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Factors that influence strategic alignment of Information Technology for Supply Chain Integration: Perceptions of Nigerian Medium-sized Manufacturing Enterprises and their suppliers

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Abstract

Strategic alignment has been considered a crucial area in the IS field of study in the over three decades. A lot of studies have been conducted to explore how strategic alignment supports business processes and strategies in organisations. However, there are still issues to be addressed in medium-sized enterprises in the manufacturing industry to achieve supply chain integration. There are factors which can pose threats to the success of supply chain integration and lead to alignment failure. Therefore, if and how medium-sized enterprises can achieve alignment to realise supply chain integration is a concern, this research aims to investigate the influence of strategic alignment factors, if any, on strategic alignment and supply chain integration and how medium-sized enterprises achieve alignment.

The study adopts the qualitative research strategy to achieve an in depth understanding of strategic alignment factors, the impact on strategic alignment and supply chain integration. An interpretive approach was carried across 15 medium-sized manufacturing enterprises. Purposive sampling was used to select the enterprises in Lagos, Nigeria. 54 participants across the firms were interviewed. 45 of the 54 semi-structured interviews were analysed in relation to the research objectives. This study provides a comprehensive review of existing literature and proposed a framework built on the co-evolutionary IS Model and Strategic Alignment Model perspective which examines alignment at strategic, operational and individual levels.

The findings of the research showed unrealised supply chain integration as a result of lack of alignment and describes how strategic alignment can be affected by internal factors (IT sophistication, management's knowledge and commitment to strategic alignment and IT expertise) and external factors (political, economic, infrastructural and external influences on IS). This study identified and described challenges that affect strategic alignment (financial constraints, limited management knowledge and commitment to IT/IS and perception of staff to IT/IS).

Table of content

List of tables

List of figures

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Chapter 1 – Introduction and rationale of the research

1.1 Research background.

Information technology (IT) as an enabler of performance within an organisation has been presented in studies over the last four decades (Davenport 1993; Dedrick et al. 2003; Sabherwal and Jeyaraj 2015). Many of the studies have focused on large organisations across several industries, and the implementation of IT by small and medium-sized enterprises has also increased significantly recently (Sharma and Bhagwat 2006; Ghobakhloo et al. 2011; Okundaye et al. 2019). Within the manufacturing industry, IT supports the integration of major processes across the supply chain (Gunasekaran and Ngai 2004). Further studies discuss an alignment of business strategy with IT strategy that enables SMEs to achieve business performance and competitive advantage (Street et al. 2017; Raymond and Bergeron 2008). This is referred to as strategic IT alignment and is described by research as the extent to which IT is implemented within the supply chain and the degree to which it is compatible with the IT of its external partners involved in the supply chain (Wu et al. 2006; Flynn et al. 2010).

Studies have presented a description of supply chain integration involving strategic IT alignment (Thun 2010; Seggie et al. 2006; Sanders 2005). These studies indicate that deploying IT in a manner that fits the supply chain integration of a firm motivates business performance (Dehning and Richardson 2002; Mithas et al. 2011; Leuschner et al. 2013). Supply chain integration effectively links key business processes in a firm and with suppliers, presenting benefits to build an efficient supply chain (Chen et al. 2009). This process of integration involves the implementation of management competencies, procedures, and technologies aligned with key supply chain functions and resources, resulting in improved firm performance (O' Marah and Hofman 2010; Stevens and Johnson 2016).

To achieve strategic IT alignment, it is crucial to understand the factors that influence its realisation. Studies (e.g., Ismail and King 2007; Gutierrez et al. 2009) reveal strategic IT alignment factors generally across SMEs such as commitment from top management, knowledge of top management, the extent of IT sophistication, internal and external expertise and financial resources are key to facilitating strategic IT

alignment. Notwithstanding its importance, there are only relatively a few studies on alignment and in particular the factors that influence alignment in SMEs. The review of literature shows that studies have discussed the factors influencing strategic IT alignment in a manufacturing industry. However, except for Li et al. (2009), studies that focus on IT alignment for supply chain integration are very rare, especially in the context of SMEs.

There is interest in the strategic alignment literature with emphasis on the need for more robust theoretical underpinnings for this area of research. Research is required grounded on more explanatory and established theories (Chan and Reich 2007; Gerow et al. 2015). This study investigates strategic IT alignment for achieving supply chain integration, because such relationships may provide advantages to business owners and managers by understanding the resources to realise the benefits of IT investments in their organisations.

Attaining strategic IT alignment in an organisation focuses on enhancing its ability to attain competitive advantage. There has been extensive research conducted, however, there exists a gap regarding successful frameworks for strategic alignment especially in developing countries (Yayla and Hu 2012; Alyahya and Suhaimi 2013). Some studies also discuss the level of strategic alignment (Luftman 2003; Gerow et al. 2015). Other research focused on examining factors that could contribute to strategic alignment (Gutierrez et al. 2009; Wu et al. 2015). Despite this, the misalignment between the business and IT strategy is regarded as a challenge by scholars (Coltman et al. 2015). Thus, there is a need for further studies examining the link between business and IT (Jorfi and Jorfi 2011; Gerow et al. 2014).

Organisations in the existing business setting across different sectors are well focused on maximising the advantage IT present and their role in improving performance. In this respect, the study seeks to emphasise on this concern in Nigerian manufacturing industry which is one of the key sectors in Nigeria. Specifically, the study's focus is on investigating the factors influencing strategic IT alignment within the context of supply chain integration. This selection is based on the notion that the realised benefit of IT systems is the capability to achieve and maintain competitive advantage as well as support efficiency of business process in the organisation. The key aim is to propose a framework that can provide directions for business owners, managers and policy

makers to identify factors influencing strategic IT alignment and enhance strategic IT alignment that can improve supply chain integration.

The study's sample, Nigerian MEs were chosen because they provide a meaningful analysis relating to the research objectives are typically discussed and categorised as part of the SME grouping. A few studies have discussed smaller firms in the context of technology adoption and implementation. There are limited studies concerning MEs and research on strategic alignment despite that they possess the infrastructure and resources to facilitate the implementation of IT alignment. In this study, the terms organisations, enterprises, and firms are used interchangeably, though these businesses may differ in size and capacity. The commonality is that they are businesses that offers value in terms of products or services to fulfil the requirements of their customers (Zeithaml et al. 2001).

1.2 Research gap

Organisations are seeking to adopt processes and approaches that support the improvement of business performance. To tackle the challenges faced such as crises in the market, internal and external pressures, organisations could develop coherent strategies to achieve business goals and objectives (Okumus 2003). Also, studies have discussed the importance of aligning IT strategy with business vstrategy as information technology is a key resource in organisations (Reynolds and Yetton 2015; Bharadwaj et al. 2013).

In developing countries, organisations seek to achieve economic improvements - this has become a primary concern for their governments. Accordingly, the need to satisfy customers' requirements is important for firms. In a manufacturing setting, the strategic information technology alignment with business strategies has facilitated the relationship between firms and suppliers to ensure members work together to fulfill unified goals (Raymond and Croteau 2009; Ngai et al. 2011). Therefore, manufacturing firms can achieve supply chain integration through strategic IT alignment. Successful strategic alignment is dependent on certain factors (Burn and Szeto 2000; Mbuyisa and Leonard 2017; Tallon et al. 2019). Studies have discussed factors across different industries. However, further research is required to investigate these factors, in which the alignment of business strategy and IT strategy is expected

to achieve supply chain integration, in organisations of developing countries rely on identifying and addressing challenges they face.

Furthermore, studies highlight that firms need to consider the importance of strategic use of IT to improve performance. For instance, the manufacturing industry can depend on improvements in technology and strategies to develop new and improve existing products and services (Chapman et al. 2003). However, studies on strategic alignment in the manufacturing sector are still limited. In general, existing studies have sought to understand the impact of strategic alignment on aspects of a supply chain. There is evidence in existing studies that alignment could influence organisational performance (e.g. Luftman et al. 2017; Ullah and Lai 2013; Wu et al. 2015; Gerow et al. 2016; Yayla and Hu 2012). Thus, researchers submit that the issue of limited understanding is dependent on the context and type of an organisation.

Integration is referred to as a significant issue for all classes of organisations (Frohlich and Westbrook 2001). Previous studies also discuss differences in how supply chain integration is implemented in large organisations versus small and medium-sized enterprises (Buonanno et al. 2005; Harland et al. 2007; Archer et al. 2008). Large organisations are known to have the capacity to invest in IT to achieve integration, while for SMEs attaining integration could be challenging due to financial constraints and technology and skills requirements which makes them adopt a different approach to supply chain integration (Harland et al. 2007). Though studies have mentioned that some SMEs are moving towards the implementation of integrated technology systems, the realisation of supply chain integration amongst SMEs generally is low (Li et al. 2009; Barton and Thomas 2009). In addition, SMEs who engage integrated systems now extend beyond the boundaries of their firms to involve suppliers (De Burca et al. 2005). Studies (such as Francalanci and Morabito 2008; Bhagwat and Sharma 2007; Amoako et al. 2022) have emphasised that SMEs may integrate their IT infrastructure internally and externally to enable the efficiency of their supply chains and achieve improved competitive advantage. Despite this, there is limited understanding based on how SMEs exploit supply chain integration. This study attempts to address this limitation by exploring how medium-sized enterprises integrate using technology internally and externally with suppliers.

The majority of the strategic IT alignment studies on small and medium sized enterprises fail to emphasise differences in implementation (Raymond and Bergeron 2008; Li et al. 2016). Studies (e.g Ghobakhloo et al. 2011) have discussed differences in the way in which IT is implemented between small and medium-sized firms. SMEs and MEs are integral to the growth of nations because they create employment opportunities. The development of new products and services and the ability to generate opportunities increases SMEs and MEs abilities and competitive advantage. However, studies mainly focus on small firms or SMEs collectively without distinction and MEs have been missing from the research (Forth et al. 2006).

Substantial evidence demonstrates that improved performance in terms of supply chain integration can be achieved when IT strategy is aligned with business strategy (Skipworth et al. 2015; Qrunfleh and Tarafdar 2014). Despite this, the interest to undertake this research remains. Moreover, research (e.g. Reich et al. 2000; Celuch et al. 2007; Chen et al. 2008; Schwarz et al. 2010; Kitsios and Kamariotou 2017) discuss the vague connection as well as mixed findings regarding the factors influencing strategic IT alignment, strategic IT alignment and supply chain integration which seek for more in-depth studies into outcomes of alignment.

1.3 Research motivation

The continuous development in the field of IT has enabled businesses to implement IT in the management of their business processes by making sure that IT strategy and business strategy are aligned such that the advantages of deploying IT are achieved (Luftman 2003; Huang and Hu 2007). Strategic alignment is relevant to top management because of its significance in measuring the fit between business strategy and IT strategy and the influence on growth, and productivity of an organisation (Cragg et al. 2002; Avison et al. 2004; Chan et al. 2006; Coltman et al. 2015). As a result of this, business owners and managers need to focus on ensuring IT investments influence an organisation positively.

Researchers have also called for further studies on factors influencing strategic IT alignment (Chan et al. 2006). Studies exist that discuss the factors impacting including the results of strategic alignment of IT (Oh and Pinsonneault 2007; Yayla and Hu 2012). Some of the factors include top management's knowledge and commitment to IT, level of IT sophistication, and internal and external IT expertise (Ismail and King

2007; Chao and Chandra 2012). Existing studies focus on factors influencing strategic alignment, and this study's premise is to further research outcomes that could improve the relationship between alignment and supply chain integration.

Furthermore, previous studies highlight the paucity of a clear theory on strategic alignment in SMEs (Wynn 2009; Kitsios and Kamariotou 2019). The findings on whether alignment improves an organisation or otherwise are generally inconsistent (Ismail and King 2006; Cragg et al. 2007). However, firms still face insufficient knowledge on aligning business strategy and IT strategy (Wu et al. 2015). There is a need to discuss IT alignment in various contexts to comprehend the outcomes in different categories and sizes of organisations. Hence, this study focuses on investigating factors of strategic IT alignment in the context of supply chain integration in selected medium-sized enterprises.

In this study context, which is Nigeria, MEs have significantly impacted the nation's economy. In 2020, MEs generally are said to contribute approximately 25% to the country's GDP (SMEDAN 2019). MEs have a formal organisational structure with improved manufacturing processes, skills, and higher level of advanced technology use when compared to small or micro firms (Tambunan 2019). This class of businesses could develop and exploit their strategic and IT resources for increased growth (Tambunan 2019).

The vague relationship and varying findings relating to strategic IT alignment factors and strategic IT alignment, present an opportunity to seek more research into outcomes of strategic IT alignment (Yayla and Hu 2012; Queiroz 2017). Thus, based on the highlighted gaps, the study focuses on supply chain integration (i.e. internal integration and external integration with suppliers) as an important outcome of strategic alignment. In addition, the need for this study is also highlighted in that organisations in various fields are investing in information technology, however, there is an increased percentage of unsuccessful IT projects (Garg and Garg 2013).

The concept of supply chain integration as a concept is a major concern for manufacturing firms specifically those that seek to improve and perform better. This study argues that a crucial value of aligning IT strategy and business strategy is emphasised in the achievement of supply chain integration. According to Vanpoucke

et al. (2017), firms can achieve supply chain integration by implementing information technology. In addition, Yu (2015) refers to the supportive roles of IT on supply chain integration, the study further stated that the relationship between IT implementation and dimensions of supply chain integration requires further investigation. Liu et al. (2021) found that IT alignment impacts on supply chain integration and discuss the relevance of enhancing alignment by driving IT investment in accordance with the strategic focus of the firm. There is a need for theoretical research on the relationships between strategic IT alignment factors, strategic IT alignment and supply chain integration which this study seeks to implement.

1.4 Research aim, objectives, and questions

The main purpose of this study is to conduct an enquiry into factors that could impact on strategic IT alignment within the context of supply chain integration in Nigerian medium-sized manufacturing enterprises. Based on the rapid growth in technology and constantly evolving organisational settings, there are factors influencing strategic alignment particularly in a developing economy like Nigeria. The key research question is: How can MEs adopt strategic alignment of IT to achieve supply chain integration in a developing economy?

To answer the main research question, the following research objectives were defined:

1. To critically review and synthesise literature on factors that could influence strategic alignment of IT, and how they relate to supply chain integration.
2. To critically examine the importance of strategic alignment of IT in Nigerian medium-sized manufacturing enterprises.
3. To critically investigate the processes of strategic alignment for supply chain integration in Nigerian medium-sized manufacturing enterprises

To investigate the influence of factors on strategic alignment in achieving supply chain integration, the research questions and sub-questions below were examined:

1. Based on existing studies, what are the factors that could influence strategic alignment and how do they relate to supply chain integration?
    - What are the factors that have crucial impact on strategic alignment?

- How do they influence supply chain integration?

2. What constitutes strategic alignment processes and why is it significant to the achievement of supply integration in medium-sized enterprises?

- What is strategic alignment and what are the current practices to achieve strategic alignment in medium-sized enterprises?
- What impact does strategic alignment have on supply chain integration in medium-sized enterprises?

3 How can Nigerian manufacturing medium-sized enterprises implement strategic alignment to achieve supply chain integration?

- What are the factors influencing strategic alignment for supply chain integration in Nigerian medium-sized manufacturing enterprises?
- What are the challenges to achieving strategic alignment for supply chain integration in a developing economy such as Nigeria?
- What are the recommendations for Nigerian manufacturing medium-sized enterprises and policymakers to provide an improved understanding of the factors and outcomes of strategic IT alignment.

1.5 Research Contributions

By addressing the above research objectives, this study aims to present an original contribution to the existing research in strategic management. This study is unique to most of the studies that investigated the impact of strategic IT alignment factors and in the context of supply chain integration. This research investigates the link between factors and strategic IT alignment and the effect of strategic IT alignment on the realisation of supply chain integration in selected Nigerian medium-sized manufacturing firms. In addition, this study focuses on supply chain integration as an outcome of implementing strategic alignment in a manufacturing medium-sized enterprise setting.

In addition, the contributions are also valuable to researchers and practitioners. Most of the studies on strategic IT alignment are theoretical and lack empirical evidence, this study provides a comprehensive review of existing studies on strategic IT alignment. Following the recommendations of previous studies (e.g. Chan and Reich 2007; Tallon and Pinsonneault 2011) that there are mixed findings on the link between

factors and strategic IT alignment and proposed additional research into intermediaries through which strategic alignment could impact an organisation. Therefore, this study incorporates various strategic IT alignment factors, strategic IT alignment and supply chain integration (internal and external integration) depicted in a theoretical framework. Furthermore, this study adopts the recommendation of studies (e.g. Coronado 2003; L'Ecuyer et al. 2019) by further developing a framework to assess strategic IT alignment within SMEs/MEs. The theoretical contribution of this study is further discussed in Chapter 7.

The research is beneficial to business owners and managers of manufacturing MEs in terms of obtaining the innovative practices for strategic IT alignment. Also, the study is beneficial for top management of MEs and their suppliers regarding the relationship between them. Therefore, the results of the study will serve as functional and practical guides for business owners and managers to analyse the investment choices and the resources pivotal to the implementation of strategic alignment. The framework could be useful to top management, researchers, and practitioners as a practical tool to support medium-sized manufacturing firms in developing economies. Further details regarding practical contribution are provided in Chapter 7.

1.6 The Research setting: Nigeria

This section discusses Nigeria as a research context, elucidating its political and economic characteristics. Nigeria as a country is prominently described as a developing economy within Africa, due to the combination of assets and potential and the increasing influence in the region (Enweremadu 2013). Although a few studies have highlighted the nation's challenges such as poor governance, corruption and poverty. Despite this, scholars have proposed that Nigeria remains attractive to foreign investments (Macaulay 2011; David 2012). The country has also witnessed developments in the last two decades. For instance, the political reforms are promising, and have fairly influenced the general elections held in 2011 and 2015 (Nwangwu et al. 2018). The economic policy reforms have resulted in economic stability and increment in the ability to produce oil for the west and Asian countries like China and India, which strengthen Nigeria's economic values (Oladipo 2012).

According to the World Bank (2022), The Nigerian economy has relatively improved in its gross domestic product (GDP) which reached $432 billion in 2020 against $375 billion in 2017. This is after a major decline experienced in 2014, in which there was a fall from $546 billion to $375 billion in 2017. Nigeria's improved economic position has been reported to be a result of policies implemented to grow the economy. Some of these include an oil price-based fiscal rule which has resulted in significant savings for the government, privatisation of some state-owned enterprises as well as deregulation of government activities in certain agencies and review of pay scales for government workers (Okonjo-Iweala and Osafo-Kwaako 2007). These reforms have also helped grow industries. Though not at a developed economic stage, the contributions of industries to GDP have evolved significantly. The agriculture (24%), trade (13%) and manufacturing (12%) industries are top contributors to the GDP (Statista 2022). As the Nigerian economy is interested in diversifying its economy, from a huge emphasis on agriculture to a more modern, developed manufacturing economy (Sanusi 2010). This motivated the study to conduct an inquiry into the strategic IT alignment factors within the manufacturing industry.

Nigeria is facing several issues because of certain insurgencies which is associated with its economic and political instability. These activities have resulted in citizens in northern-eastern Nigeria being displaced and the destruction of properties. The attacks have impacted the country enormously, for instance, the economic cost reported between 2007 to 2016 is $97 billion (UNDP 2021). The political and security uncertainties have evolved over the last 16 years. The actions taken by the governments included seeking negotiations and compromises (Vanguard 2011), deployment of new hi-tech military equipment (Vanguard 2016), and dismissals of top-ranking police and military offices (Guardian 2012). This has impacted economic development and investment opportunities. For example, several foreign and local investors are said to have abandoned investment plans for northern as well as other parts of Nigeria because of the insurgency (Anaro 2012).

Recently, the Nigerian economy appeared to be growing despite the serious social and political challenges. This serves as a reason for this study to understand the type and contribution of businesses to the Nigerian economy. According to PwC MSME Survey 2020, approximately 96% of businesses are SMEs and contribute 48% to the national GDP and 84% of the workforce employed by SMEs in Nigeria. Nigerian

SMEs can be categorised based on industries in nine groups - agriculture (15%), trade (13%), manufacturing (9%), information technology (8%), hospitality and tourism (6%), financial services (5%), education (4%), transport (3%) and engineering and construction (2%) (PwC MSME Survey 2020). Therefore, it can be said that SMEs mostly operate in agriculture, trade, and manufacturing.

There are a number of drawbacks generally with SMEs in Nigeria and perhaps globally. Major drawbacks are inadequate and shortage of managerial and employee skills (Onugu 2005). As a result of this shortage, SMEs find applying modern techniques in areas such as manufacturing, marketing, and financial challenges. To support SMEs in improving their weaknesses and limitations, the government provides training programs and financial support (Tende 2014). However, these programs for SME development in Nigeria have not been able to achieve their desired objectives because of reasons such as lack of awareness, lack of infrastructures, and improper program design and implementation (Okpara and Wynn 2007). The solution is the continuous reinforcement of government policies (Nwachukwu and Ogbo 2012).

According to SMEDAN (2017), SMEs that are concentrated in the manufacturing industry has the highest number of engagements with business plans (20%). Additionally, in the 3-size classes of businesses (micro, small and medium), medium-sized manufacturing enterprises are likely to use high levels of technology (Abereijo et al. 2009). As the main purpose of the research is to uncover factors influencing strategic alignment for supply chain integration in Nigeria, therefore a focus on medium-sized businesses appears logical, given the importance of MEs in technology usage within the manufacturing sector.

1.6.1 The Nigerian manufacturing sector

Manufacturing sectors are important for the growth of economies of nations (UNIDO 2013). As the population increases globally, the demand for manufactured products increases (Yu et al. 2013). According to a research conducted by the World Trade Organisation in 2018, manufacturing sectors make up approximately 17% of the total world economies and more than 70% of the world trade (WTO 2018). Studies also discuss that global economic growth helped the manufacturing industry to mature and develop as well (Yu et al. 2013; WTO 2018). In Nigeria, the manufacturing sector

significantly influences the economy. It comprises thirteen categories and seventy-five sub-sectors. The categories are “oil refining; cement; food, beverages, and tobacco; textile, apparel, and footwear; wood and wood products; pulp paper and paper products; chemical and pharmaceutical products; non-metallic products, plastic and rubber products; electrical and electronic, basic metal and iron and steel; motor vehicles and assembly; and other manufacturing” (National Bureau of Statistics 2017, p.10).

The Nigerian manufacturing industry has several potentials regarding its growth, for instance, the relationship with suppliers from a production perspective can be maximised through accelerated production which presents the manufacturing industry as a major driver of growth and exports (National Planning Commission 2009). Small and medium-sized enterprises make up majority of manufacturing firms in Nigeria. However, because of size are unable to substantially participate in foreign markets. An increase in the quantity of value-added exports could be achieved through direct investment in key sub-sectors. This the commission, presents could be achieved by creating an environment such that small and medium firms experience growth by improving direct investment in the manufacturing industry.

The Nigerian economy is known to be heavily reliant on oil revenue (Ku et al. 2010), contributing approximately 80% of its foreign exchange, and the performance of the manufacturing sector in Nigeria has been affected as a result (Ku et al. 2010). The contribution is apparent in the manufacturing of products while its effects on the GDP are not as high (Oluwaseun et al. 2016). In 2020 the manufacturing output was a 6% increase from the previous year and the value added to GDP was reported at 12% (National Bureau of Statistics 2021). The manufacturing sector has greater potential for growth if there is a focus on developing the Nigerian non-oil sectors (Riti et al. 2016).

The manufacturers association of Nigeria (MAN) developed a roadmap for improving the sector to transform it into an evolving and strong industry (Manufacturers Association of Nigeria 2017). The strategy primarily focuses on alleviating challenges encountered by the sector. Previous studies indicate insecurity, political instability, market distortion, state-driven monopolies, poor infrastructures, and lack of finance as major hurdles to economic growth of the manufacturing sector (Kowo et al. 2018).

Limited business and IT plans, extreme bureaucracy, and rampant corruption were also highlighted (Chete et al. 2014). The higher tax was also a noted challenge for the Nigerian manufacturing sector (Kowo et al. 2018). Information technology adoption as well as limited business and IT plan for growth are reported as critical issue of the manufacturing sector in Nigeria (Ogunlela and Lekhanya 2016; Akintayo et al. 2021). Given the relevance of implementing business strategy and IT strategy for competitive advantage, the manufacturing industry is lacking in developing the required strategies. This inspires the study to investigate strategic IT alignment and the factors influencing alignment that exist in manufacturing firms.

The manufacturing industry in Nigeria is promising with an increased rate of growth. The sector attracts both domestic and foreign investments as the industry has exposure to a potential 200 million consumer base internally and millions more consumers in neighbouring countries (Ojo and Ololade 2013). The relevance of the Nigerian manufacturing industry is also found in the fact that private expenditures could substantially increase up to 15-20% (Akinlo 2004). To harness these opportunities, it is important to invest in relevant IT skills to align business strategy and IT strategy. The government including the manufacturing association of Nigeria has introduced initiatives to strengthen the manufacturing sector. Yet, the sector has varying issues to resolve including limited managerial and employee skills is a key challenge for manufacturing businesses, this is despite the manufacturing sector in Nigeria's significant contribution to the GDP. This could be attributed to the industry's ability to understand the importance of aligning existing IT to drive business strategies compared to other industries in Nigeria. As the broad aim of the research is to investigate the factors influencing strategic alignment of IT for supply chain integration, therefore this study focuses on this sector to investigate what strategic IT alignment factors exist in medium-sized manufacturing firms in Nigeria.

1.6.2 Strategic IT alignment in Nigeria

To further conceptualise this study, this section introduces relevant pieces of literature on strategic IT alignment in Nigeria (comprehensive discussion is presented in literature review chapter)

Strategic IT alignment has been recognised as crucial in supporting organisations to achieve competitive advantage especially in the Nigerian setting (Ajibade and Mutula 2020). On the other hand, limited guidelines and knowledge exist for interested individuals and organisations.

A few studies have revealed an evolving interest through empirical research about strategic IT alignment in the Nigerian context, especially in large organisations (Celik 2014). There has been little strategic IT alignment research conducted in Nigerian SMEs. The studies which attempted adopted survey in gathering data to explore the level of strategic IT alignment in the Nigerian context (Jonathan et al. 2018; Ajibade and Mutula 2020). Nigeria has different characteristics that impact strategic IT alignment. As a result, it requires a more in-depth approach to explore the existing strategic IT alignment factors in Nigeria's emerging economy context and explain how strategic IT alignment factors can influence performance by adopting a qualitative study.

The study builds on the Strategic Alignment Model and the Co-evolutionary IS alignment model, which will support this study in exploring strategic IT alignment factors, strategic alignment and supply chain integration. Detailed review of theories and models of strategic IT alignment are presented in section 2.8.

1.7 Structure of the thesis

This section presents an outline of the rest of the thesis, the mutual interlinks between the various sections of the work, chapter by chapter, making the structure of the thesis presentation more transparent and providing some early reading keys on the thesis's overall contents to guide readers.

This thesis is made up of 7 substantive chapters, which translate into a working roadmap for readers. Having dealt with the thesis preliminaries and introduction in this present chapter, the focus is now shifted to outlining the contents of the remaining chapters beginning with chapter 2 below.

Chapter 2 sets out to achieve fundamentally the review of extant literature. The main aim of the literature review is to identify the gaps in previous studies that warrant further investigation by this study. The review begins by discussing the concept of strategic alignment of IT, strategic IT alignment factors and supply chain integration.

The chapter also presents discussions on medium-sized enterprises in Nigeria and existing strategic IT alignment models and frameworks.

Chapter 3 outlines the study's theoretical framework. The framework adopts elements of both Strategic Alignment Model and Co-evolutionary IS Alignment Model.

Chapter 4 discusses the research methodology employed in this study within the chosen interpretivism standpoint as recognised in the social science, business and management research. The chapter outlines that the qualitative research method is useful for gathering data using semi-structured interviews. The chapter progresses by reviewing the data collection method, ethical concerns, and the reasons for the choice of the data analysis approach. The chapter discusses that the interview questions were designed based on the study's literature review presented in Chapter 2.

Chapter 5 describes data analysis and findings. The chapter begins by outlining the outcome of the interview process and the profile of the participating MEs. The chapter highlights the importance of using excel and a template to analyse qualitative data. The chapter continues by presenting themes and sub-themes from the template. The chapter presents the responses of the participants using quotations.

Chapter 6 presents the discussion of findings. The chapter commences with discussing the findings and how the research objectives are achieved. The discussion of findings is grouped into five sub-headings based on Chapter 5 representing the research objectives. The emerged enhanced framework which centres on the findings of the study is presented in this chapter.

Chapter 7 wraps up the study. It discusses the conclusion and recommendations of this study. This chapter begins by discussing how the thesis addressed the study's research objectives. The study's contribution to knowledge and practice is acknowledged, next is a discussion of the research's implications for Nigerian manufacturing MEs, government and decision makers. The limitations of the study, directions for future research and a personal reflection of the research journey are presented. Table 1 represents an overview of the structure and provides a summary of how the research was undertaken.

<table>
<tr><td colspan="2">Chapter 1 (Introduction)
This introductory chapter presents the research background, discusses the aims and objectives. The research gaps and potential contributions of the study are highlighted.</td></tr>
<tr><td>Chapter 2 (Literature and defining the scope of the research)
A review of existing literature on strategic IT alignment, strategic IT alignment factors, supply chain integration, medium-sized enterprises and the Nigerian manufacturing sector</td><td>Chapter 3 (Theoretical framework)
The chapter discusses theoretical models relevant to the study and explains the theoretical framework derived from literature review.</td></tr>
<tr><td colspan="2">Chapter 4 (Research methodology)
This chapter discusses the study’s philosophical standpoint and research design. The data analysis approaches as well as ethical issues are considered.</td></tr>
<tr><td colspan="2">Chapter 5 (Data analysis and findings)
This chapter presents the findings of the template analysis of the transcribed data from the semi-structured interviews conducted.</td></tr>
<tr><td colspan="2">Chapter 6 (Discussion of findings)
The empirical findings are discussed with reference to the research objectives. The framework developed based on the findings of the study is presented and compared with the extant literature.</td></tr>
<tr><td colspan="2">Chapter 7 (Conclusions and recommendations)
The chapter addresses whether the study met the research objectives, discusses the contributions to knowledge and implications for the research MEs, government and policy makers. Also, the limitations of the study as well as directions for future research are presented.</td></tr>
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Table 1. Structure of the thesis

Chapter 2 – Literature review

2.1 Introduction

This chapter reviews relevant literature crucial to the study. The chapter strengthens the need to carry out the research by emphasising the key areas, highlighting the main gaps, and presenting ways to fill the gap through this study to provide meaningful contributions. The aspects of literature reviewed in this chapter are strategic IT alignment, SMEs/MEs, factors influencing strategic IT alignment, supply chain integration.

2.2 SMEs and strategic IT alignment

The studies on the connection between the strategic IT alignment and SMEs have explored the characteristics of SMEs that enable alignment (Johnson and Lederer 2010; Gutierrez et al. 2009). The conclusions of these studies reveal that the distinct characteristics of SMEs are acknowledged to achieve business goals and objectives. Regardless of the key studies which have addressed this relationship, there are still limited studies on small and medium-sized firms because of a set belief that the implementation of strategic alignment is challenging in SMEs (i.e. firms with less than 200 employees (Cragg et al. 2007; Wang and Rusu 2018). As a result, this study seeks to address this gap by examining strategic IT alignment in medium-sized firms and the manufacturing sector in Nigeria. The following section presents the definition of SMEs/MEs, strategic IT alignment, strategic IT alignment factors, supply chain integration in SMEs/MEs and the Nigerian context.

2.2.1 Definition of SMEs/MEs

Generally, SMEs are defined as firms with less than a specific number of employees. Though, the number is different across countries. For instance, in Nigeria, SMEs are defined as businesses with fewer than 200 staff while in the UK, the commonly used limit is adopted which are businesses with less than 250 employees.

According to the small and medium enterprises development agency of Nigeria (SMEDAN) 2013 report, SMEs are categorised in three (micro, small and medium enterprises). The definition is based on two criteria – employment and assets as shown in Table 2. Medium-sized enterprises include firms with 50 to 199 employees with assets not exceeding 500 million naira. Small businesses including companies

with 10 to 49 staff and asset should not exceed 50 million naira. The last classification are micro enterprises which are businesses with fewer than ten employees and assets less than five million naira.

Table 2 Definition of SMEs according to the Nigerian government standards (SMEDAN 2013)

Size Category	**Employment**	**Assets (million naira excluding land and buildings)**
Medium enterprises	50 to 199	50 to less than 500
Small enterprises	10 to 49	5 to less than 50
Micro enterprises	1 to 9	Less than 5

For this study, SMEDAN's definition is considered, and the following scale (see Table 3) is adopted to describe medium-sized enterprises based on the Nigerian regulations on SMEs.

Table 3 Definition of medium-sized enterprises

Criteria	**Lower limit**	**Upper limit**
Number of employees	50	199
Assets (excluding lands and buildings)	50 million naira	499 million naira

2.2.2 Definition of strategic IT alignment

The concept of strategic IT alignment has been expressed in various expressions or synonyms. Strategic IT alignment has been described using terms such as strategic fit, connection, integration, bridging, fusion, consistency, and co-variation (Gerow et

al. 2014). The studies of strategic IT alignment began in the ’90s. Henderson and Venkatraman (1999) define strategic alignment of IT as “Strategic Fit” and “Functional Integration” in terms of four fundamental domains: business strategy, IT strategy, business infrastructure, and IT infrastructure. According to Reich and Benbasat (2000), strategic alignment of IT describes the extent to which the IT capabilities—goals and objectives—help and are supported by the business capabilities. Maes et al. (2000), also define strategic alignment of IT as an ongoing process of deliberately connecting aspects of business and IT capabilities, contributing to firm’s performance. Luftman (2003) makes a supporting claim that strategic alignment of IT relates to implementing IT properly and suitably, aligned with business strategies, goals and objectives.

Although these definitions slightly differ from each other, the focus is on one goal, which is to align business and IT capabilities to realise firm performance and sustain strategic and competitive advantages. The difference noticed from the definitions is that the definitions by Henderson and Venkatraman (1999), Maes et al. (2000), and Luftman (2003) refer to the functional aspect of strategic alignment of IT that aligns IT with business strategies. Reich and Benbasat (2000) also discuss the social aspect or management role in strategic alignment of IT, describing a phase that IT managers and business managers have a unified knowledge and commitment to the business and IT goals and objectives.

The concept of strategic IT alignment has been presented in studies from the standpoint of it being an adaptable, focused and evolving process (Chan and Reich 2007; Bergeron et al. 2004). Strategic IT alignment is progressive with evolving and flexible processes linking all the interrelated elements of business and IT capabilities relating to strategic, operational and individual firm levels (Chan and Reich 2007; Vessey and Ward 2013). In organisations, strategic IT alignment is important to leverage the ability to implement IT, sustain performance continuously, provide direction and flexibility (Luftman and Zadeh 2011).

Researchers have attempted to convert the various thinking of strategic alignment of IT into functional measures as well as conduct empirical studies. Yet, the efforts are lacking, and the principles adopted for converting into functional techniques in the empirical findings are not completely accessible to managers of organisations

(Luftman et al. 2017). The wide-ranging ideas of strategic alignment of IT made studies adopt varying definitions and measures (Maes et al. 2000; Cragg et al. 2002; Ismail and King 2007), leading to outcomes that may inhibit the advancement of future studies. The varying ideas in literature led business and IT managers to describe the concept using different and uncertain approaches (Avison et al. 2004; Silvius 2007). The absence of a general agreement as well as the disjointed nature of the concept points to the paucity of its theoretical foundation. Hence, studies have presented that the concept is still influenced by challenges, and it is necessary to engage in further research and continuous development regarding its concepts, constructs, models and implementation (Walter et al. 2013; Luftman et al. 2017).

Nevertheless, for this study, the strategic IT alignment as per Luftman (2000) definition is adopted:

> "Applying IT in an appropriate and timely way, in harmony with business strategies, goals and needs"

The benefits of using IT strategically are described in ways, which include maximising return on investments, achieving sustainable competitive advantage using IT, and, presenting control and flexibility to align with recent opportunities (Handfield et al. 2015). These benefits notwithstanding, employing IT to introduce new strategies and improve businesses without considering IT investments and business together, and support from management may result in less than desired return on investments (Ward et al. 2007; Coombs 2015). Collaboration between the business and the IT departments, management team, and employees, to maximise investment in IT is vital (Fitzgerald et al. 2014). Further discussion on the advantages of strategic IT alignment is presented in section 2.5.

2.2.3 Research in strategic IT alignment

The last three decades has seen studies that are devoted to investigating strategic alignment (Reich and Benbasat 2000; Avison et al. 2004; Chan et al. 2007; Shao 2019). Generally, the concept of strategic IT alignment has been expressed in terms of two fundamental notions (Chan and Reich 2007; Kearns and Sabherwal 2006; Bergeron et al. 2004). The initial idea relates to the level to which business strategy and IT strategy are aligned and ways through which strategic IT alignment is

achieved. The second idea relates to the process involved in aligning business and IT components.

Studies describe strategic alignment as crucial for IT and business executives (Luftman 2003; Li et al. 2016). Despite this, strategic alignment is crucial, and the ability of SMEs to infuse IT in their businesses operations is important for their viability and agility (Venkatraman and Fahd 2015). Using the definition of Luftman (2000), which emphasise that strategically incorporating IT to drive business processes yields results, it appears organisations find meeting the criteria for strategic alignment of IT challenging. Many studies are concerned with strategic alignment processes in developed countries, it is important that more studies are conducted in developing countries to present complete perspectives of how SMEs align their IT strategy with business strategy.

2.2.4 The link between strategic IT alignment and supply chain integration

The increasing level of competition that exists among organisations has enabled business to implement appropriate strategies and seek collaboration with other organisations to attain business performance competitive advantage (Huang et al. 2012). Studies reveal that manufacturing firms develop strategies alongside the integration of internal processes and external partners which serve as a plan for achieving improved firm performance. Supply chain integration (SCI) is the practice which involves the close working together of members of the supply chain to achieve increased performance including profit while meeting the demands of the market.

Furthermore, studies have described SCI drivers that lead to enhanced performance, for instance, a study conducted in 2008 in UK manufacturing firms suggested a relationship between SCI, information sharing and improved supply chain performance. Another study proposed the integration of suppliers and customers with the firm's competitive strategy is able to bring about operational performance. Also, a study undertaken by Lee et al. (2007) on 122 manufacturing firms in the USA concluded that internal integration is the key strategy adopted for cost reduction in the supply chain while integration with suppliers lead to improved operational performance.

Studies exist that discuss strategic IT alignment in the context of supply chain integration. An example is a study conducted by Kim et al. (2013) on 184 firms, in

which they investigated how IT alignment between supply chain partners impact on customer responsiveness. The study suggested that strategic relevance of supply chain partners, i.e., collaboration and IT alignment that bring about improved customer value for the firm. Li et al. (2009) also examined the connection between IT implementation, SCI and supply chain performance. The findings of their study conducted on 182 Chinese companies showed that IT implementation improves the supply chain performance via enhancing SCI.

Strategic alignment of IT is examined within the context of supply chain integration in this study. It focuses on aligning business and IT infrastructure and processes within and externally with supply chain partners. Furthermore, it describes the harmonisation of business and IT capabilities between supply chain partners to allow for alignment across supply chain activities. Studies have found that there exist formal and informal integration mechanisms which facilitate the networking of business and IT strategies and capabilities, thus achieving strategic alignment of IT (Schlosser et al. 2015; Wu et al. 2015).

In SCI, formal integration mechanisms include supplier access to a manufacturing firm planning and inventory systems, mutual sharing of production and forecasting plans, information sharing in buyer-supplier interfaces of IT systems (Bagchi and Skjoett-Larsen 2002; Cousins and Menguc 2006). Formal integration mechanisms are supported by informal mechanisms such as on-site visits, joint meetings and workshops and team building exercises.

Studies have highlighted that a better understanding of SCI is required because of the lack of an accepted definition and its dimensions in literature (Fabbe-Costes and Jahre 2008; Zhang and Huo 2013). Flynn et al. (2010) considered collaboration through intra- and inter-organisational processes between a manufacturer and its suppliers. Krajewskis and Wei (2001) in their study, added coordination as a key component of supplier integration in manufacturing firms. Additional studies (e.g. Mendes Primo 2010; Pagell 2004) attempted to define SCI from the lens of key functional areas. Mendes Primo (2010) stated that purchasing of materials is to be done strategically in an organisation for integration with other areas and alignment with the business goals. Pagell (2004) pointed out that integration is evaluated across purchasing, operations and logistics and across organisations. The study

identified collaboration, cooperation, interaction, coordination, and information sharing as components of internal and external supply chain integration.

2.3 Supply chain integration (SCI)

Research have analysed and measured SCI using varied dimensions and approaches. For instance, earlier studies such as Bagchi et al. (2005), identified collaboration and information sharing as SCI elements. Other studies (Vachon and Klassen 2007; Wong and Boon-itt 2008; Quesada et al. 2008) analysed and measured SCI from three key perspectives: external (with suppliers and customers), internal integration, operations integration and information and materials flow integration. A study by Alfalla-Luque et al. (2013) proposed a model including three dimensions: information integration, resource sharing and organisational relationship. According to Stevens and Johnson (2016, p5), SCI is the

> *"alignment, linkage and coordination of people, processes, information, knowledge, and strategies across the supply chain between all points of contact and influence to facilitate the efficient and effective flows of material, money, information and knowledge in response to customer needs"*

2.3.1 The importance of SCI

SCI is a crucial area to study because the complex nature of business environments require that organisations work closely together and ensure the flow of materials and information among supply chain partners (Flynn et al. 2010; Wu et al. 2014; Zailani and Rajagopal 2005). SCI is a major pillar of increased performance in supply chain (van der Vaart and van Donk 2008). Organisations have realised the importance of integrating with suppliers in achieving competitive advantage and meet the demands of their markets (Sahay et al. 2006; Reuter et al. 2010).

SCI as a concept exists in different levels; therefore, it can be defined, described, operationalised, and described in several ways (Eriksson 2015; van der Vaart and van Donk 2008; Cragg and Mcnamara 2018). Zailani and Rajagopal (2005, p.383) refer to SCI as a "formation of network encompassing elements of a supply chain which are the suppliers, customers and company".

SCI is said to involve the complete collaboration amongst members of the supply chain at the strategic, tactical, and operational levels of decision making which make firms achieve competitive advantage (Bagchi et al. 2005). Literature is vast with

studies that present advantages of SCI, most of which revealed its influence on firm performance, supply chain performance and operational performance (Flynn et al. 2010; Prajogo and Olhager 2012; Kim 2013; Leuschner et al. 2013; Mackelprang et al. 2014; Ataseven and Nair 2017; De Vass et al. 2018; Tarifa-Fernandez, J. and De Burgos-Jiménez 2017). According to Tarifa-Fernandez and De Burgos-Jiménez (2017)'s study, SCI helps firms achieve increased information exchange and innovation, as well as facilitate a sustainable relationship with members of the supply chain. Another advantage is that SCI presents significant effectiveness by streamlining activities within business processes or across the entire production task in a manufacturing firm (Eriksson 2010; Gosling et al. 2015).

Furthermore, SCI has the capability to facilitate in firms an enhanced competitive edge that is difficult for competitors to duplicate, for instance, competition achieved through improved product quality, improved flexibility and reduced cost (Mellat-Parast and Spillan 2014). Firms' integration with suppliers in a synchronised manner, can ensure the effective sharing of information, maximising the effectiveness of managing processes, reduction in inventory and cycle times (Stevens and Johnson 2016; Yuen and Thai 2017). SCI enhances the production and flow of materials based on the resources available, and reductions in transaction and production related costs (Rai et al. 2006; Kumar et al. 2017). In addition, SCI encourages long-term relationships, client satisfaction, innovation and mutual trust that provide advantages to firms (Chang et al. 2016).

As with any concept, there are studies that have questioned the capability of SCI and the relationships that exist among the different levels of SCI, within and across the supply chain (Flynn et al. 2010; Danese and Romano 2011). For instance, Das et al. (2006), in their study highlighted a number of consequences as a result of integrating with suppliers, which relate to coordination, compromise and rigidity. Flynn et al. (2010) also proposed that integration with suppliers failed to impact positively on firm performance. The drawback of their study was the lack of focus on a particular industry. Danese and Romano (2011) examined the moderating role of external integration with suppliers and influence of customer integration on organisational effectiveness. The findings of the study presented that customer efficiency did not necessarily influence effectiveness. Despite these shortcomings,

SCI is a relevant area of research, because the review of existing literature provides a reference for examining SCI within the scope of internal integration and external integration with suppliers.

2.3.2 Components of SCI

SCI has been discussed at two levels, which address integration externally with members of the supply chain and internal integration. In this study, the focus is on external integration with suppliers and internal integration. External integration with suppliers investigates integration between a firm and its supplier(s), while internal integration examines the integration within the departments of a firm (Schoenherr and Swink 2012; Horn et al. 2014). These two levels of SCI are discussed further in detail.

2.3.2.1 Internal integration

SCI begins with internal integration amongst the departments in an enterprise, followed by external integration with suppliers (Basnet 2013). Internal integration is described as the connection amongst the internal functions and units in a firm to ensure the smooth flow of information and material to achieve competitive advantage (Lambert and Cooper 2000; Pagell 2004; Zhao et al. 2011). Internal integration involves a firm functioning as an entity, ensuring that information are shared, combined planning and cross-functional team to eliminate difficulties that arise within units and enhance collaboration in order to achieve efficiency (Foerstl et al. 2013; Swink and Schoenherr 2015). Other studies have defined internal integration and its specific impact on the firm. Chen and Paulraj (2004, p142) described internal integration as

> *"the degree to which firms are able to integrate and collaborate across traditional functional boundaries to provide better customer service".*

Furthermore, Yeung et al. (2009, p68) described internal integration as

> *"the degree to which a firm can structure its organisational strategies, practices, procedures and behaviours into collaborative, synchronised and manageable processes in order to fulfil customer requirements".*

The use of technology for internal integration is vital for the management of business processes and functions within the organisation (Li et al. 2009).

Internal integration is said to be crucial for a firm to achieve external integration (Zhao et al. 2011). According to Schoennherr and Swink (2012), internal integration facilitates the influence of external integration with suppliers on manufacturing performance. Li and Lin (2006) opine that flexibility in a manufacturing firm is not successfully achieved by external integration, but also integration within the firm.

2.3.2.1 Enterprise integration with suppliers

Using Schoenherr and Swink (2012) and Zhao et al. (2011), enterprise integration with suppliers is defined in this study as the extent to which an organisation works with, cooperates, and relates with its supplier(s) to organise inter-organisational strategies, methods, processes and activities into organised and manageable procedures. The aim of external integration with suppliers is to control flows within the supply chain to lower costs, enhance prompt delivery, decrease lead-time and increase resilience (Wiengarten et al. 2014). Literature has described external integration from the standpoint of suppliers in various ways and some studies have found a positive impact of enterprise integration with suppliers on firms (Das et al. 2006; Cousins and Menguc 2006; Perols et al. 2013). For instance, enterprise integration with suppliers is described as an upstream approach that involves coordination, communication, partnership, alliances and cooperation between a focal firm and its suppliers (Alfalla-Luque et al. 2015; Verschoore et al. 2015; Prajogo and Olhager 2012) and it is normally done with the use of shared information systems (Ralston et al. 2015; Wiengarten et al. 2016; Ciccullo et al. 2018). Enterprise integration with suppliers includes information sharing and coordination that could present the firm with an understanding of its processes, capabilities and potential challenges, and eventually bring about greater effectiveness in planning and forecasting, product design and ability to handle multiple transactions (Ragatz et al. 2002). The study conducted by Ragatz et al. (1997) revealed that enterprise integration with suppliers in a manufacturing setting helps manufacturers improve on their process and as such achieve competitiveness. The work of Khalfan et al. (2008), describing the integration of suppliers and manufacturing firms in a supply chain, revealed that integration with suppliers resulted in effective planning that led to performance improvement.

Achieving external integration with suppliers could be impeded by several challenges. First, integrating external supply chain suppliers increases the complexity of the supply chain because of various processes, cultures, individual firms and boundaries involved (Petersen et al. 2005). Next is a great investment of resources is required, because of the need to implement technology, lack of adequate knowledge and inept processes (Guan and Rehme 2012). Also, certain behaviours shown by suppliers could be a challenge. For instance, Jarett and Ceric (2015) discussed that the self-interest of partners if pursued can impact the focal firm negatively. Another challenge of integrating with suppliers could be inefficiency of the information systems of the individual firms (Awad 2010; Flynn et al. 2016). Likewise, an imbalance of social and cultural background, education, values, goals and understanding may impede integration with suppliers. Lastly, according to Khan et al. (2015), a partner's lack of interest or enthusiasm may prohibit supply chain integration.

