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**SUPPLY CHAIN COLLABORATION AND ORGANISATIONAL PERFORMANCE
IN THE FAST MOVING CONSUMER GOODS INDUSTRY**



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Abstract

This study investigated supply chain collaboration, which is a topic of high interest in the field of supply chain management.

Purpose: The purpose of this study was to investigate how collaborative relationships with international suppliers enhance supply chain efficiencies, ultimately improving the organisational performance of imported goods in the Fast Moving Consumer Goods (FMCG) industry.

Methodology: A case study approach was adopted in this research, and an online survey was conducted with the international suppliers of NHM-SA (fictitious name). Data was collected from 91 international suppliers; however, only 50 suppliers provided usable data. A quantitative approach was used to investigate the relevance of supply chain collaboration in attaining supply chain operational efficiencies, which ultimately enhances organisational performance.

Findings: The concept of supply chain collaboration is of importance in the FMCG industry but is often limited due to operational issues with constraints such as the partners' lack of commitment to a collaborative relationship. The results provided empirical evidence, showing that cost optimisation, communication and information sharing have a positive effect on organisational performance. The study results also proved that supply chain collaboration have indirect positive impacts on organisational performance.

Limitations: This study was limited to a single case study from the FMCG industry. Therefore, caution should be exercised when generalising the results. Participants provided responses based on their experiences and perceptions and may therefore not be factual.

Practical implications: The study demonstrated the various methods in which organisations form collaborative supply chains with their partners. Such collaborative relationships enhanced operational efficiencies, joint planning and knowledge sharing,

which led to the improved organisational performance of all partners involved in the collaboration.

Originality / value: The study provided tangible evidence of the applicability of supply chain collaborative initiatives in the FMCG industry. The study thus provided important inputs on how such collaborative relationships with international suppliers can enhance supply chain efficiencies. The research, therefore, proved that higher organisational performance levels could be achieved through collaboration as opposed to operating in silos.

Keywords: *Supply chain collaboration, collaborative relationships, collaborative initiatives, organisational performance, Fast Moving Consumer Goods (FMCG), efficient supply chain*



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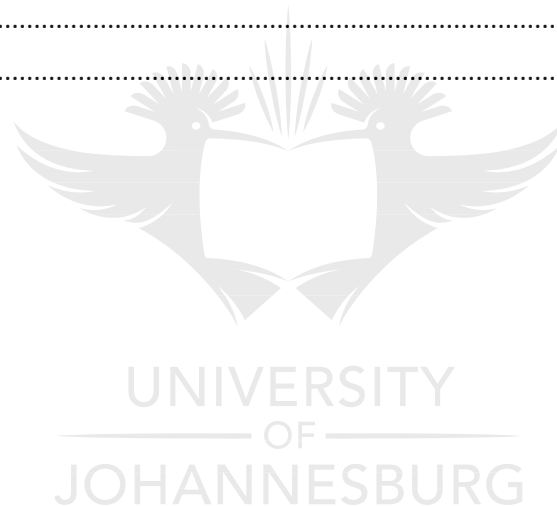
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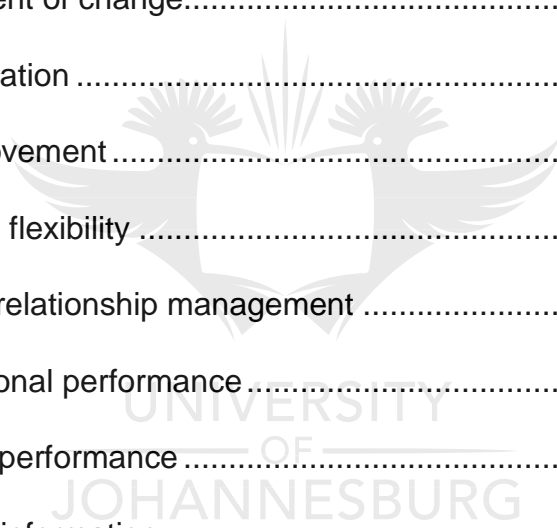
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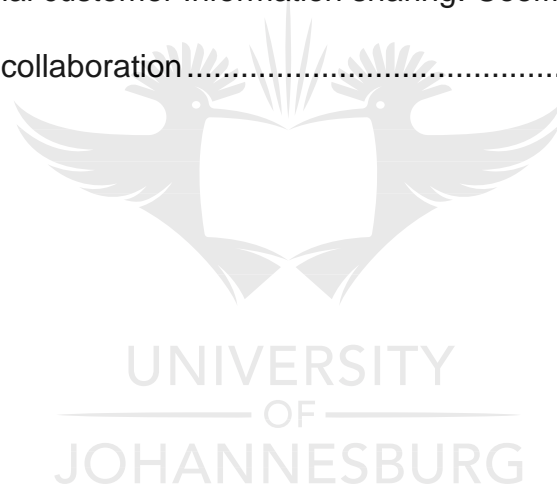
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List of Acronyms

AMR	-	America (Company internal reference)
AOA	-	Africa Oceania Asia
AU	-	African Union
BBBEE	-	Broad Based Black Economic Empowerment
BRICS	-	Brazil Russia India China South Africa
BU	-	Business Unit
CEO	-	Chief Executive Officer
CFR	-	Case Fill Rate
COF	-	Customer Order Fulfilment
CPFR	-	Collaborative Planning Forecasting and Replenishment
DPA	-	Demand Plan Accuracy
ECR	-	Efficient Consumer Response
EUR	-	Europe
FMCG	-	Fast Moving Consumer Goods
GDP	-	Gross Domestic Product
G20	-	Group of 20 member states
IBM	-	International Business Machines
ICT	-	Information and Communication Technology
IMS	-	Intermarket Supply
IMSP	-	Intermarket Supply Planner
IT	-	Information Technology
KPI	-	Key Performance Indicator
NPD	-	New Product Development
NPDI	-	New Product Development and Introduction
OOS	-	Out of Stock
OSA	-	On Shelf Availability
P&G	-	Proctor and Gamble
POS	-	Point of Sale
PwC	-	PricewaterhouseCoopers

ROI	-	Return on Investment
SACU	-	Southern African Customs Union
SADC	-	South African Development Community
SCM	-	Supply Chain Management
SCC	-	Supply Chain Collaboration
SME	-	Subject Matter Expert
SOP	-	Standard Operating Procedure
Stats SA	-	Statistics South Africa
UJ	-	University of Johannesburg
VMI	-	Vendor Managed Inventory



Appendices

Appendix 1: Questionnaire



CHAPTER 1

Introduction

1.1. Introduction to supply chain collaboration

The contemporary challenging and complex global economic conditions, together with the competitive business environment, have compelled organisations to implement lean business practices throughout their entire value chain (Wagner & Neshat, 2012). Contemporary supply chains are becoming more challenging and the collaboration across organisational boundaries, with the visibility of vital information, is increasingly considered as essential for the long-term effectiveness together with the competitiveness of the supply network (Bartlett, Denyse & Baines, 2014). Soosay, Hyland and Ferrer (2008) indicate that as global competitiveness intensifies, supply chains continuously face new complexities and challenges such as increased quality, increasing demand to reduce costs, ensuring the continuity of supply and improved customer service (Jonsson, Andersson, Boon-itt & Yew Wong, 2011) (Boon-itt & Wong, 2011). Conversely, intra-organisational and inter-organisational collaborative relationships have become more significant in ensuring organisational success towards the attainment of competitive advantage (van der Vaart & van Donk, 2008).

Collaboration is a cooperative strategy that is implemented by organisations to capitalise on supply chain efficiencies. Collaboration occurs when one or more organisations or business units (BUs) work together to generate joint benefits (Simatupang & Sridharan, 2013). Companies enter into collaborative relationships in order to improve performance and gain competitive advantage. Studies have indicated that collaboration offers the potential of enhanced supply chain performance in numerous core areas such as improved forecasts, reduced operational costs, increased sales, more accurate and timely information, better customer service and reduced inventory (Whipple & Russell, 2007). Piboonrungraj (2013) indicates that collaboration between organisations plays a critical role in terms of establishing sustained competitive advantage and improving organisational performance. Baumann and Andraski (2010) indicate that collaboration enables organisations to

synchronise more effectively and to streamline their value chain. Chakraborty, Bhattacharya and Dobrzykowski (2014) note that in the competitive business environment, organisations are continuously seeking for new opportunities to collaborate with upstream partners in order ensure supply chain responsiveness and efficiency amidst global dynamic market changes.

The enhancement of the overall efficiency of the supply chain system of an organisation cannot be achieved by one enterprise alone; it needs collaboration between the main entities in the supply chain system, thus making supply chain collaboration a significant trend in modern supply chain operations (Wang, 2016). According to Park and Jeong (2016), supply chain collaboration (SCC) is understood to be a tailored business relationship based on openness, mutual trust, joint risks and shared rewards yielding a competitive advantage. This type of collaboration results in improved business performance, which could not have been achieved, had the firms been acting individually.

Wang (2016) explains that supply chain collaboration has three objectives, namely, safety, efficiency and cost. Soosay *et al.* (2008) highlight that collaboration describes a situation where the partaking partners reach consensus to achieve goals mutually, share information, invest resources jointly, solve problems and make decisions. Collaboration is a means of synthesising, accessing and deploying knowledge in order to improve supply chain performance (Zacharia, Nix & Lusch, 2011). Nyaga, Whipple and Lynch (2010) point out that, organisations build collaborative relationships with their supply chain partners to attain flexibility, efficiencies and sustainable competitive advantage. Collaboration can be initiated either upstream or downstream with supply chain partners (Vachon & Klassen, 2005). Upstream collaboration takes place when a sourcing organisation forms collaborative relationships with suppliers. Conversely, downstream collaboration occurs when a supplying organisation forms collaborative relationships with its customers. In this study, the focus is only on assessing the supply chain performance of upstream collaborative relationships with suppliers. Vachon and Klassen (2005) maintain that collaboration is expected to influence the operational performance of entities positively. In addition, collaborative initiatives have been identified as critical enablers of improving supply chain performance (Chen, Yang & Li, 2007). Finally, the supply chain of jointly creating solutions to challenges is

increasingly imperative to an organisation's business strategy as it is also the source of competitive advantage (Zacharia *et al.*, 2011).

It is therefore evident that collaboration is positively associated with long-term relationships where partners share information, cooperate and work together to plan and modify their business practices in order to enrich joint organisational performance. Similarly, supply chain collaborative relationships are typically longer-term endeavours where partners know each other's needs, capabilities and even weaknesses. Conversely, SCC encompasses information sharing, good communication, joint planning, assets sharing, risks and rewards management. Supply chain collaboration requires coordination at both strategic and tactical level, which may require sharing sensitive information and data. Moreover, SCC enables chain partners to tap business opportunities and enhance their competitiveness. However, SCC is not an easy task since its design and implementation requires close consideration of the interests of a variety of players along the supply chain.

1.2. Background

Numerous factors lead organisations to re-evaluate their value creation and value proposition capabilities. These include compressed technology cycles, increasing globalisation, constant bottom line, and the desire to build a winning supply chain team, customer requirements of higher service levels and competitive pressure to reduce costs. These factors have led organisations to realise that doing business alone is not sustainable (Kumar, Banerjee, Purushottam & Ganguly, 2017: 45).

