

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

**The Effect of Information Alignment on Operational Performance
Among SMEs: The Mediating Role of Supply Chain Collaboration**

By

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DECLARATION

I hereby declare that this submission is my work towards the Masters of Science in Logistics and Supply Chain Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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DEDICATION

I dedicate my endeavour to God Almighty, my creator, my tower of strength, my source of inspiration, wisdom, knowledge, and comprehension. He has been the source of my strength throughout this programme, and I have only flown on His wings. I also dedicate this work to my parents, who have always supported me and whose motivation has ensured that I give it all I have to accomplish what I have begun. Again, thank you to my wife (Mrs Ruth Amoo Owusu) and children (Nana Oduro Owusu, Papa Twum Oduro Owusu, Frimpong Oduro Owusu, and Obrempong Ntori Oduro Owusu) who have been touched by our quest in every manner. Thank you very much. My affections for you are immeasurable. God's blessings on you.



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ABSTRACT

The purpose of this study is to identify the role of supply chain cooperation as a moderator in the link between information alignment and operational performance among SMEs in developing economies. In particular, a cross-sectional research design was used for this investigation. For this inquiry, a quantitative technique was applied. 384 people were chosen using the purposive sampling approach. A predefined questionnaire was the primary technique of information collecting. SPSS v26 and SmartPls v4 were specifically used for statistical analysis. The data was examined utilising both descriptive and inferential techniques of investigation. According to the findings, information alignment has a direct and substantial influence on operational performance and SC cooperation. The purpose of this study is to identify the role of supply chain cooperation as a moderator in the link between information alignment and operational performance among SMEs in developing economies. In particular, a cross-sectional research design was used for this investigation. For this inquiry, a quantitative technique was applied. 384 people were chosen using the purposive sampling approach. A predefined questionnaire was the primary technique of information collecting. SPSS v26 and SmartPls v4 were specifically used for statistical analysis. The data was examined utilising both descriptive and inferential techniques of investigation. According to the findings, information alignment has a direct and substantial influence on operational performance and SC cooperation. According to the statistics, SC cooperation has a considerable beneficial influence on operational performance. According to the findings of the study, SC cooperation strongly influences the relationship between information alignment and operational performance. According to the findings, management should leverage IT to improve relationships with SC partners and promote operational effectiveness.

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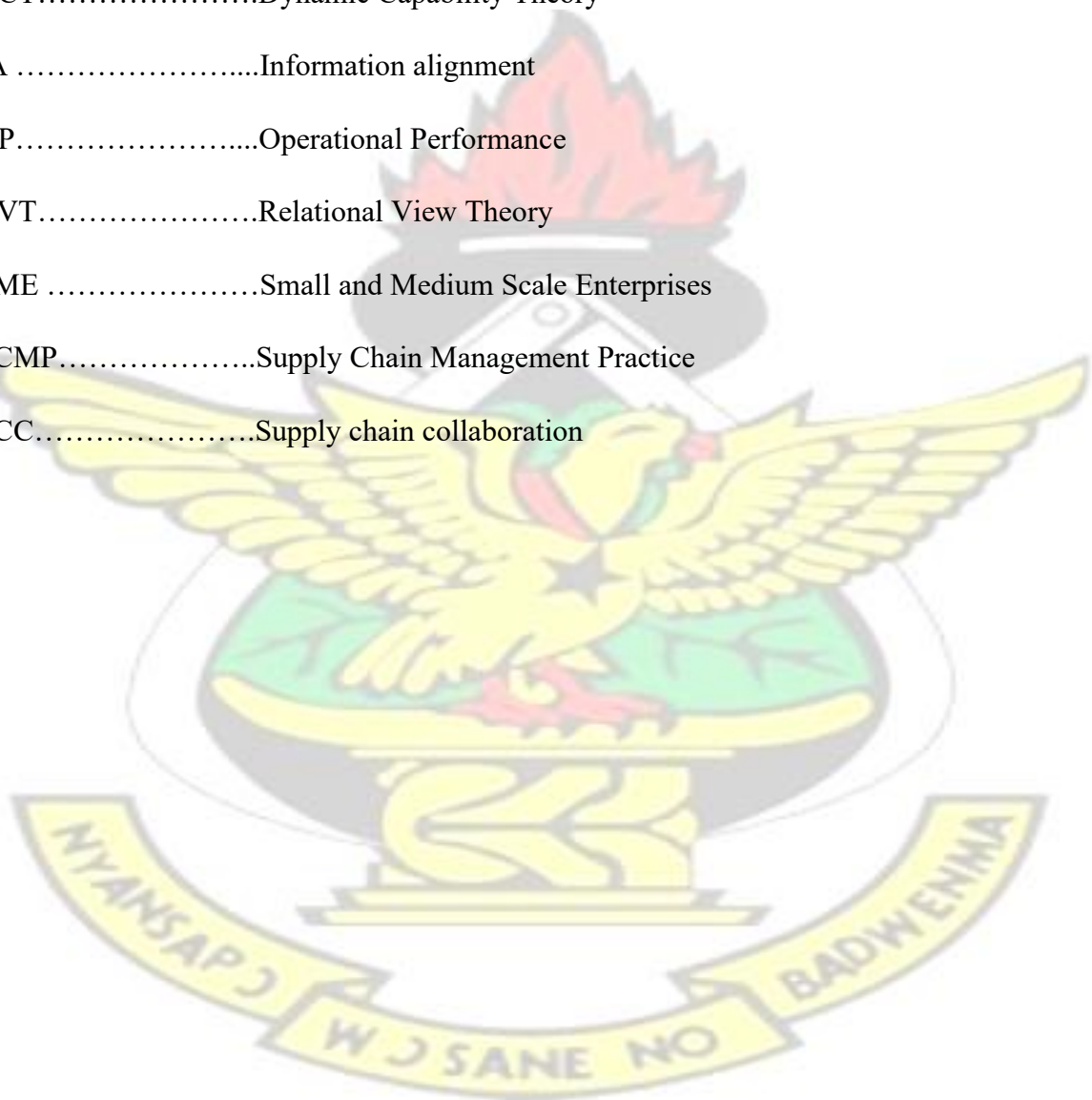
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LIST OF ABBREVIATIONS

AVE.....	Average Variance Extracted
CFA.....	Confirmatory Factor Analysis
CA.....	Cronbach Alpha
CR.....	Composite Reliability
DCT.....	Dynamic Capability Theory
IA	Information alignment
OP.....	Operational Performance
RVT.....	Relational View Theory
SME	Small and Medium Scale Enterprises
SCMP.....	Supply Chain Management Practice
SCC.....	Supply chain collaboration



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Many countries' economic and social progress depends on the success of its small and medium-sized companies (SMEs). These businesses are crucial to the economic growth of underdeveloped countries (Azumah et al., 2021). Despite their importance to the economy, SMEs confront a variety of challenges. Regardless of these challenges, customers are increasingly looking on small businesses to provide sustainability, competitive pricing, and value for their money (Tell et al., 2016). This calls for minimizing wastage at every stage of manufacturing while simultaneously satisfying shoppers' needs. Important changes on the road to higher operational proficiency can't be made without this (Dania et al., 2018). Meanwhile, operational and financial restrictions have also been cited as potential threats to SMEs (Hessel and Parker, 2013; Clegg, 2018). Which affects corporate operations in a direct or indirect way?

According to Das (2018), operational performance is the success of an organization in implementing its SC-wide plans to reduce costs and improve employee skills. The delivery and production of high-quality goods are two operational performance characteristics that become crucial to the survival and growth of SMEs in the global marketplace when effective operational performance measures are adopted (Yu et al., 2018).

When it comes to meeting customer demand in the face of rising costs and rising expectations for quality, small and medium-sized enterprises (SMEs) increasingly rely on complex networks of SC partners (Chen et al., 2013; Haleem et al., 2018; Wiengarten et al., 2016). Complex operational methods, such as SCMP, are increasingly being used by businesses as a means of differentiating themselves in the marketplace (Blome and Schoenherr, 2011; Kauppi et al., 2016).

While small and medium-sized enterprises (SMEs) are crucial to the economic growth of many countries, improving their operational performance is a key obstacle that has to be overcome (Dutta et al., 2020; Mishra et al., 2021). Despite several government programmes designed to help businesses gain and keep a competitive edge in today's increasingly competitive global market, SCM is still crucial for improving operational performance,

especially for SMEs. To achieve operational excellence, a group of people agree to work together to apply standard critical management practises (SCMPs) and other procedures (Ahoa et al., 2020). In addition, according to Owusu et al. (2017), operational performance might affect a company's ability to remain in business.

The SME sector in Ghana was negatively impacted by the worldwide Covid-19 epidemic, like with all other economic sectors, organisations, and businesses. Many countries' economic and social progress depends on the success of its small and medium-sized companies (SMEs). These businesses are crucial to the economic growth of underdeveloped countries (Azumah et al., 2021). Despite their importance to the economy, SMBs confront a variety of challenges. Regardless of these challenges, customers are increasingly looking on small businesses to provide sustainability, competitive pricing, and value for their money (Tell et al., 2016). This calls for minimizing wastage at every stage of manufacturing while simultaneously satisfying shoppers' needs. While small and medium-sized enterprises (SMEs) have been recognized as vulnerable to a number of restrictions, including operational and financial ones (Hessel and Parker, 2013; Clegg, 2018), this is vital for making key modifications on the route to greater operational competency. Which affects corporate operations in a direct or indirect way?

Operational performance is defined by Das (2018) as the degree to which a company is successful in implementing supply chain-wide measures to reduce costs and improve skills. The delivery and production of high-quality goods are two operational performance characteristics that become crucial to the survival and growth of SMEs in the global marketplace when effective operational performance measures are adopted (Yu et al., 2018).

Many small and medium-sized enterprises (SMEs) today rely on complex networks of SC partners to meet their customers' demands for timely, cost-effective product and service delivery across a wide geographic and demographic range (Chen et al., 2013; Haleem et al., 2018; Wiengarten et al., 2016). Complex operational methods, such as SCMP, are increasingly being used by businesses as a means of differentiating themselves in the marketplace (Blome and Schoenherr, 2011; Kauppi et al., 2016).

While small and medium-sized enterprises (SMEs) are crucial to the economic growth of many countries, improving their operational performance is a key obstacle that has to be

overcome (Dutta et al., 2020; Mishra et al., 2021). Despite several government programmes designed to help businesses gain and keep a competitive edge in today's increasingly competitive global market, SCM is still crucial for improving operational performance, especially for SMEs. To achieve operational excellence, a group of people agree to work together to apply standard critical management practises (SCMPs) and other procedures (Ahoa et al., 2020). In addition, according to Owusu et al. (2017), operational performance might affect a company's ability to remain in business. The Covid-19 pandemic hindered global efforts to achieve sustainable development, impacting all economic sectors, organisations, and industries, including Ghana's SME sector. SMEs in Ghana were already struggling prior to the advent of the virus.

The significance of supply chain management practises (SCMPs) and their implementation in the industry to revitalise the sector cannot be overstated. SCMPs and their integration to enhance enterprise operational performance (OP) alignment in the Ghana agri-food supply chain have garnered little attention. As a consequence, food output in the nation has reduced and varied. If this is not addressed, the situation will worsen, and the influence of the existing level of SCMPs on OP will continue to derail Ghana's socioeconomic growth, causing the country to lose its pride of position in socioeconomic development (Owusu et al., 2017). This is a cause of stress and concern for the collaboration process among chain members who need immediate care.

As a consequence, SMEs see the process of coordinating supply chain management practises (SCMPs) as a vital aspect in sustaining operational excellence throughout the supply chain. It includes, among other things, SCM activities and operations aimed at cost reduction, greater efficiency and effectiveness, value generation, and environmental sustainability. Many supply chain management specialists say that cooperation increases the performance and competitiveness of the multiple firms participating in the supply chain. In recent years, there has been a lot of empirical research that suggests that effective deployment of SCMPs may improve operational performance and competitive advantage among supply chain firms (Nkrumah et al., 2020).

Meanwhile, prior research has understudied the interdependence of modern SCMPs such as information alignment, supply chain cooperation, and operational performance. The purpose of this research was to investigate the influence of information alignment on operational performance in SMEs via supply chain cooperation.

1.2 Statement of the Problem

SMEs constitute a vast number of businesses in most countries (95% on average) and are a significant contributor to employment (WTO, 2016). Small and Medium Scale Enterprises (SMEs) are also seen as the backbone of economic progress and are recognized to be major drivers of economic growth and national development (Yamoah, 2016; Houghton, 2017; Muriithi, 2017).

In Ghana, Small and Medium Scale Enterprises constitute more than 90 per cent of companies registered providing an estimated 85% of production workers contributing 70% of Ghana's GDP. Consequently, having a catalytic effect on growth in the economy, revenue, and jobs (Abor, 2015). Because of the tremendous role of SMEs in economies, earlier studies focused on their performance and critical success factors (Amoah and Kwabena, 2018; Sulemana, 2014). It is therefore not surprising that most governments' social and economic policies revolve around them. According to statistics, 70% of SMEs in developing countries are less productive (WTO, 2016), and as a result, very few survive for more than five years (Addo, 2017; Yamoah and Arthur, 2014).

Similarly, SMEs in Ghana are not achieving the expected levels of success, despite the various policy initiatives put in place by the Ghanaian government to boost SMEs' competitiveness and performance (Dalitso and Peter, 2015; Oppong et al., 2014; Yamoah et al., 2013; Kayanula and Quartey, 2000). A study by Ghana's Capacity Development Centre (2018), which demonstrates that SMEs in Ghana lack the competitiveness of local and international business development that may push firm performance (Frimpong, 2013), is integrated into this topic under debate. Given that information sharing has been identified as an influencing component in business success in a competitive environment, innovation is a definite strategy to improve firm performance (Osei et al., 2016; Fu et al., 2018).

Firms have previously struggled with a lack of shared information in their goal of producing quality goods to help, maintain, and enhance their competitive performance in the market (Asare, 2010; Asiedu, 2015; Kiziloglu, 2015; Osei et al., 2016).

Nonetheless, the market is crowded with bigger firms (both domestic and foreign) who are market leaders, and these small and medium-sized enterprises can only survive if they can outperform the competition (McKelvie et al., 2017). The ability of SMEs to achieve certain objectives and carry out frequently recognised activities as identified in scholarly literature (Lonial and Carter, 2015). The use of subjective (financial) and objective (non-financial) factors, either alone or in combination, has been often utilised in order to construct suitable performance measures (Hudson et al., 2001; Nastasiea and Mironeasa, 2015). In the context of financial reporting, it is worth noting that owners may have challenges in providing accurate financial information. Consequently, the incorporation of non-financial measures is highly recommended, as emphasised by Hayat et al. (2019).

Based on scholarly investigations, it is recommended that a comprehensive performance measurement comprised financial metrics, including return on investment (ROI), return on sales (ROS), and net profits, as well as non-financial dimensions such as customer relationship management, new product innovation, manufacturing processes, and employee competencies (Daengs et al., 2019; Fong et al., 2014; Panno, 2020; Sangwa and Sangwan, 2018; Soto-Acosta, et al., 2018). The concept of overall productivity may be characterised as the efficient utilisation of a firm's resources, which cannot be seen via a brief time frame (Ndiaye et al., 2018; Nyeadi et al., 2015; Samans et al., 2017). Recent scholarly study has placed significant focus on the significance of IT or ICT skills in relation to the achievement of firms (refer to Ragini et al., 2018; Akter and Wamba 2019; Fosso et al., 2019; Rodriguez-Espndola et al., 2020; Sharma et al., 2020). The level of congruence between information technology (IT) skills and business strategy, as posited by Chan and Reich (2007), is often a distinguishing factor between successful and less successful organisations (Fragapane et al., 2020; Ivanov et al., 2020).