2.4 Strategic IT alignment studies in SMEs and MEs

Given there is a paucity of research on strategic alignment of IT in MEs. This section provides a review of existing literature on SMEs and a run-through of emerging studies in strategic alignment of IT for MEs. SMEs present economic and social contributions to a particular society, despite that they have a reduced output and increased cost of production (Gbandi and Amissah 2014). There has been an emerging interest in SMEs particularly in the last two decades (Ruzzier et al. 2006). However, most of the studies in strategic alignment and SMEs are explanatory and exploratory.

Generally, studies on strategic alignment in SMEs reveal that there is lacking a strategic approach to strategic alignment of IT. Many of the studies have adopted the conventional strategic alignment of IT models to inform the development of frameworks for SMEs. The paucity of strategic approach to strategic alignment of IT in SMEs has been identified as a major reason for the failure of their businesses. For example, Cragg et al. (2007) discussed in their study conducted with sixty-six SMEs in Italy that IT alignment in SMEs were less formal and could be better supported by IT.

In addition, studies report implementation of strategic alignment of IT varies significantly across sizes of organisations (Kitsios and Kamariotou 2019; Gutierrez et al. 2009; Street et al. 2017). For instance, a study conducted by Gutierrez et al. (2009) of 104 participants found differences in the implementation of strategic alignment of IT in SMEs and large organisations. Studies also show that some factors are linked to strategic alignment in SMEs. (Gutierrez et al. 2006; Ismail and King 2007). Ismail and King (2007) identified that strategic alignment of IT is related to an SMEs level of IT maturity, level of owner/managers IT knowledge, use of expertise from government agencies and accounting firms and existence of internal IT staff. Also, research highlights that SMEs have limited implementation of strategic alignment of IT than larger firms because of lack of resources and their approaches to strategic alignment of IT (Chan and Reich 2007; Cui et al. 2015). Levy and Powell (2004), concluded that the financial implication of an IT alignment specialist for a permanent role is expensive for SMEs and as a result, the implementation of strategic alignment to top management which lack a coherent strategy for business and IT.

Studies show that the implementation of strategic alignment of IT varies in small and medium-sized enterprises. Research revealed that the reason for the variation relates to an interconnection of internal and external factors. Internal factors include financial resources (Kitsios and Kamariotou 2017), size (Ismail and King 2014), sector (Budiarto and Prabowo 2015), structure (Ullah and Lai 2013), successful technology implementation (Kitsios and Kamariotou 2017), employees' participation (Chtourou Ben Amar and Ben Romdhane 2020) and management knowledge and commitment to IT (Ismail and King 2014). The connection between size and the impact of strategic alignment of IT has been studied (Yayla and Hu 2012; Chao and Chandra 2012). For instance, Yayla and Hu (2012) presented that organisational size is a major factor in describing the link. Researchers highlighted that in SMEs with fewer than 250 employees, lack of organisational structure is evidenced, and one or two persons are involved in management (O'Regan and Ghobadian 2004). Studies such as Brown (2003) highlight that increase in organisational size inform management to develop additional and formal business and IT strategies. On the other hand, the size of SMEs makes for important roles that owners/managers play

and the impact on the business and IT strategies (Huang and Hu 2007; Reynolds and Yetton 2015).

The external factors include environmental uncertainty (Kyobe 2008), competition intensity (Dutot et al. 2014), partnership with other organisations (Kim and Jee 2007) and external IT expertise (Ismail and King 2014). Studies suggested that external factors significantly impact on how SMEs strategically align their business strategy and IT strategy. For example, Okundaye et al. (2019) the development of strategic alignment of IT in SMEs in Nigeria is influenced by key influences relating to social, cultural and governmental factors. Gunasekaran et al. (2011) studied strategic alignment of IT in SMEs in Europe and found that strategic alignment of IT in SMEs can be explored using a framework highlighting the degree of internalisation of SMEs, the industry in which SMEs exist and organisational size (strategic, tactical and operational levels).

Furthermore, the performance of an SME could be associated with the education, knowledge, and entrepreneurial capabilities of the owners (Soriano and Castrogiovanni 2012). Therefore, in SMEs, it is uncommon for all firms to have the exact impact on performance because the impact of strategic alignment of IT varies from firm to firm. After all, business strategy and IT strategy are mostly determined by owners/managers (Chau 1995). In the context of this study, the resolution is to focus on firms where strategic alignment of IT is likely to be implemented because of business activities and organizational structure.

2.4.1 Factors influencing strategic IT alignment.

Realising and maintaining alignment in an organisation is crucial, still it requires work (Venkatraman et al. 1993; Niederman et al. 1991; Silvius 2009). The extensive studies on alignment present a detailed catalogue of factors influencing strategic IT alignment. Studies found many enterprises fail to exploit IT for long-term benefits because of inhibiting or enabling factors that should either be minimised and maximised to align IT with business (Mbuyisa and Leonard 2017; Tallon et al. 2019). According to Luftman et al. (2017), strategic alignment of IT involves completely identifying and understanding the factors with the ability to impact any process in an organisation. Several factors have been identified in literature that influence strategic alignment of IT in organisations depending on activities, size, and industry (Chan and Reich 2007).

Also, following the assertion of Chen et al. (2006), factors that could influence strategic alignment of IT cannot be presumed simply based on earlier studies and should be examined independently in an industry or enterprise.

Small and medium-sized enterprises are assessed to be less strategic focused in comparison to larger organisation (Sabherwal and Chan 2001). Hale and Cragg (1996) developed a method to assess small businesses using Venkatraman's six-dimensional strategic orientation tool called STROBE to develop the business strategy, and adopted the framework developed by Chan et al. (1997) for the IS strategy. The study demonstrated that existing alignment models could be adopted to present SMEs with tools and techniques to examine and improve alignment.

Luftman (1999) provided insight into six enablers and inhibitors of strategic alignment. The enablers identified include top management IT support, IT collaboration with strategy, IT knowledge of business, business and IT alliance, properly organised IT projects, IT's ability to lead. The inhibitors on the other hand are lack of synergy between business and IT, limited IT prioritisation, lack of IT commitment, lack of understanding between IT and business, lack of IT support from top management and limited leadership from IT management. Furthermore, Luftman (2000) presented a strategic alignment maturity model and concluded that agreement between the twelve components of the actual strategic alignment model developed by Venkatraman et al. (1993) is influenced by six factors namely communication, IT value, governance, partnership and scope and architecture. This maturity model serves as a foundation for higher strategic IT alignment research (Coltman et al. 2015; Gutierrez et al. 2015).

Reich and Benbasat (2000) presented a model investigating four factors that potentially impact on the social dimension of alignment - shared domain knowledge between business and IT executives, IT implementation success, communication between business and IT executives and interaction between business and IT planning processes. The social dimension of alignment emphasises the advantage of business and IT managers' knowledge (short term alignment) and responsibility to ensure alignment of business IT goals and objectives (long term alignment). All the factors identified impact short term alignment. However, shared domain knowledge was mentioned as a factor impacting on long-term alignment.

Furthermore, Chan et al. (2006) presented a model that examined five factors, the effect on alignment and organisational success. The factors identified include shared domain knowledge, planning sophistication, previous IS success, organisational size, and environmental uncertainty. The study concluded that the alignment of business strategy and IS strategy improves organisational performance by examining the factors in their model.

Ismail and King (2007) investigated factors influencing alignment in SMEs using a model with six variables which are IT sophistication, owner/manager knowledge and commitment, external and internal expertise. The study found that level of IT maturity, owners and manager's business and IT knowledge and commitment, use of external expertise and existence of IT staff are key factors to alignment.

Cragg et al. (2002) identified IT alignment factors suitable for SMEs and argued that the factors identified by Reich and Benbasat (2000) or the enablers and inhibitors by Luftman et al. (1999) do not fully represent smaller organisations. Hence, they examined factors that could influence alignment from the intellectual perspective such as IT sophistication, top management commitment and external IT expertise. Cragg et al. (2002) found that IT sophistication and top management commitment are relevant for SMEs to use IT alignment in improving business performance.

Preston and Karahanna (2009) proposed a model in which mutual understanding between chief information officer (CIO) and top management team (TMT) regarding the importance of information systems in an organisation, is identified as a key antecedent of strategic alignment. The study concluded that IS strategic alignment is impacted by the shared understanding which is made up by shared language, CIO business knowledge and TMT shared domain knowledge.

In addition, Yayla and Hu (2009) identified IT unit structure, shared domain knowledge, successful IT history as key strategic alignment factors influencing strategic alignment. The study proposed and concluded that effects of the factors on alignment are mediated by two drivers which are connection and communication.

The studies by Reich and Benbasat (2000), Chan et al. (2006) and Yayla and Hu (2009) identified a common factor which is shared domain knowledge. The studies highlight the relevance business and IT managers understanding each other's discipline. Also, in the Luftman (2000)'s strategic alignment maturity model, the

communication factor is said to contribute to mutual understanding. “Communication” also possesses features which help to measure the mechanisms in place to improve shared understanding, collaborative relationship, like communications between IS and business managers is a factor emphasised by Reich and Benbasat (2000).

IT sophistication relates to the studies by Cragg et al. (2002) and Ismail and King (2007). This term refers to the type and complexity of technology as well as the interrelationship between IT usage and management of technology in an organisation. In the Luftman (2000) model, within the governance factor, IT strategic planning and IT investment management are included which relates to IT sophistication. In addition, within the scope and architecture factor, the attributes IT flexibility, level of IT maturity and the ability to adopt to changes within the organisation is concerned with IT sophistication.

Top management knowledge of and commitment to strategic use of IT is a factor discussed by Cragg et al. (2002) and Ismail and King (2007). Cragg et al. (2002) described CEO’s commitment to IT by covering the level of CEO’s IT knowledge and involvement in planning and prioritising and implementing IT projects. These attributes are found in the communications and governance factor in Luftman (2000) model.

Ismail and King (2007) investigated the impact of a firm’s sources of internal and external expertise for small and medium-sized organisations. In their study, the participating firms achieved better alignment through gaining expert advice from relevant agencies and firms and employing skilled and experienced IT staff. Cragg et al. (2002) also identified external expertise as a factor for smaller firms. The study presented the benefit of IT experts collaborating with top management. The study further discussed that IT expertise beneficial to small firms is from vendors and consultants. However, Ismail and King (2007) argue that support from consultant and vendors did not significantly impact on alignment. The internal and external expertise is not covered in the Luftman (2000) but it relates to the partnership between business and IT.

Partnership with suppliers is considered as a factor. The studies by Sanders (2005) and Chae et al. (2005) emphasise this partnership with suppliers refers to the existing business and IT relationship between the focal firms and suppliers. This

factor is not directly related to the SAM model (Luftman 2000). Though, partnership is a factor in the alignment maturity model, but this describes the relationship between business and IT managers intra-organisational. Chae et al. (2005) observed that partnership with suppliers impacts on alignment and confirmed that IT reinforces and stabilises interorganisational structures and relationships. Sanders (2005) also discussed partnership with suppliers as a factor that might influence strategic alignment. The study emphasised that it is crucial that supplier firms participate by acquiring the required IT to be aligned with the focal firm. Furthermore, the study found that alignment between suppliers and buyers impacts on the integration between firms. Kim et al. (2005) suggested that coordination with suppliers in supply chain relationships is critical to IT's contribution to firm performance.

Another factor presented is the organisational size. This implies that larger organisations will have an increased level of alignment in comparison to SMEs. Chan et al. (2006), Chan and Reich (2007) and Ismail and King (2007) suggested that organisational size impacts on alignment. Ismail and King (2007) found that aligned firms when assessed by the number of employees were smaller when compared to non-aligned firms. The study further argued that the less complicated structure of SMEs, allow for identifying appropriate strategy and tailoring technology to the needs and goals of the organisation which leads to improved alignment. On the other hand, Chan et al. (2006) found that better alignment is achieved as the organisational size increases. The study also claimed that the centralised structure of SMEs in which decision making is mainly taken by top management, restricts the need formal processes that facilitate alignment. Chain and Reich (2007) opine that medium-sized enterprises when compared to small firms show less evidence of alignment. Large businesses tend to implement formal methods which support alignment. The factor organisational size was not found in the strategic alignment maturity model developed by Luftman 2000. Though, studies propose that organisational size impacts on alignment.

Several alignment enablers and inhibitors have been studied. For instance, Luftman et al. (1999) developed a practical extension of the original strategic alignment model by identifying the factors influencing alignment of business and IT strategies. The

study found a crucial enabling factor which is senior management support for IT and the inhibiting factor highlighted is a lack of collaborative relationship.

Table 4 shows some factors were identified as important by several studies including top management's knowledge of and commitment to strategic use of IT (Ismail and King 2007; Chao and Chandra 2012), shared domain knowledge between business and information technology executives (Reich and Benbasat 2000; Chan et al. 2006; Kitsios and Kamariotou 2017), successful IT implementation (Almajali and Dahalin 2011; Garg and Goyal 2012; Kitsios and Kamariotou 2017), clear definition of business mission, goals and vision (Chan and Reich 2007; Kyobe 2008; Kitsios and Kamariotou 2017), organisational size (Chan et al. 2006; Raymond and Bergeron 2008; Ismail and King 2014), organisational structure (Ullah and Lai 2013; Garg and Goyal 2012; Ismail and King 2007)

Table 4 Factors influencing strategic alignment of IT from previous studies

Factors influencing strategic alignment of IT	**Reference(s)**
Level of organisation's IT Sophistication	Ismail and King (2007)
Top management's knowledge of and commitment to strategic use of IT	Ismail and King (2007); Chao and Chandra (2012)
IT maturity	Dwivedi et al. (2009)
Internal and External IT expertise	Ismail and King (2007)
External IT expertise	Cragg et al. (2002); Ismail and King (2007)
Technological learning	Raymond and Bergeron (2008)
Strategic Planning processes	Chan et al. (2006); Kitsios and Kamariotou (2017)
Shared domain knowledge between business and information technology executives	Reich and Benbasat (2000); Chan et al. (2006); Kitsios and Kamariotou (2017)
Participation of employees	Chtourou Ben Amar and Ben Romdhane (2020)
Successful IT implementation	Almajali and Dahalin (2011); Garg and Goyal (2012); Kitsios and Kamariotou (2017)

Extent of IT usage	Garg and Goyal (2012)
Business-IT communication and understanding	Garg and Goyal (2012)
Top management communication with low level managers about the strategic implications of IT investments	Reynolds and Yetton (2015)
Top management communication of the strategic vision of IT to the employees	Huang and Hu (2007)
Environmental uncertainty	Chan et al. (2006); Kim and Jee (2007); Kyobe (2008)
Competition intensity	Kim and Jee (2007); Dutot et al. (2014)
Partnership with other organisations	Kim and Jee (2007)
Financial resources	Kitsios and Kamariotou (2017); Ensari and Karabay (2014)
Clear definition of business mission, goals and visions	Chan and Reich (2007); Kyobe (2008); Kitsios and Kamariotou (2017)
Organisational size	Chan et al. (2006); Raymond and Bergeron (2008); Ismail and King (2014)
Organisational sector	Raymond and Bergeron (2008); Budiarto and Prabowo (2015)
Organisation's manufacturing strategy	Raymond and Croteau (2009)
Organisational structure	Ullah and Lai (2013); Garg and Goyal (2012); Ismail and King (2007)
Organisation's age	Garg and Goyal (2012); Ismail and King (2007); Raymond and Bergeron (2008)

To achieve a successful strategic alignment of IT, researchers agree that complete knowledge of factors is essential (Luftman et al. 1999; Burn and Szeto 2000; Chan et al. 2006; Yalya and Hu 2012). For instance, Luftman et al. (1999), recognise enabling and inhibiting factors of strategic alignment between business strategy and IT strategy to be a key practical extension to the original strategic alignment model (SAM).

Majority of studies adopted SAM as foundation for their research and presented as integrating several factors which impact strategic alignment as depicted in Table 2.3. There are other factors (in addition to the earliest factors identified in the strategic alignment maturity model (SAMM) discussed by Luftman (2004)) were discovered to be important. These factors are not discussed in SAMM and studies have called for additional examination of these factors in various research settings.

Different studies (e.g) have found a few factors and consider them to be significant. For instance, level of organisation's IT sophistication (Ismail and King 2007), top management's knowledge of and commitment to strategic use of IT (Ismail and King 2007; Chao and Chandra 2012), internal and external IT expertise (Ismail and King 2014; Lee et al. 2005), partnership with other organisations (Kim and Jee 2007); Financial resources (Street et al. 2017; Kitsios and Kamariotou 2017), organisational size (Chan et al. 2006; Raymond and Bergeron 2008; Ismail and King 2014) and environmental uncertainty (Chan et al. 2006; Kim and Jee 2007; Kyobe 2008). There is a need to identify the effect of the supplementary factors. Although, studies discuss that some of the factors have no significant influence on strategic alignment. An example is that studies (e.g Gutierrez et al. 2009; Luftman et al. 2008) established that size of an organisation has no major influence on alignment.

2.4.1.1 Factors affecting strategic IT alignment in medium-sized manufacturing firms.

Though, there is extensive studies on factors influencing strategic alignment, there is paucity of studies that describe factors influencing strategic IT alignment within supply chain integration as well as medium-sized enterprises. Research (e.g., Chan et al. 2006; Chan and Reich 2007; Tallon and Pinsonneault 2011) highlighted the need for further studies to explore strategic alignment factors in other classes of businesses such as small and medium-sized businesses.

According to Flynn et al. (2010), without a distinct understanding of the influence of key factors, successful implementation of supply chain integration could be challenging. As a result, using existing studies helped narrow down to the most crucial factors influencing strategic alignment for supply chain integration. The factors are categorised as internal factors and external factors.

Studies found that level of organisation's IT sophistication (Ismail and King 2007), top management's knowledge of and commitment to strategic use of IT (Ismail and King 2007; Chao and Chandra 2012), IT expertise (Ismail and King 2014), partnership with other organisations (Kim and Lee 2017) and financial resources (Street et al. 2017; Kitsios and Kamariotou 2017) are factors influencing strategic alignment in SMEs. This study argues that three internal factors (IT sophistication, top management's knowledge of and commitment to the strategic use of IT, IT expertise) and elements of external factors depicted as political factor, economic factor and technology influences (Singh 2002; Chan et al. 2006; Melville 2010) are considered as the basis for achieving strategic alignment in the research context.

2.4.1.1.1 Internal factors

Within firms, the ability to improve performance by developing effective processes is an key driver in achieving supply chain integration. The capability of a firm to improve involves steps and approaches undertaken for the purpose of achieving performance. The following section discusses three internal factors namely IT sophistication, top management's knowledge of and commitment to strategic use of IT and IT expertise, that could influence strategic alignment.

- **IT sophistication**

In their proposed model, Ismail and King (2007) presented six factors, they are IT sophistication, owner/manager knowledge, owner/manager commitment, external expertise, internal expertise and firm size lead to increased fit between IT and business strategies. Altogether, the study found that the factors lead to increased strategic alignment. The study collected data from 230 firms using questionnaires. Alignment was calculated by multiplying the category of the IT requirement with the corresponding IT capacity. The IT sophistication factor was measured by assessing the number of technologies used in the firms as well as the number of applications.

Also, some researchers (e.g. de Burca et al. 2006; Perez Estebanez et al. 2010; Huang 2012) that IT sophistication acts a midpoint between strategic alignment and business performance. For instance, de Burca et al. 2006 argued that a firm requires sophisticated technology to automate its business processes. Also, Perez Estebanez (2010), found that SMEs particularly in the service industry use IT intensively and are keen about IT sophistication.

Studies (e.g., Raymond and Pare 1992; Ismail and King 2007) describe IT sophistication in SMEs is described as a concept with multiple dimensions. Raymond and Pare (1992) discussed IT sophistication in terms of technological, informational, functional, and managerial sophistication. They defined IT sophistication as a concept that depicts “the type, complexity and interdependence of IT and management in an organisation” (Raymond and Pare 1995, p.7), The study further described the dimensions of IT sophistication by starting with technological sophistication that elucidates on the quantity or range of information technology implemented. On the other hand, informational sophistication discusses the type of software applications used. Functional sophistication reflects the step-by-step implementation process of information technology. Lastly, managerial sophistication is concerned with the procedures engaged for planning and evaluations of the current and future IT systems.

Following the studies of Ismail and King (2007) and Cragg et al. (2002), this study defines IT sophistication based on technological and informational sophistication. According to Thong (2001), SMEs typically have singular IT functions and therefore have limited IT planning for existing and future IT systems.

- **Top management’s knowledge of and commitment to the strategic use of IT**

Also, according to Ismail and King (2007), top management’s knowledge and commitment are relevant for the effective implementation of strategic alignment in SMEs. The roles of business owners and managers is emphasised in how they bring IT into alignment with business goals and objectives (Sledgianowski and Luftman 2005). The commitment of top management could be described in their participation in IT projects which encourages their staff to take part in the implementation which in turn leads to achieving alignment. In addition, top management could allocate resources for purchasing and implementing IT systems in the organisation (Shang and Seddon 2002).

Also, further studies have corroborated that business owners and managers IT with negative perception towards IT failed to invest on IT projects and this attributed to limited knowledge of the strategic influence of information on the business. Studies (e.g. Lesjak and Lynn 2001; Levy et al. 2001; Chao and Chandra 2012) in SMEs

also discussed that strategies adopted by SMEs impacts on the adoption of information technology. For instance, Lesjak and Lynn (2001) argued that business owners and managers that implemented low-cost strategy and identified information systems as crucial to their business. Their study found that the perception of IT as integral to the business strategy of SMEs is based on the top management's innovation and commitment, which enabled the businesses to achieve competitive advantage. Also, the study examined by Chao and Chandra (2012) which discussed the influence of business owner's IT knowledge on the implementation of strategic alignment in small firms found the factor to be a major aspect of achieving alignment.

- **IT expertise**

Still, Ismail and King (2007) identified internal and external IT expertise as crucial for strategic IT alignment. Internal and external IT expertise is described in terms of the presence of an appropriate IT personnel and firms seeking for specialist's exterior to the firm respectively. Studies highlight that SMEs are aware of the importance of employing experienced IT staff. The existence of IT staff could support owners and managers to identify the appropriate IT system to generate the required information to share with vendors. Furthermore, studies (Li et al. 2016; Modimogale and Kroeze 2011) highlight the importance of specialists external to the organisation in that they provide advice and play crucial roles in encouraging SMEs to achieve strategic IT alignment. The support by these experts could enable SMEs to have a wider perspective of their information technology needs.

Therefore, internal and external expertise is considered in this study as a crucial factor to achieving strategic alignment.

2.4.1.1.2 External factors

The external setting of an organisation is important to the implementation of IT alignment and supply chain integration. The continuous changes in the market make it crucial for firms to integrate supply chain processes. In addition, the quest to ensure customer satisfaction, requires partnership and collaboration within the organisation and with suppliers. Existing studies (such as Ward and Peppard 2002; Singh 2002; Chan et al. 2006; Melville 2010) discuss that political or governmental influence, economic influence, competitive setting in which the organisation exists and information technology impact on strategic alignment.

- **Political, economic and technology factors**

Organisations do not exist in isolation; they operate alongside competitors within the market in which they exist. Also, organisations are affected by activities in the wider environments external to the firm which affect IT alignment, they can be classified as political factors and economic factors. Political factors refer to rules, laws and policies with effect on an organisation's strategic IT alignment (Reich and Benbasat 2000). Previous studies have also discussed the role of a country's political situation and the impact on organisations (Nnadi 2014; Alabi 2019). With advances in globalisation, the political setting of an organisation is important to the achievement of strategic IT alignment (Kearns and Sabherwal 2006; Perez et al. 2021). For instance, Perez et al. (2021) discuss how external political or regulatory influences impact on strategic alignment projects. Yayla and Hu (2012) also identified politics as a crucial external factor of strategic alignment in a developing country.

Studies (such as Yayla and Hu 2012; Pavlou and El Sawy 2011) discuss how the economic situation of the country in which an organisation operates influence the implementation of IT alignment. For instance, Kitsios and Kamariotou (2017) identified economic circumstances such as fluctuation in exchange rates and inflation and the impact on IT alignment. Yayla and Hu (2012) discussed the impact of economic instability and the influence on alignment in developing economies.

Furthermore, existing studies have discussed external influences on information technology and the significant impact on strategic alignment. The evolving trends in technology gave rise to organisations seeking to develop their business strategy and IS strategy and pay attention to the strategic role of IT to remain relevant in their existing markets (Merali et al. 2012; Teubner and Stockhinger 2020).

2.4.2 Strategic IT alignment in SMEs/MEs

SMEs possess advantages such as flexibility, lack of formality, viable and systemic resilience (Saini and Budhwar 2008) which is a source of competitive advantage. As a result of the paucity of resources found in SMEs, business owners and/or managers focus on activities relating to operations to enhance business performance.

Strategic alignment of IT studies in SMEs are emerging, which precipitates a recent focus on the strategic alignment of IT and performance discussion (Njanka et al. 2021). Research reveals that in SMEs, strategic alignment of IT contributes to competitive advantage and performance. For instance, Levy et al. (2011) discussed that an SMEs engage alignment by adopting various ways based on their stance in their existing markets, such that each direction leads to enhanced performance. Another study (Raymond and Bergeron 2008) found that alignment an organisation's e-business competencies and business strategy impact on performance. Furthermore, a study with a sample of 248 manufacturing SMEs conducted in Canada presented that the use of advanced systems aligned with new business opportunities leads to improved performance (Raymond and Croteau 2006). In addition, studies also discussed the connection that exists between strategic alignment of IT and performance. For instance, Johnson and Lederer (2010) established that strategic alignment of IT was positively associated with reduced cost of production and customer satisfaction. In their study, Bryd et al. (2006) found that the actual value of strategic alignment of IT to a firm is in leveraging IT investment, especially in small and medium-sized manufacturing firms. They noted that increase in revenue and profits are results of the improved alignment of IT and business strategy. Due to limited resources in SMEs, adopting a generic set of business and IT strategies across firms is not effective; firms typically engage in specific business and IT strategies. Additionally, studies highlight that the application of IT alignment vary from firm to firm. Therefore, it challenging to examine a specific type of alignment between business and IT strategies including the impact on performance in the SME context.

Furthermore, studies corroborate that such investigations are not feasible, not only because strategic alignment of IT varies but because of the presence of formal and informal business and IT strategies. In their study, Gutierrez et al. (2009) discussed that majority of studies that investigate the concept of strategic alignment of IT in SMEs, rather than distinguish between the different sizes of firms, group small and medium-sized enterprises in one category with 1 to 250 employees. Though the proposition is questionable as the management requirements of a firm with 5, 20, 50 and 250 differ significantly (Delmar et al. 2003). Studies attempt to make this

distinction focus on small firms, yet based on research, there are only few studies which consider strategic alignment in medium-sized enterprises.

Also, majority of the studies within SMEs context examined strategic alignment, its factors and performance across several sectors. Given the nature of variation of strategic alignment in SMEs, disallow researchers to provide a generic framework for the link between strategic alignment of IT and performance for all SMEs. Thus, it is imperative for further research to engage specific sectors in understanding the role of strategic alignment of IT in a SME context.

The breakdown above suggests recommendations for future research. Firstly, the type of strategic alignment of IT applicable in SMEs/MEs requires further studies. Adopting qualitative research is useful in examining the type of business and IT strategies and their alignment. Secondly, there also is a need further to explore the connection between factors influencing strategic alignment of IT and performance in SMEs/MEs. Thirdly, there is a call for additional research which focus on size based on SME class of businesses (i.e. micro, small, and medium) and to investigate strategic alignment of IT. Furthermore, most studies adopting the SMEs/MEs context are done in the western countries, and there exists limited detail relating strategic alignment across developing countries using the SMEs context. This study attempts to address the aforementioned gaps.

There are studies that have discussed the connection between strategic IT alignment factors and performance. For instance, a study conducted by Wu et al. (2015) investigated the impact of the factors influencing strategic alignment on organisational performance. The study showed that the impact of these factors is extensively mediated by strategic alignment. Bergeron et al. (2004) also attempted to define the concept of strategic alignment factors and the impact on business performance. Almajali and Dahalin (2011) examined the influence of six factors on strategic alignment and found a relationship between alignment and competitive advantage.

Studies have shown that SMEs are likely to improve business operations through partnerships. Kearns and Lederer (2003) and Seggie et al. (2006) agree that the, if partners are unable to achieve an adequate level of strategic IT alignment through partnership, hinders performance and prohibits obtaining benefits from IT capabilities

and limitation in productivity. The contributions from partners, as well the effective coordination are key in processes such as business governance and decision-making, activities involving monitoring the demand and supply of business offerings. For SMEs, it is crucial that beyond just the application of technology but focus on functional strategies that align business and IT competencies. If there is effective integration of IT strategies within an organisation's supply chain relationships, there is a likelihood that the overarching business performance improves as an outcome.

As a source of business performance and competitive advantage, strategic alignment of IT studies have been presented in growing economies as such countries are opportunities for engaging in competition internationally. In Nigeria, a developing country, strategic alignment of IT has been receiving attention from a few researchers recently. Adenike and Adewoye (2018) in their study examined the relationship between IT investment and an increase in sales, they concluded that the investment in an IT system if strategically aligned with organisational policy will have a positive impact on sales. Another study conducted in a public organisation on the barriers to business-IT alignment revealed previous IT failures, lack of feedback mechanism, organisational structure, lack of standard infrastructure, limited knowledge, and insufficient communication.

As stated by Celik (2014), the degree of competitive advantage in an organisation can be evaluated by the strategic value and significance attached to IT. The use of information technology has been reported by Agwu (2018) to be significant in enhancing the manufacturing sector in Nigeria as one of the foremost, with approximately 13% to the Gross Domestic Product (GDP). Though information technology is seen as a foundation which aid the development of the manufacturing sector in Nigeria, challenges exist such as a limited understanding of the importance of IT, limited skills, and insufficient training (Onobrakpeya et al. 2018).

The successful implementation and strategic application of IT enable SMEs to compete with larger organisations as it enables this class of businesses to compete in a manner that improves their growth, evolution and sustainability. In most cases, SMEs in Africa struggle with effectively implementing and aligning IT with business goals (White et al. 2014). The conclusion of majority of the research indicates that IT

adoption in Nigerian SMEs has developed. However, advancement is inhibited by insufficient infrastructure and corruption (Afolayan et al. 2015). This study conducted by Afolayan et al. (2015) though a limited sample, presents 92% of SMEs with technology implemented across their business activities. Erume-Esin and Heeks (2015) report that level of awareness and IT resources ease of use are important business enablers, and the knowledge of the critical role of IT is key to Nigerian SME's IT use.

The study by Erumi-Esin and Heeks (2015) supports the work of Afolayan et al. (2015) by stating that IT infrastructure is a key challenge faced by Nigerian SMEs in the use of IT. Eze et al. (2015), discussed that SMEs in Nigeria acquire inappropriate IT infrastructure for their business. Even though IT capabilities are crucial to the SME's growth and development in Nigeria, Adeola (2015) reports that there is a paucity of evidence showing that SMEs exploit the advantages of IT in comparison to developed economies. The findings of Eze et al. (2015) reveal that it is pertinent that Nigerian SMEs bridge the current technology gap as the implementation of IT brings to fore the relevance of SMEs in the business age.

2.5 Benefits of Strategic IT alignment

The alignment of business processes and IT infrastructures enables organisations to improve their operations, output, communications and customer relations. It is widely accepted that organisations achieve improved overall performance through the alignment of information technology with their strategic business management (McAdam and Bailie 2002; Luftman and Derksen 2012). Although, studies such as Ullah and Lai (2013), acknowledge that achieving strategic alignment could be impeded by challenges, regardless of the progress, the key role of strategic IT alignment in driving business performance cannot be overemphasised. Business processes in both developing and developed economies are hugely influenced by online based transactions and e-delivery systems, which have supported easier transactions. The outcome is this is more businesses are constantly investing in information systems. Though, an increasing number of organisations understand the need to align their business processes with IT infrastructure, there is a lack of business or technical skills to align IT strategies with business functions. The investment and integration of IT into each process of the organisation enables all

functions to be adequately aligned. The relationships in the manufacturing setting, the connection between supply chain partners have undoubtedly been greatly impacted and improved through the deliberate infusion of information technology. To achieve increase performance because of strategic IT alignment, key procedures have been discussed in studies. According to Chan and Reich (2007), communication of the value of IT to stakeholders, collaboration involving employees to facilitate the implementation of strategies, collective efforts between business and IT managers in decision making regarding changes or implementation of new processes. The Henderson and Venkatraman (1999) model shown in Figure 3 describes how strategic alignment is likely to be achieved in a way that enables improvement in performance.

The shortcoming of the Venkatraman et al. (1993) model is that it fails to discuss how the model is implemented practically in an organisation, this makes it challenging for business owners/managers to understand the applicability of the model within their businesses. The model is credited for presenting a distinct view of the importance of IT strategies in the performance of organisation, it also presents a beneficial thought process for organisations to engage IT systems and skills into business processes (Luftman 2015). At the strategic point, business owners/managers are expected to define and communicate business strategy and IT strategy to members of the staff that take part in the implementation process. Top management need to put efforts into carefully analysing the steps involved in integrating IT functions in the business processes, ensuring all the activities of each employee are carefully outlined.

Furthermore, at the planning and implementation phases of information systems in an organisation, decision-making regarding business and IT governance require adequate involvements from business and IT executives, managers and unit lead, which ensure that business strategy and IT strategy are effectively aligned for enhanced performance. Also, at the pre-planning stages, once they are properly executed, possible interruptions during the implementation phase are reduced. In addition, business performance is expected to improve if the corresponding stages in the Henderson and Venkatraman model are well interpreted and the skills and assets needed to achieve the proposed tasks are defined, which enable the business to compete in its existing environment. An organisation that ensures all its

processes are effectively aligned; the result is a significant performance improvement (Venkatraman et al. 1993).

Swink and Schoenherr (2015)'s study also discussed that business functions properly aligned improve the organisation's performance by ensuring that the processes are developed and allow alignment with IT strategies. They further stated that the effective use of strategic alignment at the operational level helps information sharing by utilising business and IT competencies effectively to improve collaboration, enhance integration of processes and increase knowledge sharing between business and technology employees (Swink and Schoenheer 2015).

Empirical studies on function integration in strategic alignment present limited comparison exists between hypothetical and its practical realisation in business settings. Business processes are impeded by incompetence of the personnel shown in the ineffective use of existing use of IT processes. Also, organisations are challenged by the failure to introduce theoretical frameworks to business environments and an inability to involve business owners, managers and employees in decision-making activities relating to IT implementation, resulting in a limited achievement of strategic alignment. Furthermore, functional integration involves the use top management's rules to expedite collaboration and communication among the business and IT departments of an organisation to attain a unified objective (Frankel and Mollenkopf 2015). The success of functional integration entails joint commitment from key partners, articulated by teamwork and cooperation, through strategic and operational integration to achieve performance reliant on business settings.

2.6 Components of strategic alignment and supply chain integration

2.6.1 IS strategies and supply chain integration

The topic of IS infrastructure is an important issue for researchers and practitioners over the years (Davenport 2013). An organisation's IS infrastructure enables the integration of technological components in a manner that support business needs. The implementation of IT (Ngai et al. 2011). The implementation of IS has proven to having the capacity to impact on supply chain integration (Prajogo and Olhager 2012). An important advantage of technology is that it plays a key role in supporting supply chain integration. Accordingly, this enables supply chain partners to improve the

quantity and complexity in information sharing. Also, it has been emphasised that technology allows for real-time information sharing, enhancing visibility across the supply chain (Prajogo and Olhager 2012). Several studies have also argued that IS can affect performance through supply chain integration.

Supply chain integration (SCI) is reported as important for sustainable integration and survival (Seo et al. 2014). SCI may comprise of both information and material exchange without limiting to only one source of integration (Prajogo and Olhager). Also, previous studies have mentioned two kinds of SCI which are internal and external integration. Internal integration is a system within an organisation to harmonise business processes and functions (Tarigan et al. 2021). External integration involves supplier integration and customer integration. Supplier integration relates to collaboration between manufacturing firms and suppliers using IT systems which involves information sharing that fosters decision making and partnership with selected suppliers for risk sharing (Matopoulos et al. 2009). Customer integration consists of information flow, customer service, and products delivery and information exchange from the customers to the firms (Frohlich and Westbrook 2001). A vast amount of research show that manufacturing firms especially are faced with challenges of not adopting evolving technologies and organisations that implement technology have effective supply chain integration (Power 2005; Fabbe-Costes and Jahre 2008; Naslund and Hulthen 2012).

Information technology is an important factor that enables and determines the performance of an organisation. An information system provides interaction across stakeholders, ensures the availability and accessibility to information across internal and external setting. This interactivity presents a system for firms to permit the information flow across members of a supply chain and enhances collaboration within areas of the organisation (Gunasekaran and Ngai 2004). Technology is not only considered as key for improved performance and important in achieving increased information exchange, which is crucial in achieving integration across the supply chains. IT is described as an appropriate tool for achieving integration by developing an internal and external strategy using the concepts of strategic alignment and supply chain integration. In business-IT alignment, it is crucial to select the appropriate alignment standpoint which will enable organisations to achieve set business goals and objectives, allowing for competitive advantage and to meet the demands of the

market (Avison et al. 2004). Furthermore, IT should be incorporated not as a quick solution to challenges faced and if done this way fails to guarantee competitiveness. IT implementation requires effective planning and management (Wu et al. 2006). Hence, the benefits of IT can be fully exploited with the appropriate employee skills and organisational strategy.

According to Silvius et al. (2009), the alignment approach has been developed in a practical manner. The study suggested that a recent plan in a firm could aim to emphasise on business strategy and IT as key driver to achieve business goals and objectives. The influence of IT strategy on business strategy is evolving from only providing effectiveness to enhancing the business. Based on this, the following section focuses on business strategies in order to further discuss strategic alignment and assess the influence on supply chain integration of medium-sized manufacturing enterprises, as presented in the following chapters.

2.6.2 Business strategies and supply chain integration

The thinking behind business strategy specifically in the context of supply chain integration relates to creation of a supplier and customer base (Cagliano et al. 2006). As stated by Ross (2008), supplier-based strategies are key to building formidable relationships across the supply chain while strategies relating to building customer relationships are the foundation of key strategies. Studies (e.g. Zhao et al. 2011; Cannon and Homburg 2001) have also developed concepts that have highlighted supplier relationships and internal integration which supports strategies that emphasise the need to meet the requirements of the customers. Also, the creation of a business strategy involves efforts made to develop key actions which influence the type and management of a firm's processes (Tapera 2014). Furthermore, development of business strategies supports small and medium enterprises in thinking critically; capability to analyse future direction and make today's decisions based on future results; create a coherent basis for decision making; solve challenges; manage evolving situations and develop expertise (Saragih et al. 2020; Ho et al. 2002; Sabry 2015).

Business owners and managers of small and medium-sized enterprises engage procedures to generate strategies which support the fulfillment of their goals, meeting the demands of the market and continuously satisfying customers (Simatupang et al. 2002). Furthermore, according to Bhatt and Grover (2005), previous studies have

established that practices such as information technology and strategic planning are two key organisational practices which improve a firm's competency in managing its internal and external environments.

Researchers and practitioners have presented various recommendations for organisations and medium-sized enterprises in adapting to evolving trends. For instance, beliefs, theories and notions have been presented, such as the Management by Objectives by Drucker (1995); Strategic Management (Miles and Snow 1978); Culture Theory by Hofstede (1980) and Technology Acceptance Model by Davis (1989). The concept of business strategy is considered as a foundation of these frameworks and models

There is a significant influence of business strategy and IT strategy on strategic alignment respectively, there has been an argument that IT exists alongside business strategy (Wu et al. 2015). Strategic alignment presents organisations with benefits, a key one is maximising return on investments. In addition, alignment helps in determining the path for future investment emphasising on the threats involved and opportunities for future benefits to the business (Avison et al. 2006). Strategic alignment is described as able to put into action the business goals as well as increase performance as alignment enables firms to make deliberate investments in technology to increase competitive advantage and consequently efficiency (Chan et al. 2006).

The connection between business and IT with respect to strategic alignment is important to manufacturing firms although it is also identified that further research is required to address the relevance of strategic alignment which according to Luftman (2000) is concerned with "doing right things right" as well as investigating the impact on supply chain integration (Zhu et al. 2021; Li et al. 2019).

2.7 The link between strategic alignment and supply chain integration

Over the years, the concept of supply chain integration has emerged as a major field of study which involves the strategic alignment of functions and processes in an organisation. There issue of what elements of strategic alignment contributes to supply chain integration in manufacturing firms specifically has received less attention. Furthermore, firms have different business objectives and accordingly may vary based on goals set, the stage of assessment and criteria adopted, and the standpoint used,

therefore, business can develop and manage the benchmark for achieving integration. To present more studies on the connection between strategic alignment on supply chain integration, it is crucial to develop models or tools to assist firms in assessing alignment (Kumar et al. 2017).

Studies have identified internal integration, supplier integration, customer integration and information integration as key measures of supply chain integration. According to Ralston et al. (2015), internal integration is described as an organised and strategic alignment of business processes and activities to ensure a firm achieves competitive advantage and performance.

Supplier integration refers to the situation in which suppliers collaborate in important business processes of an organisation by an exchange of information relating to projections, production and inventory levels (Thun 2010). This also involves firms and key suppliers creating partnership, maximising the advantages the collaboration presents including improving lead times, innovation and quality of materials and products (Qrunfleh et al. 2013).

Customer integration allows firms to analyse their specific needs, presenting an opportunity to ensure satisfaction. Integrating customers within the supply involves gathering relevant information such as buying patterns, choice of products and their ability to which is useful for decision making during the process of manufacturing or sales (Lotfi et al. 2013).

Information integration is regarded to be crucial especially to firms aiming to work closely with suppliers and customers (Amue and Ozuru 2014). Information integration is not limited to the implementation of technology, it also needs human skills to sort, process and transfer information through IT systems, to the correct location in a timely manner for effective decision making (Sadler-Smith 2007). At the instance information is communicated across the supply chain which allows data to be gathered in real time because of a closer relationship established with members of the supply chain, presenting benefits such as increased customer service and improvement in forecasting (Amue and Ozuru 2014).

The study conducted by Basnet (2013) highlights that supply chain integration begins with internal integration across the departments and process within an organisation, thereafter external integration is explored. Basnet (2013) highlighted that in literature

there is missing a consensus on the definition and evaluation of supply chain integration. Basnet (2013) contributed by developing an instrument for assessing integration and identified three aspects of integration namely coordination, communication and collaboration. Likewise Boon-itt and Paul (2005) proposed to develop an appropriate measure of supply chain integration. Their study employed a Q-sort technique to address reliability and validity issues caused by subjectivity and concluded that the technique is suitable for development of SCI.

There are a wide variety of dimensions and variables for defining SCI and this according to Alfalla-Luquea et al. (2013) makes it challenging to compare findings. Studies (e.g., Cousins and Menguc 2006; Briscoe and Dainty 2005; Petersen et al. 2005) examine SCI using a one-dimensional construct, with variables that are different in number and focal point. For instance, some of the studies highlighted SCI constructs are developed from three (Vickery et al. 2003) or four (Rosenzweig et al. 2003; Cousins and Menguc 2006) to eight elements (Briscoe and Dainty 2005). The wide diversity of the elements is discussed in literature. For instance, in their study Rosenzweig et al. (2003) assessed SCI enquiring about the level of internal integration within the organisation, materials suppliers, distributors and customers. This differs from the study by Frohlich and Westbrook (2001) in which SCI considers elements such as access to planning systems, collaborative production planning, shared EDI access and networks, understanding of inventory levels, joint work on packaging, frequency of delivery, shared equipment and storage and collective use external logistics. Furthermore, Vickery et al. (2003) describe SCI using three variables which are partnership with suppliers, closer relationship with customers and cross-functional teams. The above examples show the lack of consistency in supply chain integration constructs and reveal the need for exploring further SCI to establish a clear understanding of the concept.

In addition, authors have reviewed SCI from the perspective of multi-dimensional constructs. For instance, Sahin and Robinson (2005) suggested that the level of information sharing ans well decision making as key elements of SCI. Also, Lee (2001, p12) presented three dimension which are “information integration, coordination and resource sharing and organisational relationship linkage”The dimension proposed in the study conducted by Bagchi et al. (2005) is similar to Lee

(2001), the dimensions which are differing include skills sharing, beliefs, organisational culture and organisation.

The most reported SCI approaches focus on inter and intra organisational integration (for example, Cagliano et al. 2006; Wong and Boon-itt 2008). Majority of these studies focus on external integration with suppliers (e.g., Cousins and Menguc 2006; Das et al. 2006; Koufteros et al. 2007) with only a few on internal integration.

2.8 Review of Strategic Alignment Models

The Strategic Alignment Model (SAM) as well as other tools such as the Generic Framework and Strategic Alignment Maturity Model have been discussed in studies that they contribute extensively to how strategic alignment is implemented across organisations. This section presents a critical analysis of SAM and SAMM based on the context of the study – identifying the factors not included in both models but are crucial to the research.

2. 8.1 Strategic Alignment Model (SAM)

The Strategic Alignment Model has been significantly reviewed in the literature. Based on the notion that IT is an important strategic resource and is critical for effective decision making, business strategy and IT strategy integration and coordination of IT activities and business activities. According to Venkatraman et al. (1993), achieving strategic alignment requires a thorough consideration of certain approaches, to implement IT capabilities strategically with business activities and objectives.

To achieve strategic alignment of IT, a comprehensive analysis of business processes, the presence of skilled employees, and technological capabilities are important (Venkatraman et al. 1993). Engaging in these analyses will enable SMEs to achieve business goals, implement business strategies and align both business and IT in such a way that fosters the realisation of set business goals. Also, the ever-changing business environment is to be taken into consideration and the constant upgrade of IT allows changes to be made to sustain strategic alignment.

Furthermore, the SAM enables the overall planning and structuring of an organisation using four main domains which are business strategy, IT strategy, business processes and infrastructure and IT processes and infrastructure. Also, they are

categorised in two approaches, the first two are grouped as external approaches while the latter, grouped as internal approaches.

The model presents guidelines which help define the relationships between the domains which cut across the entire structure of organisations. The relationships allow an understanding of the influences of each domain without disregarding none, because the connection is interwoven.

The business strategy domain is concerned with defining goals usually by the top managers which enable effective decision making to achieve business objectives. The business strategy is identified as crucial in this model and defined in three ways namely business scope, distinctive competencies, and business governance. The business scope relates to the choice of products or services proposed to the market. Distinctive competencies refer to characteristics of the strategy which makes it unique from competition in its market. Business governance is a collection of practices and processes that help operations in an organisation such as strategic relationships and agreements.

The IT strategy domain describes the technology pathway the organisation undertakes to achieve efficiency and effectiveness. According to the SAM model, this domain highlights three dimensions which are technology scope, system competencies and IT governance. IT scope refers to a collection of information systems and capabilities that technology offers in an organisation. The competencies of IT systems are unique to organisations based on their needs and goals. For instance, suitability and investments in technology. IT governance is concerned with improving the overall management of IT and actualising benefits from investments in technology. This also allows organisation to management IT risks and ensure that processes associated with technology are aligned with the organisation's goals and objectives.

The organisational processes and infrastructure domain relates to a structure of activities and optimisation of internal business processes which leads to increase in productivity and delivery of goals and objectives. This domain is characterised by administrative infrastructure, processes, and capabilities. Administrative infrastructure refers to organisational structure, hierarchy, roles, and responsibilities. Processes

and capabilities refer to human skills present in an organisation to actualise the activities defined in the business strategy domain.

The IT processes and infrastructure domain relates to overall components and methods that support the management and usability of information systems. This domain is characterised by IT infrastructure, processes, and skills. IT infrastructure is defined as interrelated elements important to operate and manage IT environments. Processes are activities involving implementing, managing, and supporting IT elements. Skills refer to knowledge and capability to improve technology based on business goals and objectives.