Similarly, the governments of different countries across the globe continue to sign bilateral agreements with other nations in order to ease the channels of trade with their counterparts. The South African government has formed numerous bilateral trade agreements with other countries (Department of Trade and Industry, 2016). South Africa is also part of the African Union (AU), the Southern African Customs Union (SACU), the Southern African Development Community (SADC), BRICS (Brazil, Russia, India, China and South Africa) and the Group of 20 (G20) member states. These relationships create an important platform for promoting trade between South

Africa and other countries. Many governments actively support trade relations of making importing easy for organisations. Such relations undoubtedly facilitate trade agreements with other countries. Organisations also stand a chance to capitalise on these relations through the formation of collaborative relationships with international suppliers to further take advantage of improving their supply chain performance of imported goods. Imports already account for more than 25 per cent to the economy of South Africa (Stats SA, 2015).

The goods imported by the FMCG industry accounts for more than 10 percent of the Gross Domestic Product (GDP) in South Africa (Stats SA, 2015). The FMCG industry is acknowledged as a leader in contemporary supply chain management practices (Sanchez-Rodrigues, Potter & Naim, 2010). Gu, Foster and Shang (2016) indicate that the goals of FMCG distribution are to maintain management efficiency, minimise distribution costs and ensure high quality of service delivery. The FMCG industry comprise a wide range of regularly purchased consumer products (Sundarakani, De Souza, Goh, Wagner, & Manikandan, 2010) and are characterised by quick turnover, low cost, fast consumption, recurring purchase and short shelf life, such as snack food, vegetables, confectionery, cereals, ice cream and dairy products (Gu *et al.*, 2016: 157). In addition, FMCG consist of characteristics that are exclusive to the industry, namely, they are non-durable, packaged, branded and consumed daily by consumers (Nyaga *et al.*, 2012). Patidar, Khan and Ghosh (2014) also specify that FMCG products are diversified and the returns (profit) made from each product is quite minimal. However, returns become important and meaningful when the consolidated FMCG products are sold in large quantities.

Retail customers such as Shoprite and Spar are continuing to demand for reduced cost of supply and improved response time on the FMCG producers. Bala and Kumar (2011) argue that efficient consumer response (ECR) and agility are the key traits of prosperous FMCG organisations. FMCG organisations are characterised by complex supply channels and networks, as they have to cater for the daily needs of the consumer.

1.3. Statement of the problem

The local producers (manufacturers) in South Africa are finding it difficult to maintain competitiveness against international contenders, because of high labour unrest, high local wages and inflexible labour policies (PricewaterhouseCoopers, 2016). The South African FMCG industry is also facing serious challenges from global competition due to higher local costs of production, cheap imports, skills shortages, poor productivity and production inefficiencies (Agigi, Niemann & Kotze, 2016). In addition, the imposition of a variety of administered costs such as logistics costs and electricity are major challenges in the FMCG industry (KPMG, 2017). These factors negatively affect the ability of the FMCG industry to remain competitive when benchmarked against global players. These challenges have resulted in FMCG producers sourcing raw materials and finished goods from more competitive international suppliers. For instance, the cost of labour in South Africa is about 20 per cent more when compared to the salary levels of other developing countries (World Bank, 2017). This has resulted in many FMCG industry players to consider imported goods.

Inaccurate information visibility between international suppliers and FMCG producers is one of the major industry constraints which is perceived to result in poor supply chain performance. In addition, suppliers' and FMCG producers' unwillingness to share information is one of the dominant trends in the industry. Longer lead times, which ultimately result in 'out of stocks' (OOS) are also one of the major industry constraints. Suppliers also work hand in hand with other competitors. This makes it very difficult for FMCG producers to share information with their suppliers due to trust issues (Verstrepen, Cools, Cruijssen & Dullaert, 2009).

Various studies point to the benefit of improving value chain performance through collaborative planning, forecasting and replenishment (CPFR) of customers and suppliers (Mai, Chen, Anselmi, 2012; Ramanathan 2012; Wong, Boon-Itt & Wong, 2011; Naslund & Williamson, 2010; Fawcett, Magnam & McCarter, 2008a). In addition, studies conducted by Ramanathan (2014) and Olovuniwo (2010) focused on the role of collaboration in the green supply chain.

A literature search identified a number of studies on the manufacturing sector in South Africa (Mafini & Muposhi, 2017; Pisa & Heyns, 2017; Botes, Niemann & Kotzé, 2017; Igwe, Robert & Chukwu, 2016). However, whilst these studies mainly focused on the improvement of value chain performance through CPFR, none of them tested the effectiveness of collaborative relationships between international suppliers and their local (South African) customers (manufacturers). As such, FMCG organisations in South Africa can capitalise on these opportunities and enhance organisational performance by collaborating with international suppliers.

This dissertation, therefore, explores the empirical relationship between the dimensions of SCC and organisational performance within the context of the FMCG industry. The study analyses supply chain efficiencies that can be attained through collaboration with internal and external international suppliers in order to seamlessly import raw materials and finished goods. One of South Africa's largest food and beverage companies operating in the FMCG industry forms the case study of this research. The company was given the pseudonym of NHM-SA in order to maintain confidentiality.

1.4. Objectives of the study

1.4.1. Primary Objective

The research objectives are goals that are set for the study (Kumar, 2011). Consequently, a primary research objective is a statement that enables one to identify what the researcher wishes to accomplish in the study (Saunders, Lewis & Thornhill, 2016). Hence, the primary objective of this study is:

- To investigate the role of collaboration with international suppliers in improving the organisational performance of NHM-SA in the South African FMCG industry.

1.4.2. Secondary Objectives

The secondary objectives formulated for this study are as follows:

- To examine the influence of SCC on organisational performance at NHM-SA.

- To determine the effect of communication between NHM-SA and its collaborating partners on organisational performance.
- To establish the impact of SCC on supply chain efficiencies for NHM-SA and its partners.
- To establish the effect of information sharing between NHM-SA and its collaborating partners on organisational performance.

1.5. Research questions

In order to address the primary and secondary research objectives, the primary research question is stated as follows:

- How do collaborative relationships with international suppliers enhance supply chain efficiencies that ultimately improve the organisational performance of NHM-SA?

The secondary research questions for this study are as follows:

- How does SCC influence the organisational performance of imported goods at NHM-SA?
- How does communication between NHM-SA and its collaborating partners improve its organisational performance?
- What is the impact of SCC on supply chain efficiencies for NHM-SA and its partners?
- What is the influence of information sharing between NHM-SA and its collaborating partners influence on organisational performance?

1.6. Research methodology and design

The term 'research' is used to get specific products or ideas noticed by people (Saunders *et al.*, 2016). Research involves collecting information from various sources such as surveys, journals, articles as well as face-to-face interaction with people and asking questions (Kumar, 2011). Therefore, research involves the systematic investigation of concepts and ideas in order to reach new conclusions, establish facts

and to revise accepted theories in light of new facts. The choice of methodology is critical in identifying the precise solution to a certain research problem (Yin, 2012).

This study follows the 'Research onion approach', as depicted in Figure 1.1.

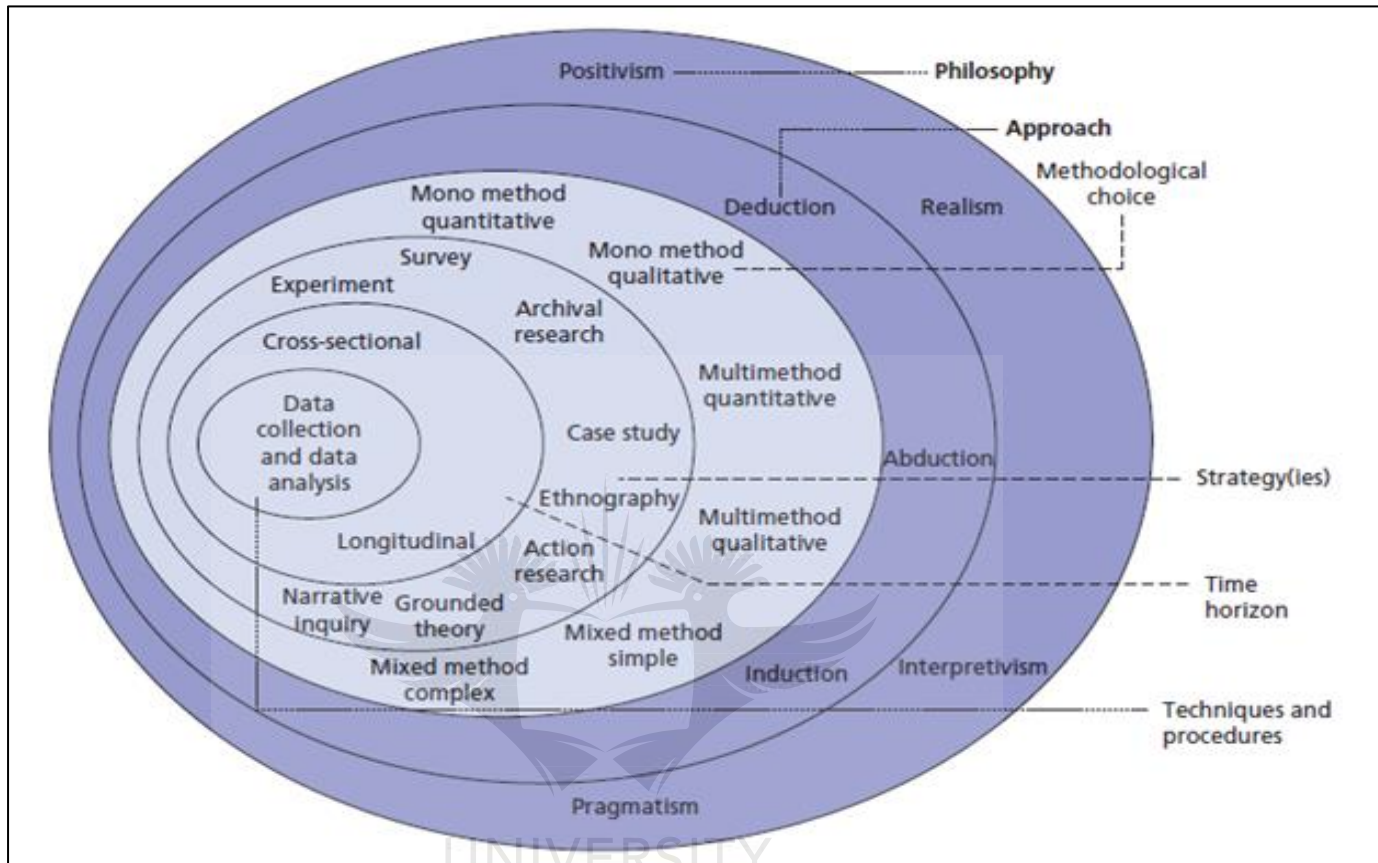


Figure 1.1: The research onion

Source: Saunders, Lewis & Thornhill 2016: 142

The outer layer, which is the first layer of the onion, consists of the research philosophy. This refers to a belief about the way in which data about a phenomenon should be collected, analysed and utilised (Creswell, 2013). Moreover, it assists individuals conducting research to recognise the required type of evidence, the manner in which this evidence can be gathered and how this evidence can be interpreted in order to arrive at answers to the research problem (Quinlan, 2011). This study will follow a pragmatism approach since it is a value driven research that is aimed at an emphasis on practical solution in real life research (Creswell, 2014). In addition, the outcomes of this study will inform the suggested future business practices (Saunders *et al.*, 2016).