Despite the existence of an expanding body of scholarly literature, there has been a limited number of empirical inquiries conducted to examine the significance of information alignment (IA) and supply chain cooperation (SCO) in facilitating coordinated task execution

inside intricate operational contexts (Li et al., 2011; Chen et al., 2019). Despite the abundance of empirical evidence in the literature, few studies have examined the facilitating link of information sharing enablers towards effective implementation among firms (Fullwood and Rowley, 2017; Masa'deh et al., 2017; Rodriguez-Gómez and Gairn, 2015), particularly in the private sector in developing economies such as Ghana (Ramjeawon and Rowley, 2017). As a result, academics (for example, Muqadas et al., 2017; Masa'deh et al., 2016) have urged for a rigorous empirical assessment of the enabling role of information alignment in improving operational performance among SMEs.

Second, successful IA is dependent on more than simply the link between IA enablers and OP. The effects of IA on OP are yet unknown, raising the issue of how to evaluate IA (Shahzad et al., 2016). Similarly, empirical research on the impact of IA on operational performance in Sub-Saharan African SMEs is limited (e.g., Ahmad et al., 2015). Hsu (2008) and López-Nicolás and Meroo-Cerdán (2011), for example, propose that the effects of IA on OP are conveyed via other mediating factors rather than the processes themselves. However, Wang et al. (2016) observe a scarcity of data on the significance of mediating factors and the mediation mechanism between IA and OP. Dubey et al. (2021) emphasised the need of investigating the function of supply chain cooperation in modulating the link between IA and OP. This study is therefore being conducted to investigate the mediating role of supply chain collaboration in the relationship between IA and operational performance using evidence from Ghanaian SMEs, which has not been done to the best of the researcher's knowledge, particularly in the context of developing economies such as Ghana.

1.3 Objective of the Study

The purpose of this research was to investigate the relationship between information alignment and operational performance among SMEs in emerging countries, as well as the mediating impact of supply chain cooperation. To achieve the purpose of the study, the research sought to achieve the following specific objectives:

1. To examine the relationship between information alignment and Operational Performance among SMEs.

2. To assess the relationship between information alignment and Supply Chain Collaboration among SMEs.
3. To assess the relationship between Supply Chain Collaboration and operational performance among SMEs.
4. To examine the mediating role of supply chain collaboration in the relationship between information alignment and Operational Performance among SMEs.

1.4 Research Questions

In order to accomplish the primary aim of the investigation, the study endeavours to address the following research inquiries:

1. What is the relationship between information alignment and Operational Performance among SMEs?
2. Does information alignment influence Supply Chain Collaboration among SMEs?
3. What is the relationship between Supply Chain Collaboration and operational performance among SMEs?
4. What is the mediating role of supply chain collaboration in the relationship between information alignment and Operational Performance among SMEs?

1.5 Justification of the Study

This research makes many contributions. Despite much study on SCMPs, the functions of information alignment and OP remain unknown. As a result, the researcher believes that when information alignment is adequately maintained by including the aforementioned SCMPs, equivalent work on SCC may be required to affect performance. The research will also increase understanding of SCC's role as a mediator in the interaction between information alignment and OP. As a result, the research will examine the mediation effect of SCC in accordance with Pati et al. (2016), who finds that the function of assessing the mediation effect between SCMPs and OP has been overlooked in prior investigations. The investigation will also add to the model's understanding by incorporating an SCC mediating variable, making another useful addition to the literature. The augmentation and implementation of this model will contribute to the scholarly community by supplementing the existing corpus of information on supply chain management.

This research aims to enhance the theoretical understanding of Supply Chain Management Practises (SCMPs) by examining the potential use of Dynamic Capability Theory (DCT) and Relational View Theory (RVT) in analysing the impact of information alignment on Organisational Performance (OP). Prior research has examined the correlation between Supply Chain Management Practises (SCMPs) and Organisational Performance (OP) via the lens of the Resource-Based View (RBV) framework (Veera et al., 2016; Bagheri et al., 2014). The incorporation of Dynamic Capabilities Theory (DCT) and Resource-based View Theory (RVT) inside this research study makes a substantial contribution to the existing body of knowledge in the field of supply chain management. These concepts will be used to describe the relationship between information alignment, SCC, and OP.

The study offers practical implications for SMEs aiming to optimize their operational performance. By highlighting the role of information alignment and supply chain collaboration, the research provides actionable insights for SME managers and decision-makers, guiding them in designing and implementing strategies to improve overall operational efficiency. Policymakers can benefit from the study's findings in formulating supportive policies that encourage information alignment and supply chain collaboration within the SME sector. Recognizing the importance of these factors can lead to the development of initiatives aimed at fostering a conducive environment for SMEs to thrive in today's competitive business landscape.

1.6 Research Methodology

The cross-sectional design was used in this investigation. This survey approach was chosen because of its capacity to draw assumptions. A structured questionnaire was utilised to gather primary data for the research after an assessment of available literature. The pieces were taken from already published literature. All senior managers and owners of SMEs in the Greater Accra Region were included in the study's population. The data was analysed using PLS-SEM (Partial Least Squares Structural Equation Modelling) and SPSS.

1.7 Scope of the Study

The study investigated the influence of information alignment on OP among SMEs in Ghana, mediating by supply chain collaboration. Although there are several dimensions of SCMPs, this study focused on information alignment, which has not been adequately explored. Also, reviewed literature identified that information alignment has not yet been tested within the SME setting. The study employed the Dynamic Capability Theory (DCT) and Relational View Theory from which the variables of the study are drawn. Geographically, the study was limited to SMEs in the Greater Accra Region, Ghana.

1.8 Limitations of the Study

The study focused on information alignment, supply chain collaboration and operational performance of SMEs in the Greater Accra Region. One limitation encountered relates to the use of the survey inquiry approach to information gathering. In this context, conclusions and recommendations are based on the information that is provided by the respondents. As a result, the researcher was not so sure of the information they provided. Again, some respondents were reluctant and suspicious of the information being retrieved from them due to competition in most SMEs. Another limitation faced by the researcher in conducting this research was the issue of time and limited resources.

1.9 Organization of the Study

The study is divided into five primary sections. The introduction to the study is included in the first chapter. It goes through the study's history, problem statement, research questions, study aims, study importance, scope and constraints of the inquiry, and chapter arrangement. The second chapter, Chapter Two, is dedicated to a review of existing literature on the study issue. Furthermore, chapter three digs further into the study's methodology. It goes into the research plan, data kinds and sources, data collection tools, data analysis procedures, and so on. In chapter four, the data analysis and discussion are handled, and in chapter five, a summary of the important results, conclusion, and recommendations for consideration are provided.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The research is organized into five major parts. The first chapter contains the study's introduction. It discusses the study's background, problem statement, research questions, study goals, study significance, scope and restrictions of the investigation, and chapter layout. The second chapter, Chapter Two, is devoted to a survey of the available literature on the subject of the research. In addition, chapter three delves further into the study's methodology. It is included into the study strategy, data types and sources, data gathering instruments, data analysis techniques, and so on. The data analysis and discussion are handled in chapter four, and the conclusion and suggestions for consideration are offered in chapter five.

2.2 Conceptual Review

This section describes the definitions, operationalization, and application of the notions in this research. The model has five main constructs (Information Alignment, Supply Chain Collaboration, and Operational Performance). These constructs have been operationalized in subsequent sections below.

2.2.1 Information Alignment

Sharing information is critical to achieving the agile supply chain strategy (Alzoubi and Yanamandra, 2020). According to Prasad et al. (2019), information-sharing skills are critical for developing and deploying systems and procedures to enable analytics capabilities. As a result, several organisations have maintained information alignment as a key priority (L'Hermitte et al., 2016).

Information should flow freely between cooperating parties to ease procedures. The effective execution of supply chain management relies heavily on the exchange of information. The issue of information distortion, which has a significant impact on performance, is a prominent subject within the realm of supply chain management (Lee et al., 2011). Consequently, the exchange of knowledge in the context of supply chain management is much appreciated by both scholars and professionals. The capacity to share information is widely seen as a crucial skill for effectively managing the flow

of information inside the supply chain process (Shore and Venkatachalam, 2003). Information alignment plays a crucial role in facilitating the exchange of information and is considered a valuable resource for achieving efficiency and effectiveness in the management of information (Wu et al., 2006).

According to Lee and Whang (2000), firms have the potential to engage in the exchange of several types of information with their suppliers, including order information, operational information, plans, and competitive intelligence. Li et al. (2008) identified three distinct kinds of information sharing, namely transactional, operational, and strategic. Numerous scholarly investigations have highlighted the importance of information management inside organisations (Costa et al., 2020). The field of information management encompasses several aspects related to the awareness, acquisition, correct utilisation, development of applications, and long-term strategic benefits associated with the information possessed by an organisation as a whole (Ruuska, 2005).

According to Canbaz and Yldz (2014), information management may be defined as the systematic integration of various operations inside organisations, enabling them to effectively gather information from diverse sources, modify and generate it, and afterwards distribute it to relevant stakeholders in order to facilitate the attainment of their goals. According to Beijerse (2000), information management may be defined as the systematic process of generating information in order to align with the objectives of an organisation. The use of information management may facilitate individuals in enhancing their knowledge and skills (Odabaş, 2008). Vjayakumar (2011) asserts that the primary focal point of information management is in its capacity as a system that identifies and responds to information assets. The author characterises it as the practise of enterprises fostering intangible principles.

The five actions often included in information management processes inside enterprises are creation, acquisition, classification, storage, transfer, sharing, and evaluation of the information system and its utilisation (Liao, 2003). The integrated user-machine system known as the information management system plays a crucial role in facilitating the operation, management, and decision-making processes inside an organisation. According to Ngirigacha et al. (2019), system computers use manual procedures, databases, and models to perform tasks such as analysis, planning, control, and decision-making. Information management systems provide long-term profits by effectively integrating people, procedures, and technology. The use and application of information generated and obtained by these systems are of utmost importance (Alsalim & Mohamed, 2013). Uzun and Durna (2008) assert that the utilisation of information should be preceded by a careful assessment of the optimal timing and context for its use.

Furthermore, Ajibade (2016) posits that an organization's capacity to effectively manage and leverage information resources is a deciding factor in its overall performance enhancement. Bowman and Turner posit this information. Following the collection of pertinent data, each organisation is classified by its constituents according to its distinct structure, objectives, culture, and strategy. Strategies pertaining to the management of information include many stages, including information perception, collection, regulation, processing, and management. Opoku and Enu-Kwesi (2017) argue that it is essential to integrate a policy and strategy that establishes a comprehensive framework and guidelines for the production, storage, processing, distribution, and utilisation of data into the processes of performance levels management. As stated by Porter (2009), the use of information by firms plays a crucial role in determining the likelihood of engaging in aggressive or defensive rivalry with their competitors.

In the event that a corporation provides comprehensive information about an upcoming concept, service, or product, competitors may redirect their resources towards the development of this idea or product. Rival firms are likely to use defensive strategies that are contingent upon the projected characteristics of the forthcoming product, particularly during periods of ambiguity around its specifications. When making decisions on the adoption of new strategies, it is advisable for senior management to use the knowledge gathered from the external environment in order to effectively compete while optimising time and energy resources. Irrespective of one's perspective, it is widely acknowledged that information management systems play a crucial role in enhancing the operational effectiveness and velocity of a corporation.

2.2.2 Operational Performance

The concept of firm performance lacks a universally agreed-upon definition in the academic literature, since it is seen as a complex and multidimensional phenomenon (Chong, 2015; Tuan et al., 2016). The structure of the subject matter is characterised by its intricate and diverse nature (Expósito and Sanchis, 2019). This study encompasses a range of interrelated indicators, including growth (Nastasia and Mironeasa, 2015), quality, innovation, and creativity (Wadho and Chaudhry, 2018), employee engagement (Sinisammal et al., 2012; Sousa et al., 2018), customer satisfaction (Fong et al., 2014), and productivity (Kumar and Rahman, 2015; Fu et al., 2018). Performance criteria include many key factors that are crucial for the success and sustainability of a business.

These factors include sales growth, market share, customer satisfaction, profitability, and the capacity to maintain a continuous presence in the market (Fong et al., 2014; Mahmutaj and Krasniqi, 2020; Mardani et al., 2018; Ndiaye et al., 2018; Sharma et al., 2016).

The most popular approaches to describe corporate success are financial and non-financial perspectives (Chong, 2015; Kaplan, 2016; Kaplan, 2010; Ndiaye et al., 2018). Financial success may be defined as business growth as measured by changes in turnover, employee numbers, investments, and profitability (Hudson et al., 2001; Nastasiea and Mironeasa, 2015; Ndiaye et al., 2018; Sangwa and Sangwan, 2018). Some studies, on the other hand, have evaluated non-financial success in terms of brand and market performance (BLGN, 2018; Unurlu and Uca, 2017). Brand performance is measured by brand loyalty, brand image, brand awareness, and reputation. Client satisfaction, new client acquisition, and existing customer retention are key market performance measures. Various academics utilise various indicators for a firm's success in their study, such as speed to market (i.e. bringing items to market swiftly) (Liu and Atuahene-Gima, 2018; Mardani et al., 2018).

According to Mardani et al. (2018), multinational corporations are able to create a product quicker and more effectively distribute R&D spending to assure increased sales while maintaining the production line of a new or upgraded product manageable and within the objective. As a result, the product that entered the market first will have various benefits, including opportunity, dominance, and feedback, i.e. quicker client input enabling rapid product revisions. A number of papers have also argued that underutilization of greater capacity is a key impediment to the growth of many African SMEs (Ahiakpor et al., 2014). In general, a firm's capacity utilisation level reflects the amount to which productive equipment is used and the length of time that resources are used (Siyabi and Bose, 2018). The better the utilisation of capacity, the better the operation resource management (Shen and Chen, 2017). Furthermore, the majority of businesses see a lack of sales and demand as a constraint on output at work. The usage of capacity utilisation is based on market demand as well as how goods are produced to make the most use of resources (Ndiaye et al., 2018).

The current research investigates the capacity of SMEs to produce targeted outcomes and operations that are broadly recognized by the company (Lonial and Carter, 2015). In order to determine suitable performance measures, it is possible to use subjective (financial) and objective (non-financial) factors, either individually or in combination (Hudson et al., 2001; Nastasiea and Mironeasa, 2015). The use of non-financial indicators is suggested since SME owners may encounter challenges in providing crucial financial information (Hayat et al., 2019).