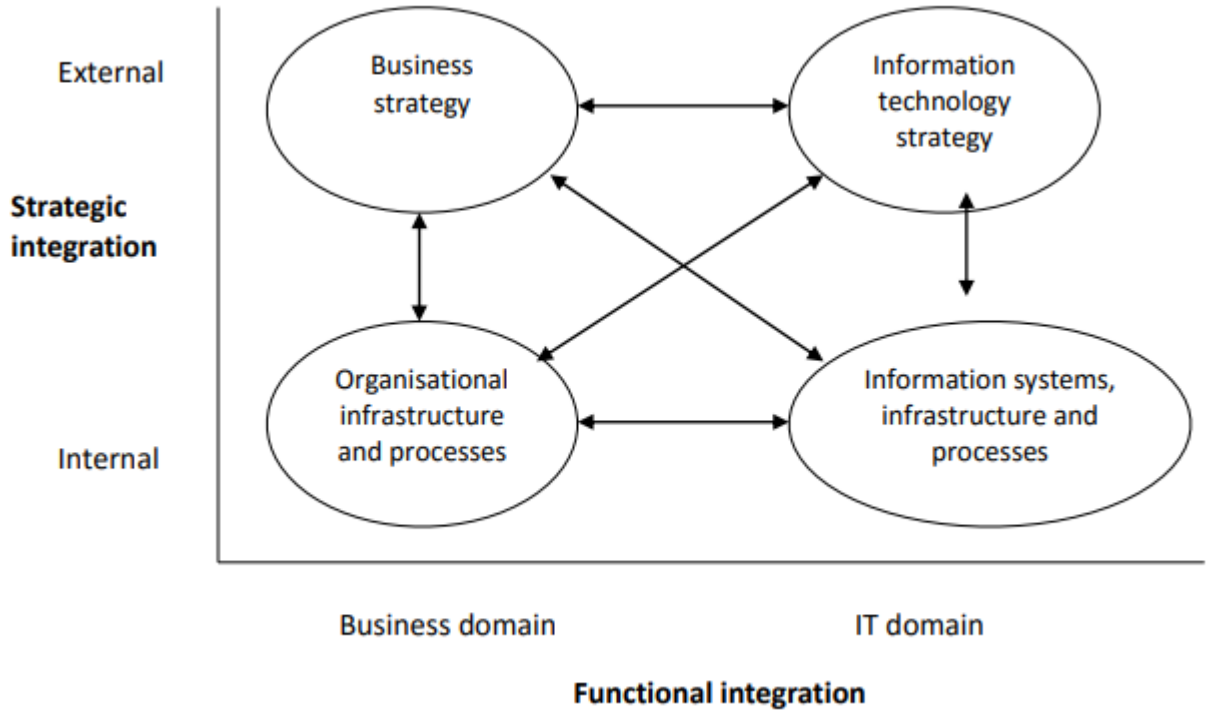

Figure 1 Strategic Alignment Model (Henderson and Venkatraman 1993).

In Figure 1, the SAM is based on the intersection of two main elements which are “Strategic Fit” and “Functional Integration”. Strategic fit highlights that the business strategy is operationalised in terms of external domain - which is how an organisation is positioned in its existing market and internal domain – described how an organisational infrastructure is developed and managed. Also, with respect to IT

strategy – this is the way the firm is positioned in the market in terms of IT (external domain) and IT infrastructure – describes how structures and facilities to support IT are built and managed.

On the other hand, functional integration is described in two ways – strategic and operational integration. Strategic integration examines the connection between business strategy and IT strategy from the external environment as IT enables the achievement of competitive advantage. Operational integration covers the internal domain which is the connection between organisational infrastructure and processes and IT infrastructure and processes.

Furthermore, Luftman et al. (1993) describes the connection perspectives between business and IT processes and activities. The perspectives can be determined using three approaches which are identifying the strongest domain – the driver of the change, the weakest domain – the area to be addressed and the third one is the impacted domain. Identifying the strongest and weakest domains allows the area that is affected by the changes to be identified.
Papp and Luftman (1995) recognised twelve alignment perspectives from analysing strategic fit and functional integration simultaneously. The study found that many participating firms failed to acknowledge alignment and the role of IT in meeting business goals and objectives.

2.8.2 The Generic Framework Alignment Model

Strategic Alignment Model, like other model has been criticised and identified to have some restrictions. Maes et al. (2000) presented that the SAM model failed to capture all key factors that could influence alignment which supersedes the horizontal dimension of business and IT strategies depicted in the SAM. Based on the work of Maes et al. (2000), alignment of business and IT is impacted by factors which could be cultural, political, financial and social. As a result, Maes et al. (2000) recommended a Generic Framework Alignment Model (GFAM) (Figure 2) in a way that extends SAM by adding an additional horizontal dimension to divide the internal domain based on structural and operational levels including an added vertical column between business and IT strategies (Avison et al. 2004). An extra horizontal column which depicts long-term architectural components, competencies, and infrastructures, while the vertical

column plays the role of an intermediary between business and technology (Avison 2004). In the GFAM, information sharing is perceived as a connecting element between business and technology which involves the implementation and sharing of information rather than the availability of information. The structural level of the model relates to architecture and competencies while process and skill relate to the operational level (Maes et al. 2000; Avison et al. 2004).

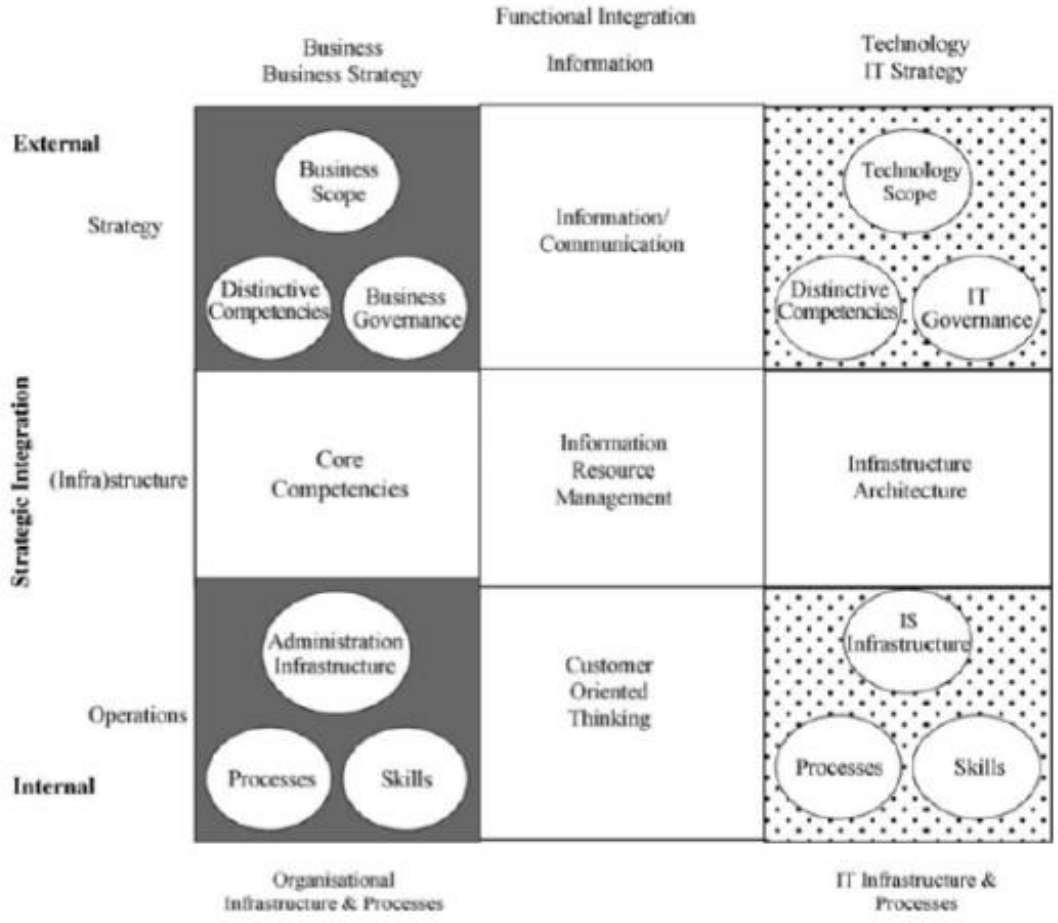

Figure 2 The Generic Framework Alignment (Maes et al. 2000; Avison et al. 2004)

The Generic Framework Model has been found to be suitable in examining external factors to an organisation. Accordingly applying this model to medium-sized enterprises will fail to effectively address internal resources holistically. For instance, in medium-sized enterprises management efforts in strategic alignment are crucial for information sharing. In addition, criticality of the information shared to suppliers via IT especially as this is important to achieve materials supply.

2.8.3 Strategic Alignment Maturity Model

Luftman (2000) proposed the Strategic Alignment Maturity Model, with the aim to evaluate an organisation's business and IT alignment. The components of SAM, the enablers/inhibitors research developed by Luftman et al. (1999) form the basis of SAMM. To achieve successful alignment, it is important that top management amplify enablers and reduce inhibitors. SAMM allows organisations to identify and analyse these elements. According to Elmorshidy (2013), an organisation is able to determine the position and how to improve when maturity of business and IT strategies.

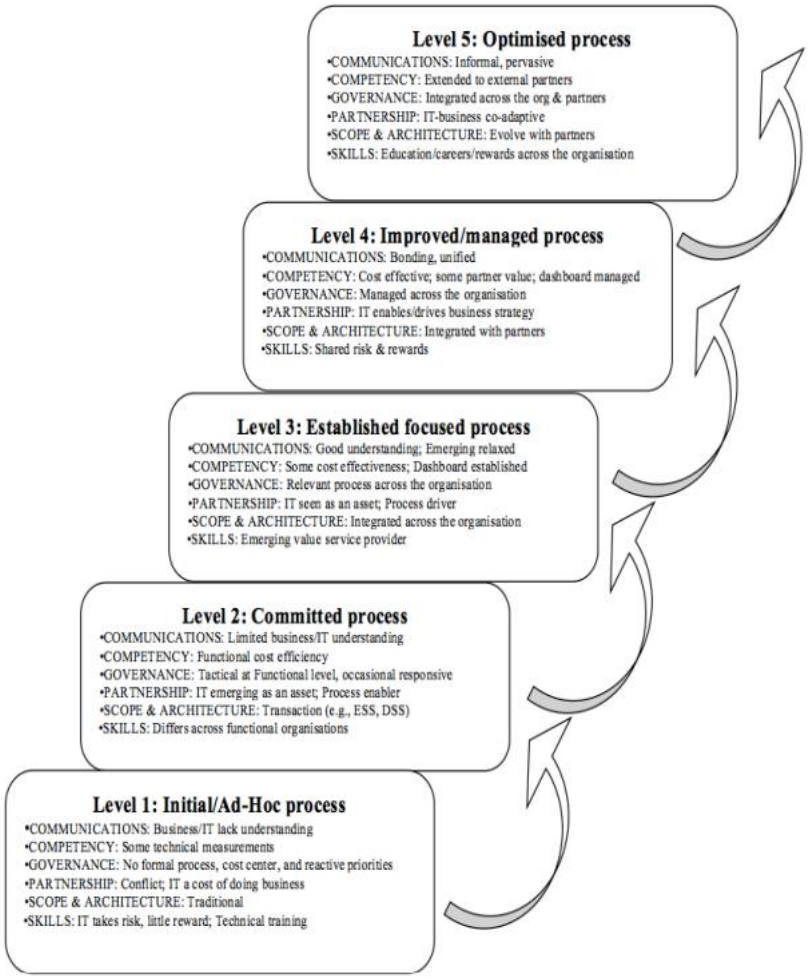

Figure 3 Strategic Alignment Maturity Model (Luftman 2000)

The Strategic Alignment Maturity Model proposed by Luftman (2000) has been identified in some studies as an important extension of the strategic alignment model (Elmorshidy 2013; Kurniawan 2013). According to Balhareth et al. 2013, the twelve elements of the SAM together with the inhibitors and enablers of strategic alignment

research are the bases for SAM. The SAM model would help organisations evaluate the processes involved in maximising and minimising the enablers and inhibitors of strategic alignment mentioned previously. Figure 3 above shows five stages of strategic alignment maturity model, which are Initial Process; Committed Process; Established Focus Process; Improved Process and Optimised Process. In each of the level of maturity, Luftman and Kempaiah (2008) highlighted six factors used in defining certain attributes: communication, competency, governance, partnerships, scope and architecture and skills. These factors have been validated to identify the level of alignment maturity in large organisations (Kurniawan 2013) as well as small and medium organisations (Gutierrez et al. 2009; Saptadi et al. 2012).

A study conducted by Gutierrez et al. (2009), highlight that there can be major differences between large organisations and SMEs relating to the following factors measurement, governance and scope and architecture. The six factors, and their attributes adapted from Luftman (2000), Luftman (2004) and Giuitierrez et al. (2009) are described as follows:

Communications: involves information sharing between the business and IT processes, such that the strategies, business and IT settings of an organisation are defined and understood. In addition, the attributes of communications factor can be described in terms of “understanding of business by IT, understanding of IT by Business, Inter and Intra-organisational learning, protocol rigidity, knowledge sharing and liaison effectiveness” (Luftman 2004, p.37).

Competency: is concerned with an assessment of IT investments, using certain metrics with the aim of identifying the influence of IT to the business. The attributes of this factor are “IT metrics, business metrics, balanced metrics, service level agreement, benchmarking, formal assessments review, and continuous improvement” (Luftman 2004, p.38).

Governance: this factor describes the level to which the power involved in decision making are defined and communicated. Its attributes are “business strategic planning, IT strategic planning, reporting/organisational structure, budgetary control, IT

investment management, steering committee and prioritisation process" (Luftman 2004, p.38)

Partnership: describes the collaboration between business and IT managers. The attributes are "business perfection of IT value, role of IT in strategic business planning, shared goals, risks and rewards, IT program management, relationship style, business sponsor" (Luftman 2004, p.38).

Scope and architecture: present an evaluation of IT maturity by assessing the level of IT flexibility, the ability to adapt to changes, facilitate and drive business strategies and provide creative solutions to meet the demands of the market. Its attributes are "flexibility, managing emerging technology, traditional, enabler/driver external, standards articulation, architectural integration, and architectural transparency" (Luftman 2004, p.39)

Skills: highlights human resources methods adopted, within the borders of IT. The skills attributes are "innovation, entrepreneurship, locus of power, management style, change readiness, career crossover, education, cross-training, social, political, trusting environment" (Luftman 2004, p39).

The Luftman's assessment tool (Figure 5) is identified as a useful tool to evaluate alignment with accepted validity for various components and recommended for use in strategic alignment studies (Straub et al. 2004).

2.8.4 Co-evolutionary Model of Strategic Alignment

Strategic alignment is referred to as a fixed and static concept in the sense that alignment fails to evolve in the constantly changing environments. Based on this, studies (e.g. Benbya and Mckelvey 2006; Vessey and Ward 2013) discussed strategic alignment to be a continuous co-evolutionary process. Co-evolution was initially used in biology which means organisms fail to evolve but co-evolve with other organisms and an evolving environment (Kauffman 1993). In addition, co-evolution is described as the processes through which elements or components of the environment are impacted by additional components. In the area of IS, co-evolution exists in alignment studies. Smaczny (2001) emphasises the merger of business strategy and IT strategy

such that both elements could be developed and implemented in a synchronised manner as opposed to the fixed traditional strategic alignment views. Although, Smaczny's study simply touched on the topic and questioned the traditional concept of SAM. However, further research has acknowledged the conventional strategic alignment is the obsolete notion of alignment and necessitates the need for future arguments. According to Agarwal and Sambamurthy (2002), co-evolution is driven by dynamic factors and IT competences. Their study focuses on three models, presenting a unique perspective of the role IT plays rather than using a strategic point of view.

Also, Benbya and Mckelvey (2006) emphasise that the infusion of co-evolution in strategic alignment enables the achievement of alignment within an evolving setting. The study addressed strategic alignment to be an ongoing process and provides a standpoint that hinges on the co-evolutionary theory proposed by Mckelvey's (2002). They further considered strategic alignment at three phases which are individual level, operational level and strategic levels, discussed with respect to the connection between business and IS strategy, business and IS departments and IS infrastructure and business staff using the co-evolutionary view as seen in Figure 4 below. In the co-evolutionary model, multiple levels are represented. First, at the strategic level, business strategy is aligned with IS strategy which hinges on top-down movement and a focus beyond standard but on the ability of the IT system to be flexible and adaptable. Second, the operational level identified by Benbya and McKelvey (2006) emphasises the importance of integration and collaboration between business managers and IT staff fulfilled by creating successful relationships at all levels. Lastly, the individual level depicts that the IS infrastructure is effective at the point of alignment with individual user's needs. Furthermore, relationships exist between the business and IS domains as well as capabilities that exist among them. One of the shortcomings of their study is that it fails to discuss how an evolving environment connects to strategic alignment.

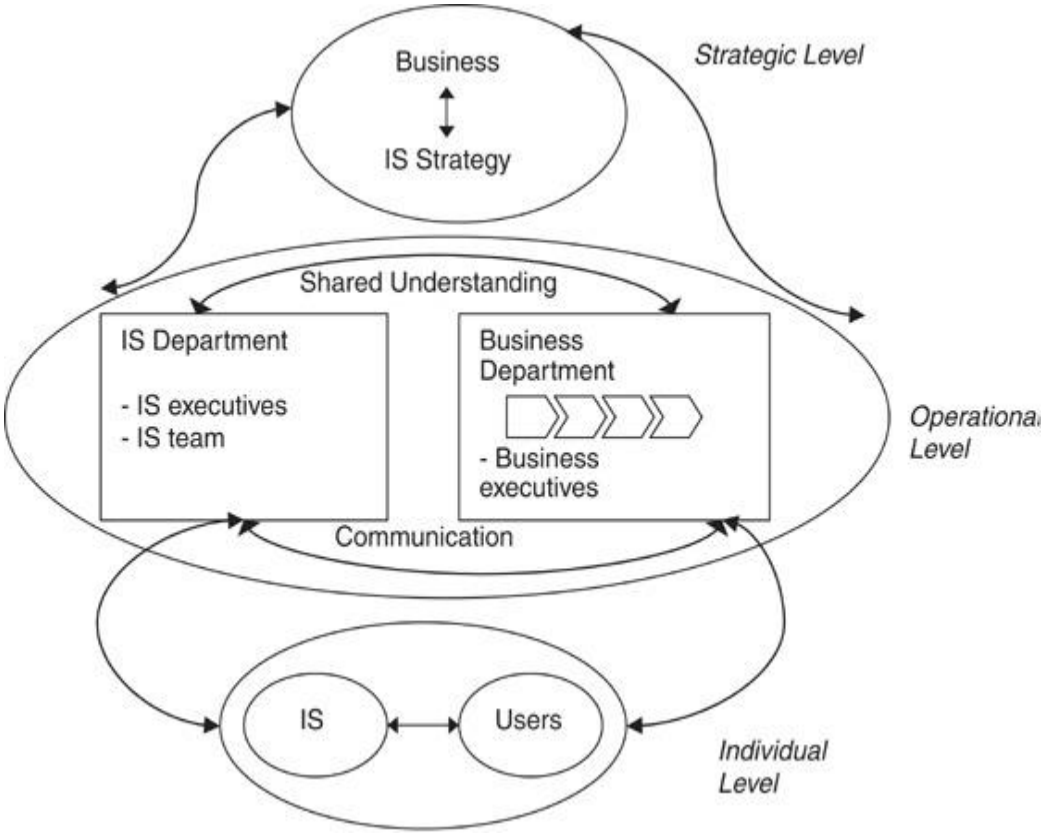

Figure 4 Co-evolutionary IS alignment model (Benbya and McKelvey 2006)

According to Tanriverdi et al. (2010) firms could change with the evolving competitive environment by assessing its organisational strategy involving business strategy and IT strategy that support firms in continuously repositioning themselves to become a leader in the existing markets. This means that alignment could evolve with the changing external environment. Nevertheless, the study considered the competitive environment and concentrated on the firm's organisational strategy with the evolving complex setting but disregarded the coevolution among business strategy and IS strategy.

In addition, the study conducted by Vessey and Ward (2013) adopted the co-evolutionary theory to investigate strategic alignment. They pointed out that strategic alignment is a changing, unpredictable co-evolutionary adaptive procedures. The study concluded that alignment could be achieved and maintained at the point when IS strategy is continuously aligned to meet the organisation's goals. They also considered the role of management by assessing the dynamic activities of alignment based on broader organisational issues. Particularly, the developed theory analysed that IS exists within the premise organisational process.

In summary, there is emphasis on the use of coevolution in strategic alignment, contributing to IS research generally and studies on strategic alignment specifically (Vessey and Ward 2013). Also, studies identify that co-evolution is crucial to continuous strategic alignment. Though, current co-evolution studies are mostly developed on testing and lack empirical support.

2.8.5 Review of strategic alignment models in small and medium-sized enterprises

Studies have also reported that most of the existing approaches are validated in large organisations and there exists minimal research on assessing the effectiveness of strategic alignment for SMEs. This section presents a review of strategic alignment models implemented in small and medium-sized enterprises.

Alyahya and Suhaimi (2013) proposed a conceptual model derived from Henderson and Venkatraman model, the study's proposed model focused on strategic integration of the alignment model. In the Henderson and Venkatraman's model the strategic integration is perceived as one of the most important benefits for a company and therefore there is a greater explanatory power when compared to the operational approach, their study because of that proposed a model that emphasised the strategic perspective of the alignment model.

Furthermore, the alignment model presented by Alyahya and Suhaimi (2013) considered also the factors influencing strategic alignment. Their alignment model focuses on the integration of three major elements of alignment, factors influencing alignment and the impact on organisational performance.

Gutierrez et al. (2009) also adopted the Strategic Alignment Model described by Luftman (2000) to determine the perceptions of SMEs based on factors described in the SAM which are most relevant to attain alignment and identified if there exists a relationship between the factors and the strategy adopted in the organisations. The study compared and reviewed the factors influencing strategic alignment discussed in SAM according to the organisational size (small and medium-sized enterprises).

Furthermore, studies have discussed alignment models from the lens of various areas of an organisation.

Ismail and King (2007) developed a research model associated with six factors influencing strategic alignment. Their study described hypotheses and justification of

how the variables are measured are also presented in the study. Jouiro and Kalika (2004) constructed a model using data from 381 SMEs across different sectors to investigate if alignment of IT with a partnership strategy and organisational size of an SME and concluded that these could have an influence of business performance. Their research also showed that to achieve a successful partnership strategy, SMEs need to evaluate the organisational impact of adopting technologies.

Cataldo et al. (2012) conducted an exploratory study on 38 SMEs in Chile and Colombia. The findings of the study failed to show significant differences between IT alignment and process level alignment although the strategic alignment approach better elucidated the inconsistency of IT success than the process approach. The findings of the study showed that alignment could influence the connection between process level alignment and IT success. The study concluded that despite that a few SMEs are involved with extensive and long-term planning, there is an implicit SME strategy that forms the way IT is used on processes. Gutierrez and Serrano (2008) proposed an alternative tool to understand Alignment at three levels of maturity namely strategic, tactical, and operational. The findings of the study demonstrated the way in which the proposed tool is used to identify the level of maturity.

Avison et al. (2004) reported on use of the strategic alignment model to determine if the tool is useful to create, access and maintain alignment between IT and business. Their study proposed a framework and established that through this, alignment is likely to achieved in firms particularly in a financial services firm. The study also contributed to existing studies by presenting an understanding of how alignment is achieved in organisations in a dynamic environment. Shibab and Rahardian (2017) identified if SMEs and large organisation implement varying approaches to achieve strategic alignment. Also, the study employed the strategic alignment maturity model for evaluation. The results showed that SMEs have the same approaches towards achieving alignment with each other and differed in comparison to the approaches of large organisation.

2.9 Research in MEs

MEs play significant roles in improving a nation's economic growth. MEs are firms that are grown more than smaller firms but have not reached the size of large enterprises

(Department of Business, Innovation and Strategy 2012). The question of what amounts to a medium enterprise differs by countries, institutions, and agencies (M Institute 2012). Although there is no agreed definition for MEs, studies have shown that majority of the definitions are based on the employee size, the asset values, and the annual turnover (Saleh and Ndubisi 2006; Abor and Quartey 2010; Berisha and Pula 2015). The European Commission defines MEs as any enterprise with employee numbers between 50 and 250, an annual turnover of between 10m euros and 50m euros, or a balance sheet between 10m euros and 43m euros in assets (European Commision 2015).

MEs are categorised in most countries as part of the SME grouping. A lot of countries, agencies, and institutions involved with small and medium-sized enterprises are limited to providing distinct characteristics between these two classes of enterprises. Limited research has been done in developed economies in this regard, but little or none has been done in developing economies. An example of this is a study conducted in the UK by the Institute of Chartered Accountants in 2005 in which 183 medium-sized UK enterprises were analysed (M Institute 2012). The study identified that major dimensions in medium-sized enterprises are different from others in the SME grouping. According to M Institute (2012), it is a problem that medium-sized enterprises are classified with small businesses via the SME definition.

2.9.1 MEs in Nigeria

There is limited research specific to MEs generally, and this paucity of literature on MEs is more pronounced in the Nigerian context. This section presents the potential characteristics of MEs in Nigeria, deduced from the general characteristics of SMEs in Nigeria.

Like the MEs in the United Kingdom, Nigerian MEs are often classified alongside micro and small firms and are found in virtually all sectors of the nation’s economy (SMEDAN 2017). According to Berg (2013) study, Nigerian MEs may possess similarities in behaviours with larger firms. For example, medium and large firms in Nigeria could sustain and grow their businesses because of their working structures, total assets, revenue, and profit margins. Additionally, large and medium firms in Nigeria can pay employees wages and review wages accordingly. Small firms

consistently trail medium and large firms in payment of employees' wages; employees in smaller firms are underpaid compared to larger firms (Page and Söderbom 2015).

The Nigerian MEs are few in comparison to micro and small enterprises, constituting less than 1% of the total number of enterprises. A study conducted by the Small and Medium Development Agency of Nigeria (SMEDAN), presented that the number of MEs has reduced drastically by 61% in 2019. In Nigeria, about 40% of medium enterprises are found in the manufacturing industry (Bank of Industry 2017). According to the National Bureau of Statistics (2020), formal establishments, staff requirements, and finance are influencers of Nigerian manufacturing MEs. Based on statistics from the Bank of Industry (Bank of Industry 2017), large firms in Nigeria employ about 50% of the total labour force, medium-sized about 27%, and small firms about 23%. Medium and large firms in Nigeria play crucial roles in job creation and staff improvement via training and developmental programmes. On the other hand, small firms are usually unable to train staff, under-equipped due to lack of funds (Ogunyomi and Bruning 2016). Typically, when offered loans, small-scale business owners are less receptive to loan finance because of a concern that private information could reach competitors or government agencies (Evbuomwan 2012). In addition, many Nigerian micro and small firms are not registered under the Corporate Affairs Commission (CAC) avoiding traceability – the CAC is an official body that deals with the registration of businesses in Nigeria (Onugu 2005). This is different in that MEs are mandated to be registered businesses under the CAC and should have some of their documentation intact and ready for inspection by the authorities. Also, the documentation indicating a firm's CAC registration are required by financial institutions for loans and grants.

Furthermore, in differentiating MEs, ownership structures can be identified as a comparative element (Onuorah 2009). MEs could be said to have a unique culture driven either by partnership, sole ownership or family, usually managed by a management team that control, coordinate, and delegate responsibilities to employees (Bank of Industry 2017). This presents Nigerian MEs with defined organisational and hierarchical structures in comparison to micro or small firms. The Nigerian MEs are characterised by a diversified customer base; customers across age

groups, locations, and needs (White et al. 2014). Profit is expected as a result of attention paid to excellent customer service. According to Nwobu et al. (2015), the ways by which Nigerian small and medium-sized enterprises could stay competitive are developing new products and services, and adopting various strategies to break into the markets (Nwobu et al. 2015). Nigerian MEs could finance some of their investments from the company's profits and bank loans (SMEDAN 2017).

MEs are affected by a few factors, that may impede their performances (M Institute 2012). The problems faced by medium-sized firms are distinct from those small or large firms encounter. Therefore, different methods could be employed in addressing the challenges (Abdulsaleh and Worthington 2013). MEs face difficulties in recruiting employees who will understand their business culture and raising expansion finance due to support from financial institutions and government bodies (M Institute 2012). Though MEs can finance certain projects, additional support is needed from government and financial bodies.

In Nigeria, some MEs face enormous challenges such as inadequate and ineffective infrastructures, and higher operation costs (Gbandi and Amissah 2014). Awa et al. (2016) specifically identified that the scarcity of resources inhibits ME's adoption of IT infrastructure. Some MEs in Nigeria have inadequate accounting systems which impacts their ability to properly access their performances. This increases the likelihood of mismanagement and business bankruptcy (Aremu and Adeyemi 2011). The MEs with better organisational structures are well-positioned to adopt IT. It is important to note that IT investments in Nigerian MEs can yield the desired returns, but lack of expertise and ineffective management support are the inherent risks (SMEDAN 2017).

The access to loans and grants by Nigerian SMEs generally may be limited (White et al. 2014). This limited access could be attributed to insufficient information, cost of managing small loans, the location of the enterprise and the return on investment. Although, MEs may be able to cater to some of their business needs due to their profitability, support from government and financial institutions are still crucial (SMEDAN 2017).

The solutions to the challenges facing MEs include stable financial development; an effectively secure financial system, industry segmentation, and targeted lending (M Institute 2012). The lack of SME segmentation is unhelpful when distinguishing medium enterprises from small enterprises. Many of policies created on small and medium enterprises focus mainly on the needs of small enterprises, rather than the significant needs of small and medium enterprises based on firm size and industry. The invisibility of MEs needs to be addressed to create a separate business sector entity.

In the following section, the theories underpinning the study are discussed. The theories are used as they help in explaining the relationship between strategic IT alignment factors and business performance.

2.10 Summary

In this chapter, an overview is presented regarding developments in existing literature on strategic IT alignment, particularly in the context of strategic IT alignment, strategic IT alignment factors, and performance, supply chain integration, strategic IT alignment factors and performance, strategic IT alignment in SMEs and strategic IT alignment in the Nigerian context. Also, a review of studies in SMEs/MEs indicates directions for future studies. First, strategic IT alignment factors in SMEs/MEs need to be studied further, using qualitative studies can help to explore strategic IT alignment factors. Also, there is a need to further explore the connection between strategic IT alignment factors and performance in SMEs/MEs. Furthermore, there is a requirement for additional studies emphasising on the sizes within SME types (i.e., micro, small and medium) and to explore strategic IT alignment factors. In addition, most of the research on strategic IT alignment factors within the SME context exists in Western countries, and there exists limited studies on strategic IT alignment in other countries within the SME context.

Chapter 3 - Theoretical framework

3.1 Introduction

The objective of this chapter is to provide an overview of the theoretical underpinnings on which this study was established. The discussion highlights elements of the Strategic Alignment Model (SAM) and Co-evolutionary Model are adopted to cover the scope of this study.

3.2 Theoretical vs Conceptual Framework

Theories attempt to elucidate on reality by trying to understand a concept and attempting to determine the reason why the world is how it is (Anderson et al. 2014). The acceptance of a theory influences researchers' perception and interpretation of their own experiences based on the principles laid down by theory. Theories drive analysis and enables development of projections and conclusions tested by findings emanating from previous studies (Myerson 2013). The theory relating to a particular context represent a generally accepted body of knowledge and a properly developed model describes systematically in a way that allows for theory validation (Thomas 2007). In qualitative studies, a theoretical framework allows the interpretation of findings based on the research questions designed (Anfara and Mertz 2014). To interpret the empirical outcomes of a study, the theories on which it is based, require proper understanding of the philosophy underpinning the research.

Theoretical frameworks have been described and conceptualised by various studies. According to D'Amour et al. (2005), a theoretical framework depicts a relationship between concepts which exist from valid research in a specific area of study. On the other hand, Taillefer et al. (2003) discussed the theoretical framework as a tool used in describing the structure of a study, based on interrelationships between the explanations through which a theory is developed. The study conducted by Macharia and Nyakwende (2009) presents a slightly different viewpoint and described a theoretical framework as a group of models used in relevant studies relating to a specific research area engaged to strengthen the study. In addition, a research paper by Ocholla and Le Roux (2011) defined a theoretical framework as a plan gotten from important and accessible knowledge relating to a research area which allows

investigation of a specific setting, concept, or phenomenon. Ocholla and Le Roux (2011) further highlighted that a theoretical framework presents the foundation for the research area, which could be used in justifying the decision to undergo a study and the process relating to existing literature.

Further studies (e.g. Ngulube et al. 2015) discuss that the limitation in equating theoretical frameworks with conceptual frameworks could be a result of being unaware of the distinction that exists. The main difference between the two concepts is that conceptual frameworks evolve from constructs related to the research area, while theoretical frameworks are made of assumptions that are interconnected. Considering this study, the conceptual framework facilitated the detailed investigation of factors influencing strategic IT alignment in MEs within the context of supply chain integration.

3.3 The study's conceptual framework

To answer the research questions, a framework based on existing studies is developed for this study. This section presents a framework which serves as a guide for data collection and analysis.

3.3.1 Description of the study's conceptual framework

The research framework presents an integration of the concept of supply chain integration and strategic alignment to highlight alignment processes and factors which impact on its achievement as well as argue the need for supply chain integration.

As discussed in Chapter 2, the concept of supply chain integration emphasises the connection between internal and external integration and presents that a change in a component is likely to impact the other. This change can be generated by the changes externally and activities or change found in the organisation. Using the concept of Henderson and Venkatraman SAM and co-evolutionary model for this study allowed us to examine the factors influencing IT alignment to achieve supply chain integration in medium-sized enterprises. Figure 5 below depicts the study's process-based framework showing elements of strategic IT alignment, its factors and supply chain integration.

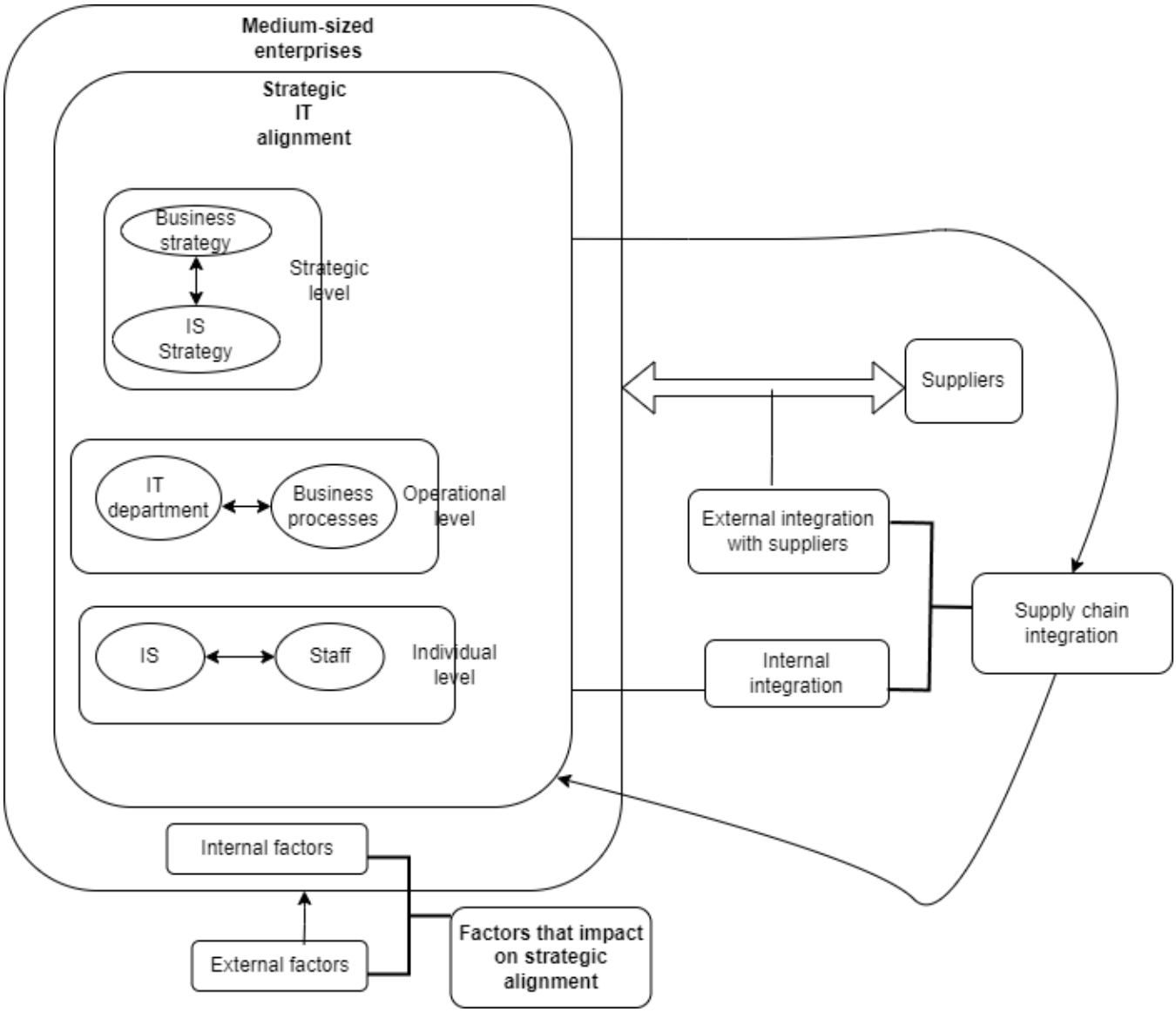

Figure 5 A process-based framework showing strategic IT alignment, its factors and supply chain integration.

3.3.1.1 Factors influencing strategic IT alignment.

The study highlighted that factors influencing strategic alignment are grouped into internal and external factors.

The term “external factors” in the framework are elements outside the organisation which significantly impact on achieving strategic alignment. As reviewed in section 2.4.1, where the external factors include environmental uncertainty and competition intensity. According to Chan et al. (2006), environmental uncertainty includes customers’ demands, political or governmental influence, economic or regulatory

influence and technology. Competition intensity refers to the firm's moves within its existing market, which could involve items such as pricing and product offerings (Kim and Jee 2007). Partnership with other organisations also identified by Kim and Jee (2007) as an external factor, which includes level of collaboration with supply companies or competitive companies.

These elements of external factors could change depending on the context. For instance, there are differences in how small enterprises implement information systems when compared to medium enterprises, there may be increased internal IT expertise with MEs, whereas both sizes of companies face similar economic challenges. Therefore, as contexts differ, themes within each factor can be modified based on context. According to the co-evolutionary model, strategic alignment changes continuously and fits to the evolving environment. The table 5 below shows external factors and definitions.

Table 5 Elements of external factors influencing strategic alignment.

External factors	Definition	References
Political	This refers to rules, regulations, laws and policies which impact an organisation's strategic IT alignment.	Reich and Benbasat (2000); Kearns and Sabherwal (2006); Perez et al. (2021).
Economic	This refers to the economic state of the setting in which an organisation exists.	Yayla and Hu (2012)
Technology	This refers to evolving trends which help organisations to pay attention to strategic use of IT	Merali et al. (2012); Teubner and Stockhinger (2020)

In Chapter 2, section 2.4.1 discussed how internal factors influence strategic alignment. Researchers suggest that strategic alignment factors impact on the internal setting of an organisation. Management's knowledge of and commitment to strategic use of IT (Ismail and King 2007; Chao and Chandra 2012), level of organisation's IT

sophistication (Ismail and King 2007) and IT expertise (Ismail and King 2007) are mentioned and discussed in literature as factors influencing strategic alignment (Ismail and King 2007; Chao and Chandra 2012). Like the external factors, the internal factors present a random relationship with strategic alignment according to the co-evolution theory. The contrast is that internal factors appear stable and evolve slower than the external factors (Benbya and McKelvey 2006). Table 6 shows some internal factors influencing strategic alignment.

Table 6 Elements of internal factors influencing strategic alignment.

Internal factors	Definition	References
Management's knowledge of and commitment to strategic IT alignment	This is described as the roles of business owners and managers particularly in how they bring IT in alignment with business goals and objectives.	Sledgianowski and Luftman (2005); Ismail and King (2007); Chao and Chandra (2012)
IT sophistication	This is described in terms of the type, complexity and interrelatedness of information technology and management in an organisation.	Raymond et al. 1995; Ismail and King (2007)
IT expertise	This is described in terms of the presence of an appropriate IT personnel within an organisation as well as seeking for specialist's exterior to the firm.	Ismail and King (2007)

3.3.1.2 Strategic IT alignment

According to the Co-evolution IS alignment perspective, strategic alignment is viewed as an evolving process. This implies that elements of alignment and the business setting in which it exists co-evolve impacting one another. The study also adopts elements of the Henderson and Venkatraman's strategic alignment model crucial for achieving strategic alignment. Furthermore, the study examines alignment at three

levels of strategic alignment. They are strategic level (Campbell 2005), operational level (Jenkin and Chan 2006) and individual level (Tan and Gallupe 2006).

Studies (e.g. Wu et al. 2015; Ullah and Lai 2013; De Haes and Grembergen 2009) present that strategies are implemented at strategic levels. In this stage, alignment focuses on how information systems support the achievement of business goals and objectives. Also, Avison et al. (2004) propose that at the strategic level of alignment, it is crucial that there is a link with the operational and individual levels.

Guiterrez and Lycett (2011) examined strategic alignment factors at the strategic, tactical and operational levels. The strategic level considers the organisation's activities and projects and aligns with the goals and objectives. In addition, Gerow et al. (2014) suggest that internal and external factors could negatively impact alignment leading to strategic misalignment.

This study addresses three levels of alignment - strategic level, operational level and individual level. The research framework is presented from Benbya and McKelvey's (2006) co-evolutionary IS alignment framework highlighted in section 2.7.4. The study described alignment in an encompassing way from a co-evolutionary viewpoint, this includes Strategic level – alignment of business and IS strategies, Organisational level – alignment of business department with IT department; Individual level – alignment of IS infrastructure with staff needs.

Studies such as Chen et al. (2008) conclude that if business strategy changes, IS strategy is expected to evolve in order to continuously meet business requirements. Benbya and McKelvey (2006) argue that IS strategy and business strategy are crucial to achieving alignment at the strategic level. In the operational level, alignment between business and IT departments requires a successful connection which enable business and IT alignment as well as enables the alignment IS infrastructure with staff's needs. According to Benbya and McKelvey (2006), business and IS domains collaboration to continuously achieve alignment is crucial. To achieve this, communication and information sharing between IT and business departments should be highlighted as essential. In addition, alignment at the operational level impacts on daily business process in organisations. Also, Benbya and McKelvey (2006) assert that strategic alignment at the operational level serve as basis for the application of IS strategy. The IT department in an organisation typically controls and manages

systems, networks and IT infrastructure. The users of IT systems are staff of the organisation who work with various business processes. The operational level is crucial as it serves as midpoint that links strategic level to individual level.

The individual level of strategic alignment depicts that user's needs continuously change and as such find innovative ways of employing information systems (Chen et al. 2008; Benbya and McKelvey 2006). It is crucial that organisations acknowledge employees specifications for IS based on the continuous changes to prevent the discontentment staff experience due to lack of inadequate inclusion of IS. Studies (e.g Kim and Kankanhalli 2009; Abugabah and Sanzagni 2010) discuss that the resistance to IS implementation could be as a result staff needs being neglected leading to implementation failure. Furthermore, assert that it is crucial for staff to meet certain criteria which include skills and knowledge for using information systems. The individual level of alignment is attained when the information system implemented in the organisation meets the needs of the staff and staff have the appropriate skills and knowledge to exploit technology effectively.

3.3.1.3 Supply chain integration (SCI)

In this study, supply chain integration is seen as the extent to which an organisation strategically coordinates within and externally with members of the supply chain, specifically suppliers as well as management of intra- and inter-organisational processes. SCI has been analysed and measured mainly from perspectives such as external (with suppliers and customers) and internal integration, process integration and information and materials flow integration (Quesada et al. 2008; Alfalla-Luque et al. 2013). The study's focus on the internal integration and external integration with suppliers.

Internal integration in this study refers to the connection that exists among the internal departments and processes in an organisation to ensure consistent flow of information and material to achieve performance (Zhao et al. 2011). In addition, internal integration relates to the functional capabilities of organisations, ensuring that information is shared, combined planning and cross-functional team to eliminate difficulties that arise within units and enhance collaboration to achieve efficiency (Foerstl et al. 2013; Swink and Schoenherr 2015). Chen and Paulraj (2004) defined

internal integration as the extent which an organisation collaborates across key business processes to provide improved customer service. Internal integration involves the application of technology important for the management of business processes and functions within the organisation (Li et al. 2009).

External integration with suppliers is defined in this study as the extent that a firm cooperates and relates with its supplier(s) to develop inter organisational strategies, methods, processes and activities into organised and manageable practices. The aim of external integration with suppliers is to control flows within the supply chain to lower costs, enhance prompt delivery, reduce lead-time and increase resilience (Wiengarten et al. 2014). The work of Khalfan et al. (2008), describing the integration of suppliers and manufacturers in a construction supply chain, revealed that integration with suppliers resulted in effective planning that led to performance improvement.

3.4 Summary

This chapter presents the study's theoretical framework. The chapter begins with differentiating theoretical and conceptual framework. The study's theoretical is presented and justification presented for the choice of both the Co-evolutionary IS alignment model and Strategic Alignment Model. The subsequent sections also discussed elements of the framework which include factors influencing strategic alignment – internal factors and external factors, strategic alignment presented at the strategic, operational and individual levels and supply chain integration – internal integration and external integration with suppliers.

Chapter 4 - Research methodology

4.1 Introduction

Chapter four attempts to discuss the proposed methodology for the concept being studied as well as interpret the overall design. A recent study by McCombes (2021) highlighted that research methodology consists of specific techniques to categorise, decide and interprete information pertaining to a topic. The chapter starts with presenting a research model and review of the research question and objectives which identified areas to focus on and emphasised key fundamental items.

The research philosophical standpoint section explores exisitng perspectives briefly and justifies the chosen position, which in the researcher's view is suitable for the study's context. The subsequent sections include research model, review of aim and research questions, research philosophy, research approach, the role of methodology in research, methodological choice, case study strategy, time horizon, data collection techniques, implementation of semi-structured interviews, data management and storage, research trustworthiness, role of a researcher, data analysis and ethics consideration.

The chapter also analysed the trustworthiness of the study and considered the steps taken with respect to credibility, transferability, dependability and confirmability. According to Saunders et al. (2009), the choice of an appropriate combination is important as the outcomes of the research methodology are affected by the choices of research methods and design utilised. The Table 7 below shows the research structure to ensure its aim, objectives and research question are addressed.

	Objectives	Method used	Chapter
1.	To critically review and synthesise literature on factors that could influence strategic alignment of IT, and how they relate to supply chain integration.	Review of Literature	Chapter 2 – Literature Review Chapter 3 – Theoretical framework
2.	To critically examine the importance of strategic alignment of IT in Nigerian medium-sized manufacturing enterprises.	Review of Literature Interviews Review of results and "Observation"	Chapter 2 – Literature Review Chapter 4 – Methodology Chapter 5 – Findings
3.	To critically investigate the processes of strategic alignment for supply chain integration in Nigerian medium-sized manufacturing enterprises	Interviews Review of results and "Observation"	Chapter 4 – Methodology Chapter 5 – Findings Chapter 6 – Discussion of Findings Chapter 7 – Conclusions and Recommendations

Table 7 The research structure showing the research objectives, method and chapter they are addressed.

Furthermore, this chapter discusses and outlines the research paradigm, approach, research design, data collection and ethical issues.

4.2 The research model adopted.

This section discusses research onion, which is one of the current models that supports researchers in methodology development. The research onion is seen as consisting of concepts to present an organisation with reasons for improvement of reasonable designs for research. Also, Raithatha (2017) identify that the exploitation of the onion model enables the gradual planning of a suitable model used in research.

Methodology is classified as a generic process a study adopts which outlines the manner in which research exploration ought to be done. It incorporates philosophical beliefs, that form the understanding of the research questions and help the decision of the suitable method for research. It is an important part of a research project which support with ensuring stability between selected procedures, practices and way of thinking.

The research onion describes the decisions made towards choosing methods for research development. Figure 6 depicts the stages or layers that are to be adopted to figure out a viable approach.

The research exploration begins with an understanding of philosophy – the primary way of thinking. The choice of approaches, methods, strategies, fundamental data collection techniques and procedures as well as characterising horizon via time point towards a design for research.

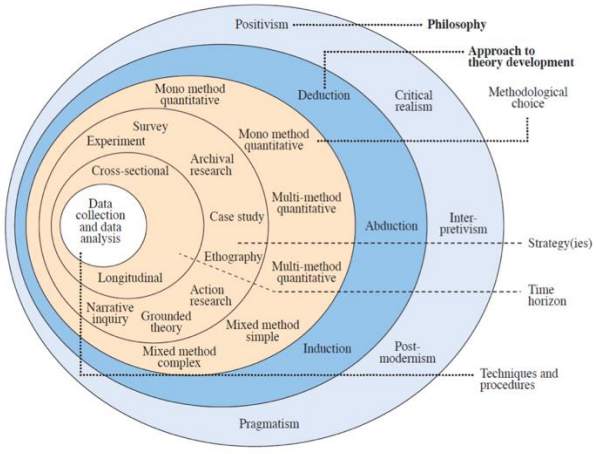

Figure 6 The Research Onion (Saunders et al. 2019, p.130)

4.3 Review of aim and research questions

To evaluate the factors influencing strategic IT alignment for supply chain integration within Nigerian medium-sized manufacturing enterprises, emphasis was placed on the current practices, views, and outcomes. The research questions are:

- Based on existing studies, what are the factors that could influence strategic alignment of IT and how they relate to supply chain integration?
- What constitutes strategic alignment practices/processes and why is it important to the achievement of supply integration in Nigerian medium-sized manufacturing enterprises?
- How can Nigerian medium-sized manufacturing enterprises implement strategic alignment to achieve supply chain integration?