The second layer consists of research approaches. This layer is divided into two groups, namely an inductive and a deductive approach. Cho and Lee (2014: 11) state that “*An inductive approach is concerned with the creation of new theory emerging from the collected data whereas a deductive approach is concerned with the development of hypothesis based on an existing theory*”. This study is based on a deductive approach as it tests an existing theory of SCC.

The third layer consists of research strategies, which can be either exploratory, explanatory or descriptive. This study is both exploratory and descriptive in nature. Exploratory research seeks to investigate questions but does not intend to offer final or conclusive solutions to existing problems (Babbie & Mouton, 2011). Consequently, exploratory research is well suited to a problem which has not been thoroughly investigated (Kumar, 2011), in this particular instance, the case study of NHM-SA and its internal and external suppliers of raw materials and finished goods. Internal suppliers are affiliates who are part of the same global company within NHM-SA. External suppliers are non-affiliates of NHM-SA. These suppliers are responsible for providing materials, supplies and products that are used to create NHM-SA final products and services. The descriptive study enabled the researcher to use descriptive tools in the analysis chapter, which is chapter 4.

The research by case study is the preferred method since it allows for a more exploratory and descriptive approach by allowing for richer insights into the research object (Yin, 2012; Quinlan, 2011). Similarly, the case study approach is selected due to the study requiring investigation of a contemporary set of unfolding events over time (Bartlett, Denyse & Baines, 2014). Saunders *et al.* (2016) further elaborate on the distinctive ability of case studies research to deal with real-life content where the researcher has minimal control over events. A case study approach is appropriate for understanding the role of the factors specified above in terms of their influence on the performance of SCC. In addition, the case study method is used as a ‘single-case design’, as defined by Yin (2012), with a single unit of analysis and a single number of cases. This study uses a single case study of NHM-SA, together with a purposive sample of its international suppliers. This will enable the researcher to attain a deeper

and in-depth understanding of the research framework and SCC initiatives that could be implemented by NHM-SA in order to improve organisational the performance.

The fourth layer of the onion refers to the research approach. There are three different approaches that can be used, namely, qualitative, quantitative and mixed research methods. Qualitative analysis involves the use of non-numeric data (Saunders *et al.*, 2016). Quantitative research, on the other hand, involves the collection, transformation and presentation of data in the form of numbers and statistics (Lindén & Schalén, 2012). The mixed methods approach involves a combination of both qualitative and quantitative elements (Creswell, 2014). In this study, a quantitative approach was adopted by sending an online survey to 100 internal and external international suppliers of raw materials and finished goods of NHM-SA. Internal suppliers are affiliates who are part of the same global company within NHM-SA. External suppliers are non-affiliates of NHM-SA. These suppliers are responsible for providing materials, supplies and products that are used to create NHM-SA's final products and services.

A purposive sampling process was used. Purposive sampling allows a study to be limited to a specific type of respondents who possess the ability to provide required information (Sekaran & Bougie, 2013). In this study, there was no need to have a sample representation of the population because the researcher clearly set out the criteria that the selected respondents should adhere to. A survey was circulated to purposively selected respondents. This ensured that the study was conducted on the basis of more valid and reliable information.

The fifth layer of the onion is the time horizon, which can be divided into two types: longitudinal or cross-sectional. This study applied a cross-sectional approach insofar as it was conducted at a specific period at NHM-SA. Cross-sectional studies take a "snapshot" of the proportion of individuals in the population at one point in time (Quinlan, 2011, 110).

The sixth layer, which is the final layer of the research onion, refers to data collection and analysis. In this study, data were collected through two methods, namely, empirical online research and literature study. The online empirical research enabled the researcher to gain quick access to study respondents, despite possibly being separated by major geographic distances. The literature review provided a depth of

understanding and information about SCC concepts, the impact of SCC in the FMCG industry, FMCG companies that have successfully implemented SCC and as well as the benefits and limitations of SCC.

1.7. Limitations of the study

The findings in this study are derived from empirical data obtained from the online survey. Because the respondents provided responses based on their perceptions, there is the possibility that these responses may not be strictly factual. The unwillingness of respondents to participate in the study could also pose a challenge and may negatively affect the response rate. Moreover, as this research is a case study, the results should not be generalised.

1.8. Validity and reliability

Hair, Black, Babin and Anderson, (2010: 7), indicate that “*validity refers to the extent to which data collection methods accurately measure what they are intended to measure*”. Conversely, Saunders *et al.* (2016: 723) state that “*reliability refers to the extent to which the techniques used in the data collection yield consistent findings*”. To ensure validity and reliability, the researcher provided respondents with the opportunity to ask questions in situations where they were unclear of what was required in various questions of the survey. Consequently, the Supply Chain Director and Demand and Supply Planning Manager of NHM-SA reviewed the survey in order to ensure its validity. Moreover, a pilot study was conducted with a number of international suppliers in order to test respondents’ understanding of the survey questions. The Cronbach’s alpha coefficient was used to judge the reliability of the questionnaire.

1.9. Ethical considerations

Ethics refers to what is right and what is wrong in conducting research (Creswell, 2014: 102-103; Mertens & Ginsberg, 2009). The researcher rigorously adhered to ethical considerations during the course of this study. Theories, ideas and contributions of

various authors were duly acknowledged and referenced. Consent to conduct the study was granted by the company under investigation, which also issued a letter of consent. In accordance with the University of Johannesburg's research ethics and guidelines, the researcher took full cognisance of the participants' right to justice, human dignity, equality and protection against harm. The participants' right to freedom of expression, choice and necessary details were clearly explained to the participants.

1.10. Chapter Outline

Chapter 1

This chapter gives an overview of the study, providing the study background, problem statement, research questions and research objectives. This is followed by the research methodology and design and concludes with a summary of the contents of each chapter.

Chapter 2

Chapter 2 provides an overview of the collaboration strategies implemented by South African FMCG companies as well as the key successes and constraints associated with collaboration in this industry. The collaborative framework associated with improving organisational performance is covered, particularly focusing on FMCG entities that have piloted collaboration with their suppliers.

Chapter 3

This chapter defines the processes and procedures that were undertaken to conduct this study. This includes a description of the research goal, methodology, approach and design as well as the data collection methods.

Chapter 4

Chapter 4 presents the results and findings of the study. Moreover, a detailed analysis of the collected data will be provided, together with descriptive summaries.

Chapter 5

This chapter puts forward the managerial implications of the findings to NHM-SA and its collaborating partners. Recommendations are made to NHM-SA and its collaborating partners on the identified implications. The study contribution is

highlighted, and suggestions for future research are made. This is followed by the study limitations and a conclusion.



CHAPTER 2

Literature Review

2.1. Introduction

This chapter provides the theoretical framework for this dissertation. Firstly, it defines supply chain collaboration (SCC), together with SCC attributes. Secondly, it looks at selected cases of firms in the global FMCG industry that have successfully achieved supply chain efficiencies through collaborative initiatives. In addition, the chapter explores the advantages and disadvantages of collaboration as well as its enablers and resistors. Finally, the chapter concludes with a discussion of supply chain performance and supply chain collaborative performance frameworks.

2.2. Supply chain collaboration

Supply chain collaboration is a cooperative strategy where one or more organisations, divisions or business units work as a collective to create mutual benefits (Simatupang & Sridharan, 2008). It can also be defined as diverse entities working together, sharing technologies, data and processes in order to maximise the value of the whole group for partaking organisations and the customers (consumers) they serve (Singh & Power, 2011). Organisations collaborate insofar to improve the supply chain performance by leveraging benefits in order to achieve common goals (Bartlett, Denyse & Baines, 2014). Similarly, organisations collaborate with others for the express purpose of attaining competitive advantage and improving performance. Hudnurkar, Jakhar and Rathod (2014) highlight that collaboration leads to improved supply chain performance. Supply chain collaboration enables organisations to synchronise efficiently and effectively and to optimise and streamline their value chains (Baumann & Andraski, 2010). Collaboration requires organisations to see the bigger picture in product design, development planning and delivery systems (Simatupang & Sridharan, 2008). In addition, collaboration involves joint integration between the focal enterprise and its partners (suppliers) in managing dynamic cross-organisational business processes, including joint product development, strategic partnership, collaborative planning and information sharing. Collaboration implies working more closely with supply chain partners based on the common ground of a

shared vision and trust (Soosay *et al.*, 2008). Joint planning, information sharing, joint decision-making and joint problems solving are some of the components of collaboration that are frequently mentioned in the literature. Through the use of systems that are interconnected by the internet, collaboration becomes possible whenever, wherever and with whomever (Attaran, 2007).

Wong *et al.* (2011) describe collaboration as a process of cooperation between diverse but related entities in terms of sharing resources to meet customers unique and extraordinary needs. Collaboration is viewed as a process that is evolving rather than a static that lies between joint ventures and adversarial relationships (Simatupang & Sridharan, 2008). Collaboration has been referred to as the vehicle that allows the chain members to improve individual and collective performance (Baumann & Andraski, 2010).

In their SCC model, Ramanathan and Gunasekaran (2013) divide collaboration into three major components, namely, collaborative decision-making, collaborative execution and collaborative planning. Working in silos is no longer an option for organisations, which are bound to join forces by collaborating with their supply chain partners. Collaboration has the potential to improve supply chain efficiency, information sharing and information flow.

In this study, collaboration considers the process of more organisations working together along the supply chain to deliver a variety of products to end customers in order to create sustainable competitive advantage and optimising long-range profitability. It also allows cooperation to develop among involved supply chain partners and encourages real-time joint planning and information (Whipple & Russell, 2007).

Mangina and Vlachos (2005) indicate that FMCG organisations are currently redesigning relations with their suppliers, co-packers, retail stores, distributors, wholesalers, shoppers and consumers. The contemporary developing market trends are increasing collaborative initiatives in distribution, which focuses on upstream and downstream distribution, retail chains, and greater collaboration with suppliers of raw materials with a purpose of building strategic relationships (Romano, 2011).

Collaborative relationships enable organisations to work with their suppliers to effectively coordinate supply chain practices such as the formulation of scheduled ordering policies and enhanced promotional plans. The sharing of information such as consumer preferences and market trends enables importing suppliers to improve forecasting and to understand customer needs better. Similarly, collaborative relationships enable importing companies to share timely and reliable demand-related information with international suppliers.

The improvement of overall supply chain efficiency cannot be achieved by working in silos. Awasthi, Adetiloye and Crainic (2016) caution that organisations may lose if they try to 'go solo' in today's complex, challenging and dynamic business environment. Wang (2016) emphasises that collaboration is necessary between the main supply chain partners and further indicates that collaboration has become a critical factor for supply chain competitiveness.

Supply chain collaboration is understood as a tailored business relationship that is based on openness, shared risks and rewards, mutual trust, yielding a competitive advantage that is greater than if the firms had acted individually (Wang, 2016). Advances in information technology and increased competition have prompted considerable structural changes in the FMCG industry (Mangina & Vlachos, 2005). For instance, the FMCG industry has witnessed increasing collaboration with its internal and external suppliers. Systematic automatic stock replenishment and distribution are some of the key tasks that are now increasingly becoming the responsibility of producers (Mangina & Vlachos, 2005).