The evaluation of small and medium-sized enterprises (SMEs) will involve the utilisation of both financial and non-financial metrics, as suggested by Panno (2020). This approach is further substantiated by the research conducted by Nastasiea and Mironeasa (2015) as well as Ndiaye et al. (2018), who contend that researchers have the flexibility to select suitable indicators for assessing the performance of SMEs. Based on scholarly investigations, it is recommended that a comprehensive performance evaluation encompasses both financial metrics, such as return on investment (ROI), return on sales (ROS), and net profits, alongside non-financial dimensions including customer relationship management, new product innovation, manufacturing procedures, and employee skillsets (Daengs et al., 2019; Fong et al., 2014; Panno, 2020; Sangwa and Sangwan, 2018; Soto-Acosta et al., 2018). When doing research, it is necessary to choose performance measures that are most applicable to the study topic and assess the consequences of this selection (Nastasiea and Mironeasa, 2015; Ndiaye et al., 2018). The significance of this issue is heightened due to the existence and complexities of the corporate framework, alongside the level of readiness shown by owner-managers to engage in the fact-finding procedures.

According to scholarly sources, it has been argued that performance indexes use many performance metrics in order to address the aforementioned limitation (Daengs et al., 2019; Hudson et al., 2001; Ndiaye et al., 2018). Therefore, it is essential for this research to establish a comprehensive set of performance indicators that are suitable for micro, small, and medium enterprises (MSMEs) operating in the manufacturing sector. Market orientation, satisfaction, financial performance, and operational effectiveness (OP) are key performance indicators that serve as measures of a company's ability to effectively achieve its goals. Irrespective of the specific sector, the primary goal of all firms is to enhance their overall performance, often measured by outperforming their rivals' achievements (Direction, 2019). It is recommended that supply chain organisations engage in performance evaluations in order to assess the desirability or undesirability of any modifications implemented (Kumar & Barua, 2021).

According to Dahal (2021), organisational performance may be classified into three distinct categories: financial performance, non-financial performance, and operational performance. Market share, return on investment, and return on assets are all financial metrics. Non-financial metrics are used to fulfil consumer requirements and meet customer expectations. The object of analysis in this research is the OP, which is evaluated based on its ability to enhance the organization's quality, flexibility, and delivery capabilities (Leuschner et al., 2013). Additionally, it pertains to a firm's ability to reduce expenses, decrease the time required to complete tasks, and improve manufacturing procedures, leading to the creation of superior products that contribute to the growth of sales and

profitability for supply chain enterprises (Truong et al., 2017). According to Sharma and Modgil (2019), the operational plan (OP) of an organisation may be described as the strategic approach used to maximise the efficiency of converting a significant quantity of raw materials into completed and semi-finished goods, while minimising resource wastage.

Research has shown that competition is not limited to inter-firm rivalry, but rather extends across the whole supply chain. In order to maintain optimal operational performance and global competitiveness, it is essential that all supply chain participants and performance metrics be actively involved at every organisational level (Basu et al., 2017). According to Chavez (2015), the concept of operational performance (OP) refers to the strategic decision-making process used by businesses to determine their participation in competitive markets. Key performance indicators (KPIs) for evaluating competitive performance include quality, delivery, flexibility, and cost.

Operationalization (OP) has significant importance across several disciplines, although its identification might pose challenges in the absence of continuous scholarly investigation. According to the research conducted by Lu et al. (2018), the primary factor that enables optimal supply chain performance is operational performance (OP).

Based on prior scholarly investigations, a primary objective of effective supply chain management (SCM) is to establish a distinctive position within a competitive market environment via the pursuit of cost efficiency and revenue maximisation.

The year 2021, according to Bhatta, the optimal approaches for assessing performance have been extensively debated in scholarly discourse. The use of a balanced scorecard (BSC) has been documented in several studies as a means to effectively monitor and enhance performance (Mukhtar et al., 2021). Yu et al. (2014) demonstrated that operational performance (OP) plays a crucial role in enhancing supply chain (SC) performance within the context of integrated green supply chain management (SCM). The study conducted by Abdullahi et al. (2017) aimed to assess the operational efficiency of Nigerian oil and gas firms via the analysis of key financial indicators, including the profit margin (PM), return on assets (ROA), and return on equity (ROE) ratios. Al-Janabi (2020) used quality, cost, and delivery as operational performance metrics in their examination of Jordanian small and medium-sized enterprises (SMEs).

In their study, Wang et al. (2018) used the criteria of effectiveness and efficiency to evaluate organisational performance within the Chinese electric power business. In their study, Trattner et al. (2017) used a comprehensive evaluation framework that included the dimensions of time, cost, quality, and flexibility in order to assess the performance of operations management practises within

the context of the United Kingdom. Lu et al. (2017) conducted a study that investigated operational performance (OP) by considering factors such as cost, delivery, and flexibility. Similarly, Ebrahimi (2015) conducted an analysis of OP in the oil and gas supply chains of the United Kingdom, focusing on quality, lead time, flexibility, and cost. In a research conducted by Munyanyi (2018), the author examined the concept of operational performance (OP) in small and medium-sized enterprises (SMEs) in Zimbabwe. The study focused on four key dimensions: operational flexibility, product quality, delivery time, and production cost efficiency.

Yu et al. (2018) conducted a study examining the relationship between supply chain information integration, flexibility, and operational performance (OP) in the Chinese Food Industry. The researchers included many factors such as firm size and age, shareholder composition, business type, and industry type. In contrast, Phan et al. (2019) concentrated their research on quality, cost, and delivery indicators. In a similar vein, Salam (2017) used identical characteristics to examine the mediating role of supply chain collaboration in Thailand in the association between technology, trust, and organisational performance (OP). These factors were cost, productivity, time, and originality.

In their study, Sharma and Modgil (2019) examined the correlation between overall quality management, supply chain management, and operational excellence within the context of the Indian pharmaceutical industry. The researchers computed operational performance (OP) by considering many parameters like innovation, quality, cost, delivery, defects, inventory, and capacity utilisation. Truong et al. (2017) conducted a study on the relationship between supply chain management practises (SCMPs) and firm operational performance (OP). The researchers found that no dimension of operational performance was identified in their investigation.

Organisations see operational performance (OP) as a significant concept for enhancing manufacturing operations, achieving superior product quality, augmenting sales and profitability, and reducing managerial expenditures (Truong et al., 2017). The ongoing investigation aims to evaluate operational performance (OP) via the reduction of many key factors, including management expenditures, order and lead times, material prices, and the proportion of delayed deliveries. The financial performance of a corporation is closely linked to its operational success as it indicates the effectiveness with which raw resources are transformed into completed and semi-finished goods within a minimal timeframe and with little waste generation (Sharma & Modgil, 2019).

2.2.3 Supply Chain Collaboration

The concept of Supply Chain Collaboration (SCC) is described by Manthou et al. (2004) as a paradigm whereby stakeholders within a supply chain collaborate by sharing risks and resources, with the ultimate goal of enhancing the overall competitive advantage of the supply chain. According to Ramanathan et al. (2014), the implementation of Supply Chain Collaboration (SCC) has been recognised as an effective strategy for improving supply chain performance, specifically in terms of environmental sustainability. Numerous organisations have used the Strategic Cost Cutting (SCC) methodology in order to enhance their overall operational effectiveness. The literature suggests that there are several factors that can contribute to the improvement of supply chain performance. These factors include the reduction of costs and the increase of profits (Cao and Zhang, 2011; Um and Kim, 2019). Additionally, improved forecasting accuracy can be achieved through transparent information exchange (Nimmy et al., 2019; Ramanathan and Muyldermans, 2010). Effective communication among supply chain members is also crucial (Cao and Zhang, 2011; Zhang and Cao, 2018). Furthermore, resource sharing has been identified as a key element (Cao and Zhang, 2011; Ramanathan and Gunasekaran, 2014). Lastly, the implementation of an incentive system can also contribute to supply chain performance enhancement (Cao and Zhang, 2011). SCC has a significant impact on an organization's ability to increase its performance in green innovation. Collaboration, according to An et al. (2014), may assist businesses acquire a competitive advantage.

2.3 Theoretical Review

The theories used in this research are the Relational View Theory (RVT) and the Dynamic Capability Theory (DCT). The use of theoretical frameworks in research endeavors offers a distinct lens through which to examine a certain subject matter. These frameworks serve to elucidate the contextual backdrop and establish connections between the many aspects and dimensions involved.

2.3.1 Relational View Theory (RVT)

Dyer and Singh (1998) proposed the development of Relational perspective Theory (RVT) as a means to overcome the limitations of the industry structure perspective. Additionally, they introduced the Relational Behaviour Theory (RBV) to elucidate the impact of individual company competitiveness on firm performance. According to the research conducted by Porter in 1980, the success of a corporation is impacted by its affiliation with a particular industry that has advantageous structural attributes, such as barriers to entry for potential rivals or a favourable level of bargaining power. The Resource-Based View (RBV), in contrast, focuses on corporate heterogeneity and posits that businesses may get a competitive advantage by obtaining resources and capabilities that include value, rarity, inimitability, and non-substitutability (Barney, 1991). The advocates of these concepts emphasise the significance of internal control and resource ownership, whether at the industry or organisational level, as the fundamental basis for achieving competitiveness. Consequently, the concept of Relational View of the Firm (RVT) presents a perspective that suggests firms can enhance their capabilities and competencies by focusing on inter-firm relationships within their supply chain networks. This approach posits that firms can achieve a greater performance advantage by investing in these relational capabilities, as it enables them to leverage synergies and optimise resources in ways that would not be possible if they were operating in isolation.

This viewpoint is supported by various scholars, including Brüning et al. (2015), Dyer and Singh (1998), and Wieland and Wallenburg (2013). According to the concept, organisations get a competitive advantage by establishing interconnected networks that enable them to access unique talents (Dyer and Singh, 1998; Kumar et al., 2017). According to Dyer and Singh (1998), the emergence of various capacities occurs when corporations are able to invest in relation-specific assets, establish inter-firm information exchange procedures, implement effective governance systems, and use complementary talents within the network. In order to provide a more comprehensive elucidation of the constituents, the theory posits that the act of investing in interfirm connection structures throughout whole supply chains enhances the resilience of organisations in the face of risks and shocks.

Furthermore, interfirm relational arrangements facilitate the ability of unique firms to mitigate risks by capitalising on collaboration advantages, synergies, and resource optimisation via distinctive combinations that would be difficult to get through distant contacts. Collaborative arrangements are positioned at the upper end of the relationship continuum, including many elements such as resource deployment effectiveness, competence development, procedures, and governance structures aimed at mitigating risk. According to Dyer and Singh (1998), it has been suggested that supply chains might potentially reduce the risks associated with interdependence by making investments in assets that are particular to interfirm relationships, establishing routines for exchanging information across firms, leveraging complementary resource endowments, and implementing efficient governance systems. According to Kumar et al. (2017), this network facilitates the development of a collaborative culture inside firms, enabling better planning and sharing of operations.

The concept of Relationship Value Theory (RVT), as discussed by Thoo et al. (2017), pertains to the strategic approach used by companies to establish mutually beneficial connections with other firms, with the objective of optimising financial gains. The Resource-Based View Theory (RVT) posits that in the context of Supply Chain Collaboration (SCC), the establishment of collaborative connections between manufacturing enterprises and their suppliers and consumers may lead to mutual benefits via the utilisation of relation-specific assets, knowledge-sharing routines, complementary resource endowments, and effective governance mechanisms. The expertise in managing relationships between suppliers, manufacturers, and customers has the potential to serve as a source of competitive advantage amongst firms, making it a crucial aspect to be regarded as a successful strategy.

The primary objective of the research was to examine the impact of information alignment, SC collaboration on the operational performance of small and medium-sized enterprises (SMEs) in Ghana. The relationship between information alignment (IA) and operational performance (OP) was facilitated by supply chain collaboration. The Resource-Based View Theory (RVT) supported the implementation of the information alignment as a precursor to the operational performance and supply chain coordination (SCC). This phenomenon arises from the inherent need of using internal dynamics inside an organisation to effectively adapt to changes, hence optimising the allocation of resources and ultimately attaining success. The inclusion of RVT in this study is essential as it provides a particular elucidation of how skills might contribute to a business's attainment of operational success and acquisition of a competitive edge. In summary, applying relational view theory to the study of the effect of information alignment on operational performance among SMEs highlights the importance of collaborative relationships and emphasizes the role of supply chain collaboration as a mediating factor in translating aligned information into improved operational outcomes.

2.3.2 Dynamic Capability Theory

Due to the volatility and instability of the corporate climate, as well as the rising consumer power in recent times, corporations have been compelled to adopt new approaches to run their operations during the previous decade. The supply networks have seen significant disruptions after the occurrence of the covid-19 pandemic. In order to restore operations to their pre-pandemic state and enhance the responsiveness of their supply chains, managers rely on a combination of internal and external competencies. Consequently, the emergence of Industry 4.0 and supply chain analytics has become imperative for firms seeking to enhance their innovation capabilities (Jing-Wen & Yong-Hui, 2017). Previous studies have extensively used a resource-based perspective (RBV) to elucidate the manner in which firms leverage their internal resources and capabilities to attain a competitive edge via innovation (Zhan and Yun, 2020; Agi and Nishant, 2017; Zailani et al., 2015). Based on the Resource-Based View (RBV) theory, organisations depend on favourable organisational reactions, such as top management dedication, employee training, research and development technologies, and environmental management systems, in order to enhance their resource

management capabilities. This, in turn, facilitates the enhancement of their innovation performance (Keller et al., 2019).

According to Grobler and Grubner (2006), the resource-based view (RB) conceptualises resources as the assets or access to resources possessed by a firm, rather than focusing on the organisation's capabilities. In order to gain a competitive edge, it is essential for a firm to effectively manage and incorporate both tangible and intangible resources (Newbert, 2007; Sirmon et al., 2008). According to Sirmon et al. (2008), in order to maintain a competitive edge over a prolonged period, enterprises need to effectively integrate their resources and competencies inside a particular area. Nevertheless, scholars who oppose the resource-based perspective argue that it lacks sensitivity to context (Lingyee, 2007, p. 360) and does not adequately address the specific conditions in which resources or capabilities have the greatest significance (Lingyee, 2007; Sedera et al., 2016).

The dynamic capability approach, in contrast, examines the ways in which resources within a specific context contribute to a firm's potential to gain a competitive advantage in a volatile economic climate (Teece et al., 1997; Sirmon et al., 2010; Singh et al., 2013). According to Teece et al. (1997), dynamic capabilities refer to the capacity of a corporation to effectively integrate, generate, and reconfigure both internal and external resources in order to adapt to quickly changing business environments. Moreover, dynamic abilities include the ability to identify and mould potential prospects, capitalise on these prospects, and sustain a competitive edge via the enhancement, integration, protection, and reorganisation of the organization's assets. Based on previous studies (Eckstein et al., 2015; Dubey et al., 2018), it has been observed that dynamic capabilities in a context characterised by high uncertainty are characterised by simplicity, experiential nature, and instability. These capabilities depend on the generation of novel insights, which enable the integration of renewable resources and competencies. Such dynamic capabilities play a crucial role in adapting to and thriving in an unstable environment. Based on previous discussions, it has been emphasised that information asymmetry (IA) and supply chain coordination (SCC) are dynamic capacities that arise from a firm's capacity to design and restructure its production and operational processes.

Consequently, it is anticipated that there exists a discernible correlation between Information Architecture (IA) and Service Component Composition (SCC), and the achievement of operational success as evaluated from the perspective of Dynamic Capability Theory (DCT).