4.4 Research philosophy – the choice of interpretivism

A philosophical paradigm refers to the rationale guiding the research and offers a set of frameworks, models, approaches, and techniques useful for defining data in a manner that the connection between data and theory is explained (Collis and Hussey 2003).

Crossley (2021) discussed that the research philosophy, using the research onion defined by Saunders et al. (2019) as the first layer. Furthermore, according to Johnson (2015), the philosophical commitment of a researcher has a significant impact not only on what they do but how they understand what is being investigated. This was also corroborated by Bryman (2012) who mentioned the concept as a compedium of beliefs relating to the nature of the reality being studied.

According to Melville and Goddard (2004), research philosophy differs across studies based on research goals and strategies adopted. Also, the type of concept being studied impacts on the choice of research philosophy (May 2011). The key perspectives of research philosophy are epistemology, ontology, and axiology.

The study embraced interpretivism. Interpretivism is an epistemology that puts forward that it is essential to differentiate between when research is conducted among humans in comparison to objects. Interpretivism analyses the value that natural science present to develop understanding in a complex social setting. Interpretivism positions that the study of the social world needs a separate research practice (asides from the natural scientists), representing the subjective connotations of social action

(Bryman 2008; Antwi and Hamza 2015). The fundamental purpose of interpretivism is to appreciate the diverse experiences of people and understand their world from their point of view (Bell and Bryman 2007). This approach also presents that empirical generalisation is less important as a result of the complexity of the study (Saunders et al. 2015). As a result, interpretivist studies are designed using qualitative methods in a relatively small sample to generate a detailed knowledge of the research objectives and generalise the findings to an expanded population.

Furthermore, interpretivism helps with explaining how individuals perceive their actions and that of others. It also enables an understanding people's culture and relationships socially. Interpretivism is different from positivism and realism as it aims to include richness in data collected rather than presenting definite and widely accepted laws that can be generalised and applicable to everyone in terms of key factors and variables (Myers 2019; Saunders et al. 2012). The approach provides a clear connection between the research and research subject as it assumes that humans cannot be disassociated from their knowledge (Saunders et al. 2012). The interpretivist approach lies in studying the facts of the society on the premise of the meaning of the context being examined. Hammersley (2012) on the other hand argues that the society develops based on the interpretation and knowledge of individuality and commonality. This distinction, Hammersley highlights is centred on the logic of social life internally and externally reasons of scientists. Thus, the interpretivist standpoint emphasises recognition and exploration of subjective meanings while reorganising and drawing conclusions (Creswell 2007).

Moreover, Collis and Hussey (2013) highlighted that research philosophy is a concept that depicts perceptions, beliefs, reasoning and nature of reality that underscore a specific study. For the choice of philosophical position, it is crucial that efforts are made to ensure that the right techniques are utilised.

In this study, the research philosophy is applied to the research problem which influence the outcomes as indicated by the research issue and literature review. The research exploration is dependent on the subject area. The literature discussed in Chapter 3 highlights the paucity of data as it relates to factors influencing strategic IT alignment for supply chain integration within Nigeria from medium-sized manufacturing enterprises.

This study endeavours to fill this gap which will contribute to knowledge. The underlying research question emphasise on factors that could influence strategic IT alignment for supply chain integration in Nigerian medium-sized manufacturing enterprises, which is subjective and controlled by humans through experiences. Therefore, positivism is not an ideal choice for this study as it presumes the concept of factors influencing strategic IT alignment as an objective reality. In positivism, there is a high tendency that a study will apply a structured methodology to produce quantifiable observations that depict statistical analysis (Gill and Johnson 2002). Also, positivism involves using the deductive research approach that entails the research moving from theory to data (Bryman and Bell 2015).

Likewise, the realism approach was initially considered for this study and was rejected because it is related to scientific enquiry in the development of knowledge. The standpoint offers a methodology that engages with causality and complexity (Smyth and Morris 2007).

The study's philosophical position is not only for answering the research question, also influences the how it is generated as well as its direction (Creswell and Cresswell 2017). This study points towards using an existing model to foster an understanding of how strategic IT alignment to achieve supply chain integration is practiced particularly for Nigerian medium-sized manufacturing enterprises by investigating the distinct factors that influence alignment. Therefore, this research has a subjective view and can differ considering various individuals (Chowdhury 2015).

The interpretivism research approach has been critiqued as it rejects knowledge developed as foundation base adopted as a universal law, brings to fore the question of validity and requires different set of criteria from the ones adopted in the positivism approach. As a result, this can lead to an awareness that research participants may not provide general interpretations (Scotland 2012). Furthermore, data collected and analysed are less likely to be generalised using the interpretivist approach as data are mainly dependent on a particular context, viewpoint, and values (Saunders et al. 2015).

Despite the critiques, the interpretivism approach is suitable for this study as it provides an in-depth understanding of phenomena being studied through collection and analysis of qualitative data leading to knowledge and conclusions that may differ

from others as argued by Myers (2019) and Saunders et al. (2015). Also, in interpretivism, induction is identified as the most suitable research approach (Bryman 2015).

4.5 Research approach – justification of the inductive approach.

According to Saunders et al. (2019), there are three major ways to deal with theory improvement, these are deductive, inductive, and abductive. The research approach informs the decision the researcher undertakes in terms of data collection and analysis.

The deductive approach is employed in quantitative studies, which is guided by a positivist philosophical standpoint and utilises experiments and surveys type of enquiry (Creswell and Creswell 2017). Additionally, as discussed by Saunders et al. (2019) in the quantitative approach, assumptions determined by prior research are created in a unique manner which leads to development of theory or hypothesis testing. Bryman and Bell (2015) discussed that the hypothesis of deduction is acknowledged as the most prevalent standpoint on the connection between theory and research. Moreover, Saunders and Townsend (2016) note that a quantitative approach presents a study from general to specific and collects information to measure the speculations to identify if the research is a distortion or confirmation of existing theory.

The inductive research approach conducts an enquiry into issues or topics to focus on, based on data collected and premises engage original or unproven conclusions (Saunders 2011). Creswell and Cresswell (2017) established that the inductive approach is guided by the interpretive approach.

In addition, creating theories from research from the perspective of Crossley (2021) study, is the subset of the inductive approach. According to this view, there is a paucity of knowledge and therefore research is to be conducted to gain understanding, that lead to development of theories instead of adopting one as in the deductive approach.

Furthermore, Bryan (2015) affirms that qualitative research emphasises on discussion form participants rather than numbers during data collection. Qualitative approach is exploratory in nature, which is employed to achieve understanding of thoughts,

understanding and emotions (DeFranzo 2020). Additionally, the inductive approach is applicable to generalise from specific to general to gather information, investigate a particular phenomenon and develop a theoretical framework with recognisable patterns and concepts.

Additionally, Flick (2018) discussed that qualitative research is widely utilised for the type of approach in which interviews are engaged based on the specific concept being studied, data is then analysed for similarities across participants. The inductive approach is adopted when there is limited research on a phenomenon. In contrast to the deductive approach, the inductive approach involves steps which include alternative course of action from research question to observation then explanation to investigation and then theory development.

The inductive approach is often engaged where there is less studies available on area of research. Induction is different from are deductive and abductive approached. The deduction rationale is related to thinking, from a general rule to a particular specific law-like outcome and is utilised for hypothesis testing. The qualitative approach is based on induction while the quantitative approach is based on deduction. Abductive reasoning can be viewed as being related to both inductive and deductive reasoning as it is used to create inferences and develop theories (Dubois and Gadde 2002). Table 8 provides a run-down of the inductive reasoning contrasted with the deductive and abductive with respect to logic, generalisation, use of data, and theory.

Table 8 Comparing the deductive, inductive, and abductive approaches (adapted from Kennedy 2018)

	Deductive	Inductive	Abductive
Logic	Here, when the premises are correct, the conclusions should also be true	In this approach, premises are established and are used to create conclusions yet to be proven	In the abductive approach, established premises are employed in creating conclusions that are provable.
Generalisation	The approach moves from generic to specific	The approach generalises from specific to generic	The approach generalises from the interaction between the specific and generic.
Use of data	Data is employed to assess the hypotheses associated with an extant theory	Data is employed to investigate the context under study, analyse themes, and patterns and develop a theoretical framework	Data is employed to examine the context under study, analyse themes and patterns, identify them in the theoretical framework and assess through data collection process that follow.
Theory	This approach has to do with theory misrepresent ation or verification	Concerned with creating and building theory	This approach is concerned with creation and modification of theory and combining existing when appropriate for the development of a new theory or modification of existing theory.

Based on the study's research question, an inductive approach is adopted. The research addresses questions with respect to how and what, this indicates an approach that allows the researcher to understand, individual perspectives as it relates to concept being studied.

To answer the research questions, the inductive approach enables the understanding the data collection to acquire perceptions of the how the participants implement strategic IT alignment and the factors influencing strategic IT alignment. Furthermore, the inductive is firmly related to the interpretivist philosophical standpoint.

In summary, as the deduction approach related to thinking which moves from a general rule to a specific outcome and is utilised for hypothesis tests. The inductive approach involves knowledge building, starts with explicit views on which a general theory is built. This study adopts induction as the preferred choice from relying on the research questions and philosophy.

4.6 The role of methodology in research

Methodology is utilised to provide a structure that serves as a guide for the research (Taylor et al. 2006). The methodology enables the researcher to have a tool useful for defining techniques and practices. Kumar (2018) and Creswell and Poth (2018) emphasised that methodology informs the manner in which an enquiry is completed.

In addition, methodology is crucial in defining relationships, assessing the data validity, developing strategies as well as activities important to addressing issues (Lewis et al. 2003).

4.7 Methodological choice

The methodological choice is characterised by justification of the data type – qualitative or quantitative research approach and the available options which could be single, complex blend or the utilisation of multi methods.

According to Creswell and Poth (2018), research conducted with an intention to understand a phenomenon or a concept in which there is paucity of studies, such exploration fits the qualitative research approach. This study suits the qualitative method approach as the researcher is interested in capturing, analysing, and understanding the experiences and perceptions of the participating MEs and their suppliers. In addition, as referenced in chapters one and two, there is little, or no research conducted on strategic IT alignment practices and the factors influencing strategic IT alignment from a Nigerian medium-sized manufacturing firm perspective. Furthermore, investigating the how, what and why of the concept understudy emphasises an approach that is qualitative.

Qualitative studies gather information in forms such as audio, pictures or documents and present the results in words. The findings in qualitative research are not simply records, perceptions or discussions. The presentation of the outcomes follows a rigorous process which involve a deep exploration of explanations, discusions and observations collected evidence on the subject matter.

Furthermore, the effective analysis supports the researcher to identify, uncover and acknowledge the complexities that could arise in the study. Additionally, the analysed data affirms the conclusions presented by the study participants.

A qualitative study is exploratory in nature and employed to achieve an understanding of key information, rationale and experiences (DeFranzo 2020). Qualitative methods

present key insights into the research problem and enable the creation of theories. Denzin et al. (2017) also put forward that qualitative studies are often associated with interpretivism. This type of research is engaged to uncover patterns in opinions and delve deeper into the identified research problem.

As a result of an idea of the data which can be obtained, researchers can inadvertently ask premeditated questions, to allow for an opportunity for the participants to respond as anticipated. Also, a respondent may decline revealing individual perceptions regarding the subject because of a disposition towards the topic or researchers. This situation could exist because of issues relating to personal feelings towards the employer or the subject matter is one that relates to the manner in which work is done.

To tackle such disposition, gathering and analysing subjective information is beyond recording of thoughts and perceptions. It is required that the analysis of findings involves in-depth examination such that knowledge emerges which improves the quality of the research.

This study adopts the qualitative research approach to achieve the study's objectives and facilitate the understanding of concepts that could be seen as complex or evolving (Ravitch and Carl 2019). Also, the choice of interpretivist research philosophy informs the choice. Moreover, qualitative methods have adopted in existing strategic alignnent research as well as social sciences studies to emphasise a deep understanding of the context being studied.

4.8 The research strategy

This aspect of the study highlights the researcher's intention to execute the examination. The strategy can include a number of distinct approaches such as survey, experiments, archival research, case study, interviews, action research, grounded theory and narrative inquiry. According to Denzin and Lincoln (2017), research strategy is the connection between the philosophical standpoint and methodological choice to gather and analyse data.

Studies such as Flyvberg (2006) mention the case study research as being suitable and mostly used for business and management research. The case study research has been criticised as a research strategy based on capability to develop viable,

generalisable and contribute to theory (Tsang 2014). This strategy is also referred to as being used in positivistic studies because it utilises small sample sizes and in interpretive qualitative research (Saunders et al. 2012). Existing research (e.g. Flyvberg 2011; Bansal and Corley 2011) have opposed this criticism, bringing forward the value of qualitative research.

Therefore, for this study, and based on the chosen philosophical stance, approach and methodological choice and the availability of relevant research organisations, a case study research strategy was suitable and adopted.

4.9 The case study strategy

The case study strategy is described as an empirical indepth investigation of a real-world phenomenon (Yin 2018). The research strategy is also defined as a set of actions which help to respond to the study's questions and address its objectives (Denscombe 2017).

The case study strategy for this research presents an in-depth investigation based on multiple views of the distinctiveness and complexity of a specific organisation, policy or plan in a physical reality as stated by Simons (2009). Case study research may consist of one or multiple scenarios with the objective of gathering in-depth and detailed understanding of the concept being examined (Thomas 2017).

In addition, this research employed represents multiple cases of the study. The aim is to collect in-depth information relating to the current strategic IT alignment processes for supply chain integration and the influencing factors within Nigerian medium-sized enterprises in the manufacturing industry. This is achieved particularly through stakeholders that are actively involved. A multiple case study allows for comprehensive information to be gathered regarding the concept being investigated as well as involve the use of comparisons between cases to improve the study (Yin 2018).

The study employed stakeholders namely directors, business owners/ top level managers, production managers, IT managers, system users and suppliers that are involved to explore the research from multiple perspectives across various enterprises. The researcher's view is that adopting stakeholders has capacity to

enrich the data and present an improved knowledge of the concept being examined because of their perceptions and professional experiences.

The case study approach has been criticised for its weaknesses and problems (Blaxter et al. 2010). The strategy is viewed in the light because of the small size of the sample, the findings are considered to be not generalisable (Blaxter 2010). This weakness is tackled in this study by including all relevant stakeholders such that generalisation is seen in the findings.

Furthermore, Schell (1992) highlighted that discussion of key findings is subjective because of researcher's bias in contrast to other research strategies. This study acknowledged this by employing diverse participants to ensure the quality of data, for instance using triangulation (Cohen et al. 2018).

The unique characteristics of the case study strategy include the capacity for multiple sources of data, detailed investigation and the need for triangulation because of the dinstinction between the phenomenon being understudied and the context (Yin 2009). Yin (2018) elucidated that case study approach is frequently employed when the boundaries between the research setting and reality are not visible. As a result, exploring the context is important to case study research.

The study's focus which is investigating current strategic IT alignment practices and the factors influencing the alignment within the context of supply chain integration, can be adequately examined through the perceptions of participants and observation of the alignment processes.

The analysis of the field notes from observing the processes elucidate on strategic IT alignment practices while the interviews and analysis presented, inform the research about the participants opinions and experiences. Subsequently, the main data sources for this study are interviews, observation and field notes.

The cost of the case study research includes gathering data in a frequent manner. The technique allows for the data collection to be conducted via multiple channels such as telephone, emails as well physical mode of interviewing. According to Gaille

(2018), the case study approach presents definite information based on the perceptions of the participants. The technique allows for a small sample size which yield a workable amount of data to be analysed.

A number of interpretivist researchers according to Stake (2005) choose to describe the case study approach in sufficient detail such that readers can build their own understanding of the research and connect to existing theory. Furthermore, Ridder et al. (2014) opines that some interpretivist researchers may choose to adopt induction by analysing data, identify themes and patterns and then identify this in existing studies to refine or generate theory.

Baxter and Jack (2008) expressed that multiple case study is utilised to understand the differences and similarities. Multiple case studies are used to support contrasting or similar results (Yin 2009). In addition, a multiple case study can be adopted on the basis that evidence are reliable and trustworthy (Baxter and Jack 2008). Multiple cases allow a detailed exploration of research questions and objectives. Hence, this study investigates strategic IT alignment factors and current practices across multiple MEs within the Nigerian manufacturing industry.

4.9 Time Horizon

This is described as the period in which data is collected (Crossley 2021) The research onion (Figure 4.1) specified two elements of time horizon which are longitudinal and cross sectional.

According to Saunders et al. (2019) and Goddard and Melville (2004), longitudinal time horizon refers to gathering data over a lengthy period, and adopted where a crucial element of the study is investigating a phenomenon that may change over time. Cross-sectional on the other hand relates to a specific period in which a study is conducted and employs survey strategy, as well as adopt qualitative or mixed method research strategies.

The above element relates to this study in which data collection was done between 2017 and 2019, the cross-sectional time horizon is adopted.

4.10 Data Collection techniques and procedures

At the centre of the research onion is data collection and analysis, according to Crossley (2021) this relates to choices made with regards to key techniques and methods. Saunders et al. (2019) discuss the importance of data collection at this stage of the research as it contributes to the overall credibility and dependability. Bryman (2012) mentioned that the choice of data collection techniques is based on the methodological approach adopted. Data collection may be primary or secondary. For this research and based on the strategies adopted the data collection technique and procedures using primary data to answer the research questions in previous sections.

4.10.1 Interviews

This study adopts a semi-structured interview technique to collect data. Semi-structured. Interviews also referred to as qualitative research interviews are described to have no uniformity, unlike structured interviews. In semi-structured interviews, identified themes and main questions relating to the study are highlighted, and the administration varies across interviews because of the differences in the context of the organisation and the importance of the research objectives (Saunders et al. 2015). This type of interview involves the use of a guide with relevant questions that cover the phenomenon under study (Blandford 2013). Semi-structured interviews are used in studies such as this, where it is essential that the concept being studied is investigated thoroughly and the answers provided are well understood (Baskarada 2014; Longhurst 2016). Also, semi-structured interviews allow flexibility such that the questions if important during the interviews can be changed, either by adding or removing questions dependent on the research setting (Noor 2008; Saunders et al. 2015).

The researcher scheduled an appointment with each research firm at a convenient time. Also, a space, as well as chairs and tables, were requested. The working order of the audio recorder was checked, and a set of spare batteries was secured. The face-to-face interviews were carried out using a document containing open-ended questions. During the interviews, the questions ensured that emphasis was maintained on the evaluation of factors influencing strategic IT alignment for supply chain integration.

According to Cassel and Symon (2004), researchers could utilise a semi-structured interview method, starting with an introduction and generic information on the interview process. Considering this, before the start of the interviews, participants were welcomed and appreciated the participant for their willingness to be part of the study. The participation information sheet and agreement form were given to each participant to read and sign. The participants were reminded that they can withdraw at any point during the interview. Finally, at this stage, the researcher asked permission to record the interviews as recommended.

The study designed two documents – one for medium-sized manufacturing firms and the other, for suppliers. For the former, interviews began by asking about the participant's educational and professional qualifications, current role, and length of stay. Next is that data is collected on the profile of the enterprise based on years of operation, goals, and objectives, the number of staff, and products offered. Following this, data is collected on the interviewee's perception on strategic IT alignment in the context of supply chain integration and firm performance. The interviews for the suppliers started by gathering data on the participant and then questions about strategic IT alignment from the supplier's perspective were asked. As earlier stated, semi-structured interviews are suitable for gathering data of this nature, the researcher engages in inductive reasoning to gain understanding on participant's understanding of the concept under studied. Interviews are useful for identifying what, how, and why strategic IT alignment factors knowledge in the scope of supply chain integration are created and applied while implementing strategic IT alignment within MEs and among MEs and suppliers.

The study initially set out to interview five target participants across the MEs because of the role they play in supply chain integration and strategic alignment of IT. The target participants were to include the top-level managers involved in strategy creation, planning, and decision-making, such as business owners, IT Managers, supply chain managers, and lower-level staff specifically IT system users. The supplier(s) of each ME was also part of the study's target participants. Appendix C8 renders a summary of the semi structured interviews conducted including the position of the interviews, date and time of interviews.

4.10.2 Development of the interview templates

Interviewing is described as the structured process of communication between the researcher and participants, where an audio device is used in recording information presented to the researcher (Goodman 2011). Interviews can be further described to be a deliberate dialogue (Lewis et al. 2003). Furthermore, Patton (2002) described interviews as an informal discussion that involves the researcher and participants to investigate a specific phenomenon. An interview can be successfully executed depending on the skills of the interviewer (Clough and Nutbrown 2007).

Saunders et al. (2015) identified three types of interviews, which are structured, semi-structured, and in-depth or unstructured. Structured interviews are described as defined and planned standardised questions, which are also referred to as interviewer-administered surveys. The advantages of structured interviews include the ease by which responses can be recorded on set codes that allow the gathering of scientific data.

Along these lines, the interviewer emphasised on the questions of real encounters extracted from the interviewee. Therefore, participants views and interactions in interviews play a significant role in understanding and exploring the phenomenon under study.

The questions for the semi-structured interviews are informed by the study's literature review and based on respondent's answers to get further information. A detailed review of existing studies was conducted to uncover the concept being studied. The literature review supported the development of two interview templates by exploring the different aspects of the study's proposed framework. The first interview template is aimed at participants from medium-sized manufacturing enterprises and the second template is for their suppliers. The knowledge and information acquired from the review of existing literature allowed the draft and eventual development of the semi-structured interviews by utilising initial discussion pointers on the research. In semi-structured interviews, interviews are not entirely structured for participants to share experiences with the researcher (Flick 2009).

Moreover, interview templates were designed to address the last two research objectives of the study discussed in Chapter 1. In the first interview template, the first eight questions in the template cover the profile of the participant such as educational

and professional qualifications, job role, and experience. The second section includes five questions covering the profile of the enterprise such as goals and objectives, number of staff, products offered, and sales revenue in the last three years. The third section comprises seven questions covering external integration with suppliers and internal integration. The fourth section comprises five questions covering strategic IT alignment and its factors. The fifth section comprises five questions covering the impact of strategic IT alignment on business performance. The second template for suppliers begins with the profile of the participants like the first template. The second section comprises ten questions covering the supplier's relationship with the MEs relating to how strategic IT alignment drives supply chain integration.

The interview questions were reviewed by the supervisory team including fellow researchers. The format of the interview questions changed slightly – some minor adjustments were made in the choice of questions and terminology suitable to Nigerian business context. Also, the structure of the interviews was deliberately designed in a semi-structured and open-ended format to enable the occurrence of unpredicted and emerging themes. This allowed the researcher to elucidate important issues. Participants were asked for their consent to participate before the interviews began. The interviews were also recorded for the purpose of the study.

4.10.3 Description of the study's participants

The study's participants include business owner/ top-level managers and lower-level staff directly linked to the use of IT systems. During the data collection phase, it was revealed, that in Nigeria the title 'production manager' is used instead of supply chain manager for a person in charge of their supply chain processes. Also, the data collection phase revealed that managers such as operation managers, plant managers, senior managers and site managers sometimes take on the role of the business owner, participate in decision making, and vice versa. In total, because of the different titles and the roles they perform being relevant to the study, nine categories of participants across the 15 MEs took part in the data collection.

The nine categories of participants in this study are classified based on the following. The top-level managers, comprising of seven participants hold titles such as business owner (BO), operation manager (OM), production manager (PM), information technology manager (ITM), plant manager (PlM), senior manager (SnrM) and site

manager (SM). They represent the top management team in Nigerian MEs, with the responsibility of making decisions that influence the totality of their enterprises. The lower-level staff represents an IT system user (SSU) and is described as one who directly uses the IT system for supply chain processes in MEs. Finally, the supplier (S) is not a staff of the ME but has a relationship of supplying materials for manufacturing.

Typically, top-level managers possess extended years of experience in management and have risen through the managerial ranks in the enterprise or in another business. An exclusion to this classification is a top manager who is also the business owner, for such a person starts a company and engages in different stages of management. The top-level management is involved with the mission, vision, and long-term strategy of the company. Therefore, the top-level managers of Nigerian manufacturing MEs have the responsibility of planning and defining the vision of their various enterprises. In this research, top management is selected because they are involved in the creation of their supply chain strategy, including the choice of their IT-based systems. The top-level managers work to make sure that the different aspects of their manufacturing processes are defined and in harmony so that the appropriate quality of products are delivered on time.

Low-level staff in this study are employees in the lower level of the organisation such as the IT system users. The relevance of the IT system user to this research is to understand the viewpoint of the individuals operating the IT systems for supply chain integration in Nigerian MEs. The chosen system users are those who understand the mechanism of the IT systems employed in the MEs.

Suppliers in this study are not employees of Nigerian manufacturing MEs. A supplier is an organisation or an individual with the responsibility of providing materials to Nigerian manufacturing MEs. In general, suppliers should provide competitive cost, quality materials, and delivery to Nigerian MEs. More recently, technology and management skills are becoming important for enterprises. This study did not choose the suppliers, the MEs led the researcher to their suppliers who then participated in the study.

4.10.4 Justification of research population

The target population for this study was medium-sized manufacturing firms in Lagos, Nigeria, and their suppliers. The choice of Lagos is based on previous studies that

have described the city as the economic nerve centre of the country (Apulu et al. 2011; Ogunyomi and Ojikutu 2014) and according to the small and medium-sized enterprises development agency of Nigeria, Lagos has the highest number of manufacturing SMEs (SMEDAN 2017). Further justification of the research sample is presented in section 4.4.1.

Most strategic IT alignment studies use the business owner/manager as the key participant. This approach has received criticism based on how it contributes to single-respondent bias. Accordingly in this study, it is considered important to capture the perspectives of business owners, managers, employees of Nigerian manufacturing MEs, and their suppliers on the perception of strategic IT alignment factors in MEs and the impact on business performance. Within the MEs, the study targeted business owners, managers, and IT system users for supply chain integration as well because of the role they play. Moreover, this allows the researcher to highlight a comprehensive link between strategic IT alignment factors and business performance using the different perspectives of various participants. The study's participants are further discussed in section 4.4.5

The sample unit is medium-sized manufacturing firms in Nigeria. The websites of the manufacturer's association of Nigeria (MAN) and small and medium enterprises development agency (SMEDAN) were visited to retrieve the list of registered manufacturing MEs. There are more than 3000 registered MEs on MAN, while there is no repository of MEs found on the SMEDAN website. Emails were sent as well as phone calls were made to the two bodies to ask for the ME's contact details, only the MAN responded. The list that was sent had 35 MEs with full contact details; the rest had either the ME's location or email address. The details provided by MAN were used in contacting MEs to be part of the research by sending introductory letters to the location of the organisations and emails were sent.

The association has been in existence since 1971 and its website is viewed as reputable for enterprises in the manufacturing industry. This research is a non-probability judgemental sampling technique in developing the sample. The method also known as purposive sampling, involves the researcher choosing the sample based on the appropriateness of the firm to the study.

4.10.5 Sampling techniques

Data sampling techniques are generally in two categories – judgemental sampling techniques and probability sampling techniques. According to Saunders et al. (2009), non-random sampling technique and the non-probability sampling technique are adopted to choose the study's sample following the research aim or objectives. In quantitative studies, the research sampling technique is implemented to choose data randomly. On the other hand, in qualitative studies non-random sampling techniques are suitable because they seek to select an exact data sample of interviewees and provide detailed information in addressing research objectives. The random sampling technique is unsuitable for a qualitative study because the research seeks to uncover challenges related to the research area rather than obtaining a more generalisable research result found in quantitative studies (Oates and McLean 2022).

On the other hand, a non-probability sampling technique is appropriate for exploratory research. The choice of this data sampling technique is established on the study's aim and objectives as well as research strategy, since the data sample presents detailed information that enables the researcher to respond to the research questions and obtain theoretical insights (Saunders et al. 2009). Instead, it is important that there is a reasonable relationship between the research aim and objectives and the sample selection approach. Therefore, the study's sample size hinges on the research objectives, specifically that which is crucial for the proposed study, what is reliable? how are IT resources implemented? what is the appropriateness of the findings, and the possible sets useful for analysis that can influence data and sample size (Patton 2015).

For this study, 35 MEs from the list given by the manufacturer's association of Nigeria were contacted. 20 MEs initially accepted to take part in the study, however, cancellations were made by five MEs prior to the interview dates given. Therefore, 15 individual MEs finally took part in the study. Across these MEs, a total number of 54 face-to-face interviews were conducted and each interview took approximately an average of 40minutes.

4.10.6 Purposive sampling technique

This study adopts the purposive non-probability sampling technique. Patton (2015) discussed factors such as snowball, convenience, purposive, and quota impact on the

choice of non-probability sampling techniques for study participants. In addition, purposive sampling is crucial in a setting in which a researcher selects a research sample that helps achieve research objectives (Saunders et al. 2009). In this study, a researcher searches for the appropriate participants employing the directory of the manufacturer's association of Nigeria website, firms were chosen according to size. To access these organisations, emails and introductory letters were put across to prospective MEs.

In addition, the selection of the sampling technique depends on the feasibility that information can be gathered to meet the research aim and objectives as well as the researcher's ability to access firms and potential respondents (Saunders et al. 2009). In this study, it is imperative to gain understanding of the research objectives, which has to with what could be actualised based on the type of research. Furthermore, purposive sampling technique is applicable in instances where the sample members in a particular group possess similarities, for instance, MEs with IS systems for supply chain integration. This allows for in-depth investigation as the purposive sampling technique is suitable for reaching out to participants using the industry contact as in the case of this study.

The criteria used in selecting the participating firms include: a)the choice of ME is considered as typical and representative of other enterprises, b)the ME should be operational in a constantly evolving environment, c) the ME should have a clear business strategy with technology implemented to drive goals and objectives, d) ME should be a manufacturing firm with a relationship with suppliers to investigate integration with suppliers.

Nigeria as a developing country is said to be evolving in its economy, politics and adoption and implementation of technology. Business in Nigeria are facing constant changes and the impact linked with the variation. This is accurate for enterprises in Lagos – which is one of the largest economies in Africa. Lagos plays an important role as an industrial and commercial powerhouse – setting the pace and making significant contributions to the development of the country.

In 1995, Lagos was regarded as megacity and in 2000, Lagos became the world sixth megacity and Africa's leading urban region and the nerve centre of national and global socio-economic and political activities. Companies in Lagos are faced with continuous

changes in the environment and ensure they adapt to continue to survive. The impact of competitive products from international organisations and the competition in the market in which the manufacturing companies exist encourage medium-sized manufacturing firms to adopt IS to meet the business goals and objectives. Therefore, this study looked out for medium-sized manufacturing enterprises in Lagos and was convinced that they met the criteria of adopting information technology for daily processes and in achieving supplier integration as well as implementing business strategy and IT strategies to direct how work is done.

In addition, open-ended questions serve as a guide during interviews. Each interview lasted about 30 minutes to an hour, and they were conducted on the premises of the MEs and for the suppliers, it was conducted onsite or online depending on the location of the suppliers. Once the interviews were completed, the researcher's notes and the participant's responses were evaluated for analysis.

4.10.7 Background of Participating MEs

The previous sections presented the criteria to select the research MEs, a total of 15 MEs participated in the study. A full description of all the MEs is presented in Appendix B. This section discusses a background for selected MEs presented as vignettes below, eight MEs are chosen because they are representative of the study's participating firms. The description follows a format, this includes an overview of ME, the information system in use in, factors influencing strategic alignment, state of internal integration and external integration with suppliers, MEs (management and/or employees) perception of strategic use of IS and supplier's perception/role in ensuring strategic use of IS.

Key

- **- Overview of ME**
- ® **- Business goals and objectives**
- ❖ **- Information system in use in the enterprise**
- **- Factors influencing alignment**
- ➔ **- Strategic alignment for supply chain integration**
- **- MEs perception on the strategic use of IS**
- ➢ **- Supplier's perception on strategic use of IS**

ME_1 has been in operation for 30years and has witnessed rapid changes in Lagos Nigeria. The business deals in manufacturing of baby diapers and privately owned.

® The mission statement of the business is to be a leading manufacturer of diapers as well provide value to customers and employees. The company targets customers across Nigeria and exports to African countries.
❖ A spread sheet is used internally within the enterprise, staff have access to the sheet depending on their roles. Interactions with suppliers are done via phone calls, emails and physical meetings.
↳ Financial constraints, limited involvement and knowledge of managers were reported as factors influencing alignment.
➔ The use of IT to drive business goals and objectives is limited. The firm employ the use of a spreadsheet primarily for data storage such as quantity, specifications, and timeline of delivery of materials.
ʘ The business owner and managers are mostly particular about the manufacturing process, not paying much attention to integration with suppliers.
➢ The suppliers the MEs engage but do not employ the use of information systems for collaboration and partnership.

ME_7 is similar to ME_1 in the use of excel spreadsheet. The business is a manufacturer of children's toys and furniture and in operation for 18years.

® To create sustainable value'. The goal of the business to serve its customers and ensure utmost customer satisfaction.
❖ The excel spreadsheet is frequently used as an inventory and financial system.
↳ Lack of commitment of top management team, limited internal IT expertise, infrastructural challenges, low level of IT sophistication and lack of access to loans are some of the factors identified by participants to be impacting strategic alignment.
➔ Top management of the company claimed to have a well-defined business strategy but not an information systems strategy. Hence, strategic alignment is limited.
ʘ The perception of this ME to the strategic use of IS is that the company cannot afford to purchase information system because of the financial challenges.
➢ The relationship that exists with the supplier is one in communication and exchange of information is done informally via telephone calls and physical presence.

ME_3 was established in 1999 and manufactures female under pads and adult pads.

® The ME's goal is to create sustainable value, serve its customers and ensure utmost customer satisfaction.
❖ An enterprise resource planning system is employed to synchronise internal processes within the ME.
↳ Top management commitment to strategic alignment, commitment from staff, focus on manufacturing process are some of the responses to factors influencing strategic alignment.
➔ Top management claim that the firm has developed business strategy as well IS strategy.
ʘ The managers confirmed that interaction with suppliers is mostly via phone calls, emails and physical presence. The responses further highlighted that suppliers are not involved in the system implementation process.
➢ Suppliers do not participate in information systems implementation and communication and information sharing is achieved.

ME_4 has existed for 17 years, the company specialised in manufacturing of beer.

® The company aimed to be the leading producer of quality beer and providing maximum value to customers and employees.
❖ The information system used is the SAP ERP, which is frequently used for automation, inventory, and financial system.

- ↳ Top management's commitment to IT and financial constraints identified as factors influencing MEs implementation of strategic alignment.
- ➔ Management identified the importance of developing an appropriate IS strategy, however mentioned financial constraints as a hindrance to achieving alignment.
- ʘ Requisite information is shared with suppliers via emails and phone calls.

ME_6 was established in 1961 and manufactures biscuits and confectionaries.

- ® The company seeks to be a leading manufacturing company in Nigeria.
- ❖ The information system in use is the Priority ERP for SMEs, which they implemented two months before the interview was conducted. Before then, inventory and other processes within the enterprise were done manually using paper, the papers are kept in folders and in a room within the enterprise.
- ↳ Top management knowledge of and commitment to strategic alignment and IT sophistication are considered key alignment factors.
- ➔ The managers said the system change happened because leadership team realised that the entire production process became redundant, they were experiencing a lot of wastage and were losing customers because of delay in delivering products.
- ʘ Their suppliers do not use the Priority software and communication is done via the emails and phone calls. The Priority software helps the enterprise internally to plan production, project, and track sales, they use it for communication across the enterprise.

ME_11 has been operation for 10years and currently has 160 employees.

- ® The goal is to be the leading producer of soap noodles in Nigeria as well as satisfy the needs and expectations of customers.
- ❖ This ME adopts an information system called Alarmin for enterprise resource planning. The system works as a single system such that the manufacturing and delivery processes are integrated into one system.
- ↳ Top management commitment to IT, financial constraints, were identified as factors influencing alignment.
- ➔ The system is used for synchronisation across the departments within the organisation., information is shared with suppliers mostly through emails and phone calls.

ME_12 was established in 1989 with 180 employees. It is privately owned businesses with one branch in Lagos.

- ® The company is committed to producing juices from premium fruits. The ME works with distributors who supply across Nigeria and other African countries.
- ❖ The ME uses the Oracle as the information system within the organisation for manufacturing and business processes.
- ↳ Financial constraints, limited partnership with suppliers and limited top management and staff knowledge of the strategic use of IT are identified as factors influencing alignment.
- ➔ The perception of the MEs is that it is not necessary for suppliers to participate in the implementation of the information system in use. Communication is done electronically for the international supplier and for the local suppliers, a member of staff, usually a quality control officer or procurement officer visits to clarify orders and check the hygiene condition of the environment where the fruits are harvested.
- ʘ Suppliers understand the importance of collaboration using technology but also confirmed nonparticipation in the implementation of information systems.

ME_15 established in 2015. It is a private company with five owners who are directors.

- ® The goal of the business is to be able to export clothing's' to other African countries and provide quality fabrics.
- ❖ The information system in use is the NetSuite ERP which integrates the different departments of the business effectively.
- ↳ Top management efforts in ensuring appropriate technology is adopted, IT sophistication. IT expertise and partnership with suppliers are identified as factors influencing strategic alignment.
- ➔ The top managers mostly discuss that they do not have a lot of interaction with the ERP system but understand the importance of IT.
- ❍ Suppliers understand the importance of exploiting IT for the benefits of the relationship with the ME but information sharing, and communication is achieved using emails and phone calls.

4.11 Implementation of the semi-structured interviews in this study

4.11.1 Participants profile

This section discusses the profile of the participating MEs and the individuals that took part in the study. Section 4.10.1 (Chapter 4) described the use of semi-structured interviews. The profile of the individuals who participated in the study are illustrated in Table 9. The table reveals that only 11% of the sample size represents women and approximately 2% are top-level managers. The low proportion of female respondents is not surprising given that a few studies on gender participation conducted in Nigerian manufacturing industries (Olukoshi 1996; Adeyemi et al. 2006; Okafor et al. 2011) suggest low representation of women in managerial roles. Although these studies were carried out more than two decades ago, they present the current state in the Nigerian manufacturing industry. Few recent studies (e.g. Ushe 2019; Ozordi et al. 2020) have examined barriers to women's managerial roles in Nigerian public and private sectors. Although 72% and 22% of the sample indicated possessing bachelor's and postgraduate degrees respectively, a fairly large percentage (63%) of the respondents have no SCM qualification. An SCM qualification is referred to as a professional certification or course on supply chain management. Additionally, almost half of the sample size, (48%) have no previous experience in the manufacturing industry. These issues could potentially impact on the perspectives and experiences presented by the study's participants.

Table 9: Respondents' Profile for the Study (N =54)				
Characteristics	**Respondents (% of the sample)**		**Characteristics**	**Respondents (% of the sample)**
Gender			**Position**	
Male	48 (89%)		Business owner	10 (18%)
Female	6 (11%)		Operation manager	1 (2%)
Total	**54 (100%)**		Production manager	15 (28%)
Age			Information technology manager	7 (13%)
18-24	2 (4%)		Plant manager	2 (4%)
25-34	16 (30%)		Senior manager	1 (2%)
35-44	20 (37%)		Site manager	1 (2%)
45-54	7 (13%)		Supply chain system user	12 (22%)
55+	3 (5%)		Supplier	5 (9%)
Didn't disclose	6 (11%)		**Total**	**54 (100%)**
Total	**54 (100%)**		**Education**	
SCM qualification			Secondary	3 (6%)
Yes	20 (37%)		Bachelor's degrees	39 (72%)
No	34 (63%)		Post graduate degree	12 (22%)
Total	**54 (100%)**		**Total**	**54 (100%)**
Years spent in company			**Previous experience**	
0-5	24 (44)		Yes	28 (52)
6-10	19 (35)		None	26 (48)
11-15	5 (9)		**Total**	**54 (100%)**
16-20	4 (8)			
20-25	2 (4)			
Total	**54 (100%)**			

Table 10 illustrates the summary of the 15 MEs selected for the study. The participating MEs cut across some of the Nigerian manufacturing sub-sectors identified in section 1.6.1. The table reveals that all the MEs employ a variety of IT systems for their supply chain activities. Also, the table shows that Nigerian manufacturing MEs engage with few suppliers, a maximum number of suppliers found is 3 and the least is 1.

Enterprise	Length of operation (years)	Sector (drawn from LR)	Products	SCM system in use	Number of supplier(s)
ME_1	30	Non-metallic products	Baby diapers	Microsoft Excel spread sheet	2
ME_2	20	Non-metallic products	Laundry Detergent	SAP ERP	3
ME_3	15	Non-metallic products	Female under pads, adult sanitary pads and under towels	SAP ERP	3
ME_4	17	Food, beverages & tobacco	Beer	SAP ERP	3
ME_5	15	Non-metallic products	Bar soap	Dedicated system, name not given	3
ME_6	59	Food, beverages & tobacco	Biscuits, chewing gum and other confectionery products	ERP tool called 'Priority'	3
ME_7	15	Wood and wood products	Children's Toys and Furniture	Microsoft Excel spread sheet	1
ME_8	12	Food, beverages & tobacco	Sweets	ORACLE	3
ME_9	20	Non-metallic products	Hair and body creams	ARP system	3
ME_10	18	Non-metallic products	Body creams	Online kanban system	2
ME_11	10	Non-metallic products	Soap noodles	ERP software called Alarmin	3
ME_12	20	Food, beverages & tobacco	Fruit Juice	ORACLE	3
ME_13	14	Textile, apparel & footwear	Textile	ORACLE	3
ME_14	18	Non-metallic products	Industrial cleaning products	TrueERP	3
ME_15	5	Textile, apparel & footwear	Ladies clothing's	Netsuite ERP	3

Table *10* Summary of the profile of the participating Nigerian manufacturing MEs.

4.11.2 Field Notes

Merriam (2015) define field notes are a collection of perceptions by the researcher. Furthermore, field notes are unique and integrate perceptions of individuals, the environment, the mode of operation or practices of individuals and the role of the researcher. Field notes are undertaken through the study and along with interviews. Similarly, field notes are generated all through the interviews in addition to the recording of responses. They are employed as updates for follow-up during the interviews, a guide for examining the research process and a data analysis technique. Moreover, notes were written and transferred into Microsoft Excel file. As suggested by Merriam (2009), the field notes were updated not far from dates interviewees were conducted permitted under the circumstances.

4.12 Data management and storage

Data management in research describes the arrangement and storage of data collected and employed in a study. This research adopted platforms such as cloud storage and external drives encrypted for security and confidentiality purposes.

4.13 Assessing the trustworthiness of the study

According to Cope (2014), identifying trustworthiness or veracity of qualitative research and transparency of the study are critical to the integrity and practicability of research findings.

The study conducted by Amankwaa (2016) emphasised that it is crucial that researchers establish processes and procedures for a study to be contemplated by readers. In addition, Leung (2015) noted that though several researchers and professionals agree trustworthiness is important, varying views are present in literature as to what forms trustworthiness.

Trustworthiness is shown using research credibility, transferability, confirmability, and dependability according to the criteria described by Lincoln and Guba (1985) and widely accepted by numerous qualitative researchers.

Credibility of this study was set up through triangulation using distinct sources and numerous techniques for gathering data for example interviews and researchers notes. In addition, credibility can be enhanced by maintaining meticulous data management. Bias was controlled by data collection from several sources and individuals with varying perspectives about the phenomenon.

The steps implemented in this study involve the researcher keeping in touch with participants at different points, specifically the transcribed interviews were sent as well as the research outcomes. The participants agreed with the results and the way they were expressed. Therefore, the credibility of the study is shown. This technique is applicable in inductive research which begins with data and insists on retaining the author's perceptions in the interpretation and creation of a framework (Wheeldon and Ahlberg 2011).

In terms of establishing transferability which relates to the extent to which the researcher demonstrates how the research findings are suitable in other settings. This is further discussed in the concluding chapter of this study where the findings are discussed, the limitations of the study and new research areas are suggested. In an interpretivist study, insights are drawn from a research context with an opportunity to implement findings in different environments. This is achieved in the study by designing the data collection taking into cognisance a particular research context and presenting a thorough description, which allows other researchers to transfer the findings and make comparisons.

Confirmability is the neutrality or the extent to which findings are consistent and could be recurrent. The perspective of Polit and Beck (2014) is that confirmability is similar to objectivity in quantitative research. The technique in quantitative studies may include maintenance of an audit trail of analysis and updates presented as a log. Qualitative researchers on the other hand keep itemised notes of choices made and findings as the study progresses. In certain studies, members of the research team inspect these notes; in different contexts, a peer-to-peer review with experienced researchers. These conversations keep predispositions from one individual's perspective on the study.

In confirmability, techniques may include triangulation, reflexivity or a confirmability review (Guba 1981). In this study, confirmability is reinforced using reflexivity and triangulation. Reflexivity is the process of critical self-reflection (Denzin et al. 2017). In essence, reflexivity explains how a qualitative researcher purposely considers who the individual in question is and is delicate to their story and how it shapes the study in agreement with Watt (2007).

Specifically, reflexivity was used during interviews and confirmability was additionally supported using progressing records of the data and insights. This was done by inferences made, if the study's outcomes agree with the reflections of the researcher, then the findings can be seen as confirmable.

Reliability can be developed using strategies, stepwise replication, development of a review trail and by leading a reliability review (Guba 1981). In this study, reliability is strengthened using varying techniques and by continuous review of the study's structure and implementation.

According to Polit and Beck (2014), transferability is the extent to which findings are valuable to people in different settings. Transferability is unique in that a researcher decides how relevant the findings are to the concept being studied. While this is seen as similar to generalisation in quantitative studies, in qualitative research, researchers emphasise on the insights from the data unique to the topic being explored.

The transferability of the study is presented by the researcher's rich, definite description of the specific situation, location and participants and by being genuine about investigation and dependability. According to Amankwaa (2016), researchers are to provide an insightful picture of the research process to the readers.

The transferability of a study according to Guba (1981) might be expanded using purposive examination, which involves categorising rich data and by developing a comprehensive description of the specific situation.

Finally, dependability in interpretivist research could involve dual researchers assessing the same context using the same set of findings separately or the same researcher examining a phenomenon at different points, arriving at the same conclusions, Essentially, to ensure dependability, the processes employed are reported in detail which may allow another researcher to obtain similar findings as this study and allow readers to independently validate their interpretive inferences.

4.14 The role of a researcher

Based on previous work experiences as an information technology specialist in small and medium enterprises (SMEs) in Nigeria as well as the goal of making a difference in Nigerian manufacturing MEs and contribution to academia, aided access to the study's research setting. Access was granted to the participating companies and there was no major challenge in approaching members of staff at varying levels. In addition,

previous work experiences in the Nigerian environment allowed the research to connect and understand the scope and nature of performances (Cohen et al. 2018).

4.15 Qualitative data analysis with template analysis method

A data analysis process describes the procedures taken to manage, organise and gain insight from collected data (Bazeley 2013). Data analysis should be done in a productive and successful approach for the researcher to get appropriate results while treating with the study's aim and objectives (Saunders et al. 2019). This study employed the principles of thematic analysis, specifically template analysis, to analyse its data. The template analysis method is suitable for this study as it offers a guiding framework within which the data can be analysed (King et al. 2018). Template analysis is a flexible type of thematic analysis and the differences are described as follows:

- Template analysis describes a process that reveals the depth of the data collected and allows such data to be organised into segments for thorough analysis (King and Brooks 2018).
- Template analysis describes a method of analysing textual data once data is arranged in an analysable manner. Template analysis allows issues such as the context under study to be split into simpler points.

Furthermore, in this study the qualitative method is appropriate based on the following: a) the approach supports further development of the research; b) allows an understanding the research participants' views on the subject matter; c) it uncovers new strategic IT alignment factors based on what is being studied. This study provided details on the procedure employed in conducting the interviews and sampling technique employed. The literature review on strategic alignment highlighted the importance of a logical review of the current studies such that analysis can take place. (Daly et al. 1997). Using the template analysis technique, factors influencing strategic IT alignment in the context of supply chain integration within the Nigerian medium-sized manufacturing firms are identified and connected to the research objectives. The next section describes the template analysis process adopted in the study.