Strategic collaborative relationships could better enable organisations competing in the FMCG industry to overcome risks such as inefficient transport systems, high operational costs, price fluctuations, opportunism, labour force issues, behavioural uncertainties and increasing competition (Ali & Shukran, 2016). Mangina and Vlachos (2005) indicate that inter-organisational communication is relatively simple and costs almost nothing. However, collaboration can also become costly and ineffective if it is not properly communicated or shared with all involved supply chain partners. In addition, inter-organisational communication sets the basis for strategic and close collaboration among supply chain partners. Collaboration is a key prerequisite of effective supply chain management (SCM).

Collaboration goes beyond managing transactions for efficiency in managing relationships for continuous improvement and creativity (Fawcett, Magnam & McCarter, 2008b). Vaart and Donk (2007) highlight that supply chain practices are seen as tangible technologies or activities that play a significant role in the collaboration of an enterprise with its supply chain partners such as suppliers and customers.

The central idea flowing through almost all these definitions is that collaboration creates a set of competitive and dynamic strategies in which two or more independent internal and external organisations bring about different complementary capabilities in order to achieve their common goals and aspirations in a competitive business environment that cannot be achieved alone. Supply chain partners opt to engage in collaborative relationships to actively develop new and improved practices, processes and strategies. Similarly, collaboration helps organisations to work together with partners in order to generate what they do not have and to retain what they have. Additionally, collaboration builds and nurtures relationships between supply chain partners, requiring a high level of trust and motivation as well as the availability of integrated information to be successfully implemented. Successful collaboration calls for specific agreements on responsibilities, targets and accountabilities along with explicit expectations to be locked in as early as possible. Moreover, successful collaboration relies on partners' willingness to share information that can benefit all involved partners within the supply chain as well as the mutual trust between business partners. The ultimate goal of SCC is to generate value for all involved supply chain partners, as well as the end consumers in the supply chain network. It is the task of supply chain leaders to ensure the successful implementation of collaboration. Supply chain leaders have to invest more time and money into the process of learning how to collaborate effectively.

2.3. Supply chain collaboration practices

Supply chain collaboration can yield tremendous benefits (Mena, Humphries & Wilding, 2009). There are several SCC practices, namely, information sharing (Ralston, Richey & Grawe, 2017; Parody, Vilorio & Gonzalez, 2017; Hudnurkar *et al.*, 2014), communication (Mafini & Muposhi, 2017; Han & Dong, 2015; Teller, Kotzab &

Grant, 2012), incentive alignment (Botes *et al.*, 2017; Igwe *et al.*, 2016; Disney & Pairach, 2012) and decision synchronisation (Soosay & Hyland, 2015; Mathuramaytha, 2011; Nyaga *et al.*, 2010). The above-mentioned SCC practices are discussed in detail in the section that follows.

2.3.1. Information sharing

Information sharing refers to the degree to which an organisation share relevant, accurate, confidential and complete information in a timely manner with its supply chain partners (Parody *et al.*, 2017). Botes *et al.* (2017: 186) describe information sharing as “*the extent to which one party in the chain communicates critical and proprietary information to another party*”. Information sharing is the key enabler of supply chain collaboration (Ponte, Costas, Puche, De la Fuente, Pino, 2016). Information plays a critical role in SCC, and it is found to be the most important factor (Hudnurkar *et al.*, 2014). Information sharing has a major influence in terms of reducing supply chain costs and achieving competitive advantage (Cheng, 2011).

Having access to relevant, accurate and timely information in a contemporary supply chain is challenging given that supply chain partners can be operationally disconnected and spatially dispersed (Botes *et al.*, 2017). Information shared by supply chain partners must be useful and should be able to improve operations of all involved partners. Therefore, the transparency of information is a fundamental requirement and a key enabler of durable collaboration in a supply chain.

Organisations are hesitant to share any kind of strategic information to partners when relational bonding is absent. This is because organisations worry about the leakage of such information to rivals (Kumar *et al.*, 2017). One should, therefore, posit that information sharing is critical to promoting effective management and global supply chain operations with partners (Ralston *et al.*, 2017).

Supply chain partners should be prepared to share critical and sensitive information among themselves to create visibility in the supply chain (Nyaga *et al.*, 2010). Supply chain visibility provides insight in terms of how FMCG producers match demand and supply to avoid having excessive inventory or inventory stockouts, which have the potential of negatively affecting customer confidence and eroding profit in the supply chain. Therefore, information sharing plays a critical role in decision synchronisation,

dedicated investment and incentive alignment in supply chain collaborative relationships.

Supply chain partners in a collaborative relationship could share information such as demand forecasts, promotional events, point of sale (POS) data, inventory holding costs, price changes, on-hand inventory levels, inventory policy, order status or order tracking, supply disruptions and delivery schedules (Mathuramaytha, 2011). Supply chain partners should create transparency by openly sharing costs, benefits and information while appropriate confidentiality measures should be put in place (Harper, Kerteloo, Heinonen & Kapoor, 2009). It is therefore essential to have an upfront agreement in terms of how data will be shared across the value chain.

Information technology (IT) has enhanced the levels of information sharing across supply chain partners. Additionally, IT enables successful collaboration through the provision of essential tools that make collaboration achievable and by supporting collaborative, inter-organisational relationships (Renko, 2011). Hudnurkar *et al.* (2014) indicate that the achievement of the effective supply chain is impossible without having well-integrated IT systems. Information technology is, therefore, the superglue that grips together with the organisational structures and plays a critical role in enabling the response and sensing capabilities of an organisation (Hudnurkar *et al.*, 2014). Information technology has immensely contributed to the growth and facilitation of SCC.

2.3.2. Communication

Communication refers to the contact and the process of message transmission between supply chain collaborating partners in terms of mode, direction, frequency and strategy influence. Communication, which is balanced, frequent, open, multilevel and two-way, is generally an indication of successful and close inter-institutional relationships (Parody *et al.*, 2017). Communication plays a fundamental role in timely decisions as to how information, goods and transactions can be effectively and efficiently provided in the most practical way (Seo, Dinwiddle & Roe, 2016). Collaborative communication is dissimilar to information sharing insofar as it emphasises how supply chain partners interact through regular platforms such as meetings and other forms of communication (Seo *et al.*, 2016).

In an era of intense, time-based and global competition, the strategic role of communication in SCC is widely recognised (Han & Dong, 2015; Wang, 2016). Effective communication within supply chain incorporates clear and visible information sharing on demand and sales forecasting, procurement, inventory management and order processing (Mafini & Muposhi, 2017). Such communication reduces uncertainty, shortens the lead times of new product development and enables supply chain collaborating partners to be more responsive to market needs than rivals (Han & Dong, 2015). However, it is imperative to note that competitive advantage is only attainable if communication is frequent, genuine and based on relevant, accurate and up-to-date information (Teller *et al.*, 2012). It is therefore imperative for supply chain partners to ensure that effective communication mechanisms are a foundation towards building collaborative efforts.

2.3.3. Incentive alignment

Incentive alignment is defined as a process of sharing risks, costs and benefits among partners in the supply chain (Parody *et al.*, 2017). Mathuramaytha (2011) echoes this definition, noting that it refers to the degree to which supply chain members share benefits, costs and risks. Incentive alignment enables supply chain partners to jointly develop systems in order to share each other's performance and also to share risks, costs and benefits. During the alignment of incentives, supply chain collaborating partners are encouraged to act in a manner consistent with the overall objectives of the documented collaboration agreement (Botes *et al.*, 2017). Incentive alignment, as an element of collaboration, is measured by sharing benefits, risks and costs and designing incentive programmes such as performance rewards, shared savings on reduced inventory cost, making provisions for defective products, penalties and agreement on order changes (Igwe *et al.*, 2016). Therefore, incentive alignment could help to strengthen the relationship and to build trust among supply chain partners, making the partners more committed to achieving their predetermined goals. In the context of an effective supply chain collaborative framework, dedicated investment is measured in terms of significant and substantial investment in respect of money, training, time, expertise, personnel, equipment and technology and has a positive relationship with organisational performance (Disney & Pairach, 2012).

2.3.4. Decision synchronisation

Decision synchronisation refers to joint decision-making in strategic, tactical, operational planning contexts (Mathuramaytha, 2011). Decision synchronisation is aimed at orchestrating decisions to maximise supply chain benefits through organisational functions such as customer service, product assortment, demand forecasting and inventory management (Botes *et al.*, 2017). Botes *et al.* (2017) further indicate that collaborative planning within the supply chain context is aimed at balancing the supply and demand of supply chain networks through demand-driven processes. The balance of supply and demand is enabled through more efficient inventory management, sales forecast, effective management of materials for production and better performance management (Soosay & Hyland, 2015). Collaborative planning is related to information sharing, as it requires the bilateral flow of information to all supply chain collaborating members in the joint decision-making process. Therefore, decision synchronisation involves joint idea sessions by supply chain partners partaking in the coordination of supply chain operations for the benefit of all parties. Moreover, decision synchronisation in SCC facilitates joint planning and helps to coordinate decisions of new product design, order placement, order delivery, inventory replenishment, demand forecasting and decisions on optimal order quantity (Krishnapriya & Rupashree, 2014). When supply chain partners work together as a team, they stand an opportunity to learn from each other in supply chain operations through gaining and sharing knowledge on market trends (Igwe *et al.*, 2016). This knowledge could result in faster new product design, development, and the creation of new ideas. The collective effort builds supply chain partners' trust and commitment (Nyaga *et al.*, 2010). In contrast, when supply chain partners take decisions without involving other members and seeking their input, it usually results in weak organisational performance.

The different stages in the evolution from open market negotiation to collaboration are illustrated in Figure 2.1. In this figure, collaboration practices such as joint planning and integration are founded in coordination (Gattorna, 2015). Similarly, coordination stems from cooperation (Jonsson *et al.*, 2011), which in turn, is derived from open market negotiation (Piboonrunroj, 2013). Open market negotiations enable partners that are intending to engage in collaborative initiatives to fully outline their expectations from these relationships. It also provides an opportunity for collaborating partners to

manage their expectations due to the lack of positive contribution aimed at making collaborative initiatives a success. Cooperation requires full dedication and commitment of all collaborating partners. Moreover, partners intending to engage in collaborative initiatives should have a will to develop and to learn from each other. Moreover, they should also be willing to share their risks and rewards that are to emerge from collaborative initiatives. A coordinated supply chain provides a platform for collaborating partners to optimise the entire supply chain performance. Collaboration is interdependent on the coordination of strategic and tactical level decisions where trust is a prerequisite for collaborating partners to share sensitive data and information

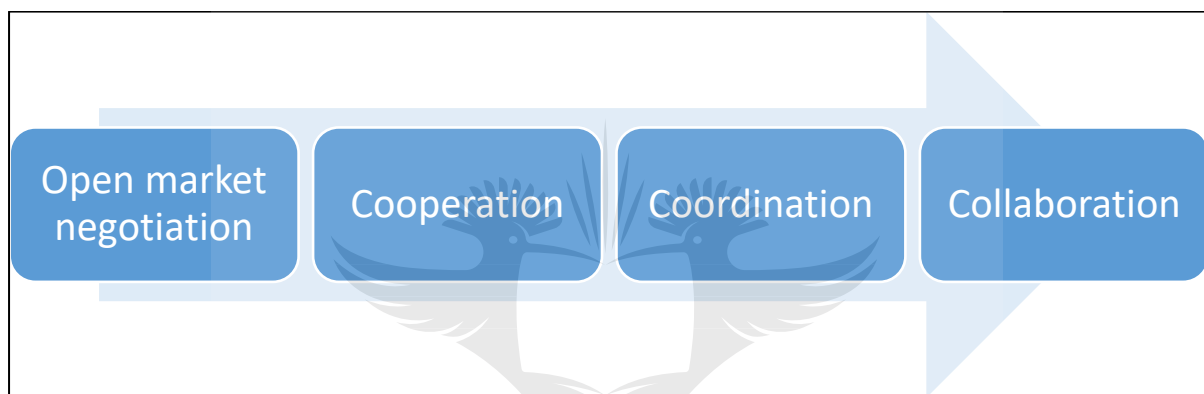


Figure 2.1: Transition of supply chain collaboration

Source: Adapted from Piboonrungraj (2013)

According to Prajogo and Olhager (2012), organisations can achieve better performance through improved efficiency and reduced costs by working collaboratively with their key supply chain partners. Disney (2003) highlights that SCC can be implemented through the usage of various types of programmes such as continuous replenishment, vendor managed inventories (VMI) and CPFR (Ramanathan, 2012).