According to the study, SCC will have an indirect influence on the link between IA and operational performance. The covid-19 outbreak has damaged almost every supply chain in the aftermath of the present global economic crisis (Dubey et al., 2018). Firms are increasingly seeking for innovative and environmentally friendly solutions to improve their company strategy (Teece et al., 1997). Despite the significance of supply chain innovation, scholars have yet to pay attention to the interaction between IA, SCC, and OP. Given that both the RBV and the DCT advocate for the use and application of the firm's knowledge resources, they may be used. DCT theory, an extension of RBV theory, was used as a foundation in this study to create antecedent knowledge resources and determine their relationship with a firm's innovation performance.

2.4 Empirical review

Bi (2020) investigate whether and how IT-business alignment enables SMEs to achieve performance goals through developing strategic business activities effectively and efficiently. The method involved a survey of 211 Australian high growth SMEs, with structural equation modeling used to analyze the data. The findings showed positive, significant, and impactful linkages between IT-business alignment, strategic collaboration, coordination, responsiveness, and SME performance. Further, strategic collaboration, coordination, and responsiveness fully mediated the relationship between IT-business alignment and SME performance. This contributes new insights on the mechanisms through which IT-business alignment influences SME success.

Nurcholis and Cahyono (2019) examined the effect of IT-strategy alignment, responsiveness, operational flexibility, and business relationship on sustainable competitive advantage, as well as the mediating roles of responsiveness, operational flexibility, and business relationship in the relationship between IT-strategy alignment and sustainable competitive advantage. The method involved collecting data from 189 Batik SMEs in Pekalongan,

Indonesia and analyzing it using Structural Equation Modeling. The findings showed that IT-strategy alignment significantly affects responsiveness, and responsiveness, operational flexibility, and business relationship significantly affect sustainable competitive advantage. Further, responsiveness, operational flexibility, and business relationship mediated the relationship between IT-strategy alignment and sustainable competitive advantage. Overall, the study provided evidence that IT-strategy alignment can enhance responsiveness, operational flexibility, and business relationships to improve sustainable competitive advantage for Batik SMEs based on customer expectations.

Miyamoto (2018) empirically investigate how Japanese SMEs view their Strategy Alignment Maturity, Short-term Linkage, and Organizational Performance, using the conceptual framework of Sledgianowski and Luftman (2001). The method involved analyzing survey data from 354 Japanese SMEs using structural equation modeling. The findings showed that factors associated with IT-Business Alignment Maturity were statistically significantly positively related to organizational performance but negatively related to Short-term Linkage. Although linkage of information system plans with organizational objectives was positive, the linkage of information systems with each factor of IT-Business Alignment Maturity was rather weak, as suggested by previous literature. Overall, the study examined the relationship between strategic alignment maturity and organizational performance using survey data from Japanese SMEs.

Mafini et al. (2016) analyzed the antecedents to supplier performance by examining the relationships between information sharing, information quality, institutional trust, supply chain collaboration and supplier performance in SMEs. The method involved administering a survey questionnaire to 400 owners and managers of SMEs in South Africa, with data analyzed using SPSS and AMOS software. The findings showed that information sharing positively influenced both institutional trust and supply chain collaboration, while information quality strongly influenced institutional trust but not supply chain collaboration. Further, institutional trust had an insignificant influence on supplier performance, whereas supply chain collaboration had a significant positive influence.

Overall, the study provided evidence that information sharing, information quality, and supply chain collaboration facilitate improvement of supply chain activities and supplier performance among SMEs.

Kusmantini et al. (2020) examined the relationships between information and communication technology (ICT), trust, supply chain collaboration and their impact on operational performance in SMEs. The method involved conducting a survey of 48 screen-printing SMEs in Yogyakarta, Indonesia and using Partial Least Square analysis to test the research models. The findings showed that ICT and trust have significant direct effects on supply chain collaboration and operational performance. The indirect effects of ICT and trust on operational performance through supply chain collaboration were also significant. Overall, the study provided evidence that ICT enables effective business communication for information sharing, while trust supports commitment to sustainable cooperation, which together with supply chain collaboration lead to higher operational performance in SMEs.

Phan et al. (2020) analyzed the relationship between customer collaboration practices in supply chain management and operational performance of manufacturing companies. The method involved collecting data between 2013-2015 from 304 manufacturing companies across 13 countries as part of the high-performance manufacturing project. Statistical descriptive, correlation, and regression analyses were conducted. The findings showed that customer collaboration practices have a positive relationship with operational performance in terms of quality, cost, delivery speed, on-time delivery, and flexibility. Overall, the study provided evidence that implementing customer collaboration practices in supply chain management can improve effectiveness for manufacturing companies. The researchers suggested that managers should develop and implement a set of customer collaboration practices to enhance operational performance.

Arsawan et al. (2022) assessed supply chain performance in SMEs, including the roles of supply chain collaboration and capabilities, innovation performance as drivers, and the moderating role of knowledge sharing. The method involved obtaining data from 179 SMEs and 537 respondents across 9 districts in Bali, Indonesia, and using partial least square

modeling to evaluate the proposed model. The findings were threefold: 1) supply chain collaboration significantly impacted supply chain capability, innovation performance, and supply chain performance; 2) innovation performance had no significant effect on supply chain performance; and 3) knowledge sharing moderated the relationship between collaboration and innovation performance. Overall, the study empirically verified the conceptual model and contributed to understanding the relationships between collaboration, innovation, knowledge sharing, and supply chain performance in SMEs.

Zaridis et al. (2021) examined the impact of collaboration in agri-food supply chains on SME performance and the moderating roles of scale constraints and firm strategy. The method involved surveying 504 agri-SMEs to test hypotheses based on the resource-based view, with data analysis using moderated hierarchical modeling. The findings showed supply chain collaboration positively impacts agri-SME performance, while scale constraints moderately impact the collaboration-performance relationship. Further, SME strategy was found to moderate the collaboration-performance relationship. Overall, the study provided evidence that agri-SMEs can strategize supply chain collaborations to overcome financial, efficiency, or innovation constraints and improve performance. The study contributed to understanding dynamic capabilities in SMEs using the extended resource-based view overlooked in prior research.

Latuconsina and Sariwating (2020) analyzed the effect of information sharing, long-term relationships, collaboration, process integration, and relationship quality on operational performance in restaurants in Ambon, Indonesia. The method involved surveying 25 purposively sampled restaurants using a Likert-scale questionnaire. Partial least squares analysis was used to identify the effects. The findings showed that information sharing, long-term relationships, and collaboration significantly positively affected operational performance, while process integration and relationship quality did not have a significant effect. Overall, the study provided evidence that information sharing, long-term business relationships, and supply chain collaboration are important factors influencing operational performance of restaurants in Ambon.

Zeraati et al. (2020) investigated the mediating role of knowledge sharing on the relationship between technological factors and supply chain performance (SCP) in the context of SMEs in Jordan. The method involved distributing a questionnaire to 371 supply chain members across various SMEs in Jordan and analyzing the data using AMOS and SEM. The findings showed that knowledge sharing mediates the relationship between technological factors (IT infrastructure and social media usage) and SCP. Specifically, the technological factors had no direct significant relationship with SCP but had a significant positive relationship with knowledge sharing. Overall, the study provided evidence for the mediating role of knowledge sharing in the technological factors-SCP relationship among SMEs in Jordan.

Cuevas-Vargas et al. (2020) examined the relationships between information and communication technologies (ICT), supply chain management (SCM), innovation, and performance in SMEs. The method involved using structural equation modeling to analyze data. The findings showed that ICT is critical for aligning operations across the supply chain and supporting innovation processes to build capabilities that improve products and services. Furthermore, SCM mediates the relationship between ICT and innovation, which is highly relevant to business performance. Overall, the study provided evidence that ICT adoption, SCM practices, and innovation are interconnected in influencing operational and business performance in SMEs. The study highlighted the importance of the machinery used in SMEs as an operational capability enabling these relationships.

Hendayani and Alviyan (2019) analysed the relationships between supply chain collaboration for value innovation (SCCVI), supply chain capability (SCC), and competitive advantage (CA) in SMEs, with SCC as a mediator. The method involved collecting questionnaire data from SMEs based on purposive sampling and using partial least squares analysis to test the second order model. The findings showed that SCC mediates the relationship between SCCVI and CA, with a positive direct relationship found between SCCVI and SCC, and between SCC and CA. In other words, better supply chain collaboration creates better supply chain capabilities, which in turn increases competitive advantage for SMEs.

Overall, the study provided evidence that SCCVI and SCC are interconnected and lead to greater CA for SMEs competing with larger companies. Further research in other creative industries was suggested.

Asree et al. (2018) investigated the impact of supply chain responsiveness and strategic supply chain collaboration on innovation performance, as well as the mediating role of collaboration between responsiveness and innovation. The method involved a web-based questionnaire survey and using structural equation modeling to test the hypotheses. The key finding was that while supply chain responsiveness and collaboration both directly and positively impact innovation performance, the mediation model where collaboration acts as a mediator result in a higher impact on innovation performance. Overall, the study provided evidence that developing responsiveness and collaboration capabilities in the supply chain enhances innovation outcomes, and there are synergistic effects when collaboration mediates the link between responsiveness and innovation.

Anwer and Siddiqui (2019) assessed the extent to which business process management influences performance and competitiveness of Pakistani manufacturing firms, with the mediating role of supply chain collaboration. The method involved collecting survey data from manufacturing firms and analyzing it using CFA and SEM. The findings showed business process management significantly influences supply chain collaboration and organizational performance. Supply chain collaboration significantly affects collaborative advantage but not organizational performance, and no relation was found between collaborative advantage and organizational performance. Overall, the study provided evidence that supply chain collaboration mediates between business process management and collaborative advantage, but not between collaboration and organizational performance. The results suggest implementing business process management can enhance performance and competitiveness of Pakistani manufacturers through supply chain collaboration.

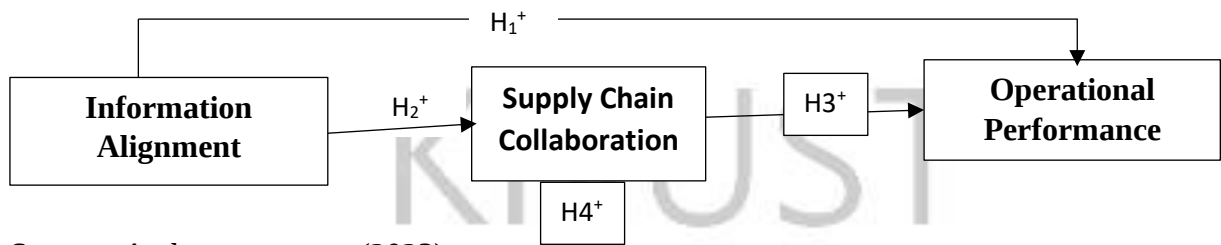
Adebayo and Lamidi (2021) investigated the influence of accounting and information technology alignment on organizational performance of small and medium enterprises (SMEs) in Lagos, Nigeria. The method involved surveying 101 SMEs in Lagos State.

The findings indicate that aligning accounting with information technology has a significant positive relationship with cost reduction and effective decision making, but a negative relationship with improving quality. Overall, investing in accounting and IT alignment can optimize SME performance through enhanced cost control and decision making, but may not directly improve quality. The study recommends that Nigerian SMEs focus on accounting and IT integration to leverage its benefits of lower costs and informed decisions, while complementing it with other initiatives to improve product/service quality.

Panda (2022) examined the effect of strategic IT-business alignment on organizational performance through the mediating roles of operational adjustment agility (OAA) and market capitalizing agility (MCA), as moderated by environmental uncertainty. The method involved a survey of 220 IT and bank managers in rural regional banks in Odisha, India. The findings indicate strategic alignment positively influences both OAA and MCA, which in turn improve organizational performance. Further, alignment has a greater impact on MCA than OAA in uncertain environments. However, OAA is a more significant mediator of the alignment-performance relationship than MCA. Overall, the study validated the positive strategic alignment-agility-performance linkages and demonstrated OAA's critical mediating role, especially when moderated by environmental uncertainty. Uniquely situated in rural Indian banks, it extends strategic alignment theory and provides empirical evidence supporting these relationships in a developing country context.

2.5 Conceptual Framework and Hypothesis Development

The theoretical model is underpinned by two key pillars, namely DCV and RVT, as seen in Figure 2.1. Based on the Dynamic skills Theory (DCT), it may be argued that firms with diverse skills are better positioned to thrive in highly unpredictable environments. In the present setting, it is expected that there would be a positive correlation between Information Architecture (IA) and Service Component Composition (SCC), leading to improved operational outcomes. The study also examined the indirect influence of self-control capacity (SCC) on the association between impulsivity and performance. The many ideas posited in this study will be further scrutinised in the subsequent analysis.



Source : Authors construct (2023)

Figure 2.1: Conceptual framework of the study

2.5.1 Information Alignment and Operational Performance

In general, information may be shared horizontally, vertically, or entirely (Huang et al., 2017), with horizontal information exchanged among consumers, merchants, or competitors. Vertical information participation involves communication between buyers and sellers, while full or total involves is a consolidation of vertical and horizontal information that may enhance SC performance and raise overall SC profit margins (Rached et al., 2016). Information serves as the primary driving force inside the supply chain system, facilitating the connection between various parties involved in the supply chain and ultimately enhancing the overall performance of many supply chains.

Bandara (2016) asserts that openness plays a crucial role in supply chains, namely in cocoa supply chains, since it facilitates effective planning of future activities. The act of exchanging crucial information among supply chain partners plays a pivotal role in fostering a high level of transparency within supply chain operations. This enables strategic collaboration (SC) partners to actively participate in comprehensive planning, coordination, and implementation processes throughout the whole SC framework, resulting in optimal effectiveness and efficiency. Trienekens et al. (2012) argue that the establishment of transparency within a supply chain may be facilitated by the interchange of information among partners. This, in turn, facilitates the development of effectively coordinated activities within the supply chain. According to Petersen (2020), the implementation of information systems (IS) has been shown to have a direct and beneficial influence on supply chain (SC) performance.

In a separate advancement, the practice of Information Sharing (IS) has been acknowledged as a significant approach to foster collaboration among participants in diverse Supply Chains (SCs). The objective is to enhance International Performance and mitigate manufacturing, distribution and strategic challenges arising from the bullwhip effect (Ali et al., 2017; Wang and Disney, 2016; Traperoet et al., 2012). The majority of scholarly investigations pertaining to the sharing of information primarily concentrate on supply networks that operate in a "one-to-one" or "one-to-many" manner, while comparatively less emphasis has been placed on supply chains that function in a "many-to-one" fashion (Huang et al., 2017). Despite the commendable concept, there exist significant obstacles in the endeavour to facilitate information sharing within the Supply Chain System (Ali et al., 2017; Spekman and Davis, 2016).

These challenges encompass a lack of trust in the system (Shnaiderman and Ouardighi, 2014), the bullwhip effect (Jeong and Jorge Leon, 2012), the potential risks associated with information disclosure, and the varying levels of information quality (Rached et al., 2016). If not effectively addressed, these issues can give rise to complications in supply chain management. However, the aforementioned challenges render the complete exchange of information across members of a supply chain unfeasible, leading to biased information sharing within physical supply chains (Huang and Wang, 2017). Riley et al. (2016) assert that effective information sharing among supply chain participants is of utmost importance for organisations aiming to detect and mitigate risks.