4.15.1 Approach to data analysis (Template analysis process)

Template analysis is a type of thematic analysis, involving the adoption of a hierarchical coding method to analyse data (King 2012). The template analysis approach facilitates the development of themes relating to the research question (King 2012). Studies (e.g. Thompson et al. 2010; Brooks et al. 2015; King and Brooks 2016) reveal that the main sources of data selected for template analysis are interview transcripts and textual data. The choice of template analysis in this study is because it presents flexibility in defining and usage of codes while working with the textual data. Template analysis presents flexibility in decoding interview transcripts to develop a hierarchic structure of themes and views that appear multiple times (Brooks et al. 2015). Likewise, King (2012) expressed that template analysis allows the comparison of the varying views of participants in a certain context. In this study, participants from Nigerian manufacturing MEs were asked about their experiences with the concept under study.

The flexibility of the template analysis as a qualitative data analysis approach is an advantage that has been discussed in certain studies. Typically, template analysis involves 6 main steps as prescribed by King et al. (2018) which are preparing and familiarising with data, preliminary coding, development of initial coding template, applying initial template to data, creation of a comprehensive template and a final template.

4.15.1.1 Preparing and familiarising with data

It is important that data gathered through interviews are prepared for template analysis, this is known as transcribing. The entire content of the interview can be transcribed. However, specific segments relating to the research aim and objectives can be transcribed and employed to cut across cases (King 2012). As transcribing requires time, and produces a lot of data to manage, relevant parts of the interviews were transcribed.

4.15.1.2 Preliminary coding process

The second process involves reducing information gathered. Data reduction involves identifying, focusing and unravelling information from interview transcripts (Namey et al. 2008). To lessen and manage data, initial codes are employed. Preliminary coding helps the researcher to conceptualise the data. In preliminary coding, the data set could be coded line by line and actions and situations are identified in the data instead

of focusing on the character of the participants. Codes allow the researcher to make the data recognisable and less complex to organise (Corbin and Strauss 2014). Codes emerge from literature review, interview questions, research, or transcribed data. Also, coding begins during the transcription phase as the researcher familiarises and understands the data. Once each interview transcript is read, location or time stamps, questions and emanating ideas are allocated to codes. The transcript once coded helps the researcher organise information and allows for initial knowledge regarding patterns of the topic being studied (Namey et al. 2008).

Brooks et al. (2015) suggested that researchers should be constantly open to discovery during preliminary coding. During preliminary coding, the researcher kept an open mind and allowed the data to lead in the analysis. There are various strategies that can be used for preliminary coding in template analysis (Forman and Damschroder 2007). The coding strategy adopted in this study involved the researcher engaging fully in the data set while the transcripts were coded, the researcher also ensured that the themes were closely related to the data. The interview transcripts were coded one after the other, line by line using words that capture the relevance of the phrase or words, representing the action happening in the data set. Hence, the researcher's role as a researcher in the analysis was clear and acknowledged because the words or phrases to code were inferred from the data. Preliminary coding involves fast coding, and the researcher did not dwell on the groups discovered while analysing, as an open mind was kept all through. Also, while analysing the researcher took note of actions rather than the role of the participant, this allowed an in depth understanding of the data set.

The interviews were transcribed following a strategy to uncover themes found across cases. During transcription, initial views and thoughts were written because it helped the researcher later during data analysis. Each transcript was read, and the interviews listened to a second time to ensure precision of the transcript and extraction of emerging themes from data.

Once interviews transcriptions were completed, initial themes can be based on the emerging themes as well as literature review. However, Ryan and Bernard (2003) state that themes developed using literature review may be unsuitable as it could be affected by the knowledge and experience of the researcher. On the other hand,

researchers have knowledge on the research topic, and this cannot be denied. Also, the existence of a framework, enables the structuring of data analysis approaches and helps to identify the theories and classifications to utilise (Miles et al. 2018).

In this study, some initial themes also referred to as ‘a-priori’ themes in template analysis are defined from relevant literature. According to King et al. (2018), this can be done if a study began with the notion that certain aspects of the concept under study is the focus. As this study investigates factors influencing strategic IT alignment, it is imperative that existing factors in literature are adopted as a priori themes when analysing the research firms and their suppliers' accounts. There is an extensive list of these factors found in literature and the choice of factors is dependent on studies however few are similar to the phenomenon being studied (e.g. Ismail and King 2007; Cragg et al. 2002). The researcher compared the findings and assessed similarities and differences in those studies to maximise their reliability. Five a-priori themes were identified, also defined as tentative and subject to change during analysis (King et al. 2018). Table 11 presents an example of the creation of preliminary codes from data. Appendix D further shows a complete list of codes adopted in this study, also the description of elements of the study’s framework which serves as a guide to defining the preliminary code is presented in Section 3.3.1.

Table 11 Example of the development of preliminary codes

Codes	Description
Management’s knowledge of and commitment to strategic use of IT	Actions by business owners and managers to understand and implement IT in a manner that drives the goal of achieving supply chain integration
IT sophistication	This refers to the information technology and type of software applications implemented
IT expertise	This refers to the presence of IT personnel and other specialists

4.15.1.3 Initial coding template

The third step involves the development of an initial coding template. The template shows the connection between the various themes from the data. The initial template

is presented in a systematic way such that it represents the relationship between different themes. An initial coding template can be developed at different points during the analysis based on the discretion of the researcher. For instance, an initial template can be created after analysis of one transcript or at the midpoint of the total number of interviews. According to King et al. (2018), at the point of developing an initial coding template, the researcher must ensure that the data set employed has captured to a large extent the purpose of the study.

The initial coding template is significant and is generally created on a section of the data (Kings et al. 2018). In most studies (e.g. Ferguson and Heiderman 2009; Waring and Wainright 2008; Brooks et al. 2015; Simons et al. 2018), the initial template is developed at a mid-point during the analysis such that the rest of the data can be approached objectively. In line with this, this study adopts the method of developing its initial template after coding ten transcripts (Appendix D1).

Using the ten transcripts, the researcher identified key themes that emerged from the interviews. Table 12 shows an example of creating a theme from preliminary codes and presented in an initial template. A full description of the initial template is presented in Appendix D1.

Table 12 Theme and codes for strategic alignment (internal) factors.

Theme	Codes	Description
Internal factors influencing strategic alignment	IT sophistication	This refers to the information technology and type of software applications implemented
	Top management's knowledge of and commitment to strategic use of IT	Actions by business owners and managers to understand and implement IT in a manner that drives the goal of achieving supply chain integration
	IT expertise	This refers to the presence of an IT personnel and other specialists

4.15.1.4 Final coding process and finalising the template

The same coding strategy employed in the initial coding process was adopted at this stage. In this step, the developed initial template is applied to the remaining data and modified as necessary (King and Brooks 2016). The remaining 44 interview transcripts were analysed, and all relevant sections of the data set were coded and in cases where the existing themes did not adequately represent an aspect of the data, the template was modified, and a new version of the template was developed (see Appendix D2). Thereafter, all 54 interview transcripts were re-coded, and a modification of the new version of the template was done, existing themes were refined, and a final version of the template was constructed). Table 13 presents the final template in a linear style, showing the themes and codes. Appendix D3 shows a more detailed template. This template was used to display the final themes and a rich and detailed analysis and interpretation of the full data set. The final template was also used to structure the writing-up and draw conclusions based on the research findings.

Table 13: Example of the final template

Theme	Codes
Strategic alignment (internal) factors	IT sophistication
	Top management's knowledge of and commitment to IT
	IT expertise
Strategic alignment (external factors)	Political Economical Infrastructural External influences on technology
Supply chain integration	Internal integration
	External integration with suppliers

4.15.2 Implementing template analysis in this study

Template analysis as a type of thematic analysis uses hierarchical coding and a well-defined structure in analysing textual data (Ciesielska and Jemielniak 2018). The technique engages the creation of a coding template on a section of the data, after which the template is applied to the rest of the data, reviewed, and refined. In comparison to other approaches to thematic analysis, template analysis does not present a defined structure of coding levels. Instead, enables the researcher to develop themes in a detailed manner where comprehensive data exist.

In this study, data gathered using semi-structured interviews presented a need for further examination and analysis. As a result, a suitable approach is crucial so that data collected can be carefully analysed. The template analysis approach in this research was divided into six steps, as shown in section 4.16.1. Step 1 involves preparing and familiarising with the data, the interview transcripts, as well as the researcher's notes, were read line by line. Step 2 is the preliminary coding process in which the researcher engaged the data fully as the transcripts were coded and ensured that the themes related to the concepts being investigated were closely related to the data. Step 3 has to do with grouping themes into meaningful clusters, once the strategic IT alignment, strategic IT alignment factors, impact of strategic IT alignment on business performance. Step 4 involves the development of an initial coding template. The initial coding template is significant and is generally created on a section of the data (Kings et al. 2018). In most studies (e.g., Ferguson and Heiderman 2009; Waring and Wainright 2008; Brooks et al. 2015; Simons et al. 2018), the initial template is developed at a mid-point during the analysis such that the rest of the data can be approached objectively. In line with this, this study adopts the method of developing its initial template after coding ten transcripts. Step 5 relates to applying the initial template to further data and modify as necessary. The same coding strategy employed in the initial coding process was adopted at this stage. In this step, the developed initial template is applied to the remaining data and modified as necessary (King and Brooks 2016). The remaining 44 interview transcripts were analysed, and all relevant sections of the data set were coded in cases where the existing themes did not adequately represent an aspect of the data, the template was modified, and a new version of the template was developed (see Appendix D2). Step 6 is finalising the template and applying it to the complete data. The 54 interview transcripts were re-

coded, and a modification of the new version of the template was done, existing themes were refined, and a final version of the template was constructed. The researcher decided at this point once all 54 interviews were coded that the template needs of the study. This template was used to display the final themes and a rich and detailed analysis and interpretation of the full data set. The final template was also used to structure the writing-up and draw conclusions based on the research findings.

4.15.3 Excel as a tool used for template analysis

The data analysis process was supported using the Microsoft Excel spreadsheet. The use of the excel spreadsheet in qualitative data analysis is acknowledged in some studies (Bazeley 2013; Watkins 2017; Ose 2016). A number of qualitative data analysis software packages were considered such as Nvivo, Quirkos, Provalis, and Excel. However, the Excel spreadsheet was employed in this study to analyse the data gathered because it allowed huge quantities of data to be easily accessed in a single location and analysed in a short time to facilitate development of theory. It also allows data to be organised and for a variety of display techniques. The use of Excel spreadsheets study is consistent with the method adopted by Meyer and Avery (2009) which includes analysing huge data in a short time, justifying quality and simplicity of the excel software over other qualitative analysis software packages.

The audio file from each of the interviews conducted was transcribed on a word document and manually input into an excel document. The step involved the researcher identifying the themes emerging from the transcripts, these themes were used as column headings in the sheet and the responses of each participant were populated below the themes. For instance, the column with the theme "IT sophistication" is populated with the responses. In addition, the excel sheet also contained information on the profiles of the manufacturing firms and the study participants. The excel sheet presented a pictorial description of the data collected.

Moreover, the earlier section presents the steps used to perform the template analysis. Template analysis was employed in identifying strategic IT alignment, strategic IT alignment factors and supply chain integration themes such that the coding process is applied to a section of the data set to yield an initial template, then a final template is generated from a coding process on the entire data set.

The findings suggest that strategic IT alignment is informal and lacks complexity than anticipated in medium-sized firms and the Nigerian context (for instance Ismail and King 2007; Abosede et al. 2016). A key information from the findings is that firms lack the required set of strategic IT alignment practices which vary from firm to firm. Additionally, the findings reveal that medium-sized firms are different in how they perceive strategic IT alignment. Given that strategic IT alignment require a significant investment in managerial and staff skills as well as finance, medium-sized firms hesitate to implement strategic IT alignment because of limited resources. This shows that strategic IT alignment is heavily impacted by a firm's capabilities and economic setting (Panda and Rath 2018). Furthermore, the results suggest the importance of the research firms to be effectively while taking strategic alignment of IT steps for supply chain integration because of limitation in development and implemented as a result of lack of resources. This leads to strategic IT alignment processes to be less formal and unsophisticated across the research firms (Queiroz 2017).

However, medium-sized enterprises are more organised when compared to smaller businesses and, findings suggest that there is some knowledge as well as an understanding of the importance of strategic IT alignment processes. This is in line with existing studies (Gutierrez et al. 2009). The interviews with business owners and managers show that businesses are more interested with implementing IT systems for internal processes and limited use of the systems for communication and information sharing with suppliers. However, it is worth finding out the current strategic IT alignment activities in medium-sized enterprises existing in the Nigerian manufacturing sector. The results of the study show a mix of factors that influence strategic IT alignment in these firms.

4.16 Ethics consideration

Ethical considerations are values and guidelines guiding the steps and actions taken during the study (Kimmel 1988). The researcher went through the ethics approval process of the University, which ensures that researchers adapt to an acceptable standard. During this the researcher completed an ethics checklist, Participant Information Sheet (PIS), and Participant Agreement Form (PAF) and presented a set of interview questions. The ethical standard of Bournemouth University confirms that there is no intrusion as regards the participant's physical and physiological well-being; the interview process is unlikely to be stressful or overwhelming; the research

documentations are insensitive, and the research design is adequately justified so the participant's time is not wasted during the interview process. In addition, the study data collection method conformed to the requirements of the University's ethical research committee. After an interview with the ethics committee where certain changes were highlighted and after the corrections were made and other criteria were satisfied, the ethics committee approved (Appendix C1) for the interview process to begin.

Before the start of each interview, the PIS (Appendix C2) and PAF (Appendix C3) were given to participants, explaining the aim of the research and highlighting that the information provided would be kept confidential and used only for the research. The participants were guaranteed that the data collected would be used in the manner that protects the confidentiality and anonymity of the MEs involved in the study. The interview process began only after each participant agreed to take part.

4.17 Summary

This chapter discussed the philosophical and methodological elements of this study. The interpretivism research philosophy and the reason for this choice were discussed. The research process was outlined – the study adopted a qualitative approach because of its nature to answer what, why and how research questions. Subsequently, the data collection method was discussed. The research sample was explained as well, the participating Nigerian manufacturing MEs were chosen to present an understanding of the concept being studied. Furthermore, the data analysis approach was outlined, and processes involved in template analysis were discussed.

The coding process involved a preliminary method as described in section 4.16.1.1 involves recognising a set of themes. For instance, the process emphasised the description of the theme, the impact of the theme on the study objectives and the relevance of the themes to the phenomenon being studied. The next in the process is developing an initial coding template that shows the connection among the various preliminary themes. The initial template is developed at a mid-point during the analysis such that the rest of the data can be approached objectively. Using the ten transcripts, the researcher identified key themes that emerged from the interviews. The final part of the coding process is based on analysing the remaining 44 interviews and a re-coding

of the entire data set. The final template is then presented which is employed in presenting the findings in the next chapter.

Chapter 5 - Research findings

5.1 Introduction

This chapter presents the findings conducted across 15 medium-sized manufacturing firms located in Lagos, Nigeria. These companies have experienced various changes over the years. 54 interviews were carried out and 45 key interviews were taken into consideration as data for analysis, to respond to the study's research questions and objectives. While majority of the companies were not effective in the implementation of strategic alignment of IT to achieve supply chain integration, the paths and attempts to develop IS and ensure integration with suppliers are relevant to this study.

This chapter presents the practices of the companies to achieve supply chain integration by exploring internal integration mechanisms as well as the external integration with suppliers. Furthermore, the study presents the factors influencing strategic alignment and the levels of alignment.

5.2 Supply chain integration

In this section, findings from the semi-structured interviews for the supply chain integration theme are presented. Also, discusses perceptions of the research firms on how the IT system delivers their business goals and objectives in the context of supply chain integration.

5.2.1 Internal integration

This section presents the elements present in a state of internal integration within the participating firms. Internal integration provides an insight into the working together within the participating firms from the lens of the information systems present. To explore and illustrate the internal integration, the elements are presented.

5.2.1.1 Organisation's focus on production process

Across majority of the participants described a focus on the working together of the different units in their organisations as well as an adequate provision for technology as well as skilled manpower. For instance, an employee of ME_5 claimed that the presence of technology improves production.

Generally, the focus of implementing technology is ensure that the production process run smoothly and ultimately satisfy customers. Specifically, based on the responses, the IS provides insight into changes to be made for improvements as well as resource planning. The users of the IT systems were more about simplifying the production

processes while the managers are concerned more with the outcome in terms of improved production. Top managers provide direction with respect to the technology in use and the production process. In other words, the understanding to focus on achieving effective manufacturing processes. As pointed out by the plant manager of ME_6:

> *"We use Oracle, it works with JavaScript and works especially with the manufacturing, it records the materials taken out and those replenished, which are accessible to all the staff. For us, it is a manufacturing tracking system".*

In addition, managers also recognise the importance of generating reports through the IT system across the departments in the organisation and the impact on production. The business owner of ME_7 stated,

> *"The system in use is effective and helps with reporting and tracking, we can track finished products as against raw materials, sales as against cost per item which is how we are performing financially"*

Although the business owner of ME_7 claimed that the IT system in use which is the excel sheet, is of advantage to the business and the staff, the sheet is unreliable and impacts not only on production but also inventory management. The production manager highlighted this issue:

> *"We experience inaccurate information with the excel sheet, sometimes staff forget to update it, we think we still have enough stock. At the point of production, we realise the raw materials available will not be enough for the production, we then contact our suppliers and wait for their deliver"*

This response is also like that of ME_1 that utilise excel sheet. The sheet is not considered as an effective tool. The production manager stated

> *"The IT system in use is the excel sheet and is considered not to be an effective tool for integration across the departments in the organisation"*

5.2.1.2 Collaboration between internal functions and processes

The relationships between the departments in the participating organisations was described as collaborative. The respondents considered information systems as bases for synergy, effective information transfer and reporting which are keys to success. The interviewees highlighted specifically the benefits of integration across the departments. They claimed that the IT system synchronises information for employees and management and enhances decision making for top management. An interviewee who works for ME_10, pointed out that:

> *"Across the departments, the system synchronises information presenting it to each member of staff as they request. The information helps each staff analyse and make certain decisions which are subject for approval by the management"*

According to this quote, collaboration gave rise to better communication between employees as well as an organised and efficient operations across departments. The production manager of the same company said that the different stages of production are impacted positively using an information system.

Many interviewees agreed that the IT system allows for improved data accessibility. For instance, the production manager of ME_5 stated that:

> *"The IT system allows access to data which help in generating reports which is good for good for monitoring KPIs, spendings and profits".*

An interviewee from ME_7 also pointed out that being able to access reports and the ability of the system to react to changes may contribute to effectiveness within the organisation. He stated:

> *"The current system cannot react to changes to inventory unless updated by designated users"*

Other respondents from ME_7 also mentioned that the IT system in use is less responsive, and this causes delay in retrieving information and data loss which impacts on production.

Many interviewees also discuss how the IT system helps to detect and resolve challenges which makes collaboration achievable. The IT manager of ME_8 stated:

> *"The system helps us to identify changes in customers demand as a result we are able to make informed decisions and respond to changes"*

Similarly, the business owner of ME_9 affirmed:

> *"The company was built to address the challenges we are facing with data synchronisation. Since the implementation of system, this enables information such as supplier information and inventory access*ible to employees in real time"

Top management across the participating firms also express that collaboration across the departments via the IT system results in reduction in waste. The production manager of ME_14 stated:

> *"Prior to using Net ERP, we experience wastage, because of the inability to track and update the materials list. The application reduced the wastage in by automating the records of materials and finished products"*

5.2.1.3 IS Infrastructure

Across the 15 participating MEs, 13 MEs have computer-based information systems in their organisations for enterprise resource planning. Two MEs (ME_1 and ME_7) adopt an excel sheet for data storage.

The employees from ME_1 and ME_7 claimed that that the system in use is ineffective and provision for technology is insufficient. Majority of the participants identified dedicated systems with diverse features. Interviewees discussed that the information systems cover elements of supply chain management such as production planning, materials planning and inventory management. The production manager of ME_4 stated:

> *"The system enables working together as a team…for instance; the planners integrate with purchase department such that when the purchasing unit has picked the suppliers. They will send it back to the MRP planner, will turn that thing to PO (Purchase Order) then moves to finance, when it gets to finance, we have levels of authorisation, then production, which is a series of processes as well"*

The business owner of ME_2 also claimed that:

> *"There is a dedicated system that helps to manage the supply chain activities. SAP is an effective software; it integrates all the aspects of the business into one system and allows the transfer of information from various departments in the business"*

Also, there is evidence from the participating MEs that there are different views on the use of outdated and current information systems. A production manager said:

> *"SAP was implemented two years ago, before then we use Alarmin, a Syrian software which was not as versatile and effective as SAP. As we have evolved as a company, the new system covers key areas not previously done such as stock management. We have also grown in the variety of products being manufactured"* (ME_2).

It is deduced from this quote that the IT system earlier adopted in the organisation no longer met the needs of the organisation. The company had developed their products and top management understood the importance of implementing a system that meets the current requirements of the business.

> *"There is a dedicated system that helps to manage the supply chain activities. SAP is an effective software; it integrates all the aspects of the business into one system and allows the flow of information from the various departments within the business. We implemented this system based on an improvement in the case of the business because of its financial and communication functionalities"* (ME_2/BO).

The production manager of another business ME_1, reinforced this view and said:

> *"The management influenced the choice of the system and although we have pushing for a more effective system, we are yet to have one"*

ME_1 is one of the two MEs who use a less sophisticated ME and the interviewees have stated that the tool is ineffective. The above quote shows the importance of top management understanding the relevance of an information system that supports business activities in the organisation.

The interviewees also addressed the hardware and network infrastructure and the role in supporting the information systems in the organisations. Across the organisations, the hardware including personal computers used are generally acceptable. According to the IT manager of ME_2, the company has a server room with servers, switches and routers in place. Another IT manager discussed the impact of budget on procurement of IT equipment. He said:

> *"There are equipment that are no longer supported like the main cisco switch, also some of the computers are slow in responding causing staff to complain, the reason why they haven't been replaced or upgraded is because of limited budget"* (ME_15/ITM).

Two interviewees from different MEs other than ME_15 claimed that the speed of their computers impact on their work and require either a replacement or repair. The other interviewees were satisfied with the equipment used in delivering on their jobs.

Furthermore, IT staff and employees are considered as integral to the organisation's information system's infrastructure. The study showed that 7 MEs have an IT manager who oversees and supervises the information system and networks infrastructure. The rest of the organisations have at least one IT staff. Some of the interviewees discussed the limited knowledge and skills to successfully use a functional information system. Also, the number of IT staff employed contributes to the effective working of the system.

5.2.2 External integration with suppliers

This section presents the elements in a state of external integration in the participating firms. External integration provides an insight into the collaboration with suppliers, information sharing as well as the extent to which MEs integrate with suppliers influencing strategic IT alignment. To explore and illustrate external integration, the elements are presented.

5.2.2.1 Communication with suppliers

According to the interviewees, communication with suppliers is effective and there is a defined process of information exchange. The production manager of ME_1 states:

> *"We ensure communication with suppliers...All the information that our suppliers require as regards design, dimension, sizing we send to them via email, they are also communicate with us. We have their numbers and call sometimes but because of the tariff of international calls, so we mostly do emails. They respond adequately to our emails, and we did not select just any supplier, they were referred to us and they have consistently delivered over time" (ME_1/PtdnM)*

The above quote reveals the communication methods and efforts to maintain a consistent relationship with suppliers. Majority of the MEs confirm that information exchange is done primarily using channels such as telephone, fax and emails. Of all the participating MEs, ME_2 and ME_15 claimed that there is information exchange via the information system used in the organisation. The production manager of ME_15 stated:

> *"I would say the extent of integration is about 50%, with our suppliers all the information required is sent to them if we require them to send samples they do, and we have specific requirements we let them know" (ME_15/PtdnM)*

Furthermore, the interviewees shared how communication with suppliers impacts on operations in areas such as on time delivery to customers, improved quality of materials and availability of inventory for production. A business owner stated:

> *"Working closely with our suppliers ensures that delivery to customer is on time. We share information with suppliers through emails mostly, calls are made as well"* (ME_2/BO).

Likewise, a production manager discussed how sharing sales data with suppliers helps in preparation of materials.

> *"We share sales data containing the quantity of products sold with the supplier from whom the product is purchase. Our company also informs suppliers from the sales forecast so that they can make production plans for materials"* (ME_4/PtdnM).

Another angle shared on how the participants endeavour to share relevant information with suppliers effectively. A production manager mentioned that specific teams are created to collaborate with suppliers. He stated

> *"Teams are created which comprise of the production manager, representatives of the procurement, quality control, research and development and logistics. The team frequently share information important for the suppliers and define the process for jointly designing the raw materials"* (ME_11/PtdnM).

5.2.2.2 The role of management in information exchange with suppliers

Some of the interviewees identify the significance of top management in achieving integration with suppliers. There appears to be divergent views on this as some employees claim that top management understand the importance of supplier integration while others addressed a limited knowledge. For instance, the production manager of ME_3 said:

> "*When it comes to integration with suppliers, because of the structure of the company, they (referring to the business owner) probably don't want to release some key information about their company because there are some reservations expressed*"

Similarly, the plant manager of ME_5 highlighted a situation in which management fail to foster a consistent relationship with suppliers. He said:

> "*We do not build a long-term relationship with every supplier; we require our suppliers to be flexible and be able to accommodate changes in our demands. We send all necessary information to the suppliers via email*"

In addition, a business owner highlighted that a reason why limited information is share with their suppliers. He stated:

> "*We have had confidential information like production plan and sales forecast leaked to other manufacturers because one of our old suppliers. We could do nothing at the time because they were one of the cheapest in the market. That relationship went sour and with our new suppliers we only share limited information* (ME_8/BO)"

An employee of ME_5 spoke about how this adopted method of interacting with suppliers could impact production:

> "*There are cases where there are errors with our orders, we notify the supplier, and the necessary changes are made"*

Another business owner explained the financial implication of investing in joint systems with suppliers and how this influences the mode and type of information shared. He said:

> "*Investing in similar systems with our suppliers will be expensive for us, also the upgrading and maintenance will add to our expenses as well. In my opinion it's almost like shooting ourselves in the leg based on the state of our finances. Rather than having a joint system, what I tell the procurement officer is to extract the information to be shared"* (ME_9/BO).

In addition, a business owner mentioned steps taken to ensure collaboration with suppliers. She said:

"*I try to visit the suppliers to see what they are doing because I have experienced a supplier who duped us, we went through a third party, and we kept waiting for delivery. It cost a lot to travel to China to check but it is better than just assuming that delivery will be made. For an initial visit, I have the pictures of the design I want, pictures of everything and I share with the suppliers*" (ME_15/BO)

5.3 Strategic IT alignment factors

According to most of the interviewees, the alignment of business strategy and IS strategy in the firms were susceptible to internal and external influences. In this section, internal and external influences on business and IS strategically are discussed.

5.3.1 Internal factors influencing strategic alignment

The interviews discussed that aligning business strategy with IS strategy were dependent on internal influences. In Table 4, section 2.4.1 the factors affecting strategic alignment of IT from existing studies, is presented. IT sophistication, management's knowledge of and commitment to IT alignment and IT expertise as factors, are presented.

5.3.1.1 IT Sophistication

The level of IT sophistication is a factor highlighted in studies as important for strategic IT alignment. Studies discuss that SMEs/MEs with a more sophisticated IT are able to achieve strategic IT alignment in comparison to those with less sophisticated IT (Ismail and King 2007; Street et al. 2017). The findings show that thirteen MEs employ dedicated IT systems mainly for enterprise resource planning. On the other hand, two MEs adopt spreadsheets primarily for inventory management. Table 10, section 4.12.2 presents the profile of the participating MEs, in addition the type of IT system in use in each firm is provided. From the results, it appears that the motivation for implementing the systems in use is for internal communication, information storage and retrieval and management of business processes. Business owners of some of the MEs support this claim. The business owner of one of the firms with a spreadsheet mentioned,

> *"the excel sheet is implemented to support with inventory management and staff have different levels of access to the system depending on their roles"* (ME_1/BO).

Another business owner illustrating the system in use said,

> *"There is a dedicated IT system purchased specifically for resource planning. It was developed and tailored according to the needs of the company with an option to chat with other members of the team. I have access to information regarding*

sales and production on the system such that I know how many pallets were produced daily" (ME_5/BO).

Furthermore, findings show that presence of IT systems for internal integration, however there is limited use of these system with suppliers to achieve strategic IT alignment.

5.3.1.2 Management's knowledge of and commitment to strategic IT alignment

Chao and Chandra (2012) assert that top management's knowledge of and commitment to strategic use of IT. In this study, most of the owners and managers acknowledge that strategic use of IT was particularly important for supply chain integration. They also agree that the knowledge and commitment to IS are crucial to their companies and its strategy. The production manager of ME_4 confirmed management's dedication to ensuring that a strategy is in place to improve information system. The IT manager of ME_8 also stated:

> *"The management see the improvement caused using the IT system in the organisation. As a result, during sessions when we create the strategy, we discuss how the business is developing, which is crucial to align the strategy with the business environment"*

Furthermore, some of the interviewees discussed the role management play in achieving work efficiency using IT. A manager of ME_6 stated:

> *"Management support a collaborative environment for staff to work effectively, the use of applications and systems to collaborate is encouraged"*

The interviewees frequently mentioned that management facilitate trainings to employees on effective use of the systems. For instance, an information technology manager commented:

> *"Managers and staff are exposed to training on how to use information systems. Top management is dedicated to ensuring we are all trained" (ME_8/ITM).*

This corroborates the findings of earlier studies that employees of SMEs/MEs are influenced by management commitment and efforts in ensuring effective IT alignment (Levy et al. 2001; Kyobe 2008; Garg and Goyal 2012; Street et al. 2017). Moreover, the findings reveal a lack of coherent strategy to achieve supply chain integration, for instance, most of the interviewees mentioned limited understanding of the relevance of implementing information systems with suppliers. The business owner of ME_10 said,

> *"we have local suppliers who do not use any form of IT system, I do not think for us to enjoy full benefits of synchronisation of information, the suppliers and us have a sharing system" (ME_10/BO).*

The IT Manager of ME_13 expressed,

> *"our local suppliers do not use the same system as we do hence the entire process of information sharing can be dragged and delayed, consequently wrong products are delivered, and products could be delayed"* (ME_13/ITM).

In addition, some participants identified limited manager/owner's understanding as a challenge of integration with suppliers. The justification for this is that ME owner/managers do not see the significance of integration; the focus is on the manufacturing process and therefore other operations such as integration with suppliers are ignored. The production manager of ME_10 during the interview stated,

> *"information exchange is difficult to achieve with suppliers, the process is often interrupted by the business owner who does not see the importance of sharing company information with suppliers. My perspective is that most of the company's resources are directed towards the manufacturing of our products and training of staff" (*ME_10/PtdnM).

Similarly, the IT manager of ME_14 expressed,

> *"the business owner was not on board with implementing a similar system with the supplier"* (ME_14/ITM).

5.3.1.3 IT expertise

Advancements in information technologies and the roles they play in driving business goals and objectives have made strategic IT alignment important for business performance and competitive advantage (Li et al. 2016; Dong et al. 2009). The relevant IT skills and capabilities possessed by SMEs/MEs and their external vendors such as suppliers have been discussed in literature as a key factor of strategic IT alignment (Cragg et al. 2011; Ghobahkloo et al. 2011). The nature of supply chain integration requires participation from both internal and external IT specialists. The main source of internal expertise for the participating firms is the presence of IT specialists, while external expertise relates to suppliers. The findings reveal that medium-sized manufacturing enterprises strive to deploy skilled IT personnel, which could be a major resource for competitive advantage in the manufacturing sector. Though, the study participants revealed that participation of external suppliers in the implementation of IT systems is limited. A business owner stated,

> *"We employed a full-time IT manager with other IT staff, their skills helped in choosing the IT system that works effectively" (ME_8/BO)*

The IT manager of the same company further confirmed the BO's statement and mentioned the limited input of external IT skills.

"The IT team is well trained, and each member has great skills…it would have been beneficial if the suppliers integrate with our system, the processes involved in ordering would have been simpler" (ME_8/ITM)

This statement reveals a constant occurrence in research firms, which is the discussion around the limited implementation of strategic IT alignment for supply chain integration as majority of the firms mainly utilise the IT systems for the effective running of their internal processes.

5.4.2 External strategic alignment influences

External influences can impact on business strategy as well as IS strategy in organisations. In this section, the effect of external factors is discussed. Political, economic and infrastructure factors are presented. In addition, the impact of the external factors on technology is discussed.

5.4.2.1 Political factors

The political setting significantly impact on business activities in Nigeria, in which policymakers develop and execute policies as the Nigerian economy and changes in political settings directly affect organisations. Changes that arise are a consequence of economic development. In some ways, the Nigerian government updates certain laws to ascertain conomic development. However, a number of these policies are not implemented. Many of the participating MEs attest that their companies are directly affected by the lack of implementation of policies. One of the directors of ME_3 stated that:

"The manufacturing industry is so dependent on government policy, if there is a change in poly on imports for instance, we are affected and this impacts on plans already laid out to run the business"

Limited support from government and government agencies came up during the interviews. Business owners noted that financial support will help to invest in technology. Two business owners remarked,

"we do not get adequate support from government especially in providing accessible loans for manufacturers, funding from the government will help us to invest in IT" (ME_1/BO).

"the government says there are loans available to medium enterprises, we have applied but have not been granted" (ME_8/BO).

The participant's views, comments and opinions on political factors were noted across the research firms. For instance, a production manager of said,

> *"what we face as a medium-sized manufacturing firm in Nigeria is huge. We face the challenges of electricity, fluctuating exchange rates and continuous changes in government policies. We must put in ten times more effort to ensure we meet up with international standards in quality" (ME_8/PtdnM).*

External bureaucracy imposed on companies' business operations is identified by the interviewees to be important. This refers to a system in which decisions relating to a country are enacted by employed staff rather than the elected persons. The responses showed that they are under an obligation to manage and fulfill the requirements of a number of government agencies. The production manager of ME_3 stated that:

> *"As a manufacturing firm, we go through series of checks and audits from agencies, this process is bureaucratic in that there are roadblocks encountered that affect our production"*

One interviewee also mentioned that bureaucracy also affected their production process, the business owner of ME_5 claimed that:

> *"There was time our manufacturing plant were seized by an official based on a claim that we hadn't paid our taxes. This was untrue because we have the accountant manage our tax and we do not default. It took three days to resolve, and we found out that the issue was with their system at the government tax office"*

Business owners also expressed their concerns on the high cost of import duties and the delay they experience to retrieve their goods. This delay leads to MEs paying demurrage. One business owner said,

> *"We had an instance where the goods had been on sea for over three months. The delay was because the staff of the Nigerian Ports Authority were on strike. The import duties we paid were exorbitant" (ME_3/BO).*

5.4.2.2 Economic factors

According to Ward and Peppard (2002), economic factors can affect alignment. In this study, majority of managers and owners acknowledge that the state of Nigerian economic is important to the companies and their strategy. A manager of ME_8 confirmed in strategy development, they considered the economic situation of the country. A business owner of ME_9 also stated that:

> *"The current state of our national economy as well as that of Lagos where we currently operate in, have a significant impact on the development of business strategy. To create a sustainable blueprint for our organisation, it is in our best interest to analyse the economy"*

Nigeria is a developing economy with approximately 3% GDP increase yearly at the time of conducting the study's analysis. According to the website of the Manufacturers Association of Nigeria, there is about 157% surge in investment in manufacturing activities. However, in the first half of 2021, the investment weakened and declined in some cities across the nation. One of the managers of ME_10 claimed that:

> *"The industry is facing quite a number of obstacles; our efforts and processes suffer because of these challenges"*

The economic situations are constantly evolving and changes that occur are sometimes unpredictable especially in a developing nation such as Nigeria. One of the top managers of ME_14 suggested that:

> *"In creating the goals of the business, we can only plan for two to five years as the industry and market is constantly changing. The needs of our customer seem to be evolving, the goals then need to be tweaked to fit those changes"*

In Nigeria, there have been rapid changes in the economy. This causes Nigerian companies seeking to modify their business strategies and adapt to changes in the economic conditions. Accordingly, technology needs to change to align with business strategy. Many of the managers acknowledged this and stated that it was not practical to change IT based on the evolving markets because of cost.

Furthermore, owners and managers discussed the impact of the fluctuations on MEs. Particularly, the fluctuation in the exchange rate which caused the drop in the value of the Nigerian naira, as a result, there is an increase in the budget for the purchase of materials from suppliers. According to a business owner,

> *"the regular drop in the price of naira because of its devaluation by the central bank of Nigeria affects procurement of raw materials, this means more money paid suppliers abroad" (ME_8/BO).*

Another business owner confirms:

> *"We have decided to source for local suppliers, the business can no longer afford to import from Turkey based on the current exchange rate" (ME_5/BO)*

The interviewees also discussed competition and their place in the market and highlighted the impact on the MEs. An understanding of the market is important in creating the direction of the company. One of the managers of ME_4 stated:

> *"Analysing the market is important for us as a business. We identify the current state and try to predict what the adoption of products will look like in a few months or years." (ME_4/PtdnM)*

A number of interviewees claimed that there are areas of improvements identified and improved upon by investigating the market trend, which also supported in the development business strategy. The plant manager of ME_5 said:

> *"We research the market where we operate and by finding what our customer's expectations and reviews are through surveys, there are complaints and suggestions that come up and we make sure to use them in the business plan" (ME_5/PM)*

Specifically, an in-depth understanding of the customers and their needs is crucial for successful implementation of strategies. For instance, the manager of ME_6 stated that:

> *"The feedback from customers helps us know the product is doing well in the market. This is an aftermath of the research conducted months ago to understand the clients and their preferences. We implemented the findings, and it has yielded in sales" (ME_6/PtdnM)*

Furthermore, the interviewees discussed the importance of considering competition when developing a strategic plan for their companies. One of the directors of ME_15 believed that:

> "There will always be competition, the important thing is focusing on providing customer satisfaction and achieving competitive advantage" (ME_15/BO)

The production manager of ME_14 also stated:

> *"Competition pushes management to take important decisions, the reality is that we do not have a lot of competitors, but we need to be strategic about reducing our cost of production to allow a drop in the cost price of our products"*

In addition, most of the interviewees spoke about the strategic plans and steps taken to achieve competitive advantage. They further highlighted a consequence on sales and market performance. The business owner of ME_12 stated:

> *"Competition is important to put us on our toes and ensure we are doing things right. Looking at the products and activities of competitors, will help identify areas of growth, especially maximising demand by improving production. The business has invested a lot in warehouses to make room for production"*

5.4.2.3 Infrastructure factors

Most of the interviewees agreed that infrastructure issues impact on the company and its strategy. Owners and managers discuss how infrastructure factors influence significantly their strategic plans. For instance, the business owner of ME_8 stated:

> *"We have these defined strategic plans but the challenges we are faced with hinder the execution"*

Nigeria, despite the report on extensive ongoing reforms, the country is still facing infrastructural challenges. This gap in infrastructure development has negatively impacted the Nigerian economy. Management of the participating MEs complained regarding the limitation of the environment and the struggle with low productivity because of infrastructure situation of Nigeria. A business owner of ME_8 stated:

> *"There is no manufacturing company you want to talk to in Nigeria that does not have sad story to tell you. The financial cost of generating our own electricity is exorbitant. We cannot shut down production because of no electricity. We spend an average of 5 million naira on diesel and we still pay electricity bills"*

Nigerian businesses are faced with inconsistent power supply, some of the interviewees commented on the increase in their running costs as a result and how this affects investments in technology. A director from ME_12 commented:

> *"We have cut a lot down on the total cost particularly because the amount spent on running our generator, we have tried to reduce the number of hours of some of our part time staff. Currently, we are also unable to invest in production equipment or any technology applications and software."*

Also, some of the interviewees highlighted the challenge they face with electricity impacts on production. A production manager stated,

> *"When we have decided to produce to meet up with the demands of our customers and our generators are faulty, it means that production has to be on hold, if this is prolonged it may affect us meeting market demand" (ME_12/PtdnM).*

Furthermore, the interviewees commented on the deplorable state of some Nigerian and how this affects their businesses. The business owner of ME_8 expressed the damage caused to their distribution vehicles as well damage to products which increases cost. The operations manager of ME_1 stated:

> "*There are unnecessary costs we incur as a firm. An example is that there are certain areas in this Lagos, we are unable to reach our customers in those areas because the roads are not motorable. An experience where one of our drivers didn't know there was a ditch in front of him because flood covered the road and there was a lot of damage to products that day"*

5.4.2.4 External influences affecting information systems

This section discussed external influences affecting information systems in the participating firms. Majority of the interviewees acknowledge that the IS is effective for their internal processes. Also, most respondents identify technology makes their job

easier. The comments show that there is no direct impact of the external factors on the use of technology.

However, some of the interviewees discussed that the financial implications of purchasing IT impacts on IS strategy. Also, this affects the quality and capabilities of IS implemented in their organisations. The IT manager of ME_15 commented:

> *"My job involves identifying the appropriate IT needs for the business which includes laptop such as server equipment, printers and applications. The cost is considered as we get quotes from different suppliers, the management must approve, and I have gotten responses that the company can't afford it. This affects the quality of systems we use"*

Another IT manager of ME_4 commented on the budget for IT being inadequate to implement an appropriate information system, he stated:

> *"The servers need updating, they are no longer supported by Microsoft, but the budget is not sufficient to purchase new equipment. Management's focus is on the production machines"*

The production of ME_4 also buttressed this by stating that the business prioritised increasing the budget to expand their production line.

In addition, competition appears to have an influence on the use of IS in some of the MEs. The business owner of ME_8 stated that:

> "*We found out competitors now adopt a particular ERP system which was beneficial to their processes, it was important to choose said system."*

Some of the interviewees also indirectly link improvements in operations and reduction in duplications and wastages, to the information systems in use in the organisations. For instance, the business owner of ME_2 commented:

> *"The system has helped in strengthening our processes, wastages are reduced because we receive notifications once inventory is low"*

Majority of the owners and managers are knowledgeable about the significance of technology and appear to be content with the IS system in their organisations. However, some of the lower-level staff suggest that IS could be improved for the benefit of their processes as technology is constantly evolving. An employee of ME_12 stated that:

> *"Forecasting and planning is done based on the information retrieved from the system but in today technology era, there is more that can be achieved with an up-to-date system in terms of reports generation"*

The advancement in information technologies enhances the operational activities of organisation, this also improves the understanding of information systems and the roles they play in companies.

5.5 Strategic alignment

The interviewees expressed how the information system in place helps to deliver business goals and objectives, improves entire manufacturing process and facilitates integration with suppliers. The following section discusses strategic alignment in terms of three levels – strategic, operational and individual levels.

5.5.1 Strategic level of alignment

Across the participating firms, there is a growing interest in expanding their business. Majority of the firms claim improved performance over the previous three years. This impacted on the need to implement IT to meet certain business objectives. One of the directors of ME_9 stated that:

> *"The system was built to address the challenges we were facing with synchronising data and making it available real time" (ME_9/BO)*

A production manager from ME_3 stated that

> *"Adopting an inventory system has made work easier for us. This switch from the previous system has helped us to manage cost as well as improve production"*

According to interviewees, majority of the MEs who have experienced a significant increase in revenue because of the information system in place within the organisations. The IT manager of ME_4 reinforced this:

> *"The system has helped in sales forecast. With the increasing amount of projects, we are involved in, the presence of the system is great for the business"*

The plant manager of ME_6 also stated:

> *"Engaging the system in place effectively enhances sales, productivity, consumer access to products and speed of service delivery"*

Another director of another company claimed that the decision to develop the information system is to standardise business processes. He said:

> *"We contracted an I.T firm to develop the ARP application specifically for our company. This application was developed to improve planning, inventory management, operations and sales" (ME_9/BO)*

The responses above show how the growth of the organisations presents the need to implement information systems. The responses from the interviewees showed that some

of the MEs improved their information systems to align with business goals and objectives. This suggests alignment at the individual level for enterprises who implement IT to support employee's work.

Furthermore, the interviewees presented varying perspectives on the business strategies employed in their organisations. There is evidence in the responses that management across the organisations make ambitious moves in developing and maintaining different strategies which are beneficial to the businesses.

A director of ME_5 discussed a strategy to ensure that inventory is available for production. He stated that previously there had been instances in which there was down time in production because of unavailability of materials. The director claimed that one of the initial steps taken once he assumed the position was to create a strategy – which is the ensure that available stock will last be based on target production volume.

The business owner of ME_1 also mentioned:

> *"When it comes to strategies, management come up with these strategies. This involves myself, managing director as well as the managers of each department. (ME_1/BO)*

In most of the participating firms, strategy is formulated by top management. Some of the companies confirmed that there are steps taken in creating strategies. For instance, the business owner of ME_2 stated

> *"We have a strategic planning and research department who work in conjunction with other departments within the company to develop ideas based individual perceptions and feedback from customers. They dig into how we can improve the quality of our products and satisfy customers better? These ideas are generated, developed and tested. After which, there is a sieving process with management".*

Other business owners provided responses:

> "*We can make smarter decisions with the feedback we get from our suppliers and the data we have available; we are able to know the needs of our market, the improvements to be done on our products and how we can satisfy our customers*" (ME_8/BO)

> *"When it comes to strategies, we come up with these strategies. We have our products on commercial buses in Lagos, the sales team go into major markets in Lagos to speak to the shop owners and see if they can stock our products. This has worked and we are a popular brand in Lagos"* (ME_1/BO)

According to the quotes, strategic alignment varies across the participating firms. For some of the firms it involves communication between departments within as well as

customers. Other firms did not confirm discussion with units in the organisations. Therefore, it can be said that the former companies considered between strategic, operational and individual levels of alignment while the latter firms failed to take into account the individual level adequately because the wishes and opinions of employees were not considered adequately during the development of strategies. This could be a ground for lack of alignment at the individual level.

A business owner pointed out how an intended strategy is formulated:

> "*When it comes to strategies for product design and pricing, we do market research using the sales team and feedback from customers, for instance what's the highest price our customers' are willing to pay for a new product or even with our current products, what are the perceptions of the price. We analyse the results and decide the direction of our development. The strategies are discussed periodically at meetings and approved upon after changes are made*" (ME_1/BO)

There is evidence from the responses given that the creation of strategy lacked contributions from lower-level employees. This to a greater level impacts on the quality, and momemtum of strategy development. Despite this, according to most of the top management, strategy development is achieved in the MEs.

The management of the firms mostly claim that their strategies have improved the business. However, employees of some of the employees alluded to some of the strategies being unsuccessful. For instance, the IT manager and an employee of ME_7 discussed the information system in the organisation was only a tool for storing data. A director in ME_7 claimed that:

> *"The consensus is that a new system is not what is needed right now because no funds to finance, the focus is on improving the manufacturing process".*

Similarly, a director of ME_1

> *"The excel spread sheet which contains relevant information in my opinion. It can be better; a system is needed to automate all the processes within the enterprise but there is a need to adequately develop the business processes"*

The above quotes show that there is an understanding that the information system provides a enabling role rather than being critical to business needs. Although the responses from the two directors failed to consider the information systems strategy, employees from other MEs discussed that the implementation of information systems improved productivity and business activities. An employee of ME_11 stated:

> *"With the system, access to information is quick. It also reduces mistakes we might make*"

Furthermore, the interview participants claimed that the information system in place is intended to help in addressing customer's demands. For instance, the plant manager of ME_5 stated that the information from the enterprise resource planning system allows to resolve requests or changes from customers.

Top managers from the MEs also discussed that information systems could be implemented as a tool to actualise business strategies. A business owner of ME_9 asserted an increased benefit from implementing an information system to drive business goals and objectives. He said:

> *"I would say the installation of the ARP system drives our business plans. The previous lack of a system could result in an inaccurate and delayed information retrieval that might lead to poor decision making. Then, with an improved system, timely and accurate information can be presented to staff and managers for decision making. This is important for planning and management in the organisation."*

However, the evidence from the responses shows that the existing systems across the MEs did not fully meet the firms' proposed plans. Majority of the companies use their information systems for functions within the organisation. Regarding synchronising with suppliers, this was mainly executed without support from information systems. For instance, the production manager of ME_13 discussed a lack of integration with suppliers despite being part of their business goal. He identified the reason for this, stating that some suppliers do not require the use of an information system:

> "*The system works but we also must put in a lot of work. For instance, there are materials we source locally, the market woman doesn't need to integrate with the system" (ME_13/PtdnM)*

Other identified reasons which impact on integration with suppliers, are discussed in section 5.6.

5.4.2 Organisational level of alignment

The organisational level of alignment depicts the interaction between the IT department and other departments in an organisation. In the participating firms, majority of the interviewees mentioned that the IT department provides support to departments and resolves IT issues that arise. The IT Manager of ME_3 stated:

"We resolve technical issues across the site, employees from different departments raise any issues they have with using their computers or the ERP system".