Supply chain collaboration is characterised by the following characteristics (Wang, 2016; Mai *et al.*, 2012; Olorunniwo & Li, 2010; De Leeuw & Fransoo, 2009):

- Shared or common objectives;
- Visibility creation;
- Long term business relationships between organisations that are independent;

- The connection of distinct groups within and across organisations;
- The shared perspective of merits attained from close ties; and
- Close coordination and cooperation of activities between partners on aspects such as joint inventory management, joint planning, information sharing and joint demand management.

From the preceding discussion, it is clear that SCC is the most recent supply chain practice that is being implemented by many organisations. In addition, SCC collaboration has evolved from a number of other supply chain practices such as supply chain coordination. The future of organisations that collaborate is brighter due to the evidence of many supply chain efficiencies that are associated with this concept.

2.4. The cost of supply chain collaboration

Professionals and supply chain experts indicate that collaborative solutions in economies of scale results to optimised operational costs and enhanced revenue (Simatupang & Sridharan, 2008). The need to lower operational costs has been – and will continue to be – the fundamental reason for pursuing more effective collaboration (Wang, 2016). Collaborative relationships are expected to reduce costs for FMCG organisations and increase the security of demand for FMCG suppliers (Rollins, Pekkarinen & Mehtälä, 2011).

Supply chain collaboration is rarely without some initial outlay costs. To realise future returns, a degree of nurturing, investing and development expenditure is required. Collaborative initiatives incur both direct and indirect costs (Mefford, 2011) which enable organisations to attain higher levels of SCC (Mai *et al.*, 2012).

2.4.1. Direct costs

Burgess, Singh and Koroglu (2006) highlight that information and communication technology (ICT) such as the software and internet for integrated information sharing and operating systems along the supply chains are regarded as direct costs.

2.4.2. Indirect costs

Indirect costs are costs that organisations may not perceive as expenses (Mefford, 2011). These costs include items such as opportunity costs and labour costs (Tate, Dooley & Ellram 2011).

2.5. Supply chain collaboration architecture

Supply chain collaboration architecture refers to the key instruments that enable chain partners to focus their attention on how to improve their overall performance (Wang, 2016). According to Ali and Shukran (2016), the architecture of SCC consists of seven elements, namely, (i) information sharing, (ii) joint knowledge creation, (iii) decision synchronisation, (iv) collaborative communication, (v) goal congruence, (vi) resource sharing and (vii) incentive alignment. The ultimate goal of SCC architecture is to enhance the supply chain performance of an organisation through supply chain efficiencies.

Each involved supply chain members has the responsibility to identify appropriate structures that will assist to improve productivity, thereby achieving collaborative objectives. Collaboration can occur at different levels of the supply chain: inventory management, shared forecasts, optimised delivery and scheduled labour. Figure 2.2 shows the elements of the supply chain architecture and their connections to each other.

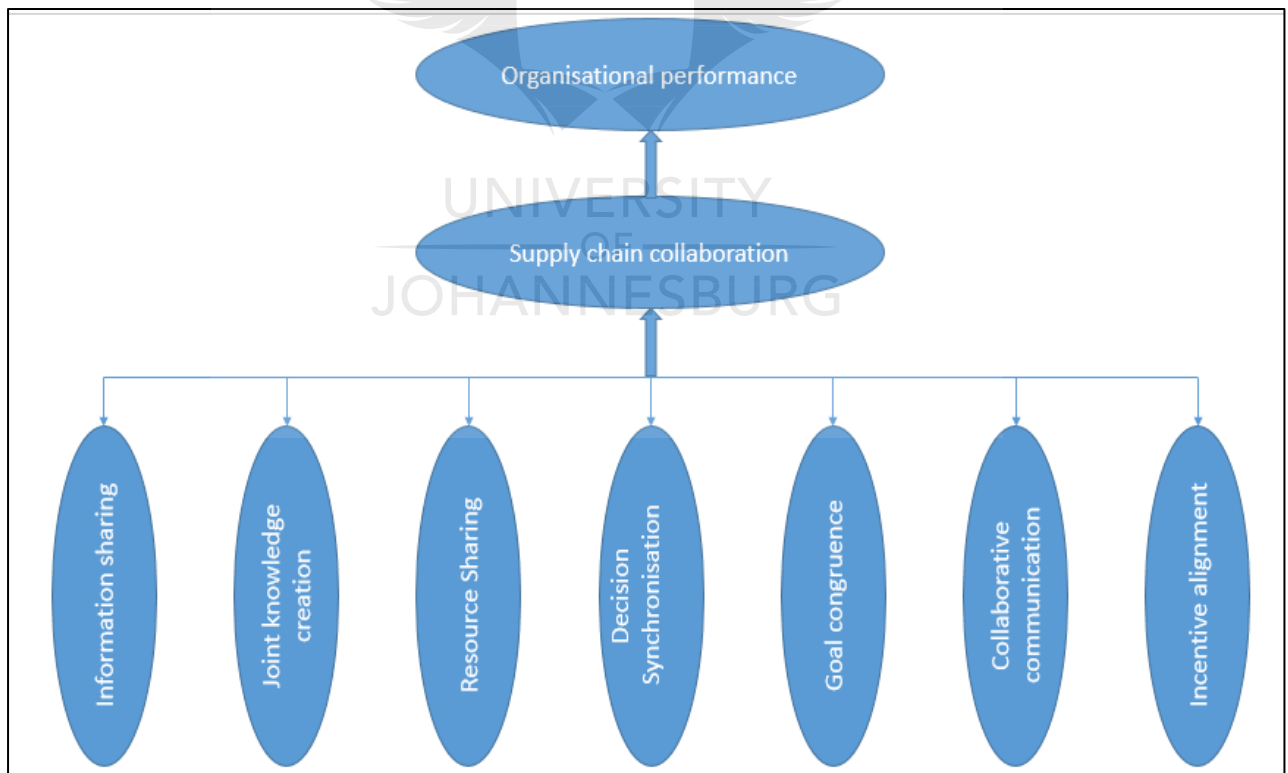


Figure 2.2: Elements of supply chain collaboration architecture

Source: Adapted from Ali & Shukran (2016: 340).

According to Simatupang and Sridharan (2008), supply chain collaborating partners should be in a position to collectively define and share five elements of collaboration architecture:

- i. Information sharing concerning processes, planning, control and performance;
- ii. Collaborative performance systems stipulating performance targets and metrics across the supply chain;
- iii. Innovative supply chain processes enabling collaborative members to smooth the flow of information, goods and money across the supply chain;
- iv. Decision synchronisation enabling the collaborating members to take decisions that have a major influence to supply chain performance and direction; and
- v. Incentive alignment that is focusing on the overall performance to improve productivity.

The idea that emerges from SCC architecture is that organisations engage in collaborative initiatives mainly to optimise their operational costs and to maximise profitability. Supply chain collaboration architecture is an enabler of supply chain operational efficiencies insofar as it consolidates numerous collaborative initiatives in order to improve organisational performance.

2.6. Benefits of collaboration

Naslund and Williamson (2010) describe SCC as partners with joint authority and responsibility who share risks, benefits and resources. This is supported by Wen, Li and Bai (2007) who explain that SCC enables partners to act as one within an extended enterprise.

The recent supply chain developments indicate that collaboration in the supply chain is becoming more of a necessity rather than an option for many organisations. Organisations such as Dell Computers, Hewlett-Packard, Proctor and Gamble (P&G) and International Business Machines (IBM) have forged long-term relationships with suppliers in order to attain a stronger competitive position and to reduce transactional costs (Cao & Zhang, 2010). In South Africa, the collaboration initiatives of retailers such as Spar, Massmart, Pick n Pay, and Shoprite have resulted in advanced CPFR initiatives with their key blue-chip food manufacturers (Tiger Brands, 2016).

Chen *et al.* (2007: 525) maintain that “a collaboration between trading partners creates greater benefits than those with superficial benefits”. Any successful collaboration should maximise benefits and opportunity criteria while minimising cost and risk criteria (Awasthi *et al.*, 2016). Similarly, collaboration enables supply chain partners to increase customer service and satisfaction levels, reduce lead times and increase profit (Ramanathan, 2014).

According to Park and Jeong (2016), collaborative supply chain systems reduce delivery vehicle traffic, increase in last mile networks delivery efficiency and prevent unlawful access by criminals imitating delivery people. Supply chain collaboration can also lead to greater operational benefits such as faster time to market, greater innovation and better financial performance (Vachon & Klassen, 2005). Similarly, Soosay *et al.* (2008) argue that collaboration benefits include operational flexibility to cope with higher demand uncertainties and fluctuations, cost reductions, operational enhancements and revenue enhancement. Furthermore, SCC is highly significant for innovation as collaborating partners realise various gains such as more timely delivery, lower costs, higher quality, effective coordination of activities and operations (Jonsson *et al.*, 2011).

A study conducted by AMA Research indicates that collaborative supply chains can add as much as 3 per cent to the overall business profit margins of all types of collaborating partners (Attaran, 2007). Similarly, Bartlett, Denyse and Baines (2014) state that successful collaboration should lead to better working relationships, reduce inventory investment, improve customer service and better utilise resources. It should also result in faster inventory turns, continuous process improvement, enhanced growth and competitiveness, more effective communication and coordination as well as faster and more responsive order fulfilment (Fawcett, Fawcett, Watson & Magnan, 2012). Cao and Zhang (2011) view the ultimate outcomes of SCC from the perspective of response time, cost reduction, innovation, resources and consequently used goal congruence, information sharing, incentive alignment, decision synchronisation, joint knowledge creation and collaborative communication. These components will be fully discussed in a later section of the literature review.