Consequently, managers have the ability to gather data from many sources and use it to make choices that yield advantages for their organisations. Dominguez and colleagues (2018) identified a significant positive correlation between information systems (IS) and the performance of supply chains. Despite the contributions made by various researchers in the field of information systems (IS) (e.g., Ali et al., 2017; Rached et al., 2016; Shen et al., 2014, Sunhee et al., 2013), a comprehensive comprehension of the relationship between IS and organisational performance (OP) has not been achieved and remains uncertain (Lusiantoro et al., 2018; Liu et al., 2015).

Based on these arguments and underpinned in the dynamic capability theory, it warrants the argument to be tested in the SME setting and therefore offers this hypothesis:

H1: Information Alignment have a significant positive influence on operational performance among SMEs.

2.5.2 Information Alignment and Supply Chain Collaboration

In recent times, there has been a growing emphasis by humanitarian aid agencies on the alignment of information technology, as highlighted by L'Hermitte et al. (2016). The alignment of information has been shown to have a good influence on organisational agility, as evidenced by the research conducted by Tallon and Pinsonneault (2011).

The unsolved issue is to whether the alignment of information enhances or diminishes agility in humanitarian contexts (Fawcett and Fawcett, 2013). The objective of this study is to examine the relationship between information alignment and supply chain agility. Organisations have a crucial role in making investments that are relevant to their relationships and in reorganising their business operations to align with both their internal and external business models. This is essential for the development of a cohesive and efficient system for responding to catastrophes.

In order to optimise operational efficiency, it is essential to establish a culture of open communication among staff. As per the perspective of humanitarian workers, it is imperative to establish and institutionalise the link via the implementation of explicit rules and procedures. According to (Oloruntoba, and Kovács, 2015), decision-makers in organisations must acquire and analyse information before making choices. This study assumes that supply chain collaboration may be driven by information alignment. This led to the second hypothesis:

H2: There is a significant positive relationship between information and supply chain collaboration.

2.5.4 SCC and Operational Performance

The concept of Supply Chain Collaboration (SCC) has been extensively studied and recognised as a very influential factor in Supply Chain Management (SCM). Numerous studies have examined the drivers and components of SCC and their impact on various outcomes (Alfalla-Luque et al., 2015; Flynn et al., 2010; Ni, 2015). The complex design of the SC has made it a significant factor in achieving the lofty performance targets of the SCC, as noted by many researchers (Lu et al., 2017; Vereecke and Muylle, 2006; Al-Doori, 2019).

The establishment and maintenance of collaborative connections are crucial for partners to effectively engage in the planning, coordination, and resolution of activities and challenges via collaborative means. Min et al. (2005) believe that successful collaborative partnerships rely on collaborative behaviours, including planning, goal setting, performance monitoring, and problem resolution, which are intricately linked to the exchange of information. Numerous empirical investigations have shown that engaging in cooperative behaviour facilitates the synchronisation of activities and protocols among partners, so fostering the development of trust and ultimately enhancing the quality of the relationship.

According to Jap and Ganesan (2000), the likelihood of companies sustaining a partnership is higher when they engage in cooperative behaviour. According to Subramani and Venkatraman (2003), the implementation of shared decision-making processes fosters a sense of commitment among suppliers, hence leading to an expected improvement in the overall performance of the supply chain. Zhang et al. (2015) argue that achieving comprehensive integration requires the incorporation of several elements, including resource flows (such as material, information, knowledge, and money), procedures and structure, planning and control activities, and supply chain participant strategies. The literature suggests that there exists a positive association between supply chain collaboration (SCC) and organisational success (Iyer, 2011; Salam, 2017; Bae, 2017; Shahbaz et al., 2018). Hence;

H3: Supply Chain Collaboration has a significant positive influence on operational performance among SMEs.

2.5.4 Mediating Role of Supply Chain Collaboration

In the link between the independent variables of trust and technology and the dependent variable of OP, Salam (2016) discovered a high mediation impact of supply chain collaboration. According to the literature and arguments presented thus far, SCC has been used as a mediator in response to several calls from SCM scholars (e.g., Troung et al., 2017; Veera et al., 2016; Alfalla-Luque et al., 2015; Memia, 2018; Tilahun, 2017; Nehemiah, 2017), but there have been few studies in the SMEs setting.

As a result, this research is needed to see if SCC can mediate the link between IA and OP. When H1 and H2 are combined, it can be deduced that SCC acts as an intermediary in the link between IA and OP. When companies successfully exploit their IA, they can reach high levels of SCC. SCC appears to mediate the relationship between a firm's IA and OP, based on the combination of these arguments. Firms with high levels of SIP could engage in SCC in a manner that enhances OP. The following hypothesis is hereby stated:

H4: Supply chain Collaboration positively mediates the relationship between IA and operational performance.



CHAPTER THREE

RESEARCH METHODOLOGY AND ORGANIZATIONAL PROFILE

3.1 Introduction

The chapter presents the research design, study population, sample size and sampling strategy, data types and sources, data collection technique, reliability and validity, data analysis method, ethical issues, and profile of SMEs in Ghana.

3.2 Research Design

The research design encompasses the temporal framework, data collection methodology, study kind, and number of participant groups participating in the research investigation (Thomas et al., 2016). Consequently, the research design functions as a guiding framework for the researcher to adhere to in order to accomplish the research goals and provide insights into the research questions posed in the study. Okesina (2020) asserts that research design has many components, including the study goal, research methodology, and time horizon. The study aim may be categorised as descriptive, explanatory, exploratory, or a mixture of multiple aims. Research technique options include quantitative, qualitative, or a combination of both via mixed methodologies.

Additionally, the time horizon can be either cross-sectional or longitudinal. Based on the positivist perspective, the research methodology used in this study was explanatory in nature, as opposed to being descriptive or exploratory. The explanatory research design is distinguished by the presence of hypotheses that anticipate the kind and direction of the connection between the variables under investigation. Furthermore, as indicated by Okesina (2020), the study may be categorised as cross-sectional in design due to the collection of data occurring within a restricted duration of one month. Cohen et al. (2017) used a cross-sectional survey design, using deductive reasoning to assess quantitative data. The survey design enables the collection of data from several entities within a specified time period. The study employs a positivist research philosophy.

The present study used the positivist paradigm, which is characterised by a research framework that is based on the scientific process of inquiry in various research procedures

(Kivunja & Kuyini, 2017). The commitment to positivist principles enables the development of knowledge by rigorous observation and examination of the objective consensus of external reality (Creswell, 2021). Furthermore, to achieve a conclusive result, this paradigm relies on the utilisation of deductive reasoning, the development of hypotheses, the execution of hypothesis testing, the establishment of operational definitions, and the implementation of mathematical equations, calculations, extrapolations, and expressions.

The primary aim of this research is to provide a comprehensive analysis and forecast of results via the utilisation of quantitative metrics, while concurrently discerning the fundamental factors that contribute to occurrences or outcomes (Patten, 2017). The importance of identifying and assessing the variables that influence observed outcomes is highlighted in positivist research, as seen in the study done by Hennink et al. (2020). The main aim of positivism is to enable the establishment of a certain degree of abstraction about the results of a research study done on a population (Iofrida et al., 2018). Positivism asserts the presence of an external reality or the objective world that exists independently of human consciousness.

Additionally, it upholds the potential to acquire objective knowledge about this reality or the objective world (Rassel et al., 2020). The importance of our paradigm resides in its ability to reveal causal connections in the natural world, rather than its position as the favoured method for scientific inquiry. Hence, the positivist paradigm is seen more suitable for achieving the aims of this research, which include examining the relationship between information alignment, supply chain collaboration, and operational effectiveness in small and medium-sized firms (SMEs). Given the intrinsic characteristics of the inquiry, the research used quantitative approaches for the purpose of data collection.

The justification for using the quantitative research methodology is in its capacity to provide precise and quantifiable data that may be generalised to a wider population (Goertzen, 2017). Furthermore, it is beneficial to assess hypotheses that were formed before to data collection in order to validate and support previously established principles on the processes and causality of phenomena. Quantitative research is often regarded as a deductive methodology for investigation (Ragab & Arisha, 2018). The research included a blend of descriptive and explanatory methodologies.

The present study conducts a descriptive analysis to assess the degree of information synchronisation, supply chain cooperation, and operational effectiveness within the context of small and medium-sized firms (SMEs). The primary objective of this study was to investigate the mediating effect of supply chain cooperation on the relationship between information asymmetry (IA) and operational performance. The data used in this study were obtained from small and medium-sized companies (SMEs) located in Ghana.

3.3 Population of the Study

The population is defined as the group of people or things that an investigator is most interested in throughout a research inquiry (Igwenagu, 2016). To put it another way, the target population consists of a diverse group of individuals from whom a sample should be drawn (Shamsuddin et al., 2017). The population of the research includes all SMEs in Ghana. Though there is no data on statistics on the population of SMEs in Ghana, the research designed its sample frame to explore the phenomenon among SMEs in Ghana's Greater Accra Region.

3.4 Sample Size and Sampling Technique

Babbie (2013) defines sample size as a representation of the population from which the researcher derives findings. The sample, according to Kothari (2012), is "the researcher's effort or strategy to determine the number of study participants who should be included in the sample." There are three basic ways that may be found for estimating sample size in a given population. To begin, sample size may be calculated using equations (Israel, 1992). Second, sample size is determined using a well-known statistical table, such as the one published by Krejcie and Morgan (1970) and Cohen et al. (2013). Finally, a researcher might choose to use census procedures, which include gathering data from the whole population. The sample size for this investigation was determined using Singh and Masuku's (2014) sample size determination method.

The researcher used the Singh and Masuku (2014) method since the researcher does not know the exact population of SMEs in Ghana's Greater Accra Region. Hence the formula is given as

$$n = \frac{Z^2(P)(1 - P)}{C^2}$$

Where Z= the standard normal deviation set at a 95% confidence level

P=percentage picking a choice or response (50%)

C=Confidence interval

$$n = \frac{(1.96)^2(0.50)(1-0.50)}{0.05^2}$$

$$n=384.16$$

$$n \sim 384$$

Based on the formula, 384 SMEs in the Greater Accra Region of Ghana were drawn for the study. It must be noted that the 384 (owners and managers of SMEs) are the minimum sample size needed. In order to meet this number and being cognizant of the possibility of non-responses and missing values, the study administered more questionnaires than the requirement for the minimum size. This resulted in a total questionnaire administration of 384. The notion was to ensure that the total numbers of answered questionnaires were more than adequately meet the minimum sample size requirement.

To select the right respondents, researchers should first know the type of sampling method they need to apply. In general, the probability sampling method and the non-probability sampling methods are the two types of sampling procedures.

The probability sampling technique is characterised by the principle that each individual within the population has an equal and unbiased opportunity of being selected as a participant in the study's sample. Probability sampling encompasses several techniques, such as simple random sampling, cluster sampling, and stratified sampling. In contrast, individuals selected by the non-probability sampling approach lack an equal chance of being included as a sample in the study. Instead, their selection relies solely on the researcher's decision (Mugenda, 2008; Kothari, 2012).

Simple random sampling, systematic sampling, area/cluster sampling, and stratified sampling are examples of probability sampling techniques, which include selecting a sample

from a population in a way that each individual has an equal chance of being chosen. On the other hand, non-probability sampling methods, such as quota sampling, convenience sampling, judgemental sampling, and snowball sampling, do not adhere to the principles of probability sampling and may introduce bias into the sample selection process. To ensure the appropriate selection of a sample, it is important for the researcher to possess knowledge on the sampling frame pertaining to the target population. This research used two probability sampling methods, namely the stratified sampling approach and the basic random sample method.

The use of stratified and simple random sampling methodologies ensures that the outcomes will be representative of known demographic groupings, so ensuring that each unit within the population has an equal opportunity of being picked, hence enhancing the overall representativeness of the sample.

The stratified sampling technique where the researcher puts the population into different strata or clusters then after, select the respondents (SMEs) proportionately from the strata. The sixteen districts within the greater Accra region were considered as the strata from which the sample was drawn. The use of stratified sampling gives high statistical accuracy and the reason is that the variability within the groups is lower compared to the variations in dealing with the entire population. Stratified was used because it was convenient to stratify the sample and it covers a better coverage of the entire population which gives the researcher control over the manufacturing SMEs included in the sample.

A combination of the stratified and convenience used in this study means that the study coverage is representative of the population and the study results are more generalizable.

The study employed multi-stage sampling. Multistage sampling involved dividing the population into groupings (or clusters). It is more complicated type of cluster sampling that's frequently referred to as multi-stage cluster sampling which combined both stratified and convenience sampling. With regards to this study, a multi-stage sampling that involved two stages was used. The first stage comprised the categorization of SMEs in the 16 operating districts in the study area; this was based on strata by the districts.

The second stage entailed the selection of 384 participants through a convenience sampling method; which was possible as all registered SMEs in the study area.

3.5 Types and Sources of Data

Two main sources of data exists to any research; this includes primary data and secondary data. While primary data refers to first-hand information gathered by the researcher for the purpose of the research, secondary data deals with already existing data gathered for a different purpose. The choice of data source in any research is dependent on the nature or the objective of the study. Considering the nature of this study, primary data are more suitable to be able to test the hypotheses proposed in Chapter two (2). The choice of primary data is justified by the quest to gather first-hand information on the views of managers on information alignment, supply chain collaboration and operational performance. Data used in this study was therefore gathered using a well-structured questionnaire. The subsequent section provides the description of the research instrument and the method of data collection used in this study.

3.6 Data Collection Method

The main instrument used in the data collection was a close-ended structured research questionnaire. According to Cohen et al. (2017), a questionnaire is an efficient data collection instrument if only the researcher knows exactly what is required and how to measure the variables of interest. The data collection process began with a letter from the KNUST Business School requesting firms to give the researcher permission to collect data of relevance to the study. After the permission letter was taken from the school, the researcher spoke with selected mining and retail companies to be used in the study. Permission was officially sought from human resource managers, informing them of the purpose of the study and the importance of the data collection for the current study.

Those who qualified and were interested in the study were given a statement of consent to read and sign as evidence of their willingness to participate, after which the questionnaires were administered to each respondent.

Respondents were given a week to fill the questionnaires and subsequently retrieved from the respondents. Participants who needed clarification on the questionnaire were provided with further clarification to assist them in filling it out.

This research focused on the usage of primary data gathered by questionnaire. The questionnaire was divided into two sections. The first section comprised the respondents' demographic information. The second section asked about the variables employed in this investigation. All items used in the questionnaire were sourced from previously validated instruments. SCC was measured by 5 items from (Tan et al., 2002). Operational performance measured through flexibility, lead time, customer satisfaction and speed delivery, five items were used to measure OP and were adapted from (Lu et al., 2018; Flynn et al., 2010). Information Alignment is measured by four (4) items adopted from previous studies of (Chan and Reich, 2007; Tan et al., 2010).

The survey respondents were asked to choose a numerical value ranging from 1 to 5 that most accurately represented their views on each matter. The instruments used for measuring the structures have been given in the appendix. In order to enhance the trustworthiness of the final results, this research used several validity and reliability tests on the items, notwithstanding their prior validation and confirmation. The researcher included a cover letter with each questionnaire, which stated the purpose of the study and requested the participation of the respondents. The cover letter also assured the chosen participants of their anonymity and provided a short overview of the research activities.