However, some of the interviewees presented different opinions. A production staff of ME_1 mentioned that there is no IT staff permanently onsite, but there is an IT contractor that comes in occasionally. He stated:

"We experience persistent crashed on two shipping stations, and this slows down operations, the IT person has been contacted, he comes in to resolve the issue, but it keeps happening"

Another interviewee, the production manager of ME_14 highlighted

"*I think one of the biggest issues is that although we are independent with our network infrastructure, the parent company oversees and grant certain permissions. This means that some IT issues may linger"*

In general, most interviewees acknowledge connection between IT staff and other departments. Accordingly, respondents discussed the significant role of IS to business performance, though some mentioned that it is challenging to have a perfect system that resolves issues efficiently and on time.

Organisational level of alignment also involves information sharing across the departments. The interviewees highlighted that information sharing helps employees perform their jobs effectively and improves decision making for management. The CEO of ME_2 commented:

"The system works effectively. All the units are integrated in the system. And we can pull out data or any information that is required for a particular task. We use emails as well; the enterprise is running smoothly. Reporting is mandatory, if there are no reports, the unit lead is held accountable, and I am sure they know how to discuss with their staff"

Another CEO of ME_5 spoke on how information sharing has improved from their transition from a manual system to an information system.

"The system helps us to communicate, store and retrieve information faster. The departments interact effectively as we decided to transition from manual storing using files to this system and it has helped the business work well"

However, one of the managers of ME_7 asserted that data is not shared through the excel sheet as it is mainly used for storage. Instead, information is retrieved manually through files and paperwork:

> *"There is delay in retrieving information as we need to go through a pile of papers and a while ago, we experienced data loss. This makes collaboration across departments difficult"*

The IT manager of ME_4 mentioned that there exists an information system in which data is retrieved, and access is given depending on roles. The business owner of ME_4 clarified:

> *"Data is aggregated from all the departments, and we can access. There are certain folders on the network that staff cannot access because they are not permitted to view"*

Many interviewees discussed that information sharing exists across their organisation because of the presence of an information system. The CEO of ME_4 suggested that the company's integrated system enhances communication and information sharing. One of the managers of ME_9 also presented that the system in use covers functional areas such as production, planning, inventory management, finance and procurement. However, an IT manager from ME_14 stated the system is limited in certain ways when it comes to information sharing, there are departments unable to view data. According to him, the presence of an integrated system for information sharing supports alignment as well as a useful decision making tool.

The relevance of information systems in the participating MEs can be shown in the presence of an IT department and size of the IT staff. In terms of the presence of an IT department, all but one ME claimed that there is an established IT department. The one ME – ME_1 highlighted that an IT contractor is engaged occasionally. Also, across the MEs, it was suggested that there are at least one IT staff overseeing the infrastructure and work with other third-party companies in MEs where their systems are managed externally. Majority of the IT managers that participated in this study stated their participation in strategy meetings. They also claimed an understanding of the organisational structure and business environments. The IT departments seem to be well involved in planning and implementation of the information systems.

5.4.3 Individual level of alignment

The individual level of alignment emphasises the connection among system users and IS. This section analyses data relating to individual level of alignment. During the interviewees, the participants mentioned their usability of the information systems which includes its functionality, access to databases, information storage and retrieval. From

the responses, it appears that the many of the systems meet the needs of the employees. For instance, a production staff claimed that:

> *"I would say that the system helps in delivering goals and objectives. My daily work is easier to do, rather than go looking out for information on the shelves, just a click and the right information is found (ME_3)"*

The business owner of ME_13 also emphasise that:

> *"IT has helped in eliminating duplication of processes and saves time. For instance, with stock taking, instead of having large number of staff counting, we use guns which are connected to the system"*

Furthermore, a staff of ME_8 mentioned:

> *"The system has improved productivity and quicker access to information. Increased interaction among staff and pulling out of data for use by any member of staff"*

The quotes show that users were satisfied with the systems. Many interviewees also attested to the system being effective. It could be said that this is because the companies align IS strategy and business strategy that relate to operational alignment. In addition, it appears that most of the company's focus on IS strategy to improve their internal processes.

Some interviewees also discussed the usability of the systems. Most of the interviewees highlighted that the ability to navigate impacts on their efficiency. One of the directors of ME_9 commented:

> *"I would say before the development of the ARP we have done research to see if it was appropriate for our use. We spoke to use to ensure that is as simplistic as possible, as if it is complex, staff may not be able to adapt quickly"*

The significance of the system is also discussed from the employee's perspective. Most of which described it as a tool for sharing and accessing information and improving work performance. Top management and owners appear to acknowledge IS as strategic for delivering business goals and objectives.

According to some of the managers, the quality of information system is as important as the capability of its users. According to the production manager of ME_13:

> *"We have staff that are still unable to use the system effectively, I have realised from interaction that interests and passion are key to this job, it doesn't matter how great the system is, if it is not being used well then it is almost a waste of fund. Speaking with the director, apart from the trainings already had, key sessions should be allocated to staff on the use of the systems"*

Also, an information technology manager discussed the commitment by management towards providing requisite training for staff.

> *"Managers and staff are exposed to training on how to use information systems. Top management is dedicated to ensuring we are all trained" (ME_8/ITM).*

However, some of the interviewees were not fully satisfied with the system in use and acknowledge that their information systems failed to perform. These were mostly interviewees from MEs 1 and 7. One of the top managers from ME_7 stated:

> *"The system does not perform optimally, and it is a system that need to be changed" (ME_7/BO)*

The operation manager of ME_1 also claimed that:

> *"I think the system does its bit in delivering our goals and objectives. Like I said we can retrieve the information of our key distributors and retailers and the customers we have used in the past and those we currently use. It can be better in analysing information and supporting to ensure jobs are done properly"*

For these interviewees, the systems need improvement. One of the managers pointed out:

> *"The system we use doesn't function optimally, but I would say it works for us. The business goals and objectives are not delivered using the system, there is room for improvement, but we put in the effort and ensure customers are satisfied"*

5.4.4 Alignment with suppliers

The study found alignment with suppliers as a theme because of the study's focus on supply chain integration which includes integration with suppliers. This spotlights on aligning the information systems with suppliers. This section analyses collected from employees of MEs as well as suppliers. During the interviews, it was asked if MEs and some of their suppliers proposed the integration process and their understanding of the role of information systems. It is noted that most of the IS systems implemented in the MEs are not integrated with suppliers. The manager of the production department mentioned:

> *"Suppliers do not integrate with us using the system. The way we share information is that once there is a trigger on our system of low level of raw materials, we contact them. Also, if we are making changes to the specifications of materials, we test it first with a few samples "(ME_3/PtdnM)*

All the suppliers that participated in the study asserted that they do not participate in the implementation of information systems in the MEs. The supplier of ME_12 commented:

"Since working with this business, we have not received any requests to take part in implementing their systems"

The suppliers presented the processes involved in communicating and collaborating with the MEs. The communication processes mainly involve the use of emails and phone calls. The supplier of ME_1 stated:

"The process starts with receiving an email or a call from the firm. If it's a product we are familiar with, we send the invoice and start getting the products ready for sending to the company. We ensure that quality of the products is excellent because we understand that it is important for the final products. We have a quality control team that ensures that standards are met"

The above quote shows that the relationship between the suppliers and MEs is not influenced by the information systems in place. In most of the MEs, there appears to be a process in place for communication. Most of the MEs clarify responsibilities and duties of suppliers and promote communication. The production manager of ME_11 highlighted that:

"The enterprise creates teams to collaborate with our suppliers. These teams are generally comprised of the production manager, representatives of the procurement, quality control, research and development and logistics. The team frequently share information important for the suppliers and define the process for jointly designing the raw materials"

One of the managers of ME_9 also commented on the relationship with suppliers:

"We designed a supplier selection process and procedure to be adhered to; we have a yearly review of our suppliers to ensure they are compliant. We also ensure to monitor the quality of the raw materials we receive. For our suppliers that meet up with our standards, we continue to do business with them"

However, some of the interviewees from the MEs claimed that they engage few suppliers at a time. This ensued from the position that the enterprise did not align their business strategy with IS strategy. The business owner of ME_1 stated that:

"A challenge we have is an absence of an IT or facilities department that caters to our suppliers, we also consider finance. Some suppliers will require that we pay a percentage of the cost, and some require the full sum, we can't afford to pay this across multiple suppliers, and this is why we have only a couple, we are able to manage the costs, and it is easier to maintain the relationship"

Also, one of the managers of ME_5 asserted that the reason for the choice of few suppliers:

"We decided to reduce the number of our suppliers so we can focus on each one and it has been easier to tackle the challenges we face with them"

The quotes show that some of the MEs are limited in building a supplier strategy to optimise business goals. This strategy typically involves suppliers and MEs agree regarding goals and customer satisfaction. The suppliers and MEs responses did not present a clear strategy, though there is evidence that MEs provide suppliers with adequate information. For instance, the supplier of ME_1 commented:

> *"I won't call our relationship a partnership. The company ask for a service, and we provide that service. When we need more information on their orders, we reach out and it is communicated"*

Almost all the MEs agreed that working closely with suppliers is important to their business processes and operations. The IT manager of ME_2 pointed out that:

> *"Collaborating with suppliers is beneficial to maximise efficiency and meeting customer's demands"*

However, despite acknowledging the significance of partnering with suppliers, some of the interviewees discussed that failure to create clear expectations with suppliers' impacts on their performance. For instance, the plant manager of ME_5 stated that:

> *"We do not build a long-term relationship with every supplier and require our suppliers to be flexible and be able to accommodate changes in our demands...there have been instances of low inventory because of unexpected demand that suppliers are unprepared for..."*

Furthermore, the role of technology from the perspectives of the MEs and suppliers is key to achieving alignment. The MEs as well as the suppliers that participated in the study failed to implement IS as a strategic tool to enhance partnership. As a result, much attention was not given to the development of IS to achieve integration with suppliers.

According to a manager of ME_8:

> *"There are restrictions on the information we share, and this is based on instructions from the business owner. This is not good for our business as there is not an alliance between ourselves and suppliers. This also affects other areas of the business such as demand forecasting and production"*

In general, the interviewees discussed that a promoting integration with suppliers requires implementation and continuous updates to help create better value and enable the MEs to be more resilient to meet the needs of their firms.

5.4.5 Summary of the relationship between the levels of alignment identified during analysis

In this study, strategic alignment is explored from the perspectives of strategic, organisational, individual and supplier levels of alignment. Using the findings from thr interviews, strategic level appears to be mostly associated with both the organisational and individual levels in which managers provide suggestions to top management regarding information systems. Also, lower-level staff and employees acknowledged the relevance of the information system to their work. However, the converse is the case with the supplier level of alignment, the strategic level is not well aligned with the organisational and individual levels. Most of the top managers present a strategy to integrate with suppliers. However, these strategies are impeded by certain challenges. Therefore, the relationship that exists between organisational, operational, individual and supplier levels was affected by the challenges, resulting in misalignment.

5.6 Findings on challenges to strategic alignment

The responses from most of the participants show that there are challenges hindering the implementation of strategic alignment which resulted in limited integration with suppliers. A major challenge was the absence of an appropriate technology to match the requirements of the business with respect to integrating with suppliers. However, financial constraint was identified across most of the MEs. One of the managers of ME_14 stated:

> *"Technology is not adequate because there should be more to meet the needs of the business. We were looking for a package to fit our company. However, we need finance to do so and it seems this is outside the yearly budget"*

Some of the management of MEs also mentioned that there is a limited knowledge of information systems and the role in driving business goals, as there are instances where there is no IT staff onsite, or the IT professional's knowledge was insufficient. A business owner of ME_7 highlighted that:

> *"One of the crucial reasons why the information system does not perform optimally is that the company is not able to employ IT professionals for strategic alignment especially one with experience in a manufacturing setting"*

However, some of the MEs discussed the presence of an IT manager and staff in their organisations. This shows that the companies treat technology and IS strategy as crucial for achieving business goals and are willing to invest in IS. Nonetheless, top

managers of all the MEs present a similar challenge relating to IS implementation as financial constraints, which also affects recruitment of IT staff.

Another challenge is the perception held by some management on the importance of supply chain integration. One of the managers of ME_8 stated that top management need to be knowledgeable on the benefits of the system before approving its implementation. Furthermore, a business owner of ME_1 believed that working with several suppliers posed as a disadvantage to their organisation as they have experienced delay in delivery of materials and consistency in quality. Also, one of the managers of ME_6 spoke about the suppliers not engaging with processes such as product design, this is because suppliers can leak important information to competitors if integrated with their system.

Another issue raised is the skills of the employees and the inability of staff to key into the vision of the company. A business owner from ME_6 discussed that the willingness of staff to switch to a new system affects its effectiveness in addressing the needs of the business. Also, the IT manager of ME_4 spoke about staff commitment and expertise. He said:

> *"There are instances where we have staff have shown limited skills with using the technology in the organisation despite trainings"*

In addition, the responses of the interviewees showed that most of the participants fail to consider information systems as critical and most held a perception of it being a tool to make their jobs easier rather than IS being a strategic tool. For instance, the production manager of ME_10 claimed that:

> *"Affordability is important for the company, we sought for a tool that is functional in supporting our work and we don't have to invest a lot of resources and time into it"*

Majority of the top management of the MEs acknowledged IS at the strategic level but still paid insufficient focus to its implementation especially. Some of the managers across the MEs opined that management considered IS to be a less important issue as there were instances where the need to change or upgrade the systems were brought forward and such requests were declined. Also, it appears that most interviewees accepted what management instructed, rather than question what exists. As a result, staff may have learnt to manage their expectations with the use of IS. For instance, the production manager of ME_1 stated:

"The excel document is not effective tool, management influenced the choice of the system. We have been pushing for a more effective system, we are yet to have one. All we do is make the most of what we have by ensuring the sheet is up to date and stored in a secured drive"

Some interviewees when asked how the information system in place helps deliver their business goals and objectives, responded by suggesting that the production machines were working effectively and claimed not to have a lot of interaction with the information system. The IT manager of ME_13 stated how staff resist the use of information systems as some thought the presence of an IT system could lead to losing their jobs.

The perception of information systems led to not fully appreciating its value. An example is that in MEs where IS was not considered as crucial to drive business goals, users will also recognise IS to be insignificant to their work. For instance, the operation manager of ME_1 discussed:

"The excel sheet contains relevant information in my opinion, it is not effective in any way but if I am looking for information and I spend a bit of time looking for it, will find it"

Also, a user from ME_7 discussed how finding information could be time consuming and challenging because it involves going through large piles of files and paper documents.

In addition, the priority for most of the MEs appears to be a focus on their business strategy rather than IS implementation and as such do not invest in it. Many of the top managers suggested that the budget for technology and information systems was limited as they are experiencing financial constraints. However, some of the interviewees implied that top management welcome and implement ideas that relate to developing business strategies in line with improving their production processes. The business owner of ME_8

"*Ideas that birth new products or improve our current products are important. Once there is a new idea usually from the production team or any staff which we have looked at and think it can improve the product or develop a new product. There are ways of implementing which includes research, product development and test the market with a few of the products"*

In summary, the challenges the participating MEs faced are due to limited IS strategy and business strategy development and implementation. The presence of business

strategy and IS strategy as well as understanding of the importance of IS could have supported in overcoming these challenges.

5.7 The effect of strategic alignment on performance of MEs

The findings of the study show a connection linking strategic IS and performance in medium-sized manufacturing firms. The interviewees discussed how the IT system has influenced the enterprise, facilitated information sharing, lead to efficiency such as maintenance or reduction in price and the impact on waste saving and keeping up to capacity. According to the managers and business owners, the IT system has a direct impact on total cost. The findings also show that the IT system in use has the capacity to reduce total cost especially if integrated with suppliers. For instance, the production manager of one of the MEs stated,

> *"The IT system has helped the enterprise simplify its processes, operations with our suppliers are likely to be seamless if we share the same system which will yield return on investment" (ME_5/PtdnM)*

The previous section (5.6.2) discussed limited integration with suppliers via the IT system. The IT systems in the MEs are utilised purposely for the simplifying of the internal processes. The business owners and managers opine that they focus on ensuring that their customer's needs are met as well as meeting the demands of the market, which has helped them to achieve return on investment. For instance, one business owner mentioned how investing in an IT system has translated to efficiency and productivity within the enterprise.

Likewise, owners and managers have expressed other ways they reduce total cost, whether it is sourcing from local suppliers, procuring materials in bulk, increased production within the shortest possible time and reduced cost of delivery. The production manager of ME_12 stated,

> *"we look out for cheaper raw materials and ability to produce more production in a shorter time is a way of saving cost. We also engage local famers we go as far as the North to source for fruits, it is cheaper for us, and we do not have to incur cost of delivery" (ME_12/PtdnM).*

The data revealed that strategic IT alignment significantly impacts on the achievement of integration within the MEs to realise business goals and objectives. However, the interviews have also revealed that the major impact of strategic IT alignment and external integration with suppliers is not clearly defined in the research MEs. In other words, the impact of strategic IT alignment processes cannot be directly reflected in the

outcomes of external integration. Data analysis highlights that strategic IT alignment contribute to business performance through internal integration because of limited external integration with suppliers.

The findings further demonstrate that accessibility to information is an important finding in the study's medium sized manufacturing firms. The staff of the MEs stated that they were able to retrieve appropriate information faster and the information are presented on the system in a manner that can be comprehended. This according to the employees supported them in being more efficient at their jobs and help in effective communication with colleagues.

In addition, the findings reveal that the IT system in use has a direct impact on maintaining or reducing price of materials. The research managers stated that the system presents information that can be used to determine the suppliers to engage with and are able to provide competitive prices at a good quality. For instance, the production manager of one of the firms mentioned

> *"The system in use impacts directly on the prices of materials as well as enables reaching out to suppliers from the reports generated from the system" (ME_1/PtdnM)*

Moreover, the participants expressed an indirect effect of strategic alignment on sales. This is discussed in how planning and forecasting result in increase in sales, they discussed that the IT system in use allows data to be retrieved and analysed based on the requirements of the market. An example is the response of an IT manager, who stated:

> *"Effective planning and forecasting results in sales, which is what the system helps us to do. The result in sales is based on what is done with the data we have" (ME_4/ITM)*

5.8 Summary

This chapter summarised the outcomes of template analysis conducted on the face-to-face semi-structured interviews conducted within Nigerian manufacturing MEs. The study found that these MEs strive to achieve strategic alignment of IT for supply chain integration. Three internal factors emerged which are IT sophistication, management's knowledge and commitment to strategic IT alignment and IT expertise. The external

factors found include political, economic, infrastructure and external influences on information systems. The analysis also revealed the strategic alignment practices of the firms to achieve supply chain integration.

Drawing from the semi-structured interviews, medium-sized manufacturing enterprises are committed to supply chain integration by reason of value it presentsto their firms. However, the results found that internal integration using the information systems exist and is mostly structured across the participating firms, while collaboration with suppliers is less formal and channels such as emails, phone calls and meetings are adopted. Firms, therefore, adopt a approach in which purchasing materials and meeting their demands are the most driven factor for integrating with suppliers. Then, the capability of being able to meet the production demands is how they perceive the success of their firms. In general, it may be inferred that supply chain integration at the medium-sized manufacturing firms is connected to an organisation's survival and production successful outcome.

Also, the semi-structured interviews showed that medium-sized manufacturing enterprises have developed a mechanism on how to achieve enterprise integration with suppliers particularly. With this mechanism, the efforts MEs make include creation of a team that liaises with suppliers and using channels such as emails, phone calls and meetings. These efforts significantly impact on supply chain integration.

Chapter 6 – Discussion of the findings and the revised framework

6.1 Introduction

This research examined factors influencing strategic IT alignment, strategic IT alignment and supply chain integration in selected medium-sized Nigerian manufacturing enterprises. Through the discussion, there is an attempt to answer the main research question which is: How can MEs adopt strategic alignment of IT to achieve supply chain integration in a developing economy? This includes three sub-questions which support in answering the study's main research question:

1. Based on existing studies, what are the factors that can influence strategic alignment processes and how do they relate to supply chain integration?
2. What constitutes strategic alignment practices and why is it important to the achievement of supply integration in Nigerian medium-sized enterprises?
3. How can Nigerian manufacturing MEs implement strategic alignment to achieve supply chain integration?

First, the revised framework is presented. The chapter is discussed based on the revised framework. Also, to present the chapter in an orderly manner, the findings are concluded and summarised in each section with reference to each research questions. Thereafter, the findings are related to extant literature by analysing the similarities and differences including corresponding the results with filling the research gap shown in Chapter 1. Thus, this chapter follows this manner: The study's revised framework; Strategic IT alignment; Factors influencing strategic alignment; Supply chain integration. Each of the sections contain the outcome and summary of the findings.

6.2 The study's revised framework

In the light of the analysis presented in Chapter 5, the theoretical framework developed in Chapter 3 was reviewed and revised.

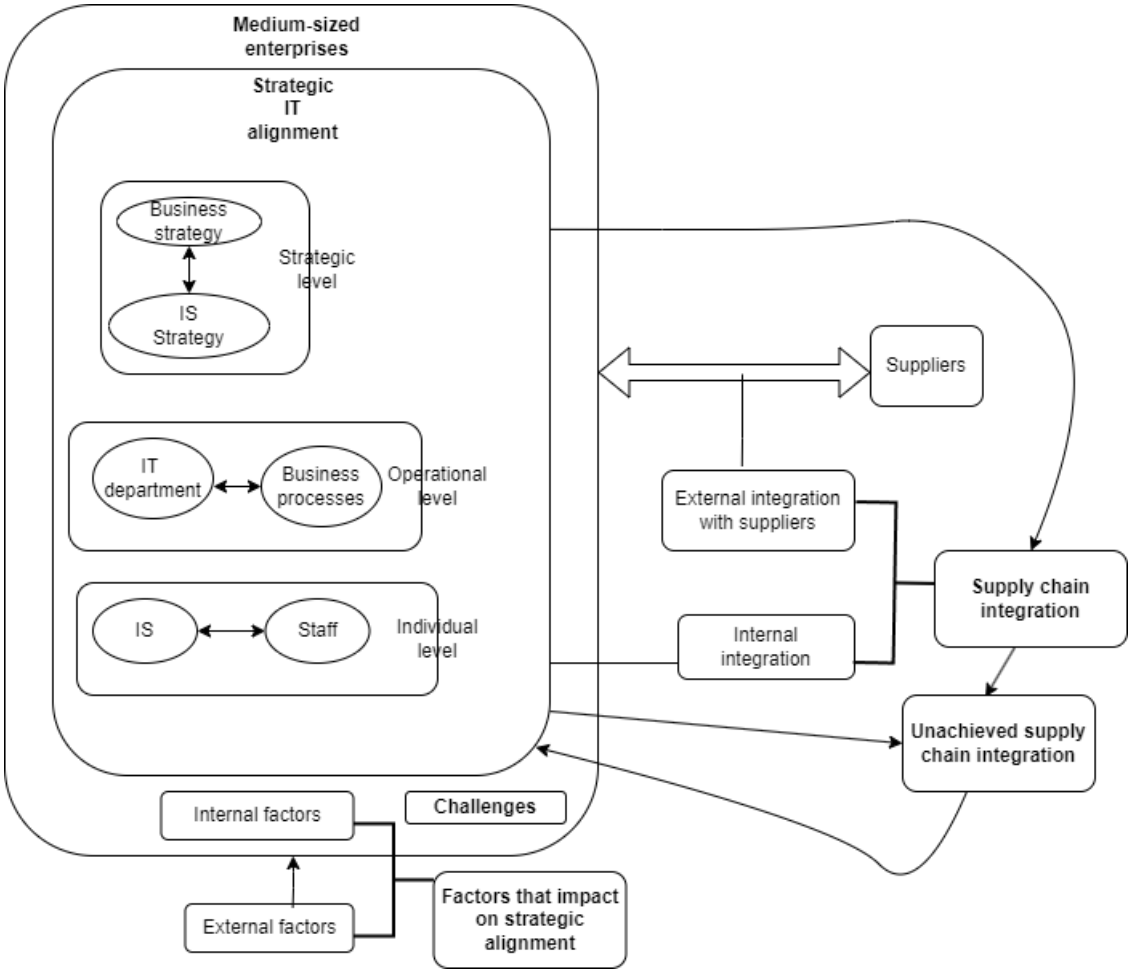

Figure 7 The study's revised framework

From the figure above, there are variations between the initial framework presented in Chapter 3 and the enhanced version. Firstly, the "unachieved supply chain integration" is added to the revised framework (Figure 7). This aspect takes into cognisance the context in which strategic alignment for supply chain integration is not achieved for certain reasons. In this study, there are instances where a few of the participating MEs made attempts to achieve alignment between business strategy and IS strategy yet this was met with organisational concerns such as top management requirements and application of business processes, there is a limited implementation of alignment. The process of integration is depicted using a line that connects "strategic alignment" to "unachieved supply chain integration. The findings as well as existing studies presented that achieving strategic alignment requires continuous and considerate influence from firms in a constantly evolving environment where there is a possibility of misalignment.

The initial framework also depicted the impact of strategic IT alignment on supply chain integration. The study's findings acknowledged that achieving supply chain integration may be limited if alignment conditions vary. The results further showed that there is limited external integration with suppliers while internal integration is established. As a result, external integration is mostly informal in the research firms. The findings highlighted that communication and information sharing is achieved mostly through phone conversations, emails, and physical meetings. Thus, the results show that strategic IT alignment for supply chain integration in the Nigerian medium-sized manufacturing enterprises is limited.

Furthermore, the revised framework showed an additional component in the revised framework which is "challenges", referring to issues that impact on strategic alignment within the Nigerian context. The challenges identified in existing studies is viewed from a static perspective (e.g.absence of appropriate technology, limited knowledge of information systems, perception held by management on the importance of supply chain integration and limited skills of staff) and not from a process lens as shown in this study. The findings suggest that the challenges Nigerian medium-sized manufacturing enterprises encounter significantly impact on the implementation of strategic alignment as well as achieving supply integration. Therefore, to understand the results of strategic alignment, it is crucial to identify the challenges and the impact on alignment and supply chain integration. Section 6.6 below discusses in detail challenges influencing alignment and its significance to strategic alignment and supply chain integration.

6.3 Supply chain integration

6.3.1 Internal integration

In this study, three sub-themes emerged (organisation's focus on production process, collaboration between internal functions and processes and IS infrastructure) from the internal integration theme established during the analysis undertaking. The findings show that internal integration seems to have an important influence on strategic alignment and supply chain integration.

6.3.1.1 Organisation's focus on production process

According to the analysis, among the participating manufacturing MEs, there is a focus on implemented information systems to improve the production process. In addition, the

impact of the different units working in unison on strategic alignment is presented. Integrating business processes is a key attribute of IT systems implemented in medium-sized manufacturing firms. According to studies (such as Chen et al. 2008; Kocoglu et al. 2011), the success of integration within firms is argued to be heavily reliant on effective technology. In this study, internal integration is defined from the perspective of how information systems implemented improves and simplifies business processes. For instance, managers emphasised the importance of IS for decision making through reports generation. On the other hand, employees describe how IS simplifies business processes. As a result, MEs with sophisticated information systems achieve integration within and improvement in their production process.

6.3.1.2 Collaboration between internal functions and processes

The findings showed that collaboration exists within the participating MEs, which meant the presence of relationships across departments in the organisations. The employees and top management also claimed that effective information sharing, and improved decision making ensue because of internal integration. Interviewees confirmed collaboration enables better communication between employees which leads to effective business operations and enhanced performance. The findings revealed that internal integration exists in majority of the Nigerian MEs. This finding supports findings of prior studies (e.g. Pagell 2004; Chen et al. 2008; Kocoglu et al. 2011; Basnet and Wisner 2014) that stress the need for integration across units in an enterprise. The findings revealed that the manufacturing and supporting processes in majority of Nigerian MEs are connected through the information systems, they also employ emails for information sharing and retrieval as additional techniques. This finding supports studies which have discussed the use of technology and its relevance in information sharing and retrieval (Rai et al. 2006; Dwivedi et al. 2009). Although, the findings of a study by Basnet and Wisner (2014) established that the IT system used across an enterprise for information sharing does not translate to internal integration. It's relevance in facilitating information sharing and retrieval, for the actualisation of internal integration is shown in the findings of the study. Furthermore, the participants discussed how the system in use facilitated complete access to information instantaneously and improved the quality shared and retrieved. This is consistent with prior studies (e.g. Rosenzweig et al. 2003; Pagell 2004), which discussed that the integration as a result of the use of an enterprise-wide IT system which facilitates information sharing.

In addition, the analysis demonstrated that information sharing, and communication across their departments are important for business performance. Existing studies state that information sharing is useful for small and medium-sized enterprises because it is viewed as a crucial for competitive advantage (Humphreys et al. 2001; Kembro et al. 2014; Li and Lin 2006). In the research firms, there is an understanding that they are expected to share information and communicate to enable the working together of departments and with suppliers. As medium-sized manufacturing firms are less structured, this enhances information sharing and communication among aspects of the enterprises.

6.3.1.3 IS Infrastructure

Interviewees discussed the presence of information systems and the influence on their firms. Most of the employees across the participating MEs considered technology to be adequate in covering key business processes. In addition, perspectives on the use of current and outdated information systems evidenced an understanding of the importance of technology in the firms. Moreover, across the MEs, majority of the management understand the relevance of IS to improved performance. For instance, one of the production managers claimed that the choice of IS is hugely influenced by management. Existing studies showed that the strategic use information technology is crucial to achieving business performance (Melville et al. 2004; Wu et al. 2015). In addition, literature presented the role of top management in the adoption and implemented of information technology to drive business goals and objectives (Oliveira and Martins 2011).

Furthermore, the hardware and network elements as part of the IS infrastructure and the role in supporting the IS are noted in the firms. Also, IT staff and employees significantly influence the IS infrastructure. An employee of one of the MEs stated that IT staff are key in ensuring jobs are done effectively.

6.3.2 External Integration

There are two sub-themes (communication with suppliers, the role of management in information exchange with suppliers) to the external integration theme identified during the analysis process. The findings of the study show that external integration seems to have significant impact on strategic alignment and supply chain integration.

6.3.2.1 Communication with suppliers

Achieving external integration with suppliers using IT systems in research medium-sized manufacturing firms is less sophisticated and informal. Eighty percent of participating enterprises have an IT professional and an information system that automates their processes and simplifies the processes within the firms. In a study conducted by Mothe and Nguyen-Thi (2012), firms with IT systems were majorly large and found in finance, manufacturing, and IT sectors. Despite the presence of IT system and business strategies, strategic IT alignment lacks a structured and experienced viewpoint. The lack of standardisation of strategic IT alignment for supply chain integration is often due to informal relationships between MEs and their suppliers, level of organisation's IT sophistication, internal and external IT expertise, financial resource constraints, and political and infrastructure issues. During the course of interviews, a number of business owners/managers established that implementing strategic alignment of IT or purchasing similar IT system with their suppliers is expensive. The formalisation of strategic IT alignment requires financial commitment and the active participation of business owners and managers about the benefits of IT. For the advancement of strategic IT alignment, commitment and knowledge of owners/managers is required in aligning strategies with IT. However, in medium-sized enterprises, developing strategic IT alignment is important as organisations grow. Generally, medium-sized manufacturing firms understand the importance of strategic IT alignment particularly for supply chain integration, there are difficulties encountered that impact on the implementation.

It has been recognised that a truly integrated supply chain requires an extensive commitment from members of the supply chain (Chen and Paulraj 2004; Kocoglu et al. 2011) and involves communication and information sharing, participation in decision making of suppliers and vice versa and organisation with supply chain members (Jayaram and Tan 2010). Information sharing with suppliers helps firms to create partnership which leads to effectiveness of the supply chain processes (Yu et al. 2001). In addition, the use of sophisticated IT systems for communication and collaboration supports the achievement of supply chain integration (Gunasekaran and Ngai 2004).

At the medium-sized manufacturing firms, a limited use of IS systems for supplier integration is evidenced in the findings. The findings presented the use mainly for internal integration which helps with information storage and retrieval. Majority of the

participating firms have adopted a method for information sharing and communication with suppliers, informal techniques which impact on partnership with suppliers.

6.3.2.2 The role of management in information exchange with suppliers

The position of management in fostering integration with suppliers is presented in diverse perspectives by the interviewees. A number of managers claimed that top management make efforts in ensuring partnership with suppliers. In addition, some interviewees alluded that the limited sharing of information with suppliers is influenced by management in that they dissuade building lasting relationships and sharing information with suppliers consecutively. Furthermore, an employee confirmed the influence of management and proposed that information sharing with suppliers impacts on business performance. Also, the financial implication of synchronising systems with suppliers seems to be a key reason for management's hesitation, however, there were mentions of steps taken such as visiting suppliers to ensure collaboration.

The study conducted by Li and Lin (2006) examined the impact of inter-organisational relationships on information sharing. Their study suggests that top management influence positively information sharing by providing vision and support as well as create an environment suitable for information sharing. However, the results of this study reveal that top management are limited in understanding the importance of fostering information sharing without delay or distortion. Also, studies (such as Chen and Deng 2015; Hsu et al. 2008; Baihaqi and Sohal 2013) discuss the impact of information sharing on the entire supply chain. For instance, Chen and Deng (2015) postulate that information sharing improves production. Furthermore, findings of the study conducted by Hsu et al. 2008 described a positive relationship between information sharing capability and partnership with suppliers and their role in driving performance. Therefore, top management promoting information sharing strengthens partnership with suppliers in terms of encouraging quality information void of alteration.

Suppliers and organisations collaborating has a key role to play in achieving strategic IT alignment. Prior studies (e.g., Kim and Jee 2007; Sanders 2005; Qrunfleh and Tarafdar 2014; Cai et al. 2013) discuss collaboration and partnership between suppliers and firms. Kim and Jee (2007) found that strategic IT alignment is influenced by partnership with external organisations. Similarly, Sanders (2005) investigated the advantage of investing in interorganisational IT between suppliers and firms. The study found that

partnership with suppliers' impact on successful strategic IT alignment. Also, Qrunfleh and Tarafdar (2013) found that partnership with suppliers is essential in supporting the alignment between information systems and supply chain.

The limited association between partnership with suppliers and strategic IT alignment in this study could be discussed by a number of reasons. First, the limited partnership with suppliers particularly in establishing a unified vision for the supply chain which impact on the strategies and implementation of information technology. A limited partnership can impact on supplier’s participation in development of strategies leading to misalignment between information technology and business (Simatupang et al. 2002).

The second explanation might be that the limited partnership is because of unwillingness to share information. This could result in situations such as delay in delivery of materials and incorrect specification/size of materials. A limited partnership with suppliers can negatively impact on sharing of information and joint-solving effort causing a reduced quality in supplier operations and decreased quality materials, which results in lower product quality (Qrunfleh 2010). Nevertheless, another possible explanation for this finding is that the participating Nigerian manufacturing MEs are not aware of the importance of coordination in terms of long-term partnerships or implementing similar technologies to help the firms and their suppliers achieve significant and continuous benefits. Therefore, there is a need for further research to understand how partnership with suppliers directly impacts strategic IT alignment.

6.4 Factors influencing strategic IT alignment

Having evidenced that the success of strategic IT alignment is connected to its factors (see Chapter 2), this section discusses the factors influencing strategic IT alignment across the research firms. The analysis presented two main themes which are internal and external factors.

6.4.1 Internal factors

There are three sub-themes (IT sophistication, management’s knowledge of and commitment to strategic alignment, and IT expertise). The findings of the study reflect that the internal factors impact on strategic alignment.

6.4.1.1 IT sophistication and strategic IT alignment

The study proposed IT sophistication as a factor. The findings of the study identified the level of sophistication of the IT system in use in the enterprise impacts on the

achievement of strategic IT alignment. Majority of the participating firms have invested in IT systems for enterprise resource planning. Therefore, IT sophistication in the research firms to enhance strategic IT alignment for supply chain integration was found to be in existence. This study defined IT sophistication based on two dimensions (technological and informational sophistication). This finding is consistent with existing literature (such as Raymond et al. 2011). Cragg et al. (2002) conducted an inquiry into the influence of IT sophistication on strategic IT alignment and discovered the technology in use significantly influence on strategic alignment. Likewise, Raymond et al. (2011) found that the adoption of advanced applications such as ERP system presents advantages to SMEs in terms of increased competitive advantage. The study also discussed the effective management of IT is as a result of the strategic role technology plays in the firms.

Majority of the research participants discussed the use of the implemented IT system mainly for internal processes. The research firms focus on the production processes ensuring that the products are designed and manufactured to meet the customer's demands. Customer satisfaction has become an important competitive subject for the research firms and the motivation for processes they adopt in sourcing, production, quality control, feedback from customers, storage, and delivery facilities. Research participants reported that production and quality control procedures are priorities for owners/managers. The firms adopt unique ways to design and price their products from their competitors. In addition, market research and the study of the buying behaviour of customers enable owners/managers to develop strategies. Thus, firms attract sales through an effective production process. Indeed, this is not a factor that enables the achievement of strategic IT alignment for supply chain integration, however it certainly has some influence over how IT is fully exploited for benefits in the research firms.

6.4.1.2 Management's knowledge of and commitment to strategic IT alignment

The study found management's knowledge and commitment to strategic IT alignment to be a key factor. In other words, the important role of owners and managers understanding of strategic plays a crucial function in achieving strategic IT alignment. This suggests that when managers implement the strategies and top management realise the resources and capabilities, then strategic IT alignment becomes achievable. Managers and business owners across the MEs confirmed knowledge and commitment

to IS are important to business performance and strategy development. According to Luftman et al. (2004), if a business leader fails to consider IS as important, the firm may likely not develop IS. The business owners and top management with the key power to decide on IS and technology, acknowledged IS as a tool to drive business and strategy. The literature review discussed information systems to be of greater relevance than just a tool (Ward and Peppard 2002). Also, literature reported that management's knowledge and commitment have a significant role in the choice of IS systems in use, as well as participation in the implementation. In addition, Cragg et al. (2011) assert that top managers with the decision making power over IT require the appropriate business and IT understanding to adopt and implement in an organisation.

Kearns and Sabherwal (2006) found an immediate connection between top managers' knowledge and commitment and strategic IT alignment stating clearly that an organisation's emphasis on knowledge management and centralisation of IT is critical for its achievement. Chan et al. (2006) argued that owners and managers who are more familiar with information technology are more likely to participate in planning and implementation, this in turn fosters strategic alignment. In the participating MEs, it is evidenced that there is limited IS knowledge including business owners and top managers who have the crucial role of decision making. Therefore, strategic alignment is influenced at the strategic level, which implies that the developed IS strategy may not adequately align with business strategy. For instance, due to limited knowledge of IS, one of the employees of the MEs stated that the company focused on manufacturing processes and ignored supply chain integration.

Ismail and King (2007) also found that management's knowledge and commitment was found to significantly impact on strategic alignment in the firms they studied. Street al. (2017) discussed that the understanding and participation of management is a major factor for successful strategic IT alignment. They further said that management of firms that participate in formulating business goals are more able to understand business goals and can align IT strategies with business strategies.

6.5.1.3 IT expertise and strategic IT alignment

The analysis reported the presence of internal IT expertise in the research firms and how this influences successful strategic IT alignment. Some of the interviewees mentioned

the influence IT expertise on their organisations and the impact substantial. Majority of the employees considered IT expertise as an important internal factor that could affect strategic alignment. Furthermore, respondents discussed expertise in terms of the presence of skilled IT professionals

On the other hand, there is limited evidence to support the participation of suppliers especially in the implementation of their IT systems. Therefore, in this study, internal expertise supports the achievement of strategic IT alignment while external IT expertise from suppliers is lacking. Previous studies have discussed the link between internal/external expertise on strategic IT alignment in small and medium-sized enterprises. Cragg et al. (2002) investigated the impact of the presence of an external IT expertise for a small organisation, the study found that successful outcome was attained when IT experts worked with top managers. The study further stated that because small organisations have limited resources to set up an IT department or have an IT manager, IT expertise comes from the influence of consultants and vendors. Gutierrez et al. (2009) also discussed that small and medium sized enterprises differ with regards to resources and IT expertise, the internal and external IT expertise factor impacts on strategic IT alignment regardless of the size of the firm.

6.4.2 External factors influencing strategic alignment

The analysis showed that external factors affect the strategic alignment process. According to Landon and Landon (2009), external settings tend to evolve quicker than organisations. The analysis identified four sub-themes which are political, economic, infrastructure and external influence on information systems.

6.4.2.1 Political factors and strategic IT alignment

According to Yayla and Hu (2012), the political context is important for strategic alignment as a result of globalisation. In Nigeria, the government act a more controlling role than developed economies. Thus, political factors impact on the practices and processes of organisations in Nigeria (Tende 2014). In the context of the participating MEs, the political factors are viewed as vital since the manufacturing industry is being interfered with by the government. For instance, some business owners and managers of the MEs discuss the control government has in terms of policy to run the industry which has significantly affected their business strategy. Furthermore, the analysis revealed that MEs endeavour to work with and satisfy the requirements of governmental organisations to ensure the development of the manufacturing industry. However, in

return, there is limited support from government and its agencies particularly in financial support and bureaucracy. Also, the participating MEs could be influenced by political challenges. For example, the companies are affected by constant changes in the policy on imports. The rules, laws, policies and political changes impacted greatly the study's MEs. These findings are consistent with previous studies, which suggest that organisations are influenced by political settings (Barron 2011; Craig and Campbell 2012) and the MEs were affected greatly because of the Nigerian context (Adeoye and Elegunde 2012; Okike et al. 2015). In developing business strategy, the MEs considered the Nigerian political scene, which implied that IT alignment is impacted by politics.

Moreover, the government regulations and policies impact information systems directly. For instance, some business owners and managers mentioned that investment in information systems were influenced by government policy changes. The cost of IT infrastructure was one of the issues considered in the actualisation of strategic alignment. Also, the Nigerian manufacturing MEs claimed a lack of adequate support from government to develop their IS in terms of favourable policies. In their study, Okundaye et al. (2015) discussed the influence of Nigerian government's policies on IT which is consistent with this finding.

Furthermore, the political factor impacts on the production processes of some of the organisations. According to Mark and Nwaiwu (2015), political changes impact on manufacturing products in Nigeria. For instance, some interviewees mentioned that bureaucracy affects production. Rogger (2014) confirmed this and discussed that bureaucracy impacts on the Nigerian economy.

6.5.2.2 Economic factors and strategic IT alignment

The economy factor also significantly influenced alignment of the MEs. In recent times, the economic circumstance of nations had been seen to be uncertain and unpredictable. In Nigeria, this is the case as there is also a slowdown in economic growth which impacted on the business strategy. The economic situation of Nigeria is described as unsteady over an extended period of time. Based on the data presented by the World Bank (2023), the Nigerian growth rate and GDP decreased from year 2015 to 2022 and further dropped to the bottom in 2023 because of economic crisis. A business owner of one of the MEs also affirmed that the current state of the economy allowed for

companies to amend or develop their strategy which impacts on alignment at the strategic level.

The existing markets also form part of the economic environments and impacts on alignment. The manufacturing industry faced obstacles. Generally, the MEs endeavour to plan involving constant changes as the market and needs of the customers evolve. Some of the top management of the MEs confirmed that their business strategies are developed based on an analysis of the markets. Hallberg (2000) assert that if an organisation adopts a strategy focused on its existing market, the company will succeed.

In addition, some of the MEs considered competitors. However, the interviewees presented a perception that competition is not a challenge because they engage internal resources and strategic plans to achieve competitive advantage. This gave rise to perspectives from some of the interviewees in which they claimed it was not crucial to employ a good information system to gain competitive edge.

6.4.2.3 Infrastructural factors and strategic IT alignment

The analysis presented infrastructure factors as crucial to the achievement of strategic alignment in the participating firms. The issues raised include bad electricity, poor roads, and fluctuations in exchange rate. Majority of the research firms indicate that infrastructure and political issues impact on the achievement of strategic IT alignment. Participants reported that irregular electricity is a barrier to the participating medium-sized firms aiming to increase the scale of their production, bad roads delay and disrupt delivery to customers, and fluctuations in exchange rate impact on importation of materials from international suppliers. Furthermore, these issues if resolved help improve firms' ability to adopt strategic IT alignment. Owners and managers frequently reported that infrastructure and political issues impede business performance. Although, this is not a factor highlighted in previous studies that affect strategic IT alignment, however it certainly has some influence over the views of medium-sized enterprises on strategic IT alignment factors.

Previous studies have discussed issues facing the successful implementation of information technology in developing countries such as Nigeria. Apulu et al. (2013) found issues limiting SMEs in Lagos Nigeria from benefiting from the use of IT. Some of the

issues identified in their study are lack of electricity, lack of government policies and limited support from banks and regulations. Olugbenga et al. (2013) also address some of the challenges they encounter because of lack of electricity. The work of Olatunji et al. (2018) assert that bad electricity supply is a barrier to several manufacturing enterprises in Nigeria who want to maximise the scale of their production. The findings of this study recognise bad roads delay delivery to customers. The role that transportation plays in the delivery of manufactured products across the world should be acknowledged because of its relevance in the global supply chain (Gurtu et al. 2019). Evidence from the study identified that the current state of many Nigerian roads is deplorable because of government policy failures. The state of the roads has caused delay and disrupted the smooth and timely distribution of products to their preferred destination (Onuorah 2009).

Furthermore, the analysis revealed that the research firms experience the challenge of fluctuation exchange rate. The fluctuation occurs because of the drop in the value of the Nigerian naira against the dollar, which makes the MEs spend more on the purchase of raw materials from international suppliers. This research finding builds on the work of Adeniran et al. (2014) who assert that the surge in exchange rate because of the devaluation of the naira has impacted on MEs that import materials from other countries. The research firms require support in the form of trouble-free access to government grants and loans so that they can compete effectively with the manufacturing firms from developing countries. There are only some grants and loans available to participating enterprises such as the SME finance, development bank of Nigeria loans, micro, small and medium enterprises development fund. Despite the limitation in number, there are stringent conditions set by banks and the bodies handling the grants and loans that reduce the chances of MEs accessing them.

6.4.1.4 External factors influencing information systems

The analysis revealed external factors influencing information systems strategy in the firms. Some interviewees mentioned that IS impacts on their organisations, but the effect is seen mostly internally. The respondents acknowledged that technology improves efficiency. For instance, one of the business owners claimed the IS helped the company to achieve reduction in wastages. In discussing the impact of external factors on IS, most of the respondents asserted that external factors have little impact on their use of technology. However, the influence of finance on IS strategy is emphasised. An example is an IT manager who claimed that cost is a key factor in purchasing IT and the

management's role as it relates to approval. The literature (Levy and Powell 2000; Ismail and King 2007) showed that finance impacts on the development of information strategy in organisations.

In addition, the choice of information systems is affected by competition in the organisation's existing market. One of the business owners stated that the firm's management was able to decide on an information system which is similar to the one used by its competitors. As a result, this company was able to face such competition with great benefits from the use of IS. Also, findings revealed the link between the use of technology and improvements in operational activities of the organisations. Studies (such as Beheshti and Beheshti 2010; Santa et al. 2014) who emphasised that information technology and its strategic use is key to achieving operational efficiency.

Most of the top managers of the participating MEs understand the role of technology in organisations but there is limited commitment to ensure IS strategy is updated with business strategy. Majority of the lower-level staff of the MEs asserted certain processes within the organisation require up-to-date technology. The fact is that technology is constantly evolving for the benefit of business processes. Webb and Cox (2004) suggest that it is important that managers stay committed to develop their information system strategy.

6.5 Strategic alignment

To answer the second research question "What constitutes strategic alignment practices/processes and why is it important to the achievement of supply integration in medium-sized enterprises?", this section highlights levels of strategic alignment and the effect on supply chain integration.

6.5.1 Strategic level of alignment

The model presented in Chapter 3 was presented based on current strategic alignment literature. The study identifies limitations in achieving strategic alignment and there is minimal discussion in existing studies. In literature and practice, it is claimed that many organisations encounter challenges in achieving the proposed alignment. Thus, the initial framework is revised by adding "unachieved supply chain integration", which is a consequence of lack of strategic alignment. This section provides a discussion of the enhanced version of the model emphasising on the process of strategic alignment for supply chain integration. Previous studies (such as Venkatraman et al. 1993; Luftman et al. 1999; Avison et al. 2004; Chenhall 2005) have developed frameworks to describe

and analyse strategic alignment. Many of the models propose a perspective that strategic alignment is fixed and unchanging. Though, components of alignment including business strategy tend to evolve with the constantly changing environments. Subsequently, misalignment may happen, resulting in competitive disadvantage for an organisation (Chan and Reich 2007; Shpilberg et al. 2007). Thus, literature suggests that IT alignment may be considered to be a process instead of viewed as a static state (Vessey and Ward 2013; Baker et al. 2011; Baker et al. 2009). Also, scholars (such as Chen et al. 2008) have developed frameworks to identify and examine strategic alignment as a process. This study develops a framework to examine strategic alignment process implemented to achieve supply chain integration. In the strategic alignment process, a proposed alignment is the phase in which alignment is designed and explored. Chan et al. (2006) asserts that alignment could fail due to lack of in-depth analysis of implemented alignment. Based on the findings of the study, realising strategic alignment is limited due to internal and external factors and challenges that arise which impact alignment.