The overall objective of collaborative supply chains is to attain a competitive advantage by improving the performance of the chain through the adoption of a holistic

approach as opposed to improving each independently (Prajogo & Olhager, 2012). Increased collaboration is believed to result in seamless, synchronised supply chain that in turn leads to improved customer service levels and lower cost (Ramanathan, 2014). Other potential gains of SCC include all of the following, but not limited to, better utilisation of resources, greater flexibility, increased quality, development of competency and improved control of delays, each of which leads to higher profits and lower costs (Mefford, 2011). A more common benefit of increased SCC is related to its positive effect to organisational key performance indicators (KPIs), thus leading to increased organisational profitability (Audy, D'Amour & Rousseau, 2011).

Organisations should focus on expanding supply chain gains through collaborative initiatives. Successful collaboration should result in win-win outcomes in terms of supply chain efficiencies for all participants across the entire value chain. It is likely that these benefits have motivated the FMCG industry to engage in SCC initiatives.

2.7. The disadvantages of collaboration

Various researchers and experts in the field have indicated that SCC is not always a solution to solving organisational problems (Ramanathan, 2014; Ramanathan & Gunasekaran, 2013; Piboonrunroj, 2013; Romano, 2011). Collaboration can be problematic if not properly implemented (Barratt, 2004). This can occur because of the practical difficulties that are associated with the implementation of collaboration (Naslund & Williamson, 2010). Singh and Power (2009) caution that collaboration with suppliers does not automatically represent a source competitive advantage. Enhanced collaboration fully requires information sharing, flexibility, continuous capacity and capability building of suppliers. For instance, activities such as investment in information technologies, supplier development and inter-organisational product development teams may require the deployment of resources from organisations (Vachon & Klassen, 2015).

A study conducted by Gattorna (2015) indicates that greater collaborative supply chain strategies with suppliers do not necessarily improve cost performance and flexibility of the buying organisation. Moreover, SCC can cost the organisation in terms of transaction and ownership costs (McLaren, Head & Yuan, 2002). Attaran (2007) argues that there has to be an incentive for buyers and suppliers to develop trust.

Collaboration also demands that buyers and suppliers develop integrated systems that link business processes (Wagner & Neshat, 2012).

Matopoulos, Vlachopoulou, Manthou and Manos (2007) highlight that SCC become complex as supply chain partners increase due to many companies that do not have compatible systems of information exchange. Integration in such a scenario would require a great deal of systematic change (upgrade) and training, which could be costly. Similarly, there has to be a common language used by collaborating partners for identifying products and making decisions about them. Finally, security protocols have to be implemented to safeguard both buyers and suppliers from potential leaks of critical propriety information (Singh & Power, 2009). Bartlett, Denyse and Baines (2007: 298) state that organisations should return to “aggressive sourcing” that is based on free market principles rather than the implementation of collaboration.

2.8. Enablers of collaboration

According to Fawcett *et al.* (2012), collaboration consists of a number of enablers. These fundamental enablers include:

- Process transparency and supply chain mapping;
- Learning, and experiential mechanisms;
- Supplier development and integration;
- Senior management level commitment;
- Aligned supply chain measures and more accurate costing;
- Accurate and timely information sharing;
- Trust-dominant collaborative culture;
- Employee buy-in and empowerment;
- Intra- or inter-organisational team structure; and
- Disciplined decision-making and follow through.

2.9. Barriers and resistors to collaboration

The sections that follow, discuss the barriers and resistors to SCC in relation to supply chain partners in the FMCG industry.

2.9.1. Barriers to supply chain collaboration

The barriers to successful supply chain collaboration may appear insurmountable, especially if there is a lack of commitment from involved partners. Barriers to supply chain include factors such as the duration of partnerships, making decisions regarding the right number of partners and the capital to be invested in ventures (Asree, & Gopalan & Zain, 2016). Moreover, the lack of transparency is recognised as a major hindrance of communication and information flow (Ralston *et al.*, 2017). These barriers could cause information sharing delays, inter-firm conflicts or collaborative failures. Therefore, it is of critical importance for all involved supply chain partners to maintain higher levels of trust for creating and maintaining successful effective collaborative initiatives. The following are a number of other supply chain barriers hindering SCC:

2.9.1.1. Lack of trust

Successful SCC between partners requires commitment and trust. The lack of trust is seen as a major limitation in SCC. Trust is earned over time between supply chain partners (Gumboh & Gichira, 2015). Each partner thus earns trust while building its reputation among other organisational collaborating partners. Organisational relationships that are based purely on trust result in win-win outcomes for all partners. Therefore, partners have to fully comprehend that it is in their own best interests to share information and to trust each other.

2.9.1.2. Technological barriers

The lack of appropriate technology has been cited as one of the key impediments to successful SCC growth and innovation in the FMCG industry. The lack of information systems is also regarded as a key barrier to supply chain coordination and cooperation (Gumboh & Gichira, 2015). Collaboration is largely information-based. Therefore insufficient information system support is a critical barrier. Moreover, it is virtually impossible to coordinate value-added activities across organisational, functional, divisional and inter-organisational boundaries without any form of shared information regarding order status, product designs, inventory levels and delivery schedules among other transaction-orientated variables. Therefore, inadequate information systems can result in problems in managing complex data in supply chain networks,

as it requires collecting and analysing huge amounts of data (Ralston *et al.*, 2017). However, modern technology has led to the greater use of data servers that are able to collect, store and process enormous quantities of data.

2.9.1.3. Risk barriers

Supply chain collaboration is relatively easier to coordinate when there is a limited number of partners. However, it becomes more complex as more partners become involved. Increases in information sensitivity, time investments, project costs and company size come with an increase in risk such as the leakage of information to rivals (Kubickova & Wang, 2009) (Fawcett, Magnan & McCarter, 2008c). Information leakage poses the greatest threat to the success of SCC in the FMCG industry. However, the benefits of SCC should by far outweigh the associated risks, which should encourage all involved partners to participate in collaborative initiatives.

2.9.1.4. Alignment barriers

Alignment barriers occur as a result of inconsistent objectives, goals and poorly defined measurement practices. Dissimilar goals may lead managers to take business decisions that are opposed to those taken by other supply chain partners (Gumboh & Gichira, 2015). Full alignment only occurs when supply chain members are working towards attaining common goals or pulling in the same direction. Divergent goals thus hinder organisational performance and make SCC difficult to achieve. Mismatched goals could also lead to supply chain members viewing others as only partially committed to the course (Gumboh & Gichira, 2015).

2.9.1.5. Lack of effective metrics

Organisational metrics that consist of performance measurements of all supply chain partners are essential. Supply chain partners should invest efforts into optimising chain operations as opposed to individual organisations. Therefore, supply chain collaborating partners need to work together to ensure mutual savings and gains for enhancing better service delivery. The lack of visibility across end-to-end supply chain

could result in performance improvements becoming enormously difficult (Gumboh & Gichira, 2015) which would negatively affect the quality of collaboration.

2.9.1.6. Cultural or organisational barriers

The lack of management support and commitment to collaboration, workplace culture and unsuitable backing structures can pose a challenge to SCC (Kubickova & Wang, 2009). Organisational culture and attitude among employees can also hinder SCC. Organisations that consist of employees with a negative attitude towards SCC may find it difficult to implement SCC initiatives due to such resistance to change.

2.10. Levels of supply chain collaboration

Supply chain collaboration takes place at three levels, namely, strategic, tactical and operational (Naslund & Williamson, 2010).

Strategic level collaboration involves activities that influence the future direction of the supply chain in a collaborative manner, with shared responsibilities among the involved actors (Gable, Peteraf & Thompson, 2017). Strategic collaboration enables an organisation to define its direction, strategy and to make decisions on allocating resources in order to pursue its desired objectives. Therefore, strategic collaboration is long-term in nature and provides a platform to enable an organisation to attain its long-term goals and objectives.

The tactical level collaboration includes activities of coordinating and controlling the flow of goods together with information flows. Therefore, collaboration at this level can result in reduced uncertainty through the creation of visible and transparent demand patterns upstream in the supply chain (Jones & George, 2014). Tactical collaboration places greater emphasis on the current operations based on the short-term. The period (time) at this level would be about one year or less. Collaborating managers use tactical collaboration to outline the necessary actions required to ensure the successful implementation of collaborative initiatives.

The operational level collaboration includes working together on transactional, routine and daily activities (Zacharia *et al.*, 2011). From an operational point of view, effective collaboration among supply chain partners leads to procurement shorter lead times, joint assets utilisation and production efficiency (Hudnurkar *et al.*, 2014). Operational collaboration links strategic objectives and goals to tactical objectives and goals. Senior managers have a better understanding of organisational collaboration strategies than lower-level managers and are therefore charged with developing strategic collaborative initiatives. On the other hand, lower level managers possess a better understanding of the day-to-day collaborative processes.

Thus, supply chain collaboration is not simply about information sharing based on relationships at an operational level but also needs to be executed at the strategic and tactical levels of an organisation. Organisations can have collaborative processes at an operational level. However, if processes at both the strategic and tactical levels are not collaborative, then the organisational performance gains of collaboration will be incomplete.

2.11. Types of supply chain collaboration

Naslund and Williamson (2010) argue that collaborative relationships should not, and cannot be established with all collaborating partners in the supply chain, as long-term obligation and commitment are required between involved parties. Mentzer, Stank and Esper (2008) concur, stating that collaboration is not an easy task as it requires organisations to share vital and strategic information. Furthermore, the establishment of collaborative relationships demands different forms of investment such as resourcing of information technology. IT integrates all supply chain partners across the value chain irrespective of their geographic location.

Researchers and experts refer to various types of collaboration as joint ventures, strategic alliances, internal collaboration, horizontal collaboration, vertical collaboration, virtual collaboration and cooperative arrangements (Soosay *et al.*, 2008). These various types of collaboration are discussed below.

2.11.1. Joint ventures

Traditionally, joint ventures are used to cultivate fresh market opportunities (Gable, Peteraf & Thompson, 2015). This typically involves an organisation looking for new opportunities to provide goods or services, financial capability and marketing strategies whilst the local party provides support in terms of labour contribution, market access and knowledge to private and public sector networks (Yazdanparast, Manuj, & Swartz, 2010). In addition, joint venture participants collaborate at a single point in the collaborative supply chains in order to ensure the economies of scale in manufacturing and distribution networks (Wagner & Sutter, 2012).

2.11.2. Strategic alliances

Strategic alliances are regarded as a specific mode of inter-firm collaborative relationships that are intended to be long-term. Strategic alliances enable two or more supply chain partners to share skills, knowledge, capabilities and resources (Verstrepen *et al.*, 2009). The fundamental objective of strategic alliances is to enhance the competitiveness of each supply chain partner (Gable *et al.*, 2015). Soosay *et al.* (2008) indicate that strategic alliances can be used to penetrate new markets with agility, avoid government controls, disseminate new technologies and swiftly gain business knowledge from local industry leaders.

2.11.3. Internal collaboration

According to Mai *et al.* (2012), internal collaboration can be defined as a mutually shared process within an organisation where two or more departments closely work together to attain collective goals and display a shared vision and mutual understanding. Internal collaboration allows different departments to share knowledge and information about logistics, quality, production processes as well as supply and demand status that enable better management and coordination of production processes (Cheng, 2011).

Internal collaboration involves two critical aspects, namely, process coordination and information sharing (Chen, Sohal & Prajogo, 2013). Process coordination is imperative insofar as a poor collaboration between logistics, procurement and marketing would result in imported products being delivered late. This would ultimately result in out of stock (OOS) situations. In addition, poor communication could also result in the late launch of new product developments (NPDs). Collaboration through information

sharing and support helps to manage planning complexities in the supply chain (Hernández, Poler & Mula, 2011).