3.7 Data Analysis Method

The Statistical Package for Social Sciences (SPSS) software version 23 was used to analyze the information acquired from the surveys and questionnaires. Data coding and data entry were the first steps in the data analysis process. The assignment of numerical values to variables within the "Variable View" of the SPSS software was the process of data coding. The specific data preparation activities started with the retrieving or collection of the questionnaires from the respondents. The questionnaires items were assigned numerical codes for easy identification of items and the dimension of items. Missing values were addressed using the listwise deletion method. This method requires that cases with missing

values are omitted completely from the data. This is the most common and frequently used method for handling missing data. This method of treating missing values does not introduce bias in the dataset if only the remaining complete cases are more than the minimum sample size required (Donner, 1982). With respect to this study, the minimum sample size required for the study was 384. However, 10% more of the questionnaires were administered so that after taking care of non-responses and treatment of missing values, the valid cases will be equal to or more than the minimum required sample size.

3.8 Validity and Reliability Tests

Tests for reliability verify that a survey instrument generates the same results across measures, whether they are conducted with the same population or with a similar population (Singh et al., 2015). By measuring or analyzing the Cronbach alpha coefficient, it is possible to determine or analyze the instrument's reliability. Following George and Mallery (2010)'s Cronbach alpha coefficient of 0.7 or higher was considered to be a reliable instrument to meet the reliability standard. Singh et al. (2015) indicated that validity is a measure of the degree to which an instrument measures what it claims to measure. Robson et al. (2011) also defined validity as the degree an instrument actually measures what it is intended to measure or how accurate an instrument is. The process of ensuring that the survey accurately measured what it was intended to evaluate in terms of the constructs is known as validity of research instrument (Singh et al., 2015). For data collection and analysis, proper research processes were followed in order to verify the validity of the results. The questionnaire was presented to the supervisory team of experts to review the instrument. Once corrections were approved, no changes were made to the questionnaire and was distributed as such. The validity of the instrument was measured using the discriminant validity, convergent validity and average variance extracted

3.9 Ethical Considerations/Issues

The rules that must be observed while doing any form of study are known as ethical concerns (Singh et al., 2015). According to Fleming and Zegward (2018), informed consent, risk of harm, confidentiality and anonymity, and conflict of interest are all ethical considerations that must be evaluated and addressed in a research. During the data gathering procedure, ethical concerns were followed, the first of which was informed consent. All research participants were fully told about the study's objectives and were given the option of participating or not. For data collecting reasons, only individuals who actively accepted to participate in the research were included.

Individuals who felt uncomfortable disclosing information about their employment, on the other hand, were excused from the survey. In this way, participation in this research was entirely optional and respondents may opt out at any moment throughout the data gathering procedure. Another ethical consideration that drove the data collection process was the secrecy of information obtained. The researcher confirmed that all data obtained from survey respondents was kept safe and that no third party had access to it.

Participants' anonymity was also essential during the data collection process. The researcher ensured that no information revealing the participants' identities, such as names, addresses, or phone numbers, was included in the data collection instrument.

3.9.1 Profile of SME Sector in Ghana

Small and medium-sized businesses (SMEs) are vital to the global economy because they promote innovation, job opportunities, and economic progress. SMEs play a key role in social development, economic growth, and regional integration in Africa. Particularly in Ghana, where they contribute significantly to the GDP and support the livelihoods of a large number of people, SMEs play a significant role in the economy. These companies encourage entrepreneurship, help the economy diversify, and support the growth of regional industries. Additionally, by generating employment possibilities in rural regions and minimizing the migration of people to cities in pursuit of work, SMEs in Ghana play a critical role in bridging the urban-rural gap. Additionally, because they are more flexible and nimble than larger firms, these small businesses frequently act as a platform for innovation and technological

growth. In general, Ghana's SMEs must expand and prosper if the nation is to sustainably develop and its citizens to live well.

3.9.2 Summary

The study strategy and technique used to solve the research topics were provided in the Chapter. The sections provided methodology options and reasons for those options. There are seven parts in this chapter. The study population, sample size, sampling strategy, data source, research instruments and data collecting technique, validity and reliability, and ethical considerations were all adhered to in accordance with the research design and procedures. The following part analyses the data acquired by the methodology outlined in the preceding chapter.



CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULT

4.1 Introduction

This chapter is divided into seven sections. The study population, sample size, sampling technique, data source, research instruments and data collecting process, validity and reliability, and ethical consideration were all followed by the research design and procedures. The data produced using the approach given in this Chapter is examined in the next section.

4.2 Respondents Profile

This section provides the demographic information of the respondents, which offers insights into the characteristics of the subjects and the companies that took part in the survey. The primary data acquired from participants include gender, age, educational attainment, respondents' department, respondents' position, age of businesses, number of workers, and ownership type.

Table 4.1: Respondents Profile

Variables	Categories	Frequency	Percent
Gender	Female	103	26.8
	Male	281	73.2
Age	18-30 years	20	5.2
	31-40 years	199	51.8
	41-50 years	105	27.3
	Above 50 years	60	15.6
Level of Education	Bachelor Degree	157	40.9
	Diploma	22	5.7
	Graduate studies (Master/Ph.D.)	202	52.6
	Senior High School	3	0.8
Your position in the firm	Business Owner	243	63.3
	Business Owner and Manager	97	25.3
		41	10.7
	Production Manager	3	0.8
Years of Business Operation	1-5 years	129	33.6
	6-10 years	159	41.4
	11-15 years	62	16.1
	16 years and above	34	8.9

Size of employees	5-29 employee	9	2.3
	30-99 employees	131	34.1
	More than 100	244	63.5
Type of ownership	Fully locally owned	342	89.1
	Fully foreign owned	29	7.6
	Jointly Ghanaian and foreign owned	13	3.4
	Total	384	100.0

There were 26.8% females and 73.2 men among the 384 valid replies. According to the data, the study included more men than women. This also implies that males occupy the vast majority of managerial positions in SMEs. 5.2% were between the ages of 18 and 30, 51.8% were between the ages of 31 and 40, 27.3% were between the ages of 41 and 50, and 15.6% were beyond 50. The bulk of individuals who answered were between the ages of 31 and 40, according to the statistics. A bachelor's degree was held by 40.9% of the 384 respondents, a diploma by 5.7%, graduate studies (Master's or Ph.D.) by 52.6%, and a high school diploma by 0.8%. According to the statistics, a significant proportion of respondents have either a Master's or Ph.D. degree. Out of the total sample size of 384 participants, a majority of 63% identified themselves as company owners.

Additionally, 25.3% of the respondents held positions as both business owners and managers, while 10.7% exclusively identified as managers. A small proportion of 0.8% of the participants reported their occupation as production managers. According to the statistical data, the majority of respondents were individuals who identified themselves as company owners. Out of the total 384 logistics service organisations surveyed, 33.6 percent have a duration of existence ranging from one to five years. Additionally, 16.1 percent of these firms have been in operation for a period of eleven to fifteen years, while 8.9 percent have been functioning for more than sixteen years. Furthermore, 41.4 percent of the logistics service firms have been in operation for a span of six to ten years. Based on the provided data, a significant majority of the firms that participated in the survey had a duration of operation ranging from 6 to 10 years. Out of the total sample of 384 logistics service firms, 34.1% were found to have a workforce size ranging from 30 to 99 people.

Additionally, 2.3% of the organisations had a staff size between 5 and 29 employees, while the majority, accounting for 63.5%, had a workforce above 100 employees.

Based on the provided data, a majority of the surveyed enterprises reported employing a workforce exceeding 100 individuals. Among the 384 participants who responded, it was found that 89.1% indicated that the firm in question was under complete ownership by Ghanaians. Additionally, 7.6% of the respondents said that the company was exclusively owned by foreigners, while 3.4% mentioned that it was jointly owned by both Ghanaians and foreigners. Based on the data provided, it can be seen that a significant majority of the participants' enterprises operated only within their local vicinity.

4.3 Reliability and Validity Test

Cronbach's alpha and composite reliability are statistical measures used to assess the internal consistency of measurement instruments in terms of how reliably they measure the variables of interest. According to Hair et al. (2013), it is essential that these values fall within the range of 0.7. Variables that have values over 0.7 were deemed to be reliable. To assess convergent validity, the average variance extracted (AVE) value was found to exceed 0.5, as reported by Hair et al. (2013). The Fornell-Larcker criteria were used in order to assess the discriminant validity. Each individual item has a stronger degree of association with itself compared to any other variable. The cross-factor loadings also indicate that each component exhibits a stronger correlation with its respective variable compared to the other variables, suggesting that the relevant variables were appropriately included into the study.

Table 4.2: Reliability and Validity Test

Construct	Number of items	CA	CR	AVE
Information Alignment	4	0.885	0.891	0.743
Operational Performance	4	0.884	0.888	0.743
Supply Chain Collaboration	5	0.929	0.933	0.779

The ratings for CA, CR, and AVE are shown in Table 4.2 above. Cronbach alpha scores for information alignment, operational performance, and supply chain collaboration were 0.885,

0.884, and 0.929, respectively. For Composite Reliability, Information Alignment obtained a score of 0.891, Operational Performance received a score of 0.888, and Supply Chain Collaboration received a score of 0.933. A score of 0.7 is acceptable for each of these values, reflecting the variables' dependability.

For the Average Variance Extracted (AVE), information alignment and operational performance both obtained a score of 0.743, while Supply Chain Collaboration received a score of 0.779. Because there is a minimum permitted value of 0.5, the variables are suitable.

Table 4.3: Correlations and Square Root of AVE (Fornell – Larcker Criteria)

Construct	1	2	3
Information Alignment	0.862		
Operational Performance	0.534	0.862	
Supply Chain Collaboration	0.538	0.662	0.883

The researchers used criteria and cross-factor loadings as a means to establish discriminant validity. In contrast to the evaluation of convergent validity, which pertains to the degree to which latent variables effectively capture the main variable, the assessment of discriminant validity focuses on the accuracy with which latent variables reflect additional dimensions within the study context. The Fornell-Larcker Criterion is a widely acknowledged method used for evaluating the discriminant validity of conceptions (Henseler et al., 2015; Hair et al., 2017). Hair et al. (2017) argue that a model demonstrates strong discriminant validity when the correlation between two theoretical constructs is lower than the square root of the average variance extracted (AVE) for each construct variable.

Based on the data presented in Table 4.3, the correlation coefficient between Information Alignment and its own variable was determined to be 0.862. Furthermore, it is worth noting that Information Alignment demonstrated correlations of 0.534 and 0.538 with Operational Performance and Supply Chain Collaboration, respectively. The study revealed correlation values of 0.662 and 0.862 for operational performance and supply chain cooperation, respectively. The calculated correlation coefficient between SC Collaboration and itself was determined to be 0.883. Consequently, it was seen that each variable exhibited a stronger

correlation with itself compared to the variables positioned above it, so establishing its validity.

Table 4.4: Cross – Factor Loadings

Factor	Code	Information Alignment	Operational Performance	Supply Chain Collaboration
1	IA1	0.835	0.372	0.418
2	IA2	0.881	0.447	0.451
3	IA3	0.860	0.512	0.503
4	IA4	0.873	0.494	0.473
5	OP1	0.404	0.892	0.585
6	OP2	0.473	0.900	0.598
7	OP3	0.518	0.870	0.591
8	OP4	0.443	0.781	0.504
9	SCC1	0.431	0.503	0.827
10	SCC2	0.470	0.565	0.891
11	SCC3	0.507	0.578	0.891
12	SCC4	0.488	0.641	0.896
13	SCC5	0.475	0.624	0.907

The cross-factor loadings test is the most often used validity test for determining the relationship between each latent variable and the principal variable or idea. The components having the greatest relationships with the principal variable are deemed valid. The items with the codes IA1, IA2, IA3, and IA4 received scores of 0.835, 0.881, 0.860, and 0.873 for the Information Alignment, accordingly. Criteria 5 to 8 loaded the most heavily under Operational Performance and are therefore appropriate factors to use when assessing Operational performance. It was decided to employ the objects OP1, OP2, OP3, and OP4 since they loaded highly across all structures. The results are, correspondingly, 0.892, 0.900, 0.870, and 0.781. Indicators 9 through 13 have the greatest SC Collaboration loadings and are therefore appropriate factors for assessing supply chain collaboration. Due to their large loading in all builds, the elements SCC1, SCC2, SCC3, SCC4, and SCC5 were employed. The results are: 0.827, 0.891, 0.891, 0.896, and 0.907.

4.3.1 Descriptive Analysis

To summarise respondents' perspectives on the numerous factors investigated in this research, descriptive statistics such as mean and standard deviations were employed. Details are provided in the following sections, which are labelled.

4.3.2 Information Alignment

Four (4) valid and reliable variables were used to quantify information alignment following the completion of the reliability and validity tests. Using the scale 1-strongly disagree and 5-strongly agree.

Table 4.5: Descriptive Statistics of Information Alignment

Variables	Min	Max	Mean	Std. Dev
We use informal information sharing agreements among participating organizations	1	5	3.88	0.845
We regularly communicate our future strategic needs to our service providers	1	5	3.87	0.791
We regularly communicate our future strategic needs among partners	1	5	3.75	0.882
We create compatible information systems among organizations	1	5	3.84	0.846
Overall Mean			3.83	0.841

Descriptive statistics, including means and standard deviations, were employed in this stage of the studies to summarise respondents' perspectives on information alignment. According to Table 4.5 findings, all of the questions do, in fact, assess information alignment. Organizations that have informal agreements in place to share data with other participating businesses have a mean score of 3.88, while those that frequently communicate their future strategic requirements to their service suppliers have a mean score of 3.87. The average score for the statement " We create compatible information systems among organizations is 3.84.

4.3.3 Supply Chain Collaboration

Five (5) reliable and valid variables were used to assess the SC collaboration after the reliability and validity tests were completed. Using the scale 1-strongly disagree and 5-strongly agree.

Table 4.6: Descriptive Analysis of Supply Chain Collaboration

Variables	Min	Max	Mean	Std. Dev
My company actively provides resources to assist suppliers in improving their skills.	1	5	3.86	0.882
Supply chain partners collaborate to set strategic goals.	1	5	3.96	0.836
The performance of suppliers is continuously evaluated and serves as the foundation for future business.	1	5	4.00	0.845
Third-party service providers handle order processing for my company.	1	5	3.95	0.869
Members of the supply chain share value-added resources.	1	5	3.96	0.859
Overall Mean			3.95	0.858

In this part of the analysis, the mean and standard deviation were used to describe how respondents felt about SC collaboration. Table 4.6 shows that all of the items seem to test how well SC members work together. Although, supplier performance is closely watched and used to make decisions about future business.

This gets a mean score of 4.00, followed by a mean score of 3.96 for strategic goals being set by supply chain partners and value-added resources being shared among supply chain members. Also, the average score of the third-party service providers my company uses to handle order processing is 3.95. My company shares resources with suppliers in a big way to help them improve their capabilities, which have a mean score of 3.86. The results showed that indicators of SC collaboration were those that were above the overall mean of 3.95. This means that an organisation keeps a close eye on the performance of its suppliers and uses that as a basis for future business, that strategic goals and value-added resources are shared among supply chain members, and that order processing is done by a third party service provider.