Furthermore, this study highlights that strategic alignment is significantly altered by internal and external factors. For instance, some of the interviewees of the MEs discuss a focus on improving production process which implies that less attention is paid to information systems. In addition, findings revealed that an alignment process is influenced by challenges such as financial constraints, infrastructure issues and limited knowledge and commitment to IT alignment. As a result, its implementation across most of the MEs was hugely affected and led to unachieved strategic alignment.

With the lack of strategic alignment, various aspects of an organisation are affected. In this study, though the MEs have devised ways to communicate and collaborate with suppliers using telephone calls, emails and physical presence – this shows less reliance on strategic alignment to drive business goals. The findings of this study also show that though top management of the MEs appear to understand the role of alignment, the development and implementation of IS strategy is lacking. The challenges mentioned earlier hindered the actualisation of strategic alignment. Furthermore, the responses of the interviews show that minimal attention is paid to improving the IS strategy.

6.5.2 Operational level of alignment

The organisational or operational level of alignment depicts the relationship between the IT department and business departments. This level of alignment emphasises that the IS

strategy and accompanying IS infrastructure support the achievement of business goals and objectives. At this phase, the business could be adversely affected if strategic alignment fails. Studies (such as Tan and Gallupe 2006; Kearns and Sabherwal 2006) suggest that it is crucial for IT professionals and business managers to communicate efficiently to achieve strategic alignment. In this study, most of the interviewees highlight that communication between IT and business units exist and IT staff provide support to staff of business departments. This enabled the effective use of IT for work and business processes. The current IS in the majority of the participating MEs appears to be adequate for work.

Also, the operational level is said to be beyond communication between IS and business departments. It also involves information sharing which is key to strategic alignment (Reich and Benbasat 2000; Ye and Wang 2013). As a result, if communication between IT managers and top management as well as within employees is lacking, misalignment may occur (Reich and Benbasat 2000). This played out in the MEs which took part in the study. For most of them, the IT departments play significant roles in their organisations, Business owners and top managers appear limited in their understanding of the role of IS and their participation in IS strategy development unclear. On the other hand, the IT managers of most of the MEs discussed participation in strategy formulation and are fully involved in IS strategy development. Also, the IT departments across the MEs engaged in planning and implementation of IS. When the interviews were conducted, the majority of MEs employed information systems with sophisticated functionalities which can meet the needs of organisations. Yet IS is fairly explored to meet the needs of internal processes and limited when it comes to external collaboration with suppliers.

In addition, despite the interviewees acknowledging the presence of IS, some of the systems had been used for a few years and the IS strategy underdeveloped as several of the businesses grow. This shows that as the business environment changed, technology was not developed as business strategy evolved. Studies (such as Chan et al. 2006; Tallon and Pinsonneault 2011) conclude that a lack of IS knowledge and ignoring the importance of IS can lead to misalignment at the operational level.

The absence of alignment at this level brings about negative effects and limits business performance (Gutierrez and Serrano 2008). For instance, the information systems in

most of MEs were mostly used for communication and information sharing and simple processes without operational functionalities and few mention IS is employed to promote some key functional areas in their organisations. Therefore, though the MEs claimed to have increased in terms of business activities, but the conventional way of working affected these organisations. Also, the lack of alignment in some of the MEs gave rise to increased workload. For instance, the staff of one of the MEs claimed that the system in use was ineffective and only increased their workload. They complained to the top management, but it was ignored. This shows misalignment as top management lacked sufficient knowledge about business strategy and IS strategy which then cause increased workload with less contribution. According to Wu et al. (2015), the participation of IS executives as members of the management team supports the achievement of strategic alignment.

The analysis revealed that the lack of alignment at the operational level impacts on organisations especially the business processes. Avison et al. (2004) assert that operational level is crucial as it connects the strategic level to the individual level.

6.5.3 Individual level of alignment

The impact of IS infrastructure on an organisation is affected by if the individual needs and requirements are met (Chung et al. 2003). Studies (Benbya and McKelvey 2006; Allen and Verga 2006) also state that the needs of system users evolve as they find new ways of working with information systems. According to Benbya and McKelvey (2006), the information system is affected by feelings and resistance of individuals to its use, and this affects the potential benefits of IS. In this study, most of the interviewees mentioned that the IS system meet their needs. For instance, a production staff claimed that the ERP system made everyday work easier.

However, when lack of alignment at this level occurs, it means that some of the systems failed to meet the needs of the users. For instance, some interviewees mentioned that they require to use certain functionalities in the system, but the IS does not evolve to meet the needs. Therefore, the users' notion of IS are impacted resulting in IS resistance. This prevents effective implementation of IS. This finding relates to the study conducted by Hong et al. (2011) on users' resistance to IS implementation in which they suggest that once user satisfaction exists and a user is confident using the system, resistance decreases. Existing literature (e.g. Lapointe and Rivard 2005; Kim and Kankanhalli 2009; Jiang et al. 2000) suggest that resistance to information systems is a

key reason for failure of technology implementation in organisations. In addition, the ability to use effectively is crucial to information technology implementation. This study identified the usability of the systems as important. For instance, some managers stated that the choice of a simple system was based on staff's ability to use and adapt quickly. According to McCloskey (2006), the ease of use is a key factor in user's acceptance of IT. Furthermore, the study found that management play significant roles in user's acceptance of the system. For example, an IT manager of one of the MEs discussed the commitment of management by providing requisite trainings which enables staff use IS well. This finding is consistent with the study conducted by Pangarkar and Kirkwood (2008) who suggest that it is important that key employees are trained to get knowledge and broaden IT skills to achieve strategic alignment.

6.5.4 Alignment with suppliers (Unachieved external integration with suppliers)

A number of studies (e.g. Subramani 2004; Sanders 2008) discuss the impact of integrating information systems with suppliers. However, the findings revealed that majority of the MEs do not integrate their information systems with suppliers and come up with informal ways of collaboration and communication. Subramani (2004) propose that the use of an interfirm information system leads to a closer relationship between firms and their suppliers. In this study, some of the suppliers who participated claimed that partnership with suppliers is non-existent, yet information is shared mainly using emails and phone calls to ensure the needs of the buyer are met. A supplier mentioned that information is received via emails and if there is a need for additional details, they reach out to the firms.

The information systems implemented did not integrate with those of the suppliers. For instance, the study's participating firms described the relationship with suppliers not being influenced by technology which results in lack of partnership. This result is consistent with the findings from Prajogo and Olhager (2012), who state that lack of integration with information systems impact on collaboration and partnership with suppliers. Existing literature suggests that an absence of partnership is a key reason for strategic misalignment (Koza and Lewin 2000; Cousins and Spekman 2003). Additionally, the study finds that for some of the MEs there is no clear strategy for engaging suppliers, for instance a staff of one of the MEs mentioned their supplier selection process changes often and another mentioned few suppliers are engaged per time. However, the study showed that MEs endeavour to communicate requirements

with suppliers using emails and phone calls, the informality of these communication methods tend to affect integration with suppliers. Similarly, Sanders (2005) suggest that it is important for suppliers and buyers to collaborate using IS to achieve strategic alignment.

In addition, the results of this study suggested a lack of knowledge on the role IS play as a strategic tool to enhance partnership, impact strategic alignment. A manager discussed that a top manager restricted integration with suppliers because of a previous experience in which a supplier leaked vital company information to a competitor. The consequence of this is delayed materials which also affect other areas of the organisation. According to Cousins (2005), a key success factor of alignment is technological collaboration between buyers and suppliers to leverage resources and capabilities of key members.

6.6 The challenges to strategic alignment

The analysis revealed challenges the participating MEs face in attempting to achieve strategic alignment. Studies (e.g. Bhattacharya 2008; Bell and Orzen 2006) acknowledge that organisations encounter challenges which left unaddressed cause misalignment. The findings chapter has presented challenges affecting IS implementation and strategic alignment in Nigerian manufacturing MEs, these challenges are common to majority of the firms. This section then synthesises the challenges into three categories which are financial constraints, limited management knowledge and commitment to IT/IS, perception of staff to IT/IS.

6.6.1 Financial constraints

Previous studies such as Street et al. (2017), and Kitsios and Kamariotou (2017) identified finance as a factor affecting strategic IT alignment. In this study, most of the MEs identified financial constraints as affecting IT alignment. The analysis presented evidence to support the role of financial resources constraints on firms to execute their IT based strategies. This implies that if a firm chooses to focus on improving their operations, this may require interorganisational information systems or in another case if a firm is interested in expanding to multiple location, this may involve new IT infrastructure. The literature reported that financial resource has a significant role in that it enables IT investments to be made which support business goals and objectives (Wade and Hulland 2004; Street et al. 2010).

Wade and Hulland (2004) found that in firms who are financially constrained especially SMEs, the result may be unrealised business and IT strategies and thus strategic IT alignment becomes unsuccessful. Street et al. (2010) also argued that finance resource constraints have been shown to impede the achievement of strategic IT alignment. Also, according to Street et al. (2017), the limited financial resource has not been researched extensively in studies because it is assumed that firms have similar opportunities to finance. The study further said that a further investigation of the relationship between financial resources and strategic IT alignment is required. Based on the above discussion, this study confirmed a link between financial resource constraints and strategic IT alignment.

Research identified financial constraint as a strategic IT alignment factor (Street et al. 2017; Kitsios and Kamariotou (2017). Financial resource is recognised as key for manufacturing enterprises to achieve competitive advantage. Given that MEs are engines to the economic development in Nigeria, access to finance significantly influence the success of medium-sized enterprises (Ogujuiba et al. 2004). As reported in the literature, acquiring IT and training on its use are limited by lack of funds (Fatai 2011). According to majority of research participants, finance serve as the primary vehicle for strategic IT alignment for SCI and the acquisition of information technologies and trainings was mainly for the internal use in enterprises. Furthermore, some owners/managers acknowledge that the IT/IS in use is a decision made because of cost.

6.6.2 Limited management knowledge and commitment to IT/IS

Kearns and Sabherwal (2006) found an immediate association between top managers' knowledge and commitment and strategic IT alignment stating clearly that an organisation's emphasis on knowledge management and centralisation of IT is critical for its achievement. In this study, management of MEs showed limited knowledge of IS and its role in driving business goals. According to the responses, some top managers showed limited commitment to IS which had significant influence on supplier integration. Wu et al. (2015) suggest that the critical role of owners and managers commitment to IT plays a crucial function in achieving strategic IT alignment. The literature reported that management's knowledge and commitment have a significant role in the choice of IT systems in use, participation in the implementation. In this study, most of the top management of the MEs acknowledge IS by recognising that IT support business processes, however there is still an insufficient focus of its implementation in the

organisations which could lead to failure of IS. Also, the findings revealed that the disposition of top management to IS also impacted on employee's perception of the value of IS and staff began to view IS as less important. This is further discussed in section (6.3.4.3) below. Chan et al. (2006) argued that owners and managers familiar with information technology are more likely to participate in planning and implementation, this in turn fosters strategic alignment.

6.6.3 Perception of staff to IT/IS

Existing studies reveal that the perception of staff to technology is connected to user resistance and IT adoption (Beaudry and Pinsonneault 2005; Kim and Kankanhalli 2009). In this study, the analysis showed that most employees across the MEs failed to consider information systems as vital and more than simply a tool which support their daily work activities. The literature has discussed extensively the crucial role of information systems in achieving competitive advantage and business performance (Zhang and Lado 2001; Bhatt and Grover 2005; Pearlson and Saunders 2009). Furthermore, the findings identified that some pointed out that technology did not require investment of resources and time. Al-Gahtani (2004) in his study found that user's perception towards IT hugely impacts on resistance and adoption of IT.

In addition, this study identified that the perception of some staff to IT which led to not fully appreciating its value. This was described in terms of the willingness to learn and commitment to exploiting IT effectively. Existing studies on perception to IT emphasises on the impact on IT acceptance (Saade and Bahli 2005; Venkatesh et al. 2003). Also, perception of IT also affects the implementation of information systems (Lee and Kim 2007; Kim and Kankanhalli 2009). The analysis suggested that the direct impact of adverse perception to information systems is seen in how some top managers appeared to focus on improving production processes and overlooked IS implementation leading to insufficient investment in technology. The study conducted by Legris et al. (2003) found that managers may view information systems as unimportant because of the negative perception towards technology.

6.7 The effect of strategic alignment on performance of MEs

The study reported a relationship between strategic alignment and performance of the MEs. The research analysis revealed that strategic IT alignment, the alignment between business and IT strategy in Nigerian medium-sized manufacturing firms impacts on performance. However, because of the limited integration with suppliers via the IT

systems, it can be stated that strategic IT alignment has helped the research firms to improve their performance in areas such as sales, customer satisfaction, improved manufacturing processes, efficiency of business processes. With supplier relationships, strategic IT alignment has failed to support in enhancing its performance. It is noteworthy that the findings are consistent with previous studies such as that have investigated this relationship (Wu et al. 2015; Gerow et al. 2015; Santa et al. 2010). For instance, Gerow et al (2015) concluded alignment links to performance results in productivity of processes, customer expectations and financial performance. Also, Wu et al. (2015) presented that the level of alignment among realised business and IT strategies impacts on customer satisfaction and financial performance as well as operational performance. Likewise, Santa et al. (2010) mentioned that firms are able to improve their performance by implementing information technology and aligning with business strategies of the organisation.

Based on the findings from interviews, the study proposes that strategic IT alignment contributes to firm performance through internal integration. The research firms describe an increase in sales, which they experience by improving quality of products, production process and effective planning and forecasting. They further reported ways of reducing total cost whether it is sourcing from local suppliers, procuring materials in bulk, increased production within the shortest possible and reduced cost of delivery. Earlier studies focused on what factors influence strategic IT alignment and the if and how an organisation's strategic IT alignment contribute to business performance stayed under researched (Wynn 2008; Kitsios and Kamariotou 2019).

The findings show that processes within a firm and externally with suppliers are enhanced by activities engaged by medium-sized firms. MEs maximising their internal and external resources will help achieve and sustain business performance. As stated above, medium sized manufacturing firms have ways of improving their business processes through activities to facilitate production and information sharing with suppliers. The proposition is that firms aligning their business strategies with IT accordingly emphasises the importance of MEs and suppliers integrating to enhance collaboration and facilitate growth of the firm.

6.8 Recommendations for implementation of the framework

The study's conceptual framework presents medium-sized manufacturing firms some implemental directions using the analysis of primary and secondary data, and how IS can be structured to promote strategic alignment for supply chain integration. This section discusses the proposed recommendations for implementing strategic IT alignment for supply chain integration framework (Figure 6.1). The recommendations highlight the ways the research firms can implement their IS to engage strategic IT alignment emphasising factors influencing strategic IT alignment, strategic alignment, supply chain integration (internal integration and external integration with suppliers).

This research found that supply chain integration was unachieved across majority of the participating MEs. The key steps regarding the partnership with suppliers to achieve supply chain integration through strategic IT alignment include that business owners and their suppliers should be aware of the importance of the factor in contributing to strategic IT alignment. The steps would include 1. The crucial role of the management of the research firms in collaborating with suppliers which involves practices such as product design and development 2. Participation of suppliers in the implementation of information technology to achieve supply chain integration 3. Integrating with suppliers via similar information systems. These are some recommended steps to ensure achieving strategic IT alignment through partnership with suppliers. Partnership with suppliers enables the research firms and suppliers to collaborate effectively such that advantages are presented.

The major implementation steps regarding IT sophistication include different plans that can be presented to achieve strategic alignment. These may include: 1. choosing the appropriate IT based on the needs of the business, 2. Emphasis on the nature of the systems application which are relevant to the business processes. Therefore, it is important that top management and researchers focus on how to strengthen IT sophistication to contribute to strategic IT alignment.

The findings of the study referred to management's knowledge of and commitment to strategic IT alignment as an important factor. The proposed steps include: 1. Business owners/managers need to understand the nature of implementing IT to meet business goals for achieving supply chain integration 2. Business owners/managers provide

required support for the actualisation of strategic IT alignment. Therefore, it is pertinent for business owners/managers and researchers to improve how to strengthen management's knowledge of and commitment to IT.

Also, IT expertise is considered as an essential factor for strategic IT alignment. The recommended implementation steps regarding how internal and external IT expertise impacts on the achievement of strategic IT alignment includes 1. Acquiring expert advice and assistance from suppliers 2. Employing IT staff who can contribute to the achievement of strategic IT alignment. 3. Trainings for IT staff to harness their capabilities. Internal/external IT expertise enables SMEs achieve success alignment by gaining expertise within the firms and externally from suppliers to achieve supply chain integration.

The study also found other factors which are infrastructure and political issues as a factor. Though the findings show that these issues have no direct impact on strategic IT alignment, they are identified as challenges that significantly affect the research firms. The recommended measures include that business owners/managers should take steps to alleviate challenges relating to infrastructural issues 2. The government should work towards ensuring that the existing policies continue to be beneficial to Nigerian manufacturing medium-sized enterprises.

This study uncovered economic factor which major leads to MEs experiencing financial constraints. The recommended steps are that business owners/managers are aware that financial resources can impact on strategic IT alignment by different ways. This includes 1. The use of financial resources to purchase the required information technology 2. Allocation of financial resources to engage training programs to improve the knowledge on the use of IT. 3. Seeking for available grants from the government initiated to support SMEs in growing their businesses.

6.9 Summary

This chapter discussed the findings of the study presented in Chapter 5 in relation with existing literature. The findings of this research suggested that Nigerian manufacturing MEs benefit from internal integration, while limited integration is achieved with suppliers through their information systems. The research findings have shown that MEs employ diverse dedicated IT tools for a few reasons to effectively manage their supply chain activities. The need for external integration with suppliers has been highlighted from the findings. The suppliers of Nigerian manufacturing MEs consider integration and communication using the information systems as vital. However, implementing contemporary integration and communication processes is out of their control. Evidence from the study has shown limited supplier's participation in the implementation of the MEs information systems. Also, the findings reveal that Nigerian manufacturing MEs strive to share relevant information with their suppliers' using emails and telephone calls. The study also discussed the proposed framework based on the findings of the research and recommended steps to implement the framework.

Chapter 7 - Conclusions and recommendations

7.1 Introduction

This chapter presents a summary of key findings of the study, theoretical and practical implications, limitations, and directions for future research. In addition, a summary of the research is discussed as well as the research aim and objectives, an overview of the study's framework and research methodology are highlighted. Then, the theoretical and practical contributions are presented. Lastly, this chapter concludes with research limitations and provides direction for future research.

7.2 Summary of research

It is widely stated that strategic alignment hugely influences organisations (Chan et al. 2006; Sardana et al. 2016). For medium sized manufacturing firms, IT alignment is a strategic tool as they endeavour to achieve business performance and competitive advantage through supply chain integration. The research contributes to the existing debate on strategic IT alignment and varying contexts in strategic IT alignment literature in major ways. For instance, by exploring the existing strategic IT alignment factors prevalent in medium-sized manufacturing enterprises and their relationship with supply chain integration. Then it developed a framework using SAM and the coevolutionary alignment model based on literature review and findings.

The research contributes to strategic IT alignment literature which includes factors influencing strategic IT alignment and supply chain integration, strategic IT alignment in medium-sized firms in the manufacturing sector and strategic IT alignment in a developing country context – Nigeria. The findings suggest a lack of alignment in majority of the research firms. The findings confirmed based on the views of owners and suppliers that despite the perceived misalignment, the MEs engage in processes which allow for communication and information sharing. In addition, the findings propose that strategic IT alignment implemented as a crucial tool for medium-sized manufacturing enterprises to achieve organisation performance and competitive advantage. The hope is that future research will use the findings of this study and examine the limitations of the research to further research the factors influencing strategic IT alignment and the outcome on supply chain integration within the industry and national context.

7.2.1 Meeting the research aim and objectives

This study set out to understand the influence of strategic IT alignment factors on strategic IT alignment in manufacturing MEs focusing on supply chain integration in the Nigerian context. To address this aim, three research questions were developed and presented in section 1.4. In addition, a few sub-questions are presented to answer the research aim. The following summarise responses to each of the study's research questions.

1. Based on existing studies, what are the factors that could influence strategic alignment of IT and how they relate to supply chain integration

    a) What are the factors that have significant impact on strategic alignment?

This study identified internal and external factors which significantly impact on strategic alignment. Existing studies suggested factors such as IT sophistication, top management's knowledge of and commitment to strategic use of IT and internal and external IT expertise. The findings of this study align with extant literature and reveal top management's knowledge of and commitment to strategic alignment and IT expertise as two key internal factors influencing alignment. Also, the IS literature discussed politics, economic situation, social, information technology to be external factors influencing strategic alignment (Chan et al. 2006; Ward and Peppard 2002). Political and economic factors are identified as external to the MEs in this study. The findings of this study relate to existing literature, infrastructure factors and external influences affecting information systems are added based on the findings.

    b) How do they relate to supply chain integration?

This research discovered that both internal and external factors significantly impact on supply chain integration. In this study, strategic IT alignment is examined in the context of supply chain integration. The literature has already shown some effects of information technology on supply chain integration (Ye and Wang 2013; Vanpoucke et al. 2017). The study found that the influences of strategic alignment factors on achieving supply chain integration. For instance, IT sophistication impact on communication and staff's perception to IS. Also, management's knowledge and commitment to IT alignment impact on information sharing and changes in information systems. In addition, IT expertise can potentially influence the perception of staff to IS, communication and information sharing. Political and economic factors impact on strategy development influencing alignment. Infrastructural factors also influence indirectly on strategic

alignment processes. Furthermore, the external factors affecting information systems can impact on business processes within the organisations.

2. What constitutes strategic alignment processes and why is it important to the achievement of supply integration in medium-sized enterprises?
    a) What is strategic alignment and what are the current practices/processes to achieve strategic alignment in medium-sized enterprises?

Chapter 2 introduced strategic alignment as a concept and presented a review on how small and medium-sized enterprises utilise strategic alignment for performance and to achieve competitive advantage. Section 2.2 presents the definition and existing studies in strategic alignment. Section 2.7 introduced the review of strategic alignment frameworks such as Strategic Alignment Model (Henderson and Venkatraman 1993), the Generic Framework Alignment Model (Maes et al. 2000; Avison et al. 2004), Strategic Alignment Maturity Model (Luftman 2000), Co-evolutionary Model of Strategic Alignment (Benbya and McKelvey 2006). The study further reviewed strategic alignment models in small and medium-sized enterprises and found that the majority of the studies engaged existing frameworks and adapted the models to their studies. In addition, section 5.4 illustrated the processes the participating MEs engage in to achieve strategic alignment. The analysis found the proposed strategic alignment processes in the firms were impeded by factors that influence alignment and challenges. Furthermore, the study showed that if the participating MEs are able to overcome the factors influencing IT alignment and the challenges, achieving successful strategic alignment.

    b) What impact does strategic alignment have on supply chain integration in medium-sized enterprises?

Existing literature shows that strategic alignment impacts on organisational performance (Swink and Schoenheer 2015; Luftman and Derksen 2012). Within the context of supply chain integration in which the study is being investigated, this research found that strategic alignment is unsuccessful due to internal and external factors, supply chain integration will be affected. Section 6.4 discusses the effect of strategic alignment at the strategic, operational and individual levels in the participating Nigerian manufacturing MEs. If a firm achieves strategic alignment at the strategic level, this implies that the business strategy of the organisation is aligned with IS strategy. On the other hand, the failure to achieve strategic alignment at a strategic level may result in lack of success in

implementing both business strategy and IS strategy. Likewise, at the operational level or organisational level, strategic alignment supports communication and daily tasks, while lack of alignment may bring about failure of IT application and consequently affect business activities in the participating firms. The individual level of alignment supports technology implementation, also the study found lack of alignment can lead to low user performance. Furthermore, the study presented an analysis on alignment with suppliers based on the context of the study which spotlights aligning information systems in MEs with external suppliers can hugely affect communication and collaboration, the lack of alignment impacts on integration with suppliers. Therefore, the study argues that the three levels of strategic alignment and a finding of this study - “alignment with suppliers” or lack of alignment can influence supply chain integration.

3. How can Nigerian manufacturing MEs implement strategic alignment to achieve supply chain integration?
    a) What are the factors influencing strategic alignment for supply chain integration in Nigerian medium-sized manufacturing enterprises?

The current literature presented factors influencing strategic alignment in large as well as small and medium-sized enterprises. Section 2.4.1 proposed factors across several studies and Table 3 shows factors influencing strategic alignment from previous studies. Although, there is a paucity of studies that discuss factors influencing strategic alignment of IT for supply chain integration in medium-sized manufacturing enterprises. This study argues that three factors (IT sophistication, top management’s knowledge of and commitment to the strategic use of IT, IT expertise) are considered crucial to achieve strategic alignment. Thus, Table 4 presents factors adopted in this study. However, the analysis of this study found that there are external factors influencing alignment in the participating firms, the findings revealed political, economic, infrastructural factors and influences on information systems such as competition impact on the capacity to achieve supply chain integration. The study found that majority of the MEs implement IS and focus primarily on internal integration while information sharing and communication with suppliers is limited using the IS. Majority of the firms adopt the use of less complicated and informal options while communicating with suppliers which impacts on partnership.

b) What are the challenges to achieving strategic alignment for supply chain integration in a developing economy such as Nigeria.

In addition to the factors which influence strategic alignment in Nigerian medium-sized manufacturing enterprises. The study found three main challenges to achieving supply chain integration via strategic alignment in this study. These are financial constraints, limited management knowledge and commitment to IT/IS and perception of staff to IT/IS.

Financial constraints in the participating firms led to unrealised business and IT strategies because of limited investments in IT. Also, the study found limited knowledge and commitment to IT which restricted the development of IS strategies in the organisations. Also, the study found an insufficient focus on the implementation of IS for the purpose of achieving integration and partnership with suppliers which significantly affected strategic alignment. Perception of staff to IT/IS is evidenced in this study as resistance to the use of IT based on reason such as lack of appreciating its value and unwillingness to learn.

c) What are the recommendations for Nigerian manufacturing medium-sized enterprises and policymakers that provide a better understanding of the factors and outcomes of strategic IT alignment.

The participants of this study highlighted the impact of IS on the performance of their MEs. The responses highlighted some internal benefits of implementing IT such as improved manufacturing processes and efficiency of other business processes. While with supplier relationship, their IS is lacking in driving performance. Generally, the study found a limited in how strategic alignment is implemented in the participating firms and specifically to achieve supply chain integration. Based on this, the study proposed directions on how the participating firms could promote IS to strategic alignment within the context of supply chain integration. The recommendations cover aspects of factors influencing strategic alignment, strategic alignment and supply chain integration.

7.2.2. Overview of the research methodology

To address the study's aim and objectives, the study adopts the realist approach and qualitative research design. The qualitative study was implemented to investigate strategic IT alignment factors, the strategic alignment processes, supply chain integration – internal integration and external integration in the Nigerian medium-sized manufacturing enterprises context. Semi-structured interviews were administered with

54 participants from 15 medium sized manufacturing firms located in Nigeria. To achieve this, two interview schedules were created, one for MEs and another for suppliers. The study engaged template analysis that allows an in-depth understanding of the data collected as well as extract inference (see Chapter 4, Section 4.16)

7.2.3 Overview of the study's conceptual framework

The literature review helped to develop the study's conceptual model. The model adopted elements from the Henderson and Venkatraman strategic alignment model and Co-evolutionary IS alignment model which allowed us to examine the factors influencing IT alignment and the effects on internal and external integration as well as view strategic alignment processes. For an in-depth understanding, MEs and their suppliers provided practical information details of the concept being studied. This model contributes to the literature on strategic IT alignment by exploring factors influencing IT alignment within the context of supply chain integration and in Nigerian medium-sized manufacturing firms. Also, the framework examined the alignment between MEs and their suppliers to achieve supply chain integration (internal integration and external integration). Furthermore, the framework contributes to existing knowledge by adopting a theoretical approach that adopts the participating MEs and their supplier's perspectives. Also, the model brings both size and sector specific justification to the fore, because of the need for studies in medium-sized enterprises context, given their significant contribution to the nation's GDP. The next section presents the theoretical and practical contributions of the research.

7.3 Contributions of the research

The study contributes to theory by firmly establishing the research's framework in strategic IT alignment literature. In addition, the research contributes to practice by presenting recommendations to support business owners and managers and practitioners to attain strategic IT alignment within the context of supply chain integration. This section discusses both theoretical and practical contributions concluded from the study.

7.3.1 Theoretical contributions

First, this research deveoped a theoretical framework hinging on extensive literature review. This literature guided the study in creating a theoretical framework relating to

factors influencing strategic IT alignment, strategic IT alignment and supply chain. This study could be the first research to combine factors of strategic IT alignment, strategic IT alignment and supply chain integration. Based on the researcher's understanding, there are no studies that combined and examined the above components. Therefore, this study has provided additional insight into the existing literature in strategic IT alignment and supply chain integration studies by presenting findings from employees, business owners/managers and suppliers perspectives.

Secondly, this research provides an integrated perspective on strategic IT alignment factors, strategic alignment and supply chain integration based on a combination of the Henderson and Venkatraman strategic alignment model and Co-evolutionary IS alignment model to the strategic IT alignment literature. The expectation is that strategic IT alignment helps MEs, and their suppliers develop collaboration which can lead to supply chain integration. According to the Co-evolution perspective, strategic alignment may be viewed as an evolving process. This implies that elements of alignment and the setting in which it exists co-evolve together impacting one another. The study adopts elements of the Henderson and Venkatraman's Strategic Alignment Model and Co-evolutionary IS alignment model crucial to achieve strategic alignment based on existing studies.

Thirdly, this study contributes to the field of supply chain integration. The findings confirmed the two dimensions of supply chain integration crucial to the concept being researched, which are internal integration and external integration with suppliers. The study shows that strategic IT alignment factors could play a crucial role in presenting the capabilities of MEs and their suppliers for effective supply chain integration in MEs in Nigeria. The study investigated supply chain integration based on two elements: internal integration and external integration as both an outcome of strategic IT alignment. Therefore, this study presents a discussion on the relationship between strategic IT alignment and supply chain integration in the research context. In line with this, internal integration and external integration with suppliers are considered important for the success of a manufacturing medium-sized firm.

Another contribution of the study is in the field of medium-sized enterprises. Existing studies have explored factors influencing strategic IT alignment but mostly situated

within the context of large enterprises. The study contributes to strategic IT alignment literature by presenting evidence previous studies with a clear focus on medium-sized manufacturing enterprises. To achieve competitive advantage necessitates small and medium-sized enterprises to develop an effective strategic IT alignment (Raymond and Bergeron 2008), this study presents a model in which strategic IT alignment is exploited to provide support to manufacturing MEs to achieve internal and external integration with suppliers.

The study further contributes to the request to conduct studies in developing countries. Studies highlight that SMEs generally should create a structure that allows for effective exploitation of IT. This study provides crucial knowledge relating to the existence of strategic IT alignment factors eand the influence of strategic alignment on supply chain integration in selected medium-sized manufacturing enterprises in Nigeria.

A further contribution is proposing a model that describes the relationship between factors influencing strategic IT alignment, strategic alignment and supply chain integration. The theoretical framework recommends that strategic IT alignment factors are expected to influence alignment then, affect internal integration and external integration with suppliers. The model is based on elements of the Strategic Alignment Model and Co-evolutionary IS alignment model focused on how the participating firms adopt strategic alignment to achieve supply chain integration as well as identifying the factors that impact on strategic alignment. Also, the study collected data from different participants such as owners, managers, employees, and suppliers. Gathering multiple data enabled an in-depth understanding of strategic IT alignment from varying perspectives.

7.3.2 Practical contributions

The initial practical contribution is regarding strategic IT alignment, that has significant implications for top management of the organisations. Studies have acknowledged that scholars and practitioners pay critical attention to outcomes such as productivity, profit making and customer satisfaction and not focusing on the relevance of the process involved. This study presents that business owners and managers, and scholars give adequate attention to strategic IT alignment and investigates its factors and outcomes.

Moreover, the study's theoretical framework presents guidelines on how medium-sized manufacturing firms can organise their IS to promote strategic alignment for supply chain integration. For instance, the revised framework includes internal factors such as IT sophistication, management's knowledge of and commitment to strategic alignment, IT expertise and external factors – political, economic, infrastructural factors as well as external influences on IS. It is important to focus on IT sophistication to attain alignment over time. Based on this, various initiatives can be presented, this would include choosing the appropriate IT systems based on the strategic goals to achieve alignment over time. The findings of this study have established that IT sophistication as a factor impacts on strategic IT alignment. Thus, it is important for business owners, managers, and researchers to investigate such influence and focus on how to strengthen the link.

Also, management's knowledge of and commitment to strategic IT alignment emerged as a factor. It is crucial to pay attention to this factor to achieve alignment. Based on this, some steps may be adopted which include understanding and appreciation of top management of the importance alignment. Thus, the findings of this study have established that management's knowledge of and commitment impacts on strategic IT alignment. Hence, top management are encouraged to concentrate on improve the influence of the factor on strategic IT alignment.

IT expertise is also considered as a factor for achieving strategic IT alignment. This study acknowledged that it is important to identify the critical role internal and external IT expertise to achieve alignment. On this particular point, initiatives can be presented including contributions and assistance from external suppliers, employment of expert IT personnel and trainings to improve their skills. Therefore, business owners, managers and researchers investigate the influence of internal and external IT expertise and emphasis on how this factor can be improved and implemented.

The external factors such as political instability, economic and infrastructural issues that Nigerian manufacturing medium-sized firms encounter are considered to impact on strategic IT alignment in this study. Although these issues have no direct impact on internal workings of the firms. However, business owners, managers and government should be aware that these issues can be addressed by taking steps to alleviate the challenges and work towards ensuring businesses are not affected.

Furthermore, the results of this study showed that if firms are seeking to achieve strategic IT alignment then they should achieve supply chain integration which covers internal integration and external integration with suppliers. Internal integration is considered to be an outcome of strategic IT alignment. This study explored the fact that internal integration presents benefits to the research firms. On the other hand, external integration is found to be limited. Based on this, steps can be adopted to actualise integration with suppliers by effectively exploiting IS.

Finally, the study's framework could be applied by top management, practitioners and scholars as a critical tool to support firms. Furthermore, top management should collaborate with suppliers to achieve strategic IT alignment and realising supply chain integration. Also, business owners and managers need to understand that strategic IT alignment is an evolving process and as such requires certain changes. As businesses differ in how they respond to challenges of strategic IT alignment, an effective partnership between business strategy and IT strategy is an appropriate way to respond to specific conditions. The next section presents the study's limitations.

7.4 Limitations of the research

Though this research has significant contributions, a number of limitations are identified, important for future studies on strategic IT alignment literature. Based on vast research, this study concluded that both internal and external factors impact on strategic IT alignment in the research context. Thus, future studies may explore additional factors and investigate if they influence strategic IT alignment, with the ability to extend the findings.

Next, while this study targeted various participants (employees, business owners, managers, and suppliers) to obtain their viewpoints on the constructs and relationship depicted in the research framework, this study did not present the difference in perceptions based on their roles. Therefore, future studies should consider the differences in views of each participant. Similarly, this research's focus is Nigerian medium-sized manufacturing firms which are distributed under the following sub-sectors (oil refining; cement; food, beverages and tobacco; textile, apparel, and footwear; wood and wood products; pulp paper and paper products; chemical and pharmaceutical products; non-metallic products, plastic and rubber products; electrical and electronic,

basic metal and iron and steel; motor vehicles and assembly; and other manufacturing) to obtain data, however this study did not present the benefits of the differences across the sub-sectors on the research relationships. Therefore, it is important to conduct more research to identify the variances in views of the research participants that operate in these different sub-sectors.

Furthermore, though the qualitative methodological approach here encompasses not only the manufacturing MEs but also their suppliers. Given that there were only five suppliers took part in the study, the lack of access to a larger number of suppliers and the inability to study the relationship the research firms with suppliers over an extended period, could be noted as a limitation of this study. Thus, conducting more interviews with suppliers could enlarge the size of data and enrich the quality and credibility of the research analysis. Also, it might be possible to conduct an in-depth case study in investigating the study's key concepts.

In addition, the insights and conclusions described in this study are based upon only one country (i.e., Nigeria) and thus is applicable specifically to the Nigerian context. This raises concerns regarding the transferability of the findings to other developing economies. Therefore, there is a need for further studies in various countries because this would enable the advancement in understanding of strategic IT alignment with respect to the factors and outcomes of achieving it in several contexts.

The study gathered data from participants using a qualitative method. Thus, there is a need for future studies to explore a quantitative approach to support the research findings from qualitative data and test the credibility of the current findings. Another limitation is that this study did not investigate the performance of the participating MEs in-depth in terms of profit margins and number of sales. Analysing financial documents and survey questions could be useful in capturing financial performance.

Finally, this study was grounded in theory which led to the development of a theoretical framework of the factors and outcomes of strategic IT alignment. Extant studies across the concepts under study and semi-structured interviews were employed to achieve the concluding results. Thus, this study has contributed to theory and practice based on the outcomes of the developed theoretical framework.

7.5 Directions for future research

The study's theoretical framework was revised by employing the findings from medium-sized manufacturing firms in Nigeria. Though the country choice supported in identifying sectors and country differences as potential interferences in investigating the framework, it places a constraint on the transferability of the results. Future studies can reproduce the study in various environments, inclusive of other economies and industries. In addition, although this study highlighted that medium-sized enterprises are capable of implementing and attaining strategic IT alignment, future studies should implement the insights presented to investigate factors and outcomes of strategic IT alignment in smaller firms. This is consistent with the study of Chen et al. (2006) that emphasise the impact of firm size on strategic alignment. As a result, further studies are needed to examine the impact of strategic IT alignment on supply chain integration and performance in SMEs generally.

This study identified internal and external factors to be impact on strategic IT alignment within the research context. Though an exhaustive number of factors, future studies could examine additional factors to explore the impact on strategic IT alignment and performance. Moreover, for supply chain integration, the study focused on internal integration and external integration with suppliers. Further research could examine the dimension of customer integration to present robust findings.

In addition, although the study revised the framework based on the outcomes of the qualitative research, further studies especially a quantitative or mixed method research approach could validate the framework. Also, the proposition for further research is that a case study is needed for in depth inquiry of the relationships. Firms have varying organisational structures, information technology infrastructure and systems, therefore identifying distinctions across the participating firms would be advantageous.

While the study's outcomes are based on the perceptions and understanding of the research participants, the study did not present the value of exploring differences among views within the scope of the research concepts and relationships. Additional studies could consider in depth differences among the views of the participants and examine the impact on strategic IT alignment. Additionally, future research should discuss the framework considering other economies to validate the presented framework and

present results that are transferable. Specifically, further studies could validate the framework by reproducing it in the rest of the Nigerian states as well as other African countries.

7.6 Summary

This study set out to investigate the factors that influence the strategic alignment of IT and the impact on supply chain integration and business performance in Nigerian manufacturing MEs using the elements of Strategic Alignment Model and Co-evolutionary Alignment Model as the theory underpinning the research. To set the scene for the study, the review of extant literature on the subject area was carried out. The literature review chapter as well as the consequent chapters focused on addressing the gaps identified in Chapter 1 (section 1.3) of the thesis. This concluding part of the thesis presented findings of the research and the study's contributions to theory and practice as well as its implications for Nigerian manufacturing MEs, government and decision makers. The chapter also provided recommendations for Nigerian manufacturing MEs to address the factors that influence strategic alignment of IT.

Also, the outcome of this body of work could be useful in providing some direction for management of Nigerian MEs and practitioners willing to understand the factors that influence strategic alignment of IT for SCI in developing countries such as Nigeria. Finally, this chapter presented the limitations of the research and suggested potential areas for future research.

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Appendices

Appendix A - Definition of terms

Information technology/information systems (IT/IS) – IT/IS is a system that collects, creates, stores, process and distributes information, typically involves hardware and software, data, as well as the people who manage the system. Furthermore, IT/IS is regarded in this research as an application or software used to serve major business functions such as the enterprise resource planning (ERP) that integrates all business functions into a single computer system (Beynon-Davies 2019).

Medium-sized enterprise (ME) - "An ME in this study refers to an enterprise with an asset base of more than 50 million naira but not more than 199 million naira, excluding cost of land but including working capital and/or a staff strength from 101 to 300" (SMEDAN 2019).

Strategic alignment of IT - The term strategic alignment in this study refers to employing IT in an appropriate and timely manner, in agreement with business strategies, goals and objectives (Elmorshidy 2013; Gerow et al. 2014).

Supply chain integration (SCI) - This study defines SCI as the alignment, relationship and organisation of people, processes, information, knowledge, and strategies across the supply chain among all points of contact and influence to expedite the efficient and effective flows of material, money, information, and knowledge in response to customer needs (Stevens and Johnson 2016; Wang et al. 2016).

*The references here can be found in the study's main body.

Appendix B – Profiles of the participating enterprises

For anonymity, this study's participating medium manufacturing enterprises are referred to as ME_1, ME_2, ME_3, ME_4, ME_5, ME_6, ME_7, ME_8, ME_9, ME_10, ME_11, ME_12, ME_13, ME_14, ME_15.

ME_1

ME_1 produces baby diapers and has been in operation for 30 years with staff strength of 80. Strategic IT is limited in this ME. Business owner and top manager are mostly particular about the manufacturing process, not paying much attention to integration with suppliers. The company has three suppliers which are local. Interactions with suppliers are done via phone calls, emails and physical meetings. This ME has an excel sheet which they use to store information such as quantity, specifications, and timeline of delivery of materials. These information helps their relationship with suppliers. This sheet is also used internally within the enterprise, staff have access to the sheet depending on their roles. Financial constraints, limited involvement and knowledge of managers were reported as factors. The business owner reported good sales, the production manager however expressed that the company is performing fairly.

ME_2

In this ME, laundry detergents are manufactured. The enterprise has been in operation for 20 years and there are 189 staff members. Strategic IT alignment for SCI is identified but also limited in this ME. The business owner discussed strategies in place to improve their supply chain. There is there is evidence that the system in use enables integration. The company liaises with international as well as local suppliers. The system in use for the supply chain is SAP ERP. The ME highlighted that suppliers are not involved in the system implementation process. However, there is an international supplier which use the same system as the ME. The ERP system is majorly used to share information across the ME and supplier. The system supports internal processes within the ME. The factors identified limited owners/managers knowledge and strategic use of IT, top management efforts in coordinating the supply chain and partnership with suppliers. Top management claim increase in sales because of restructuring of production process.

ME_3

This enterprise manufactures female under pads and adult sanitary pads, has staff strength of 100 and has been operating for 15years. The company is jointly owned by three partners – two Nigerians and a foreigner. It is mainly operational in Lagos and has begun to expand to another city – Abuja. The company's total assets exceeded 200 million naira excluding property or warehouses. The system in use in this enterprise is the SAP ERP. The managers confirmed that interaction with suppliers is mostly via phone calls, emails, and physical presence. The company engages three

suppliers, all located abroad. The SAP ERP is mostly used to synchronise internal processes within the ME. Top management support, commitment from staff, focus on manufacturing process, and extent of IT sophistication are identified as factors. Business owner discussed an increase in sales from their manufacturing process.

ME_4

The enterprise manufactures beer has existed for 17 years with staff strength of 100. The company is privately owned and with only one branch mainly operational in Lagos Nigeria. It is situated across 750 thousand square metres production property and warehouse. The company's total assets are said to be approximately 150 million naira. The company aimed to be the leading producer of quality beer and providing maximum value to customers and employees. The IT system used is the SAP ERP. Strategic IT alignment for SCI is limited in this enterprise. The enterprise works with three suppliers, information is shared with suppliers via emails and phone calls. The IT system is adopted, and the applications are custom made suited to the uniqueness of the enterprise. Majority of the staff have access to use the IT system with different levels of access granted to them based on their roles. The enterprise employs the system for the effective running of the different processes within. The advantage of the IT system involves tracking sales, enables real time gathering of information in a manageable manner, for example a sales manager may need to verify what the salesperson presents in a report. The system helps collect data and organises it in such a way that is reasonable. The cost of purchasing was identified as a factor that determines the enterprise's purchase of IT. The management has identified the importance of IT effectiveness, but they are expensive. The enterprise does not have the finances to justify the buy. The business owner also stated that they are not guaranteed that if they spend more money their business will grow. Business owner/ mangers commitment to the growth of staff in terms of training, the management encourages hands-on training, which enables staff to get used to using the applications is another factor identified. The participants discussed an above 20% increase in sales. This is attributed to the innovative ways of developing and manufacturing products.

ME_5

This ME manufactures bar soaps. The ME employs a system helps the enterprise to budget for the production projects effectively. The name of the system was not given. Strategic IT alignment of IT for SCI is limited in this enterprise. The enterprise has two local suppliers and one international supplier and none of them use system, hence there is interaction or sharing of information through the system. The interactions with suppliers are done mostly through emails. The system helps the employees involved in production to take as much as they can execute at a time and this ensures on-time delivery. Mainly the production team uses the system, management also have access to the system. Limited management commitment to strategic IT alignment, focus on the internal processes (manufacturing) within the enterprise and financial comstraints.

Participants claim that sales revenue increased more than 20% over the last three years despite the limited strategic IT alignment. This is because of top management focusing only on the manufacturing process by investing in employees and creating an

enabling working environment where employees can come up with expectations, opinions, and ideas.

ME_6

This enterprise is involved in the manufacturing of confectionary products with 150 employees. with the business' main operation in Lagos and has now grown with branches in Abuja and Kano, Nigeria. The company produces biscuits and confectionaries. The company goal is to the leading manufacturer of biscuits and confectionaries. The assets of the company were estimated to be over 100 million naira excluding land and properties. The enterprise employs a called Priority ERP for SMEs, which they implemented two months before the interview was conducted. Before then, inventory and other processes within the enterprise were done manually using paper, the papers are kept in folders and in a room within the enterprise. The production manager said the system change happened because the management realised that the entire production process became redundant, they were experiencing a lot of wastage and were losing customers because of delay in delivering products. Three suppliers are identified in this ME. Strategic IT alignment is limited in this ME. Their suppliers do not use the Priority software and communication is done via the emails and phone calls. The Priority software helps the enterprise internally to plan production, project, and track sales, they use it for communication across the enterprise. All the employees have access to the IT system with varying levels of access.

The practices identified include management commitment by operating a policy that enables employees to come up with ideas. Management also encourages employee training relating to production. The focus of this ME is on simplifying the production processes and foster internal collaboration. The participants reported a 10% increase in sales. The employees are exposed to the business goals and objectives of the enterprise, from the responses of the production manager and supply chain system user; they are motivated to perform their job roles effectively. They understand that the stability of the ME is hinged on their knowledge and performance.

ME_7

This ME deals with the production of children's toys and furniture with 55 employees. The enterprise has been in operation for 15years. The enterprise employs a Microsoft excel spread sheet. Strategic IT alignment for SCI is limited in ME. The ME deals with a local supplier and communicates via telephone calls. The excel sheet is employed for internal functions and shared across the departments within the company.

The lack of commitment of the top management team, limited internal and external expertise, infrastructural challenges, low level of IT sophistication, lack of top management and staff knowledge of the strategic use of IT, limited top management efforts in coordinating the supply chain and financial constraints (lack of access to loans or grants) are identified as factors. The business owner did not provide a lot of information about the state of the business financially. However, the production manager, senior manager and supply chain management user stated that the business was not making as much sales and in the past two months they had not been paid their

salaries. They stated that the business had experienced a down turn in the sales revenue in the last three years.

ME_8

This ME produces sweets and has 192 employees. The ME implements the Oracle, the number of people involved in the use of the system are not ascertained, however the top-management, and employees directly involved in planning, budgeting and production have access to the IT system. Strategic IT alignment for SCI is limited in this ME. The ME has two international suppliers and one local supplier. The business owner and production manager mentioned that their suppliers did not participate in the implementation of the SCM and there is no interaction via the system. When asked the reason for this lack of interaction, the business owner said communication on raw materials or payments are done via emails. For the internal processes, the system allows for budget planning, material requirement planning – every part of the production process is synchronised.

Top management efforts in coordinating the supply chain, internal expertise and limited partnership with suppliers are identified as factors. The business owner, production manager and IT manager all state that there has been an increase in sales revenue, more than 20% in the last three years. Business owner specifically mentioned a 40% increase in sales. A major factor in the success of the ME with respect to increase in sales as mentioned as the production manager, IT manager and supply chain system user is the support they receive from the business owner, the management style is one such that teamwork, trainings and innovation are emphasised.

ME_9

This ME produces hair and skin care products, with 70 employees, 20 of which are contract employees. The IT system in use is an ARP system. In addition, an Excel sheet is used for storing inventory data, suppliers and customers' records. Strategic IT alignment for SCI is limited in this ME. The ME has three local suppliers and no international supplier; there is no system integration with any of the supplier. Information sharing is done by sending emails or through phone calls.