Internal collaboration is viewed as an intangible organisational resource that can yield a positive impact on organisational performance (Mai *et al.*, 2012). In addition, high levels of internal collaboration within an organisation can help to align better and allocate the necessary resources and transform inputs into outputs (Mai *et al.*, 2012). Cheng (2011) highlights that information sharing is the beginning point for successful internal SCC. On internal collaboration, dedicated cross-functional teams are created to integrate different knowledge, skills and abilities from different organisational departments (Cheng, 2011).

2.11.4. Horizontal collaboration

Horizontal integration occurs when two or more competing or unrelated businesses produce different components of one product or similar products from a cooperative association such as manufacturing capacity and warehouse space (Coyle, Langley, Novack & Gibson, 2016). Horizontal collaborative relationships can help to find and eliminate supply chain hidden costs that everyone pays for by allowing joint sourcing, manufacturing, product design and logistics. Coyle *et al.* (2016) also indicate that horizontal collaboration could be a relationship that is seller-to-seller or buyer-to-buyer and in some cases, even between rivals.

According to Gable *et al.* (2015), horizontal collaboration yields the following benefits:

- Improved access to international markets due to assured continuity of supply;
- Lower fixed costs of indirect labour (for example, sales, technical, quality assurance and marketing);
- Reduced administration and logistics costs for each involved organisation; and
- Improved procurement terms and conditions through group purchasing power.

Furthermore, higher customer service levels (fast delivery and break bulking), lower stock cover levels (higher inventory rotation), lower cost of labour (elimination of duplicated tasks), lower number of kilometres driven across transport networks, reduced traffic (positive impact for society) and higher rate of utilisation for delivery vehicles (weight and cube fill) were identified as some of the key benefits of supply chain horizontal collaboration (Park & Jeong, 2016).

2.11.5. Vertical collaboration

Vertical collaboration takes place at different supply chain levels (Ramanathan, 2014). For instance, the integration between the supplier and the distributor enables the enhanced flow of goods and information, required average inventory, improvement in the trade-off between the levels of service and transportation, better transportation systems and more economical inventory management control (Singh & Power, 2009). Gable *et al.* (2015) indicate that companies vertically collaborate to strengthen their competitive position and to boost profitability.

2.11.6. Virtual collaboration

Internet and technology are the keys enablers of virtual collaboration. Virtual collaboration occurs when dependent and interdependent organisations (customers, suppliers, distributors and competitors) are interconnected by telecommunication technologies (Almeida, Marins, Salgado, Santos & Silva, 2015). Telecommunication technologies facilitate the sharing of skills, costs and easy access to global markets without incurring any travelling expenses (Audy *et al.*, 2011). George and Jones (2011) highlight how Toyota used a virtual team to develop a radical new product through collaborative technology. Similarly, Barloworld Logistics has optimised the travelling expenditure of project managers by almost 70% through virtually collaborated technologies (Montreuil, 2011).

2.11.7. Cooperative arrangements

Rapidly changing technology, widening of sourcing capabilities and a competitive environment compels organisations to continuously seek for cooperative arrangements with other organisations (Almeida *et al.*, 2014). The rationale behind cooperative arrangements is aimed at sharing tangible and intangible resources while pursuing business goals between supply chain partners (such as survival, efficiency and competitive advantage) through the redesigning of products and supply chain processes (George & Jones, 2015). The main objective of cooperative arrangements is to fully shift to more trusting relationships with supply chain partners from contractual arrangements (Attaran & Attaran, 2007). This shift enables the exporters (manufactures or suppliers) and importers (customers) to be helpful to each other, to deal constructively with any arising conflicts and to build trust by taking a long-term view of relationships (Ramanathan, 2014).

2.12. Case examples of successful collaboration in the Fast Moving

Consumer Goods industry

FMCG organisations across different industries are now engaging in collaborative initiatives with the intention of capitalising on supply chain operations. Many FMCG companies that have successfully achieved supply chain efficiencies through collaboration and include Procter & Gamble (P&G), Heineken, Walmart, Tongaat Hulett Sugar, Clover South Africa and Entyce Beverages. The following section discusses some of the collaboration initiatives implemented by these companies.

2.12.1. Procter and Gamble (P&G)

Supply chain collaboration has enabled P&G to work together with its suppliers during the process of new product development and introduction (NPDI). Alan Lafley, a former Chief Executive Officer (CEO) of P&G was one of the initiators of the P&G Connect and Development Innovation Strategy, he stated that: “We want to be known as the company that collaborates inside and out better than any other company in the world” (Huston & Sakkab, 2006). Procter & Gamble obtained 42 per cent of its new product development ideas externally, which increased from just 10 per cent in 2000 (Fawcett, Jones & Fawcett, 2012). Therefore, the success of collaborative initiatives for P&G is based on sharing information with suppliers.

2.12.2. Heineken

Collaboration with distributors has enabled Heineken to reduce its delivery lead-time from 12 to 8 weeks (Attaran, 2007). Heineken is using the advanced technological systems to do the joint ordering, replenishment and forecasting that is performed in real-time with its distributors (Ramanathan & Gunasekaran, 2013). Conversely, the system has enabled Heineken’s sales personnel to connect with the central database. Moreover, the CPFR enables Heineken distributors to log in online, view their sales together with forecast and also to amend and submit their orders online (Soosay *et al.*, 2008). On the other hand, the company order cycle times have been reduced from 3 months to 1 month (Attaran, 2007). Other benefits of Heineken collaboration include smaller inventory holding, fresher products to consumers and lower procurement costs (Romano, 2011).

2.12.3. Walmart

Walmart relies on the usage of strong supply chain collaborative relationships to drive sustained growth and new market entry success (Fawcett, Hofer & Fawcett, 2014). For instance, Walmart gained access into the South African market through the acquisition of the Massmart group. In addition, collaboration has enabled Wal-Mart to share point of sales (POS) information with its suppliers in order to improve the performance of its supply chain. Equally, the development of smaller suppliers has proved to be fruitful for the organisation due to ensured supply and better negotiation of rates with respective suppliers (Ramanathan, Gunasekaran & Subramanian, 2011). Similarly, the company has established a joint initiative with P&G where managers from both organisations collaboratively forecast sales of P&G products at Walmart stores and then plan replenishment jointly (Attaran, 2007). This collaborative initiative ensures that there is no gap between what P&G is planning to produce and what Walmart is planning to sell (Singh & Power, 2009). Similarly, Walmart also introduced an open-door policy to its suppliers for the purpose of requesting them to evaluate the behaviour of its buyers (Ramanathan *et al.*, 2011). These evaluations are considered critical for Walmart due to merchandise planning, inventory support and new product ideas that the company receives from its suppliers (Fawcett *et al.*, 2012).

2.12.4. Tongaat Hulett

Tongaat Hulett collaborates with its local suppliers for the purpose of continuously improving its local procurement. Such collaboration has enabled the organisation to maintain favourable Broad-Based Black Economic Empowerment (BBBEE) ratings (Tongaat Hulett, 2017). Conversely, collaborative initiatives with suppliers have allowed Tongaat Hulett to implement green procurement initiatives such as the development of resource-efficient and environmentally friendly products (Tongaat Hulett, 2017). Collaboration with suppliers has also enabled the organisation to reduce its carbon footprint as well as major growth in the local market through the reduction of imported goods.

2.12.5. Clover South Africa

The customer collaboration project of Clover SA has enabled the organisation to link data across the entire value chain (Clover SA, 2017). That is from different supply chain partners in the value chain, right through to the customer point of sale. In addition, such collaboration has also enabled Clover SA to collaborate with its retail

partners such as Shoprite, Spar and Woolworths. These collaborative initiatives have enabled Clover and its retail partners to identify optimal solutions and opportunities that will benefit all partners involved in collaborative initiatives. Conversely, this visibility has enabled Clover to capitalise on its supply chain efficiencies and to develop new market solutions for its retail customers easily.

2.12.6. Entyce Beverages

In the case of the organisation Entyce Beverages, collaboration with local suppliers advances its objectives of empowering its partners (Entyce Beverages, 2017). Furthermore, the company strategically collaborates with its local suppliers to improve its BBBEE scorecard through the implementation of sustainable supplier development initiatives (Entyce Beverages, 2017).

2.13. Status of imported Fast Moving Consumer Goods products

Mangina and Vlachos (2005) indicate that the FMCG industry, specifically the food sector, which is illustrated by exclusive features that distinguish it from other sectors of the economy namely:

- Imported goods make an important contribution to the Gross Domestic Product (GDP) of South Africa. On the other hand, a substantial portion of imported finished products and raw materials from the FMCG industry are being sourced from numerous international markets. Diverse and geographically dispersed sourcing markets imply a complex distribution network for the FMCG industry (Bala & Kumar, 2011).
- There is a major supply variation due to weather conditions, biological nature of agricultural products and the seasonality of agricultural production, which results in input variation and unpredictability. However, collaborations aim at guaranteeing the planned delivery of supplies and smoothing supply variations (Ramanathan, 2014).
- The current safety and food quality standards require product traceability, which is a continuous requirement throughout the supply chain. In addition, the short shelf life of FMCG products requires an agile and time-efficient supply chain (Kumar, 2005).

- Retailers continue to place excessive pressure on FMCG producers to reduce the price. This condition is most beneficial for multinational FMCG companies, which have the strong purchasing power to buy and sell in bulk to bargain prices to their own benefit (Vlachos, 2005). In addition, the FMCG producers have to negotiate prices with large retailers who are often involved in price competition (Sandberg & Abrahamson, 2010).

Imported FMCG products lose almost 90 days of shelf life after production due to long sea freight times and congestion in ports in South Africa (NHM-SA, 2016). Longer lead times mean that products have already aged almost three months after production upon arrival in South Africa. Conversely, airfreight transportation is not a preferred option due to the higher transportation costs associated with this mode of transport. Despite the shorter lead times that are provided by airfreight, it is estimated that costs are about six times higher when compared to the sea transportation rates (DB Schenker, 2016). These higher costs associated with airfreight mean lower profit margins for FMCG producers.

2.14. Organisational and supply chain performance

Organisational performance is defined as the operational capability of management, directed towards attaining the business goals of major shareholders. This stands as a key measure of organisational success. Chakraborty *et al.* (2014) define organisational performance as the success of an enterprise in terms of fulfilling its business goals better than competitors. Therefore, organisational performance is the outcome of achievements driven by managerial skills and capabilities. Igwe *et al.* (2016: 141) indicate that “*organisational performance stands as a strategic tool that provides an avenue to attain predetermined objectives needed in satisfying the organisational mission or strategy statement*”. Igwe *et al.* (2016: 141) further indicate that organisational performance “*acts as a watchdog of standards to guide the course of action of organisational members*”.