4.3.4 Operational Performance

Five (5) reliable and valid variables were used to assess the operational performance after the reliability and validity tests were completed. Using the scale 1-strongly disagree and 5-strongly agree.

Table 4.7: Descriptive Analysis of Operational Performance

Variables	Min	Max	Mean	Std. Dev
Our organisation can swiftly adapt our products/services to fit the needs of our customers.	1	5	3.90	0.859
Our organisation is capable of fast introducing new items to the market.	1	5	3.91	0.807
Our organisation is able to adapt rapidly to market developments.	1	5	3.98	0.784
The lead time for completing clients' orders is minimal.	1	5	3.92	0.805
Our organisation gives excellent customer service.	1	5	3.88	0.8
Overall Mean			3.92	0.811

In this stage of the studies, mean and standard deviation were utilised to summarise respondents' perceptions of operational performance. According to Table 4.7's findings, all of the criteria seem to be used for assessing operational performance.

However, the company's ability to adapt fast to market shifts received the highest mean score (3.99), followed closely by the short lead time for delivering customers' orders (3.92). The average score for a company's ability to bring new items to the market rapidly is 3.91. The median customer requirement score for our organisation is 3.90, indicating that we can make rapid adjustments to our goods and services to satisfy our clientele. The average score for the quality of our company's customer service is 3.88. The findings revealed that operational performance metrics were located above the general mean of 3.92. This indicates that the firm is fast in its response to market fluctuations and that it has a short processing time for client orders.

4.4 Structural Model Analysis and Hypotheses Testing

Researchers may use the structural model, sometimes referred to as the inner model, to evaluate the potential of the model and make predictions for one or more desired structures. The research will use a bootstrapping technique, namely resampling with replacement, to generate 5000 samples. The standard error will be calculated based on the confidence level specified by the measurement model. These samples will be used to evaluate the mediating and moderating models proposed in the study, as outlined by Hair et al. (2014). In this work, we conducted an analysis of several statistical metrics, including the f-value, p-value, path coefficient, R² values, effect sizes of f² and q², and R² values for the structural model. When the coefficient of the route is assigned a value of +1, the structural model exhibits a robust and positive correlation. In this research, the p-value and t-value were used to assess the significance of the structural path coefficient. This was particularly important since the standard error of the structure route coefficient exhibited significant variability throughout the process of bootstrapping. The expected t-value was 1.96 with a significance level of 0.05%.

4.4.1 Predictive Relevance

Table 4.8 shows the investigated route coefficients for the structural model. These constructs were judged significant because their t-values were more than 1.65 at the 5% level of significance. Confirmatory Factor Analysis (CFA), another piece of software, is comparable to this one. Alternatively, the significant p-values for the aforementioned constructions were all less than 0.10.

4.4.2 Coefficients of Determination (R²)

The coefficient of determination (R²) demonstrates that the independent variables account for a portion of the overall variance in the dependent variable (R²). (R²) assesses how well the independent factors predicted the final outcome. Falk and Miller (1992) state that an R² of 0.10 or above is necessary to recognise a model's predictive relevance. Table 4.8 shows

that prediction accuracy (adjusted R²) for Operational Performance is 0.483 and for SC Collaboration is 0.289.

Table 4.8: Coefficients of Determination (R²)

Construct	R-square	R-square adjusted
Operational Performance	0.483	0.481
Supply Chain Collaboration	0.289	0.287

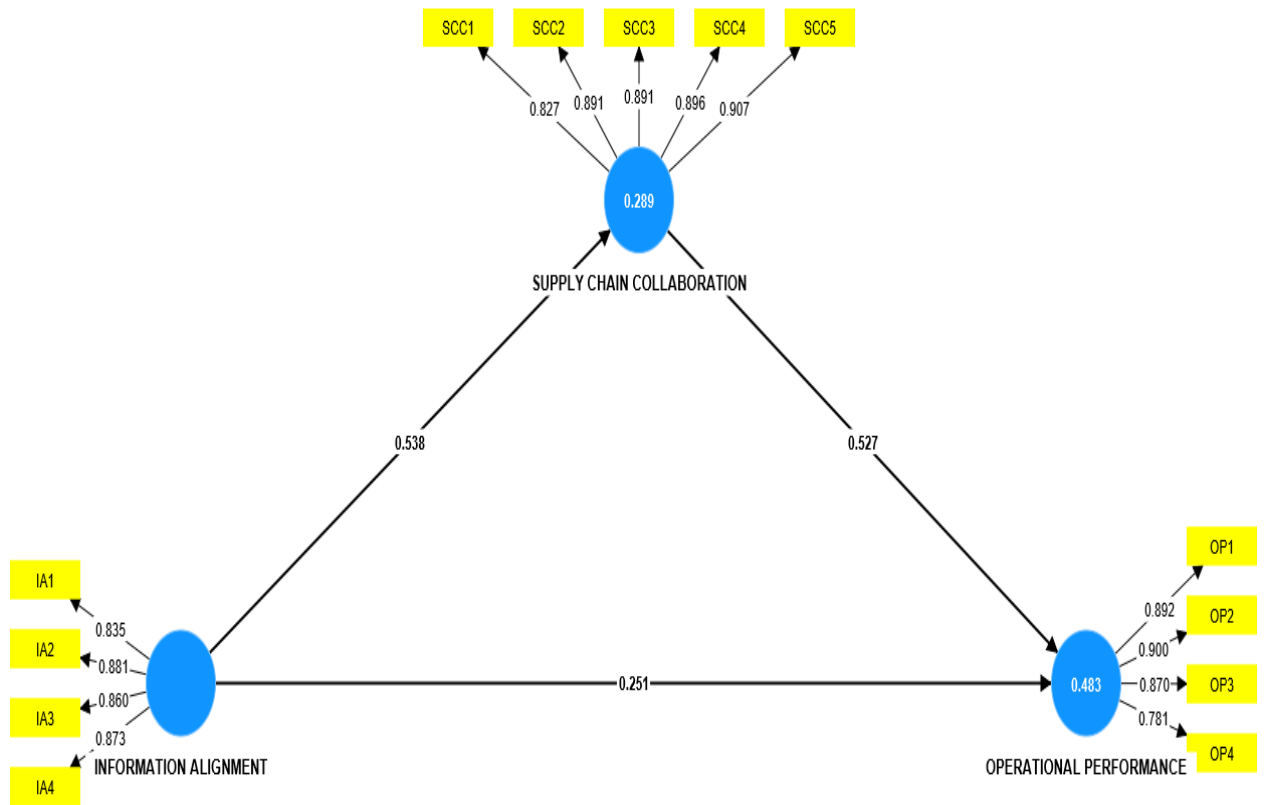
4.5 Model Fit Summary

There are three primary categories of fit indices in the context of confirmatory factor analysis (CFA), which have been subsequently expanded upon by various scholarly investigations. These categories include "actual fit indices," "parsimony correction indices," and "comparative fit indices" (Kline, 2005; Brown, 2015). The present study used the Root Mean Square Error of Approximation (RMSEA) index, as well as the Normed Fit Index (NFI) and the Standardised Root Mean Square Residual (SRMR) indices for comparative and absolute fit assessment, respectively.

The calculated model's standard deviation of the mean residual (SRMR) was found to be below 0.08. The calculated NFI value for this model was deemed insufficient, since it exceeded the threshold of 0.95. The standardised root mean square residual (SRMR) for this particular question was calculated to be 0.052. This value is within the acceptable range of fit, as shown by the guidelines provided in Table 4.9. The Normal Fit Index (NFI) yielded a value of 0.910, while the Chi-square statistic was calculated to be 336.759.

Table 4.9: Model Fit Summary

	Estimated model
SRMR	0.052
d_ULS	0.246
d_G	0.146
Chi-square	336.759
NFI	0.910



Source: Field Survey (2023)

Figure 4.1: Measurement Model Assessment

4.6 Hypotheses for Direct and Indirect Relationship

SmartPLS 4 is utilised in this section to test the study hypotheses. Table 4.10 summarises the findings. The primary purpose of the research is to determine how information alignment influences operational performance by examining how SC cooperation functions as a connection. **Table 4.10: Hypotheses for Direct and Indirect Relationship**

Construct	Path Coefficient	T statistics (O/STDEV)	P values	Results
Information Alignment -> Operational Performance	0.251	4.884	0.000	Supported
Information Alignment -> Supply Chain Collaboration	0.538	9.726	0.000	Supported

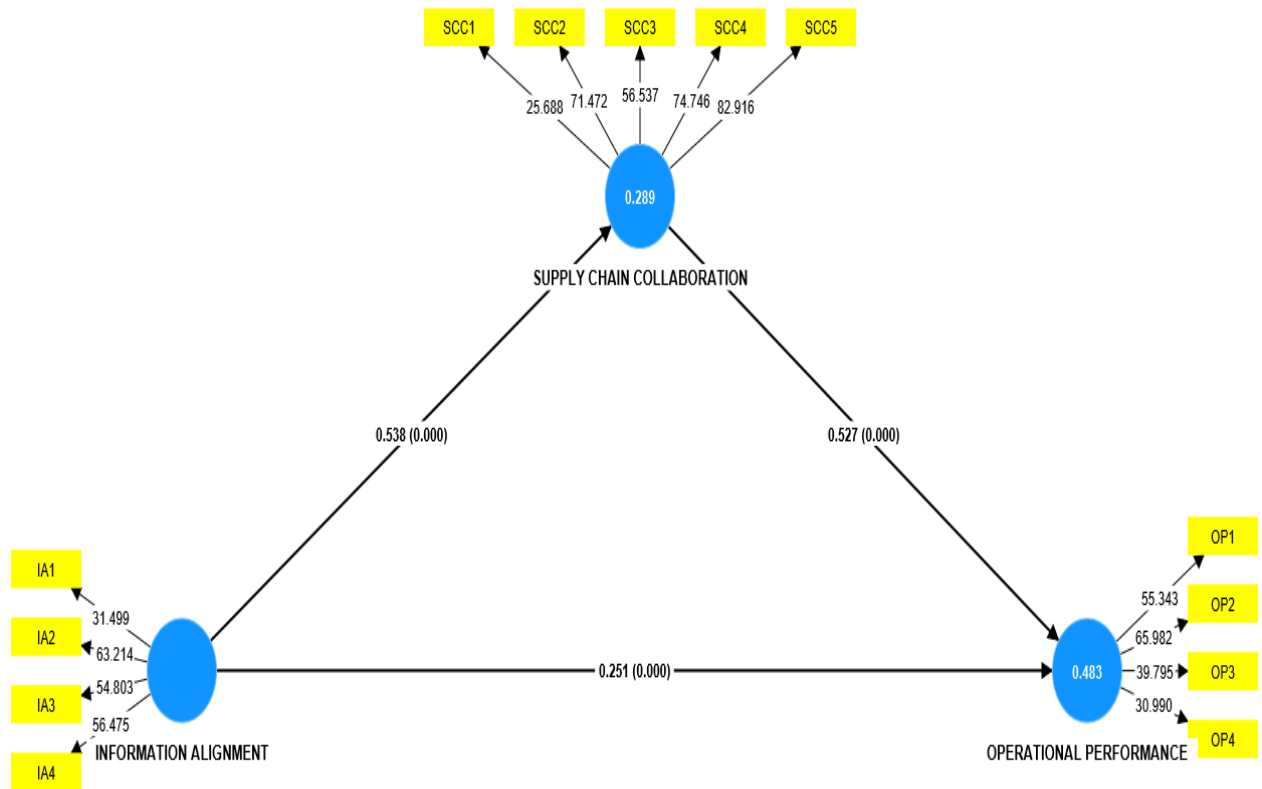
Supply Chain Collaboration -> Operational Performance	0.527	10.397	0.000	Supported
Information Alignment -> Supply Chain Collaboration -> Operational Performance	0.284	7.547	0.000	Supported

With the variables $B=0.251$, $t=4.884$, $P=0.000$, and $Sig0.05$, Table 4.10 shows the direct influence of information alignment on operational performance. Because the p-value for H1 was less than 0.05 and the path coefficient was determined to be positive, it implies that information alignment had a significant positive direct influence on operational performance. greater information alignment leads to greater operational performance if the route coefficient is positive.

Information alignment has a direct influence on SC cooperation ($B=0.538$; $t=9.726$; P value $=0.000$; $Sig0.005$). Because the p-value for H2 was less than 0.05 and the route coefficient was determined to be positive, there was a significant positive direct influence on information alignment to SC cooperation. Improved information alignment promotes SC cooperation since the path coefficient is positive.

Collaboration among SCs improved operational effectiveness ($B=0.527$; $t=10.397$; $P=0.000$; $Sig0.005$). Because the p-value was less than 0.05 and the path coefficient was determined to be positive, it concludes that SC cooperation had a significant positive direct influence on operational performance, confirming the third hypothesis (H3). The positive path coefficient indicates that as SC cooperation expands, operational performance will improve.

SC cooperation influenced information alignment and operational performance in a significant indirect way ($B=0.284$; $t=7.547$; P value $=0.000$; $Sig0.005$). Because the p value for H4 was less than 0.05 and the path coefficient was found to be positive, SC cooperation may be argued to be a positive mediator between information alignment and operational performance. Because SC cooperation has a positive route coefficient, it is an important moderator in the link between information alignment and operational performance.



Source: Field Survey (2023)

Figure 4.2: Structure Model Evaluation

4.7 Discussion of Findings

This section discusses the study findings in respect to the body of existing literature. It explains how information alignment on operational performance by analysing the function of SC collaboration as a mediator. The study goes on to explore the objectives about the connection between information alignment, operational performance, and supply chain collaboration.

4.7.1 Effect of Information Alignment on Operational Performance

The first goal of the study is to look at how SMEs' information alignment affects their operational performance. The data demonstrates that the information alignment to operational performance was significantly influenced positively. This indicates that better operational performance occurs when management enhances information alignment. Over time, companies are investing more in their IT to cultivate the internal skills necessary to

fully exploit emerging technology (Coltman et al., 2015). A higher investment in IT is not, however, always indicative of better resource management inside a company. Companies often find that investing much in their IT and communication infrastructure does not provide the desired results (Héroux and Fortin, 2018). However, businesses have a real opportunity to boost efficiency by implementing cutting-edge IT into their operations (Luftman et al., 2017). According to the research, IT has to be introduced before rivals or ingrained inside an organisational process before it can become a firm-specific method and increase its appropriateness (Héroux and Fortin, 2018). It is more likely that companies will gain a competitive advantage if they adopt cutting-edge IT before their rivals do. Once collected, a high degree of IT innovation is projected to bring additional benefits that would be unavailable to late adopters. Particularly, a company's emphasis on IT development reflects its commitment to adopting cutting-edge technology in order to remain competitive. When this happens, IT loses some of its universality and becomes firm-specific, giving the early adopters a competitive advantage over their peers for at least some time (Bagheri et al., 2019; Coltman et al., 2015; Mikalef and Pateli, 2017).