Top management and staff knowledge of the strategic use of IT, financial constraints, limited partnership with suppliers are summarised as factors. The focus appears to be on the product production process. The top managers claim that the products are widely accepted in the market, with above 20% increase in sales revenue in the last three years.

ME_10

This ME produces body creams with ---- employees. The IT system used in this enterprise is Kanban, the system is used in the enterprise as a scheduling system that tells them what to produce, when to produce and how much to produce. The ME

employs two suppliers and who are not involved in the IT system. Strategic IT alignment for SCI is limited. The system supports the ME by identifying issues that can hinder the production process and fix them so work can flow through it at an optimal speed and effectively managing cost.

The Kanban system implemented in this ME was found to be adequate due to the many benefits such as operational costs, wastes, scraps and losses were minimised. However, respondents identified some of the factors that the achievement of inadequate partnership with suppliers, limited management, and staff knowledge of the strategic use of IT and financial constraints. The respondents highlighted an increase in sale of products.

ME_11

This has been operation for 10years and currently has 160 employees. It is a privately owned company with branches in other states Nigeria – Sokoto, Ondo and Abuja. The goal is to be the leading producer of soap noodles in Nigeria as well as satisfy the needs and expectations of customers. The company's assets exceed 300million naira. The company produces soap noodles to other manufacturers and ships across West Africa. This ME adopts an IT system called Alarmin for enterprise resource planning. The system works as a single system such that the manufacturing and delivery processes are integrated into one system. All employees have access to the system as it is used for communication across departments. However, their suppliers are not integrated into the system. Information is shared with suppliers mostly through emails and phone calls when necessary. Strategic alignment of IT for SCI is limited. The factors identified include top management efforts in coordinating the supply chain, limited supply chain partnership, infrastructural challenges and financial constraints. The respondents put forward that the sales revenue has remained the same over the last three years.

ME_12

This ME produces fruit juice and has staff strength of 180. The company's assets are estimated to be about 100million naira excluding building and machinery. The ME uses the Oracle as the information system. The ME has two main local suppliers who provide the fruits and one international supplier that provides the packaging materials. None of their suppliers interact with the ME using the IT system. Communication is done electronically for the international supplier and for the local suppliers, a member of staff, usually a quality control officer or procurement officer visits to clarify orders and check the hygiene condition of the environment where the fruits are harvested. It was observed that strategic IT alignment for SCI is limited in this ME. The IT system enables access to information across the departments. Majority of the employees can access the IT system. Some of the employees have limited access to the system; the top-level management has full access to the system while the middle-level managers can access more, but not all information.

Financial constraints, limited partnership with suppliers and limited top management and staff knowledge of the strategic use of IT are identified as factors. In this ME over the last three year, there has been an increase in sales of approximately 5%; the business owner and production manager confirmed this.

ME _13

This ME manufactures textile has been in existence for 14years with staff strength of 100. The ME uses an oracle system. From the responses of the IT manager, the system is not fully explored, as it should be in the enterprise. There were still processes that are still done manually such as inventory taking. The system is used across departments in the enterprise and all employees have access to it. Interaction with suppliers happens manually, via emails or phone calls. The procurement officer liaises with the international suppliers and when there are mistakes with the order, it is sent back to them, which delays production in some cases. The business owner did not say a lot about the IT system, he mentioned that it is the IT manager's responsibility to present a system that works for the system.

The working environment seems to be not as friendly; the business owner mounts a lot of pressure on the production team to ensure deadlines are met. The business owner mentioned some challenges that the ME faces with finance, lack of employee commitment to the job, losses that occur when a production process is altered and products that are not up to standard.

The enterprise looks like it is struggling with meeting up with customer's demands, the business owner states that in the last year the increase in sales revenue was about 5% compared to the 25% in the previous years.

ME_14

This ME manufactures industrial cleaning products with 190 employees. The IT system in use here is the TrueERP; the system integrates the different processes within the enterprise. The enterprise has three international suppliers, however none of the suppliers integrate with the enterprise using the TrueERP. Communication with suppliers occurs using emails and phone calls or fax. The system is used mainly for interactions within the enterprise.

The IT manager introduced the system to the enterprise recently (two months before the interview was conducted) and is working on ensuring the functionalities of system suit the current state of the enterprise. At the time of the interview there were also training programs for employees on how to use the system. Prior to introducing the TrueERP, the enterprise employed an Excel sheet; piles of papers and folders were stored in a room within the ME. The production manager mentioned that retrieving information was a difficult task as they spent hours looking a document that could be accessed just by a click.

Limited top management efforts in coordinating the supply chain and inadequate top management and staff knowledge of the strategic use of IT are identified as practices within the ME.
The enterprise appears to increase their sales with approximately an increase of 20% in the last three years.

ME_15
This ME manufactures ladies clothing's, it has been in operation for 7years with a staff strength of 50. One of the youngest companies but it seemed organized. The assets of the company are valued above 70 million naira in terms of its net value. The business goals and objectives were printed and hung in the general staff room and everyone that participated in the study showed great enthusiasm as they responded to the questions. The system in use in the ME is NetsuiteERP, their supplier uses the system as well.

The business owner, site manager, supply chain system user, and IT manager are all trained in the use of the system. The business owner does not have a lot of interaction with the system but understands it's working. The system integrates the different aspects of the business effectively.
The factors include top management efforts in coordinating the supply chain, extent of IT usage and partnership with suppliers. Top management stated that there has been an increase in sales revenue, which is about 5%.

Appendix C : Data collection documents

C1 – Research ethics checklist approval

Bournemouth University

Research Ethics Checklist

About Your Checklist	
Ethics ID	23946
Date Created	01/12/2018 12:38:13
Status	Approved
Date Approved	23/05/2019 15:34:29
Date Submitted	23/05/2019 12:32:15
Risk	High

Researcher Details	
Name	Atinuke Muraina
Faculty	BU Business School
Status	Postgraduate Research (MRes, MPhil, PhD, DProf, EngD, EdD)
Course	Postgraduate Research - BUBS
Have you received funding to support this research project?	No

Project Details	
Title	What are the factors that influence the strategic alignment of IT in Nigerian medium size supply chains and how does this impact upon performance?
Start Date of Project	01/05/2018
End Date of Project	31/08/2019
Proposed Start Date of Data Collection	31/01/2018
Original Supervisor	Milena Bobeva
Approver	Research Ethics Panel

Summary - no more than 600 words (including detail on background methodology, sample, outcomes, etc.)

The research will be conducted using semi-structured interviews. The interviews will be done in a medium-sized manufacturing company which typically has a staff strength of 101 to 300. The data collection will be specifically done on the supply chain process that occurs in these manufacturing firms. I am looking to having participants from between 5 to 10 manufacturing firms.

This research's target participants are Supply chain managers, IT managers, Chief Information Officer, Chief Executive Officer, Supply chain management system users (the focus of this research is on the enterprise resource planning (ERP) system), Suppliers.

Filter Question: Does your study involve Human Participants?

Participants

C2 - Participant information sheet

Bournemouth University

Version: V.1

Ethics ID number: 23946

Date: 23/05/2019

The title of the research project

What are the factors that influence the strategic alignment of IT in Nigerian medium sized manufacturing enterprises and how does this impact upon supply chain integration and firm performance?

Invitation to take part

You are being invited to take part in a research project .This document will offer you details on the research and how you will be involved. Please take time to read it carefully and ask me if there is anything that is not clear or if you require more information. You are also welcome to contact any of my research supervisors. Please see details below.

What is the purpose of the project?

Medium-sized enterprises (MEs) like yours are important for the growth and stability of the Nigerian economy. They face certain challenges in aligning IT and effectively using it for competitive advantage. Research so far is focused on large enterprises across the world; there are few studies on medium-sized organisations like yours and there are no studies with Nigeria. This research aims to seek how MEs in Nigeria manage IT strategically and what are the factors influencing this.

Why have I been chosen?

You have been invited to be a participant in this research because you are a member of a ME. Your perspectives and experiences would go a long way in showing how the enterprise operates and manages IT. 29 other ME staff across Nigeria will be interviewed as part of this research.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a participant agreement form. You can withdraw at any time, up to the point where data is processed without giving any reason (data will be translated anonymously without your name or your company's name and address, therefore your identity cannot be determined). If you decide to withdraw we will usually remove any data collected about you from the study. Once the data collection process is completed you may still be able to withdraw up to the point where the data is analysed and incorporated into the research findings or outputs. Deciding to take part or not will not adversely impact upon this research.

What would taking part involve?

You will be required to give your opinion on questions relating only to the enterprise you currently work. The interviews will be conducted individually, which means only one person will be interviewed at a time. The interview will last between 45 minutes to 1 hour. No travel expenses will be provided for participating in this research, the researcher will make every necessary arrangement to avoid inconveniences to the participants.

What are the advantages and possible disadvantages or risks of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that the results from this work will produce a framework which when implemented, will improve MEs in Nigeria. Also, interviewing you will take some of your time. Asides the discomfort this might cause, there is no risk associated with taking part in this study.

What type of information will be sought from me and why is the collection of this information relevant for achieving the research project objectives?

Information about your job role and location (city) of work place are required. You will also be required to share your views about the way IT is used in your organisation and how it impacts on business performance. This will help authenticate that I collected the data from the right place as contained in my research work. It will also help in putting some of your opinion in context. You will also give your opinion to questions asked during the interview process. This information is to achieve the objectives of this research.

Will I be recorded, and how will the recorded media be used?

You will be recorded using an audio recorder. The audio recordings made during this research will be used only for analysis and the transcriptions of the recordings for illustration in conference presentations and lectures. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.

How will my information be kept?

All the information we collect about you during the course of the research will be kept strictly in accordance with current data protection legislation. Research is a task that we perform in the public interest, as part of our core function as a university. Bournemouth University (BU) is a Data Controller of your information which means that we are responsible for looking after your information and using it appropriately. BU's Research Participant Privacy Notice sets out more information about how we fulfil our responsibilities as a data controller and about your rights as an individual under the data protection legislation. We ask you to read this Notice so that you can fully understand the basis on which we will process your information.

Publication

You will not be able to be identified in any reports or publications about the research, your information will only be included in these materials in an anonymous form, i.e. you will not be identifiable.

Security and access controls

BU will hold the information once the research work is completed and provided in the researcher's thesis (hard copy) in a secure location and on a BU password protected secure network where held electronically.

Retention of your data

All data collected for the purposes of this study will be held for a period of 2 years up until the degree is awarded. As stated earlier, published research outputs are anonymised, data is also retained in an anonymised form for a certain period to enable the research to be audited and/or to enable the research findings to be verified.

Contact for further information

If you have any questions or would like further information, please contact me at:

Atinuke Muraina
PhD Researcher
Bournemouth University
Faculty of Management
Executive Business Centre
89 Holdenhurst Road
Bournemouth
Dorset
BH8 8EB
Email: amuraina@bournemouth.ac.uk

or my research supervisors:

Dr Milena Bobeva
Executive Business Centre EB50
Bournemouth University
01202965193
mbobeva@bournemouth.ac.uk

Professor Dean Patton
Executive Business Centre EB503
Bournemouth University
01202968747
dpatton@bournemouth.ac.uk

In case of complaints

Any concerns about the study should be directed to the research supervisors (details given above). If the research supervisors have not answered your concerns, you should contact Deputy Dean for Research and Professional Practice, Faculty of Management:

Professor Michael Silk,
Dorset House D164,
Talbot Campus,
Fern Barrow,
Poole.
Email: researchgovernance@bournemouth.ac.uk

If you decide to take part, you will be given a copy of the information sheet and a signed participant agreement form to keep.

Thank you for considering taking part in this research project.

C3 - Participant agreement form

Version: V.1

Ethics ID number: 23946

Date: 23/05/2019

Bournemouth University

Participant Agreement Form – General Use

Full title of project: What are the factors that influence the strategic alignment of IT in Nigerian midsize supply chains and how does this impact upon performance

Name, position and contact details of researcher: Atinuke Muraina, PhD Researcher, amuraina@bournemouth.ac.uk

Name, position and contact details of supervisor: Dr Milena Bobeva; mbobeva@bournemouth.ac.uk, Professor Dean Patton; dpatton@bournemouth.ac.uk

PART A

In this Form we ask you to confirm whether you agree to take part in the Project. You should only agree to take part in the Project if you understand what this will mean for you. If you complete the rest of this Form, you will be confirming to us that:

- You have read and understood the Project Participant Information Sheet [version 1] and have been given access the BU Research Participant Privacy Notice which sets out how we collect and use personal information (https://www1.bournemouth.ac.uk/about/governance/access-information/data-protection-privacy)

- You have had the opportunity to ask questions;

- You understand that:

- Taking part in the research will include being recorded (audio) on the basis that these audio recordings will be deleted once transcribed.

- Your participation is voluntary. You can stop participating in research activities at any time without giving a reason, and you are free to decline to answer any particular question(s).

- If you withdraw from participating in the Project, you may not always be able to withdraw all of your data from further use within the Project, particularly once we have anonymised your data and we can no longer identify you.

- Data you provide may be included in an anonymised form within a dataset to be archived at BU's Online Research Data Repository.

- Data you provide may be used in an anonymised form by the research team to support other research projects in the future, including future publications, reports or presentations.

Consent to take part in the Project	***Yes***	***No***
I agree to take part in the Project on the basis set out above	☐	☐

_____ _____

_____

Name of Participant Date Signature

_____ _____

_____

Name of Researcher Date Signature

This Form should be signed and dated by all parties after the participant receives a copy of the participant information sheet and any other written information provided to the participants. A copy of the signed and dated participant agreement form should be kept with the project's main documents which must be kept in a secure location.

C4 – Introductory letter

Executive Business Centre,
Bournemouth University,
89 Holdenhurst Road,
Bournemouth.
Bh8 8EB

Addressee's name
Address
Date
Dear Sir/Madam,

I am a PhD student at Bournemouth University, I have identified a need for research into the factors that influence the strategic alignment of IT in Nigerian medium sized manufacturing enterprises and how does this impact upon supply chain integration and firm performance?. I am writing to ask if it would be possible to recruit participants for this study from your organisation and other organisations similar to yours.

I have prepared a description of the study and what this would involve for potential participants, which is attached for your information. Ideally, I would like the collection period to run from June to August 2019 but will look to be flexible whenever possible.

I anticipate that the study will take no more than 1 hour for each participant, and I would need a quiet place on your premises to conduct the study. I will endeavour to keep the disruption to your working day to an absolute minimum.

At the end of the study, I aim to provide an executive summary of the outcome.

I hope that you find the attached project of interest and will be interested in working with me on it. Please contact me if you have any queries. Alternatively, you may wish to contact my supervisors - Dr Milena Bobeva;

mbobeva@bournemouth.ac.uk, Professor Dean Patton; dpatton@bournemouth.ac.uk.

Thank you for taking the time to read the enclosed information.

Yours Sincerely,

Atinuke Muraina
amuraina@bournemouth.ac.uk

C5 - Interview questions for medium-sized manufacturing enterprises

Time for data collection – June to August 2019.

Four Target participants – Business owner, IT Manager, supply chain managers, IT system users.

Six areas of focus – supply chain management, supply chain integration, competition capability, IT systems, alignment, and enterprise performance.

Duration – 45minutes to 1hour.

Part A

This section builds on the research on the company and the respondent that will be done prior to the interview, if the researcher is unable to gather all these information before the interview, then some or all of the questions will be asked.

Profile of Participant

1. Age
2. Gender
3. What is the highest educational qualification you possess please?
4. What SCM professional qualifications do you have?
5. What previous experience do you have before joining this current company?
6. What exactly is your job role please?
7. How long have you worked in this role?
8. How many years have you been at this company you are currently working?

Profile of Enterprise

1. How long has the enterprise been in operation?
2. Can you please state the goals and objectives?
3. How many staff does the enterprise have?
4. What are the products the enterprise offer?
5. In the last three years would you say that sales revenue has increased or decreased by 5%, 10%, 20%, and more than 20% or has it remained the same? i.e., income received from selling products over the period of three years.

Part B

B1 - Supply chain management

I. **SCM practice**

a) What would you say is the importance of effectively managing your supply chain processes?

b) How would you describe the SCM practice in the enterprise?

c) What would you say, are the efforts the enterprise (management) makes in coordinating the supply, demand and relationships in order to satisfy your customers?

d) Would you say there is adequate provision for technology in your organisation? And does this cover SCM?

e) How is the supply chain personnel structured and administered in your organisation? Is there a written down procedure of the organisational structure?

f) Are there training programs on SCM practices available for executives and managers? What forms? How often?

g) How would you describe your proximity to the customers and suppliers?

B2 - Supply chain integration

1. Supply chain integration

I. Enterprise integration with suppliers

a) How would you describe information exchange with your suppliers?

b) To what extent would you say the enterprise integrates with the suppliers starting from product design leading to the sale of the item?

c) To what extent will your suppliers make changes to reflect your requirements? How would you say the suppliers address changes in the enterprises demand? (supplier network responsiveness)

II. Internal integration

a) Would you describe how the IT system in your organisation impacts on the functions of the different units? In relation to procurement, inventory management, logistics and production process.
b) How would you say that the IT system allows for data integration in the functions of the different units?
c) Can you please explain how you report on your job role and to whom do you report to?
d) How would you describe the interaction between departments in the enterprise with respect to the IT system?

B3 – *SC Strategies*

1. Cost leadership

a) How would you describe the capabilities of SCM in enhancing the competition capabilities of medium enterprises generally? Please, also explain in view of your own enterprise.
b) Based on question 1, would you say the above has any relationship with quality control measures, market growth and demand, minimising cost of production, maximising demand, meeting up with demand, etc.?
c) How would you describe the relationship SCM has with innovation in medium enterprises? Please can you explain the strategies employed in your enterprise?

2. Customer service

a) How does the enterprise ensure that the products are delivered to the customers on time?
b) How does the enterprise ensure that the right quality product is supplied?
c) How does the enterprise ensure that delivery is done within customers' expectations?
d) What facilities do you have in place to deliver products irrespective of the volume, size and location?
e) How would you say the enterprise competes in its existing market?
f) What after sale services do you render to your customers?

3. Differentiation

a) What would you say are the strategies in place in your organisation in terms of product design and pricing? And what role does SCM play in this?

4. Marketing strategies

b) Would you describe the marketing strategies in place in your organisation? Do you think SCM plays any role in the marketing of your products?

B4 – IS system

a) Would you say there is a dedicated system in the enterprise that helps to manage all the supply chain activities that go in the enterprise? A follow up question will be to describe the system in use.

b) How would you say the system helps in interacting with suppliers across the supply chain?

B5 – Strategic Alignment

a) Would you say the suppliers participate in any way in your enterprises' IT system implementation?

b) How would you say the IT system in use helps to deliver business goals and objectives? (Does it function optimally?)

c) How would you say the IT system improves the entire supply chain process?

B6 – Firm Performance

1. Market performance

a) What effect does SCM have on the enterprise's sales?

b) How do you perceive the enterprise has performed in terms of customer satisfaction and product sales when placed alongside its competitors?

c) What ways have the IT system influenced the enterprise in terms of response time for product design, order processing and delivery to your customers?

2. Financial Performance

a) How do you perceive the enterprise has performed in terms of reducing total cost?

b) How do you think the IT system in use has influenced the enterprise in the different areas of the enterprise?

c) How do you think the IT systems helps to maintain or reduce price?

d) How would you describe the enterprises' return on investment and return on assets?

e) How would you describe the manner in which the use of the IT system impacts on waste saving, keeping production up to capacity etc?

3. Operational performance

a) How would you describe the enterprises' manufacturing process in terms of planning, organising, managing, controlling and supervising?

b) What would you say is the average time it takes to manufacture and process one or more products of the enterprise?

c) How would you say these products are accessed in terms of their quality?

d) How does the enterprise handle the process of producing different (or same as the case may be) products?

e) How would you describe the delivery process of products to your customers?

C6 - Interview questions for supplier(s)

This section highlights questions the researcher will ask the suppliers, the outcome of this section is to determine the level of supply chain integration between the suppliers and the manufacturing MEs. The respondent(s) here will be the business owner of the supplier company, in case the business owner is unavailable, a supply chain manager will be approached for the interview.

Target participant – Supplier

Focus of questions – Profile of participant, supplier integration with customer

Duration – 30minutes

Part C - *Profile of participant*

a) Age
b) Gender
c) What is the highest educational qualification you possess please?
d) What SCM professional qualifications do you have?
e) What previous experience do you have before joining this current company?
f) How long have you worked in this role?
g) How many years have you been at this company you are currently working?

Part D - *Supplier integration with MEs*

a) Can you please take me through the process from the point of customers ordering to delivery?

b) How do you ensure that the quality of the customer's recurring order is maintained?

c) How would you describe communication with your customers?

d) Are you aware of the needs of your customers based on the products you offer?

e) How long would you say the association between your company and your customer has lasted?

f) Would you describe the company's relationship with your customers as symbiotic (partnership)?

g) Would you say information exchange between you as the supplier and your customers are on the same page?

h) To what extent would you say the company integrates with customers starting from product design leading to the sale of the item?

i) How would you say you as the supplier address changes in the enterprises demand? (supplier network responsiveness)

j) Would you say your customer participates in any way in your organisations IT system implementation?

C7 – Interview excerpt

Interviewer: what would you say is the importance of effectively managing your supply chain processes as the production manager?

Production manager (ME_3): I will start from planning, in supply chain; actually the basis of everything is planning. Planning comes from material requirements and even before that we talk about budget planning. Budget planning involves the capacity you have to run, and the resources the company has.

There are people called planners, material planners; their own work is actually to plan for materials, either raw material, packing material whatsoever. Also, we have what we called MRP run (Material Requirement Planning). For the MRP, what it does is that, for your system it has been synchronized into this system as a data base which lead into your resources in terms of machines, which leads into your semi-finished goods in terms of what you pack, it leads into your filling lines, it leads into several other things.

Interviewer: How would you say the system helps in interacting with suppliers across the supply chain?

Production manager (ME_3): All suppliers are registered suppliers under the company and this is done that way because one is able to decide the suppliers. We have about three of all of them are registered with us. So, we calculate the need time ok, this thing we need it for so materials, need time is always 20days so, when your stock level has gone to 25days you will start to raise order or you will tell them to start your order and they process it so that before you finish this one, you will have another one. That's at the point of ordering and reordering. Now to the point of your stock management, we run quality check on every raw material they bring to actually see if it meets with specifications. We also have what we called certificate of analysis that give you the composition and the percentage purity of individual raw material. We also have safety material attachment (MSDS) that shows you what is the adverse effect of this, how do you handle it and several other stuffs, Now, during the supply of materials you have requested for, there are several procedures that are involved. First In First Out or you use First to Expire First to use. First In First Out is, if i receive a consignment today I have a place to put it, I will use the old stock before coming to the new stock. There are some things may be when the material is actually scarce, you source from your local suppliers and it is from what they have before they are bring when you look at it what I still have in stock will expire 2024 and what they are bringing will expire 2021 so, I will use 2021 first before using 2024. Is that done manually? It is done synchronising with the system because everything they bring CA (Certificate of Analysis) will show the date of manufacturing and that is the way it will also be logged into the system and say ok this batch that just comes in, this is the expiring date. Even when we do a kind of material requirement planning run, it is something that runs in the system every 24hours to actually check what you have in stock, the way you put it in it will actually suggests to you that you will use this one first before the other so, we have different storage locations for all those ones, the system takes care of that. So, what else?

Do you have a professional qualification for supply chain management?

Production manager (ME_3): Well, I'm a key user for SAP, introduction aspect. we have basic users; basic user in the sense that, all this day to day run, the release of KP what they want to produce, we have basic users that do it. what comes to key users is like check and balance, the procedure that is on ground is it being followed the same way it should be followed? then, if they have any mistake or any error, let's say... now, there is handshake between production and warehouse, whatsoever they produce they transfer to warehouse. Let say there is discrepancies in the sense that I have brought 14 pallet to you, no I have received this this. May be the basic user made a mistake and they want to reconcile he doesn’t have that authorization,

there are levels of authorization that, just a common user cannot access only the basic user then, when it comes to bumps setup, finance setup, costing and some other stuffs, there are different transaction code (T.Code) and authorization. If a basic user should type some T.code it will tell you that sorry, you're not authorized for this. That one is there as a control and check that is not everybody that have access. Individual also have his own password and login. You cannot login with this or that.

Are there training programs on SCM practices available for executives and managers, what type and how often?

Production manager (ME_3): Ok, actually for me and my colleague, in 2017 and 2018 there was a year training for supply chain management and managerial training at Nigerian Breweries/Heineken University, we benefitted from that one and it cut across all the different areas of the supply chain. We call it ALARMIN. It's also a database that takes into consideration your planning, your production, but it's not widely known like SAP.

Interviewer: How would you describe the enterprises' manufacturing process in terms of planning, organizing, managing, controlling and supervising?

Production manager (ME_3): when all the specifications are captured in the SAP, the material requirement does a kind of run and put it into activities hour. Activities hour in the sense that, for this particular resources the filling machine can pack so cases per hour, this one can pack so cases per hour and all these ones goes into the SAP and does a kind of material running and they break this down into yellow budget, they call it KP, it could be KP 2020, and this KP includes all the volume you run in packs; 200kg etc. With all those ones, we have what we referred to as your basic raw materials now, when the MRP run, the system will do the calculation in terms of packing materials, raw material, energy and several other things. We will throw a kind of proposal that this is the proposal for KP of 2020 that will load into the SAP. We can say that monthly we have different periods, we have some periods that are peak periods that we sell more, we have some period that are low period that you sell less like this raining season is a period of low period. Now, all those ones would have been put into budget planning so, when they run a whole full year, they have run the one for 2020 now. If they run a whole of full year, the MAP will look into for 2020 from January to December what do you actually need for the raw materials this and this and that. The system will also put a kind of buffer and say ok, even though your ...let say monthly tonnage let say 6,500tonnes, they can put like plus 2 or -2percent in cases of, there may be peak in cases of what you have budgeted for them. What will be the cost of these materials in 2020? Do you buy to stock? What is our warehouse capacity to actually hold all these ones and several other things? When this is done, budgeting is done in the sense that for the first quarter, this and this are the things we want to take and for the second quarter, The money is released into a kind of an account that takes care of that one. And from time to time they also look at what are the need time to supply? What is your reordering point? And what is your stock level? Stock level is; as of every time our capacity in terms of warehouse can hold like 700,000 finished goods and monthly, there is a maximum shipping per month and we are producing to stock, what is our holding capacity? what is our reordering point for packing material? What is our reordering point for raw material? and what is the low level that when it gets to this point it cannot last more than 10days? when do you start disturbing the supplier to bring materials? Then, we also have need time. The need time is the time between you raise a PR (process requisition) for a particular material till the time it comes to PO(purchase order) till the time the material is actually supplied. Now, if it is imported goods, the need time is actually much because of the import settlement and some other things.

Interviewer: To what extent would you say the enterprise integrates with suppliers from product design to sale of products?

Production manager (ME_3): Yes, that was what I was talking about when i talked about certificate of analysis. Certificate of analysis includes all the specifications of all your materials raw materials, packing materials and every other thing. For raw material, we have different raw materials they use. For powdered one they check density, purity and some other stuff. For packing material, they look at the density, the colour shade, the thickness and every other thing. At the point of receiving, if it is not up to specifications, it is something they send back. Even before then, the supplier will communicate a kind of pilot sample he has done; give it to you before it goes into mass production. So that one, most of the times prevent all these rejection and all those stuffs.

What would you say is a dedicated system in the enterprise that helps to manage all the supply chain activities that go in the enterprise? Please describe

I said the other time that SAP started 2years ago, before now we use Alarmin, Syrian software similar to SAP but not as versatile and effective as SAP. SAP could cover your customer cares and from different regions they could get into your system and check what is actually in.

What effect does SCM have on the enterprise's sale?

Yes definitely, I will say it increase revenue performance because the initial system will used you have to have a dungeon like a flash drive, that is what actually give you access to the Alarmin and if you don't have a flash drive, you cannot work with it. For SAP even at home, it can work at home and anytime. It is just for you to have domain site of the company so there was actually improvement, even that give you accommodation to have your customers and your suppliers included in the basic thing. You can check what is my customer over here, what is the product they needed, how much as he paid and those kind of stuff. You can also get customer complaint's feedback and every other thing so, it is very versatile more than previous software we are using.

How do you think the SCM system in use has influenced the enterprise in its different areas?

I will say yes. Increasing competition in the sense that, you have more room to actually expand in supply chain and people you actually work with are not necessarily people that are in your domain, you connect to different places. I have several people I have not even see physically and they have vital contribution to what I actually do and I can say with the previous software, it's a no go area. It is more or less that they are just locally enclosed and one-way. But for this one, it opened us to several things. It actually makes the work faster, at least you still have more rooms for improvement and enlargement, from time to time we upgrade, upgrade from C50 to P50 and from P50 to maximo. These upgrades give a wider scope to expand.

How would you describe the enterprises' manufacturing process in terms of planning, organising, managing, controlling and supervising?

Production manager (ME_3): We have female under pads that is the major one almost like 45% of the business. We have adults sanitary pads and under towels. We have contractors or should i say sales representative that sell all those products in Nigeria.

In the last 3years has sales revenue increased or decreased using a margin of like 5%, 10%?

Production manager (ME_3): Ok, if I'm talking about sales revenue, volume is about how many pieces did you sell for each month, volume is also about the quantity. Before the exchange of government, majorly what they produce is smaller **SK use** like 15grams, 25grams, and 30grams majorly then, 200grams was also in the market then. We have little of 1kg, 1.8kg, 900 then and the target was, for customers who are on the neutral ground, they should be able to afford and that is the market strategy and idea behind that one. An average low-income

earner should be able to afford a detergent then, the turnover was high. Turnover in the sense that, it was cheap, it was small and easily affordable. The turnover was high but profit margin was not much because they believe that why will I sell this thing 25 naira and I will have it in my warehouse for almost 2,3 decades when I can actually sell it at 10 naira and the rate of turnover will be high. That is the way the previous business actually think.

You were saying that lack of managerial support is one of the challenges. What are the other challenges with the use of supply chain management system?

Production manager (ME_3): How does it come into managerial support, we have all the I.T that we will use, SAP without people actually managing it, it is useless. when you talk about managerial support, it's not just human resources, can we actually meet up with the task given to us, can we multitask, can we do anything extra from that thing that was given to them. I say from my experience, transition from alarmin we use before to SAP makes me to know that there is a lot you can do that is not part of the training we were given before. It is in the use and the challenges you encounter that actually give you a kind of edge. In the real sense, the managerial support plays a key role, managerial support also comes from that point of training. So, we talked about encouraging your good hands so that they won't go to other places, we also talked about training that actually impact them and actually make them a better person.

You also mentioned challenges with the SAP system? What are the specific ones as regards system?

Production manager (ME_3): In the start-up of the SAP, we have server domain issue. server domain in the sense that, before they enlarged the bandwidth, we use to have challenges in gateway, sometimes we want to work, the server is down, sometimes we also do a kind of upgrading. During that period of upgrading, they would send messages ahead.. We used to have challenges at the early stage but with update, improvement etc they have been able to eliminate major challenges. Everybody uses central server that is connected to the region. we have a cisco, a kind of remote controller, if you switch on your cisco it will change the IP address and connect you to the region even with your local network provider..

How do you perceive the enterprise has performed in terms of reducing cost?

If you are selling 2.3million pieces when you translate it to money, if one is 25naira for instance, multiply by 2.3million multiply by the number of cases in one (26), you can actually use that one to look at what will be they are actually making from it. When you now look at it that what is the profit margin between what they actually sell. it could be 25% or 30% profit margin so.

Would you describe how the system impacts on the functions of the different units? In relation to procurement, inventory management, logistics and production process.

Yes, we also use the SAP it is a chain work. This is the way it works, the planners have integration with purchase department, and the purchase department is the one regulating what do we buy. I'm planning for 78metric tonnes of a particular product, I'm planning for 25metric tonnes of this particular cotton, this is the need time of purchase department. Purchase department will raise a process PR (Process Requisition), the purchasing department will get it through SAP. The suppliers will then be contacted, this is a particular metric tonnes of what we need, individual of them will bring their prices and here, we don't look at the lowest price, we look at what is your own need time that you can deliver? If I have somebody that is taking the average let say per kilo, one is quoting 100naira per kilo, another is quoting 150 per kilo and another is quoting 200 naira per kilo. The one that is quoting 100 naira per kilo is need time is almost 4months, the one that is quoting 150 is telling you that you will get it in 25days and the one that is quoting 200 naira is telling you, you will get it in 20days now, I will look at it, what I still have with me in stock will it last 30days. This one will bring it in 20days with extra 50naira, this one will bring it in 25days with 150, this one is 3months though is cheap, I will just go for

150 that's what purchasing do so, when purchasing have picked the suppliers. They will send it back to the MRP planner; will turn that thing to PO (Purchase Order) in lieu of the requisition. Requisition is that we are still looking for suppliers. Coming from purchase order, it will go to finance, all these things are on SAP, when it get to finance, we have level of authorization ok, you can take the 75metric tonnes or looking at what we have in the pulse now we can only go for 50metric tonnes. By the time 50metric tonnes is supplying in 15days before the remaining 10days for the 25days need time, we can reimburse the payment for the 25metric tonnes that is what finance will do. What does production does? Production is concerned with what the stock level is. Ok, for this one, it's less than 10days and he will be checking up with the material planner that, how many days are mine expecting this? are we still on track? All these things happen on the system SAP you will see it there. Sometimes, if there is need for mail to actually follow up, the material planner will also have asked you (production) even though you have the capacity and it is there in the system, how do you actually want to run? do you want to run all your resources or you have some you just want to dedicate to run? there is a particular line I have not run for like almost 2 to 3weeks now because this is not peak period and I'm still having a constraint with storage so why do I have to run all my resources and everywhere will be filled up so, stop line 3. They also need to communicate even though you have these resources to work, how do you want to run? do you have space? logistic aspect from the warehouse will come, this is how our warehouse is, even from the system you will see, the stock they have, the daily productions, what they ship out. If what they are producing daily is more than what they ship out and there is no any other warehouse, we need to call it out either you push on the sales to bring more order and to ship or you look at it like do we get external warehouse? do we have the money to finance that in terms of workmanship? people you take there, security etc. If that is not there, we start to look if we do just in time now are we able to use up the space? The HR will also come in so, what is the headcount you have working with per session? the admin will also come in that, how many people are we taking care of in terms of feeding and logistics.

No	ME	Position	Sex	Age	Qualification	SCM qualification	Previous experience	Years spent in company	Date of interview	Length of interview (minutes)

C8 – Summary of semi-structured interviews conducted

1	ME_1	Business owner	M	Didn’t disclose	Bachelors degree	None	None	25	12/07/2019	30
2	ME_1	Operation manager	M	Didn't disclose	Bachelors degree	None	Yes	10	12/07/2019	25
3	ME_1	Production manager	M	31	Bachelors degree	None	Yes	5	12/07/2019	35
4	ME_1	Supply chain system user	M	28	Bachelors degree	None	None	5	12/07/2019	41
5	ME_1	Supplier	M	Mid 30s	Secondary school leaving certificate	None	None	15	12/07/2019	50
6	ME_2	Business owner	M	50+	Secondary school leaving certificate	None	None	20	15/07/2019	26
7	ME_2	Production manager	M	42	Masters degree	Yes	Yes	6	15/07/2019	34
8	ME_2	Information technology manager	M	36	Bachelor's degree	Yes	None	6	15/07/2019	34
9	ME_2	Supply chain system user	F	27	Bachelor's degree	None	None	4	15/07/2019	30
10	ME_3	Production manager	M	45	Bachelors degree	Yes	Yes	8	18/07/2019	25
11	ME_3	Information technology manager	M	30+	Bachelor's degree	Yes	Yes	4	18/07/2019	44
12	ME_3	Supply chain system user	F	26	Ordinary National Diploma	None	Yes	7	18/07/2019	23
13	ME_3	Supplier	M	40+	Bachelor's degree	None	None	7	20/07/2019	25
14	ME_4	Business owner	M	62	Technical college certificate	None	Yes	17	22/07/2019	25
15	ME_4	Production manager	M	40+	Bachelors degree	Yes	Yes	5	24/07/2019	34
16	ME_4	Information technology manager	M	40+	Master's degree	Yes	Yes	8	24/07/2019	36
17	ME_4	Supplier	M	32	Bachelor's degree	None	None	No response	02/08/2019	41
18	ME_5	Business owner	M	51	Master’s degree	None	Yes	15	27/07/2019	40
19	ME_5	Plant manager	M	45	Bachelors degree	None	None	3	27/07/2019	36
20	ME_5	Production manager	M	35	Bachelors degree	None	None	7	27/07/2019	35
21	ME_5	Supply chain system user	M	28	Bachelors degree	None	None	3	27/07/2019	45
22	ME_6	Plant manager	M	32	Masters degree	None	None	4	04/08/2019	32
23	ME_6	Production manager	M	28	Bachelors degree	None	None	3	04/08/2019	27
24	ME_6	Supply chain system user	M	30	Bachelor's degree	None	None	4	04/08/2019	28
25	ME_7	Business owner	F		Bachelor’s degree	None	None	15	05/08/2019	28
26	ME_7	Senior manager	M	47	Masters in Business Administration	Yes	Yes	8	06/08/2019	34
27	ME_7	Production manager	M	32	Bachelors degree	Yes	Yes	5	06/08/2019	42
28	ME_7	Supply chain system user	M	27	Degree from a Technical college	None	None	5	06/08/2019	41
29	ME_7	Supplier	M	30s	Secondary school leaving	None	None	10	08/08/2019	23

					certificate					
30	ME_8	Business owner	M	Didn’t Disclose	Bachelor’s degree	Yes	Yes	12	10/08/2019	35
31	ME_8	Production manager	M	35	Bachelors degree	Yes	Yes	2	10/08/2019	34
32	ME_8	Information technology manager	M	40+	Master's degree	Yes	Yes	6	10/08/2019	36
33	ME_8	Supply chain system user	F	26	Bachelor's degree	None	Yes	2	10/08/2019	34
34	ME_9	Business owner	M.	55	Bachelor’s degree	Yes	Yes	20	12/08/2019	36
35	ME_9	Production manager	M	45	Master's degree	Yes	Yes	10	12/08/2019	37
36	ME_9	Supply chain system user	M	27	Bachelor's degree	None	None	4	12/08/2019	34
37	ME_10	Production manager	M	30+	Bachelors degree	Yes	Yes	4	14/08/2019	36
38	ME_10	Supply chain system user	M	30	Higher National Diploma	None	Yes	2	14/08/2019	37
39	ME_11	Production manager	M	40	Masters degree	Yes	Yes	8	18/08/2019	38
40	ME_11	Supply chain system user	M	25	Bachelor's degree	None	None	3	18/08/2019	26
41	ME_12	Business owner	M	52	Master’s degree	Yes	Yes	20	25/08/2019	28
42	ME_12	Production manager	M	30+	Masters degree	None	Yes	5	25/08/2019	34
43	ME_12	Supply chain system user	F	23	Bachelor's degree	None	None	8months	25/08/2019	28
44	ME_12	Supplier	M	39	Bachelor's degree	Yes	None	10	28/08/2019	35
45	ME_13	Business owner	M		Bachelor’s degree	None	None	14	02/08/2019	34
46	ME_13	Production manager	M	42	Higher National Diploma	Yes	Yes	7	02/08/2019	35
47	ME_13	Information technology manager	M	Mid 40s	Masters degree	Yes	Yes	5	02/08/2019	26
48	ME_14	Production manager	M	38	Bachelors degree	Yes	None	10	01/09/2019	28
49	ME_14	Information technology manager	M	38	Bachelor's degree	None	None	7	01/09/2019	27
50	ME_15	Business owner	F	Didn’t disclose	Masters degree	None	None	7	15/09/2019	37
51	ME_15	Site manager	M	26	Bachelors degree	None	None	2	15/09/2019	38
52	ME_15	Production manager	M	41	Bachelors degree	None	Yes	7	05/08/2019	37
53	ME_15	Information technology manager	M	35	Bachelor's degree	None	None	4	05/08/2019	42
54	ME_15	Supply chain system user	M	24	Bachelors degree	None	None	1	05/08/2019	38

Appendix D : Data Analysis Template

D1 - Analytical template v.1

The analytical template v.1 was derived from ten interview transcripts. The researcher applied and hierarchical coding was done in order of importance based on themes that emerged from the interview transcripts, this allowed for the analysis of the interview data at different theme levels. This first version of the study's analytical template displays sub-themes at two levels.

Themes		Codes
Strategic IT alignment factors	Internal factors	IT sophistication
		Top management's knowledge of and commitment to strategic IT alignment
		IT expertise
	External factors	Political factor
		Economic factor
		Infrastructural factor
Existing processes to achieve strategic alignment		Management efforts in IT system to help to deliver business goals and objectives
		Information sharing and communication within
		-System's interaction with suppliers across the supply chain
		-Dedicated system that helps manage the supply chain activities
		-Supplier's participation in their system
Supply chain integration	Internal integration	-Information exchange across departments
		-IS system allows for data integration
		-Impact of IT systems on different

	External integration	units
		-Information sharing with suppliers
		Lack of integration with suppliers
Challenges		Financial constraints
		Limited knowledge and commitment to strategic alignment
		Bad roads that cause delay in deliveries

D2 - Analytical template v.2

The second analytical template was created by employing the remaining forty-four interview transcripts and identifying segments relevant to the research question using the themes earlier defined. New themes (for example, “other factors (infrastructure and political issues”, “training”, “efficiency within enterprise”) were identified.

Themes		Codes
Strategic IT alignment factors	Internal factors	IT sophistication
		Top management’s knowledge of and commitment to strategic alignment
		IT expertise
	External factors	Political
		Economical
		Infrastructural
		Political issues
Existing strategic alignment of IT practices		Management efforts in IT system to help to deliver business goals and objectives
		Information sharing and communication within
		-System’s interaction with suppliers across the supply chain
		-Dedicated system that helps manage the supply chain activities
		-Supplier’s participation in their system
		Training
Supply chain integration in MEs		-Information exchange with your suppliers
		-Extent of integration with suppliers from product design

	to sale of item
	-Impact of SCM systems on different units
	-SCM system allows for data integration
	-Reporting process
	-Interaction between departments with respect to the SCM system
	-Effect of IT system on reduction/maintenance of price of materials
	Efficiency within the enterprise
	-Performance in terms of ensuring customer satisfaction
	-Impact of IT in terms of response time for product design, order processing and delivery
	- System maintains or reduce price

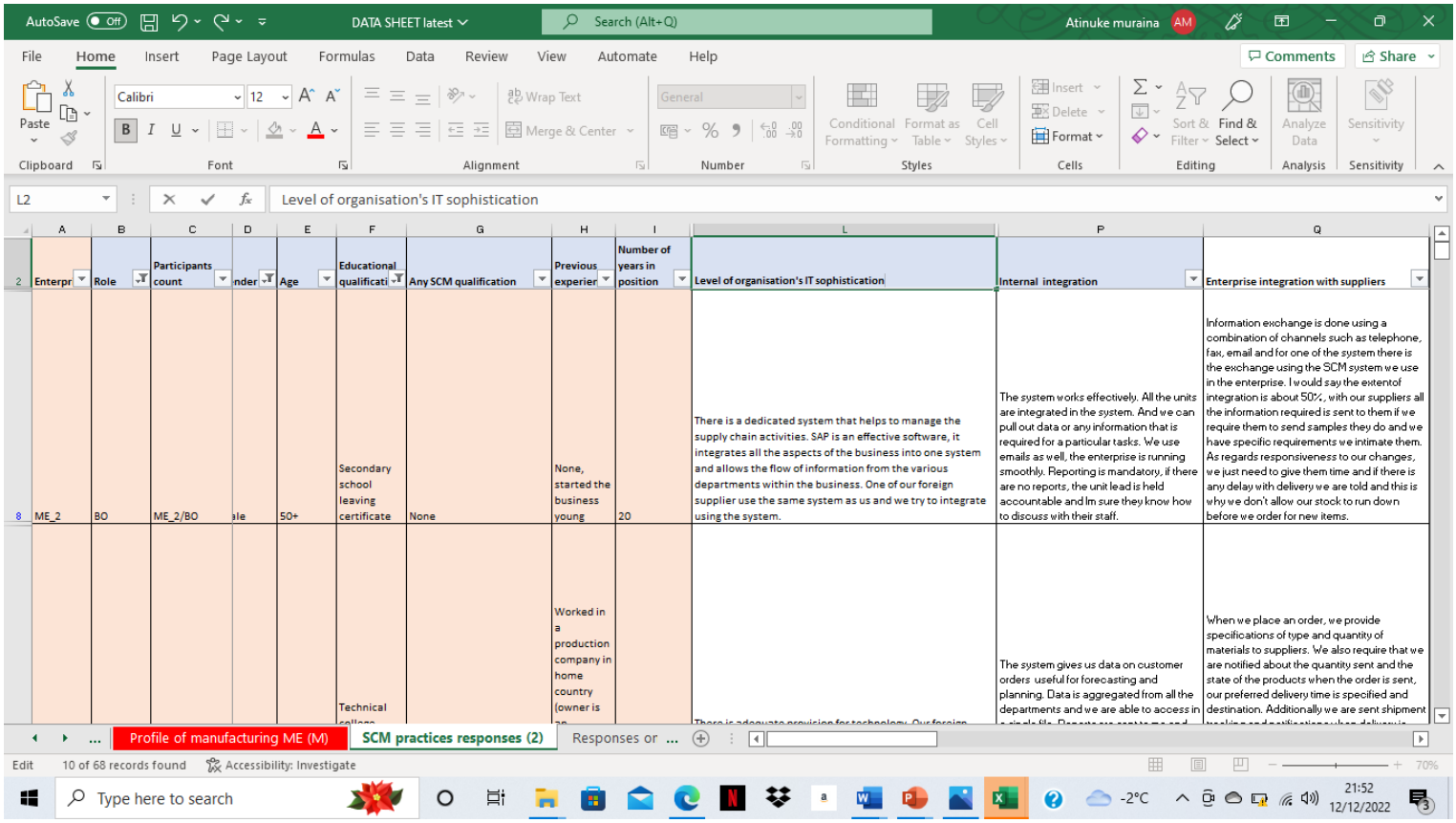
D3 - Analytical template v.3

The third version of the analytical template is the study's final template modified from the previous templates, Similar themes were categorised and phrases refined and a final version of the template was constructed. This final analytical template serves as a basis for interpretation of the interview data and a structure for writing up research findings.

Themes		Sub theme	Codes
Strategic IT alignment factors	Internal factors	IT sophistication	
		Top management's knowledge of and commitment to strategic use of IT	
		IT expertise	
	External factors	Politics	
		Economic	
		Infrastructure	
		External influences on information system	
Strategic alignment		Strategic level of alignment	
		Organisational level of alignment	
		Individual level of alignment	
		Alignment with suppliers	
Supply chain		Internal integration	

integration		Enterprise integration with suppliers	
Challenges to strategic alignment		Financial constraints	
		Limited management knowledge and commitment to strategic use of IS	
		Perception of staff to IT/IS	

D4 – Excel sheet employed to analyse data in the study



	A	B	C	D	E	F	G	H	I	L	P	Q
2	Enterpr	Role	Participants count	nder	Age	Educational qualificati	Any SCM qualification	Previous experier	Number of years in position	Level of organisation's IT sophistication	Internal integration	Enterprise integration with suppliers
8	ME_2	BO	ME_2/BO	ale	50+	Secondary school leaving certificate	None	None, started the business young	20	There is a dedicated system that helps to manage the supply chain activities. SAP is an effective software, it integrates all the aspects of the business into one system and allows the flow of information from the various departments within the business. One of our foreign supplier use the same system as us and we try to integrate using the system.	The system works effectively. All the units are integrated in the system. And we can pull out data or any information that is required for a particular tasks. We use emails as well, the enterprise is running smoothly. Reporting is mandatory, if there are no reports, the unit lead is held accountable and Im sure they know how to discuss with their staff.	Information exchange is done using a combination of channels such as telephone, fax, email and for one of the system there is the exchange using the SCM system we use in the enterprise. I would say the extentof integration is about 50%, with our suppliers all the information required is sent to them if we require them to send samples they do and we have specific requirements we intimate them. As regards responsiveness to our changes, we just need to give them time and if there is any delay with delivery we are told and this is why we don't allow our stock to run down before we order for new items.
						Technical		Worked in a production company in home country (owner is			The system gives us data on customer orders useful for forecasting and planning. Data is aggregated from all the departments and we are able to access in	When we place an order, we provide specifications of type and quantity of materials to suppliers. We also require that we are notified about the quantity sent and the state of the products when the order is sent, our preferred delivery time is specified and destination. Additionally we are sent shipment

An excel version of the sheet employed in data analysis can be provided upon request.