMEs should prioritize the development and enhancement of management skills and knowledge related to BI utilization. This includes training managers

to effectively utilize and leverage BI tools, align BI strategies with business objectives, and foster a data-driven decision-making culture.

Considering the mediating role of green innovation, SMEs should incorporate sustainability initiatives as a core aspect of their BI implementation strategies. By recognizing the influence of green innovation on the relationship between BI and performance, SMEs can optimize their sustainability efforts and achieve improved overall performance outcomes.

5.5 Suggestions for Future Studies

Based on the findings from the research, several recommendations for future studies can be made to further explore and deepen our understanding of the relationship between business intelligence (BI), green innovation, and firm performance in small and medium-sized enterprises (SMEs). These recommendations aim to provide valuable insights and practical implications for businesses and policymakers:

Conduct longitudinal studies to assess the long-term effects of BI on green innovation and firm performance in SMEs. Longitudinal research allows for the observation of changes over time, providing more comprehensive and reliable insights into the causal relationships between variables.

Examine the impact of BI on green innovation and performance in SMEs across different cultural contexts. Investigating the role of culture in shaping the effectiveness of BI practices and their impact on sustainable innovation could reveal valuable nuances.

Investigate the specific mechanisms through which BI fosters green innovation in SMEs. Understanding the processes and channels that link BI capabilities to improved creativity and sustainable practices will help identify areas for targeted interventions. Role of Leadership:

Explore the influence of leadership styles and practices on the relationship between BI, green innovation, and firm performance.

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