4.7.2 Effect of Information Alignment on Supply Chain Collaboration

The second goal of the research is to analyse how SMEs might benefit from supply chain collaboration via information alignment. According to the results, information alignment has a direct and significant effect on SC collaboration. This suggests that better cooperation with SC partners occurs when management enhances information alignment. According to Tatham and Rietjens (2016), successful cooperation requires an appreciation of the complexities inherent in a given setting, including the many roles, connections, capabilities, motivations, and information-sharing demands that exist within it. Further, Chi et al. (2020) believe that proper rules and procedures should be in place to guide and control IT-enabled collaborative actions in order to maximise the impact of relationship-specific IT investment. Since this is the case, we may say that information alignment boosts teamwork (Simatupang and Sridharan, 2018; Gumboh and Gichira, 2015; Chi et al., 2020).

The establishment of long-lasting, trusting bonds between channels partners is aided by advances in general technology infrastructure (Afshan et al., 2018; Salam, 2017; Kim, 2017).

Collaboration in the supply chain is impossible without technological procedures that allow for the smooth transfer of data between parties. Information sharing technology is one example of such a method. Electronic data exchange (EDI), the internet, and other forms of IT have greatly facilitated cooperation in the supply chain. It has also been shown that IT may facilitate trade between different parties (Oguz et al., 2018). As a result of its potential to boost both individual company performance and supply chain performance as a whole, IT has been universally acknowledged as a crucial aspect in the supply chain. Streamlining processes requires open communication between cooperating partners.

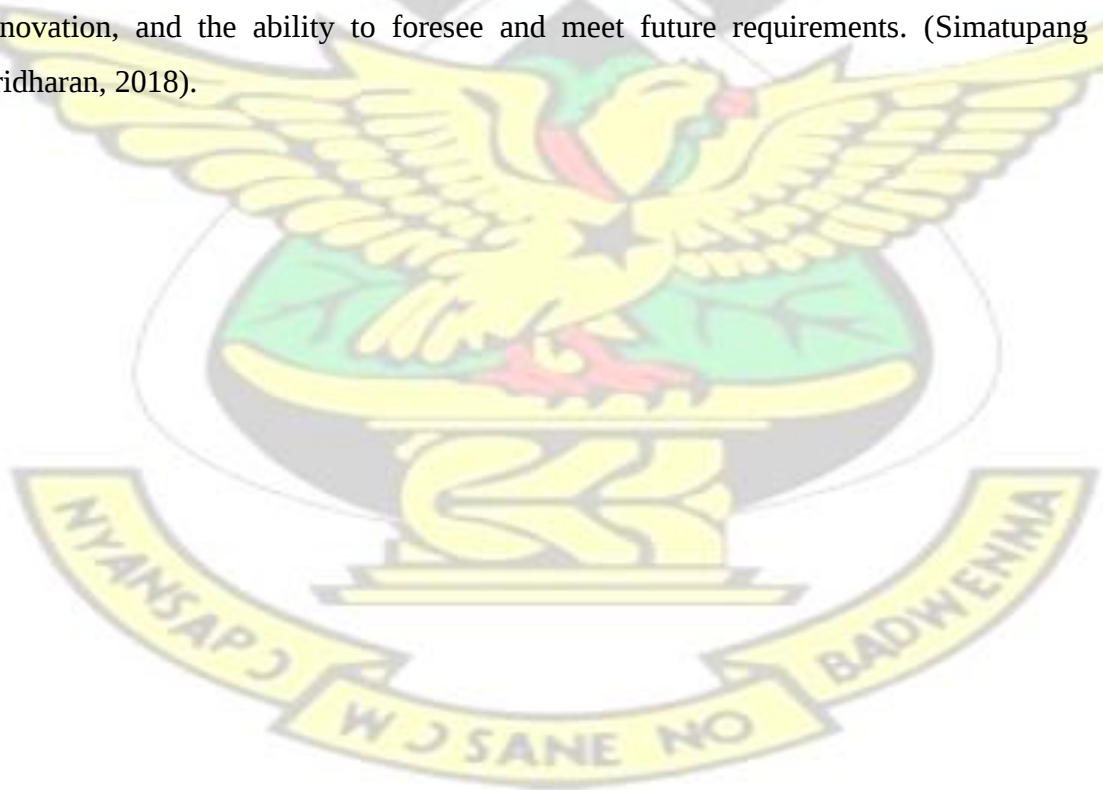
4.7.3 Mediating Role of Supply Chain Collaboration

The final goal of this research is to see how supply chain collaboration plays a mediating role in the connection between information alignment and operational performance in SMEs. The data indicates that SC collaboration significantly impacted operational performance positively. This indicates that a company's operational efficiency improves when its management works to foster better communication and cooperation with its supply chain partners.

It's also possible that SC collaboration positively mediates the connection between information alignment and operational performance. Because of this, the research once again stresses the significance of management's dedication to enhancing information alignment and collaborating with supply chain partners in order to boost operational performance. Differential performance is the ultimate goal of every successful collaborative effort (Alsaad, Yousif, and AlJedaiah, 2018). Many previous studies have shown that the capacity to recognise and combine complementary qualities via cooperation leads to improved performance (Moshtari, 2016; Liao et al., 2017; Rezaei et al., 2015; Ralston et al., 2015). Also, cooperation shortens cycle times, increases quality, decreases product and supply chain costs, and enhances customer service (Kotzab et al., 2018; Yu, 2015; Wang et al., 2015; Panahifar et al., 2018). Because rivals would need to buy the same supplementary resources and use them in the same way, collaborative benefits are notoriously tough to imitate (Singhry et al., 2015).

Collaboration's advantages include increased profits, decreased expenses, and more adaptability in the face of fluctuating demand (Salam, 2017).

Hewlett-Packard, IBM, Dell, and Procter and Gamble are just a few companies that have tapped into the benefits of collaboration via tight engagement with partners (Damang and Munizu, 2019; Dubey et al., 2021; Gumboh and Gichira, 2015). It is crucial for the success of collaborative partnerships that partners work together to plan and organise activities and find solutions to issues that arise. Joint activities, such as planning, goal setting, performance monitoring, and issue resolution, were shown to be crucial for effective collaborative partnerships by Afshan et al. (2018), and were found to be directly associated to information sharing. According to Total integration, according to Zhang et al. (2015), necessitates supply chain partners integrating resource flows (material, information, knowledge, and money), processes, and organisational, planning, and control activities and strategies. Other recent studies, such as Zhang and Huo (2013) and Qrunfleh and Tarafdar (2014), agree on the existence of a favourable relationship between supply chain cooperation and a company's success. Members of the supply chain are able to better serve their consumers when they work together, since this facilitates faster responses to client demands, better product innovation, and the ability to foresee and meet future requirements. (Simatupang and Sridharan, 2018).



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The purpose of this research was to investigate the relationship between information alignment and operational performance in SMEs in emerging countries, as well as the mediating impact of supply chain cooperation. The study's findings and conclusions are described and briefly discussed in the first section of the chapter. The chapter finishes with research recommendations.

5.1 Summary of Findings

This section provides a summary of the study's principal results. The summaries are given in accordance with the study's three particular goals.

5.1.1 Effect of Information Alignment on Operational Performance

The first goal of the study is to look at how SMEs' information alignment affects their operational performance. The data demonstrates that the information alignment to operational performance was significantly influenced positively. This indicates that better operational performance occurs when management enhances information alignment.

5.1.2 Effect of Information Alignment on Supply Chain Collaboration

The second goal of the research is to analyse how SMEs might benefit from supply chain collaboration via information alignment. According to the results, information alignment has a direct and significant effect on SC collaboration. This suggests that better cooperation with SC partners occurs when management enhances information alignment.

5.1.3 Mediating Role of Supply Chain Collaboration

The final goal of this research is to see how supply chain collaboration plays a mediating role in the connection between information alignment and operational performance in SMEs. The data indicates that SC collaboration significantly impacted operational performance positively.

This indicates that a company's operational efficiency improves when its management works to foster better communication and cooperation with its supply chain partners. It's also possible that SC collaboration positively mediates the connection between information alignment and operational performance.

Because of this, the research once again stresses the significance of management's dedication to enhancing information alignment and collaborating with supply chain partners in order to boost operational performance.

5.2 Conclusion

The purpose of this study is to identify the role of supply chain cooperation as a moderator in the link between information alignment and operational performance among SMEs in developing economies. In particular, a cross-sectional research design was used for this investigation. For this inquiry, a quantitative technique was applied. 384 people were chosen using the purposive sampling approach. A predefined questionnaire was the primary technique of information collecting. SPSS v26 and SmartPls v4 were specifically used for statistical analysis. The data was studied utilising both descriptive and inferential techniques of investigation.

According to the findings, information alignment has a direct and substantial influence on operational performance and SC cooperation. The data indicates that SC collaboration significantly enhance operational performance. The study also found that SC collaboration significantly mediates the connection between information alignment and operational performance. In conclusion, this study emphasizes that though information alignment is essential for achieving operational performance, supply chain collaboration plays a supporting role in achieving optimal operational performance.

5.3 Recommendation

This section gives suggestions to various stakeholders based on the study's findings. These proposals are urged to be considered by management and researchers.

5.3.1 Recommendations for Management

According to the results, information alignment has a direct, positive effect on operational performance. This indicates that better operational performance occurs when management enhances information alignment. As a result, the research suggests that management use IT to boost interactions amongst SC partners and increase operational performance.

The research also discovered a direct and positive effect of information alignment on SC collaboration. This suggests that better cooperation with partners occurs when management enhances information alignment. Companies should think about using IT solutions, since studies have proven that information alignment improves collaboration.

In conclusion, the research confirmed that SC collaboration has a direct, positive effect on operational performance, also acts as a positive mediator between information alignment and operational performance. Businesses should prioritise methods that encourage cooperation and integration across supply chain partners in light of the substantial influence collaboration has on operational performance. Study findings stress the importance of management's dedication to enhancing information alignment and collaborating with supply chain partners to boost operational effectiveness.

5.3.2 Recommendation for Future Studies

Despite its importance, this research must be viewed in light of its limitations. Even though the research revealed a causal relationship between the variables, the cross-sectional nature of the data used in this analysis made it more difficult. A longitudinal research might help to correct this in the future. Using quantitative methodologies, the research also investigated the mediating influence of SC cooperation on the connection between information alignment and operational performance.

As a consequence, doing such research in the future may need the employment of a qualitative approach. This work implies that future studies may use additional statistical analytic methodologies to evaluate the influence of information alignment on operational performance by examining the mediating role of SC collaboration. These findings highlight the need of future study into the role that internal and external cooperation plays in enhancing operational performance. Future research should incorporate more complete cooperation facilitators. Managers' devotion is another component that may pave the route for success.

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APPENDIX I
SURVEY QUESTIONNAIRE

Dear Sir/ Madam,

My name is, a postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me carry out research to examine how supply chain innovation could be achieved through knowledge management capability and the mediating role of organizational learning in the direct relationship. Any information provided will be used for academic purposes ONLY. There are no risks associated with your participation, and your responses will remain confidential and anonymous.

SECTION A: RESPONDENT'S BIOGRAPHY AND COMPANY PROFILE

When completing this questionnaire, please tick [☒] in the applicable box or provide an answer as applicable.

Please answer the following questions:

1. Gender: Male ☐ Female ☐

2. Age

18-30 years ☐ 31-40 year's ☐ 41-50 years ☐ Above 50 years ☐

3. Level of Education

Junior High School ☐ Senior High School ☐ Diploma ☐ Bachelor Degree

☐ Graduate Studies (Master / Ph.D.) ☐ Others ☐ For Others, Please specify:.....

4. Your Position in the Firm

Business Owner ☐ Business Owner and Manager ☐ Manager ☐ Production

Manager

☐

Others

☐.....

5. *How many years have your firm been in operation?*

1 - 5 years ☐ 6 - 10 years ☐ 11 – 15 years ☐ 16 years and above ☐

6. *How many employees are in the firm?*

Less than 5 employees ☐ 5 – 29 employees ☐ 30 – 99 employees ☐ More than 100 ☐

7. Type of ownership:

[] Fully locally owned [] Fully foreign owned [] Jointly Ghanaian and foreign owned

SECTION B: KNOWLEDGE MANAGEMENT CAPABILITY (Gold et al. (2001), Chih et al. (2008), Fan et al. (2009), Tanriverdi (2005), Aujirapongpan et al. (2010).

To what extent do the following statements apply to your company by checking the appropriate number from 1 to 5, using the following scale:

Item	Knowledge Transfer	1	2	3	4	5
KT1	We are already equipped with adequate professional knowledge					
KT 2	We able to proactively obtain new knowledge					
KT 3	We are adept in utilizing information technology to search and obtain the required knowledge					
KT 4	We are able to proactively share their knowledge					
KT 5	We already equipped with the ability to record and store various knowledge (or techniques)					
KT 6	We are already equipped with the ability to filter knowledge					
KT7	We are already equipped with the ability to methodically classify and summary knowledge					
KT8	We are already equipped with the ability to transfer organizational knowledge to individuals					
KT9	Our company is already equipped with the ability to retrieve knowledge from individuals into the organization					

KT10	We are already equipped with the ability to apply their knowledge to develop new products/ services We are already equipped with the ability to apply knowledge to improve work efficiency					
KT11	Our company is already equipped with the ability to apply knowledge to adjust strategic direction					
KT12	We are already equipped with the ability to use knowledge to solve problems Knowledge protect					

Indicate the extent to which you agree or disagree that your firm attach importance to these activities by checking the appropriate number from 1 to 5 using the following scale:

Item	Knowledge Protect	1	2	3	4	5
KP1	Our company is already equipped with the ability to apply knowledge to face challenges from the competitors					
KP2	Our company has clearly pointed out which knowledge should be strictly protected					
KP3	We are already equipped with the ability to apply information technology to prevent any inappropriate knowledge accessing					
KP4	Our company has established an incentive scheme as an effective way to protect knowledge					
KP5	Our company has established an effective protective policies and procedures to prevent knowledge theft					
KP6	Our company has established an effective protective policies and procedures to prevent knowledge from any inappropriate access					
KP7	Our company has established an effective policies and procedures to prevent knowledge from any inappropriate usage					

KP8	We are already equipped with the concept of knowledge protection						
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SECTION C: SUPPLY CHAIN INNOVATION (Panayides and Lun, 2009)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 5 using the following scale:

Item	Statement	1	2	3	4	5
SCIN1	We frequently try out new ideas in the supply chain context.					
SCIN2	We seek out new ways to do things in our supply chain					
SCIN3	We are creative in the methods of operation in the supply chain.					
SCIN4	We often introduce new ways of servicing the supply chain					
SCIN5	We motivate supply chain members to suggest new ideas					
SCIN6	We pursue continuous innovation in core processes					
SCIN7	We pursue new technological innovation					

SECTION D: ORGANIZATIONAL LEARNING (Bontis, Crossan and Hulland, 2002; Real, J.C., Roldán, J.L. and Leal, A., 2014)

To what extent do the following statements apply to your company by checking the appropriate number from 1 to 5, using the following scale:

Item	Organizational learning	1	2	3	4	5
OL1	We have a strategy that positions us well for the future					
OL 2	The organizational structure supports our strategic direction					
OL 3	The organizational structure allows us to work effectively					
OL 4	Our operational procedures allow us to work efficiently					
OL 5	The organization's culture could be characterized as innovative					
OL 6	We have a realistic yet challenging vision for the organization					
OL7	We have the necessary systems to implement our strategy					

OL8	Our organizational systems contain important information						
OL9	We have company files and databases that are up-to-date						
OL10	We have an organizational culture characterized by a high degree of trust						

Thank you for participating in the survey.