Richey, Roath, Whipple, and Fawcett (2010) view organisational performance as the cost and service effectiveness to the organisation. Generally, quality, delivery, cost and flexibility are usually used for measuring performance (Krause, Handfield & Tyler,

2007). Regular performance measures adopted in most organisations include market share, profits, customer satisfaction and loyalty and earnings on investment. Within the supply chain context, organisations should measure the effectiveness of their performance based on the capability to differentiate themselves from other business performance models (Krishnapriya & Rupashree, 2014). Performance capability is defined as the organisational ability to provide superior performance and to deliver on the promise to its stakeholders such as customers (Cao & Zhang, 2011). Performance capability materialises as organisations invest in vital processes, systems and skills (Crum, Poist & Daugherty, 2011). These investments increase interdependency and improve transaction efficiency (Ramanathan *et al.*, 2011). Advanced levels of performance capability establish the confidence that supply chain partners seek to justify investments in more intense relationships (Romano, 2011).

Supply chain collaboration categorises organisational performance into three types: strategic, financial and operational (Fabbe-Costes & Jahre, 2008; Chen & Paulraj, 2004). Operational performance encompasses the enhancement of supply chain organisational measures including on-time delivery, cycle time reduction, logistics cost reduction and inventory turnover. The proper execution of SCC would lead to better operational performance (Talavera, 2013). The financial performance with international suppliers occurs when efficiency improvement and cost reduction is needed (Stratton, De Leeuw & Sabet, 2016). Moreover, collaboration with international suppliers, through information sharing, leads to better financial performance and cost reduction of buyers (Huo, 2012; Kumar & Banerjee, 2012). Financial performance is effective when costs are optimised across the entire value chain. Strategic performance is attained as a result of focusing on broader business goals such as increasing market share, creating new revenue streams, improving customer service and increasing productivity.

Supply chain collaboration directly improves organisational performance in terms of growth of sales, return on investment and profitability margins (Cao & Zhang, 2011). The supply chain partner who possesses a higher level of collaboration is able to achieve innovative activities and improved operational performance (Banchuen, Sadler & Shee, 2017).

Organisational performance is influenced by factors such as the growth of market share, return on investment (RIO) growth, the growth of sales together with the profit margin on sales and overall competitive position (Mathuramaytha, 2011). Organisational performance can also be measured by quality, cost and delivery time (Krause *et al.*, 2007). In the FMCG industry, the performance of the organisation can be measured by customer satisfaction and service quality levels in terms of order accuracy and delivery time (Simatupang & Sridharan, 2005).

Therefore, effective performance in the FMCG industry occurs when organisations are able to react positively in terms of meeting the needs of customers and consumers through the delivery and products at the right location, at the right time, of the right quality and in the right quantity. In this study, organisational performance is measured by growth of the following: sales, the profit margin on sales and return on investment. Organisations tend to judge the effectiveness of their collaborative relationships with supply chain partners in relation to their performance (Bartlett, Julien & Baines, 2007). For organisations that have collaborative programmes in place, supply chain performance is known to be a fundamental determinant for nurturing and maintaining the relationships (Ramanathan, 2012). Furthermore, supply chain collaborating partners tend to become more satisfied when their supply chain performance is improved (Prajogo, Daniel & Olhager, 2012). Having discussed SCC, the next section presents SCC performance framework

2.15. Supply chain collaboration performance framework

Supply chain collaboration performance occurs as a result of informational, operational and relational collaboration. Collaborative performance should have a positive impact on the overall organisational performance such as improving business, relational and operational factors. Conversely, supply chain performance is only effective if it improves supply chain efficiencies such as speed, cost and quality. Figure 2.3 clearly shows the end-to-end SCC framework where the end goal is to improve the organisational performance.

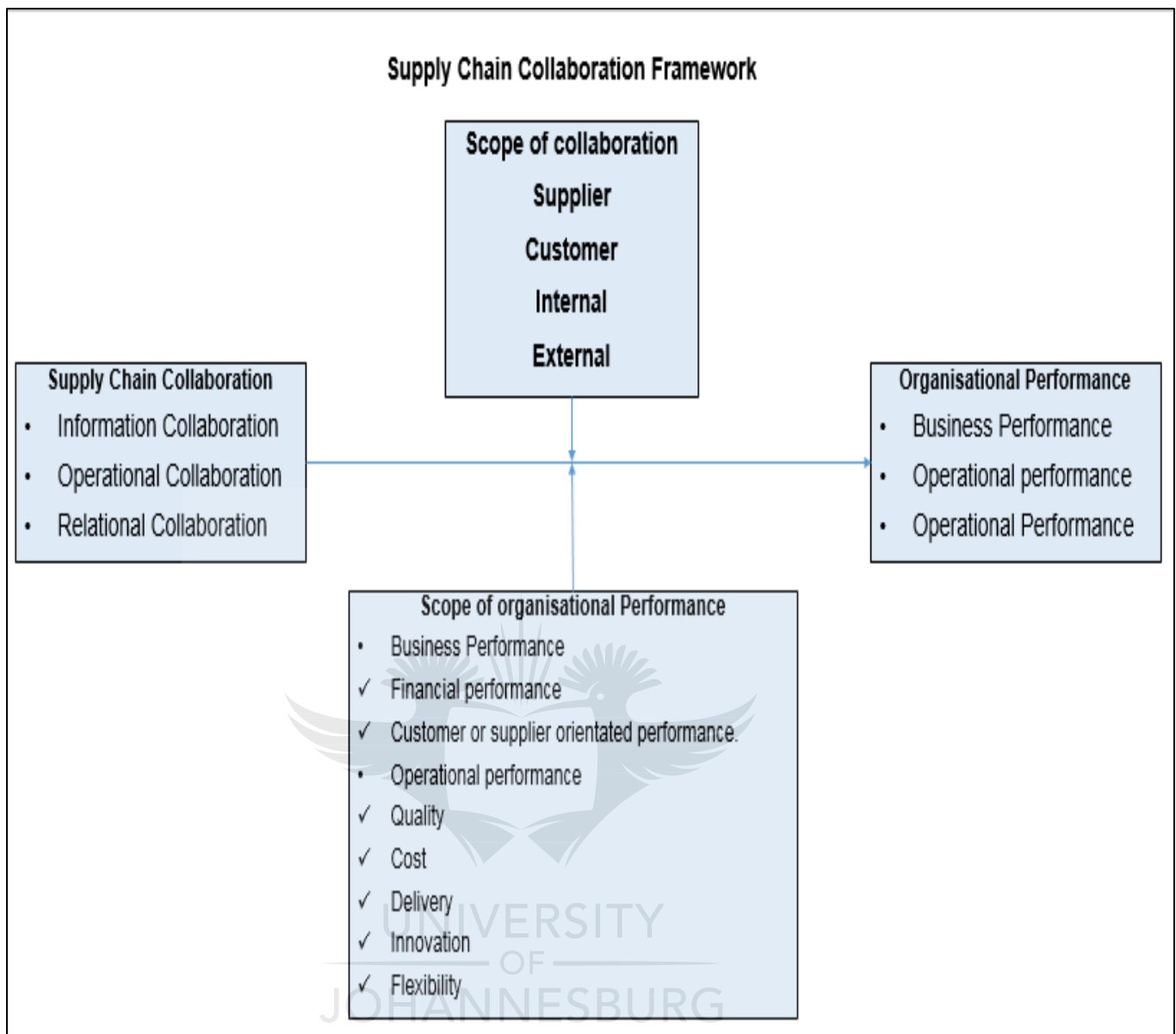


Figure 2.3: Supply chain collaboration framework

Source: Adapted from Leuschner, Rogers & Charvet (2013: 42)

There is an increased need for supply chain partners such as suppliers and customers to work together more closely. The SCC framework in Figure 2.3 indicates that collaborative relationships have the potential to create a competitive advantage for organisations, which allows enterprises to have one or a combination of the following capabilities when compared to its competitors: dependable delivery, competitive pricing, production innovation, premium pricing and added value-to-customer quality (Mathuramaytha, 2011). A competitive advantage is created through well-managed relations that enable organisations to share information continuously. The ultimate

goal is a positive impact on the organisational top line, bottom line and higher ROI for all supply chain partners.

2.16. Conclusion

Intense global competition has compelled organisations to optimise their operations through SCC initiatives. Supply chain collaboration is fast becoming a focal point for many organisations, especially in the FMCG industry. As a result, organisations are more likely to attain supply chain efficiencies in their operations as they collaborate with their international partners. Such efficiencies result in improved organisational performance in the form of increased profitability. Consequently, this chapter discussed various SCC collaborative initiatives that can be used to enhance organisational performance in the FMCG industry, including the benefits and barriers associated with the implementation of such initiatives. The enablers and resisters to successful SCC were also presented.

It can be concluded that SCC is highly dependent on the effective cooperation of organisations that seek to achieve common goals. However, the benefits of collaboration are not simply attained by default. Partners must purposefully dedicate their efforts towards attaining these benefits. Successful collaboration is the one which results in the sharing of risks and rewards by all involved parties. Collaboration must be correctly implemented if it is to be successful. The ultimate goal of SCC should be to maximise the profitability of all involved partners.

Finally, the preceding literature review provided the framework to develop the research instrument that is used to collect data from NHM-SA and its partners. The next chapter discusses the methodology of this research.

CHAPTER 3

Research Methodology

3.1. Introduction

In this chapter, the research design and methodology, the geographical area where the study was conducted, the study population, the sampling technique and size are discussed. In addition, the instrument used for data collection, including methods to maintain validity and reliability of the study are presented. Finally, the chapter provides an explanation of the statistical procedures applied in the study to analyse the data.

3.2. Research goal

The goal of any study is either basic or applied research. For the purposes of this study, the researcher made use of applied research. Fouché and De Vos (2011) indicate that applied research induces a change in a troublesome situation in order to solve specific problems in practice.

The applied research goal of this study is as follows:

To investigate the role of collaboration with international suppliers in improving the organisational performance of NHM-SA in the South African FMCG industry using a case study approach.

Applied research is well suited to the purposes of this study due to its ability to accomplish certain tasks and solve specific problems. The researcher is of the view that SCC with international suppliers has the potential to result in supply chain operational efficiencies to enhance organisational performance. As specified in chapter one, the primary research objective is as follows:

- To investigate the role of collaboration with international suppliers in improving the organisational performance of NHM-SA in the South African FMCG industry.

The following secondary research objectives are also in place in order to support the attainment of the primary objective:

- To examine the influence of SCC on organisational performance at NHM-SA.
- To determine the effect of communication between NHM-SA and its collaborating partners on organisational performance.
- To establish the impact of SCC on supply chain efficiencies for NHM-SA and its partners.
- To establish the effect of information sharing between NHM-SA and its collaborating partners on organisational performance.

To achieve the study objectives, the research methodology that was followed is discussed in detail in the following sections.

3.3. Research Philosophy

According to Saunders *et al.* (2016: 142-143), the term 'research philosophy' refers to a system of beliefs and assumptions about the creation of information. A research philosophy determines ways in which data about a phenomenon could be collected, analysed and used (Creswell, 2013). Four major research philosophies have been identified, namely, pragmatism, positivism, realism and interpretivism (Saunders *et al.*, 2016). These philosophies are discussed in detail in the following section.

Pragmatism

Creswell (2014) indicates that pragmatist researchers focus on the ability of research findings to generate practical consequences. This philosophy only accepts concepts as relevant if they support action (Burns & Bush, 2014). The research questions are the most important determinant in pragmatic research (Saunders *et al.*, 2016). This philosophy can accommodate more than one research approach or strategy within the same study (Babbie & Mouton, 2011). Saunders *et al.* (2016) contend that the pragmatist research design seeks to facilitate relevant, reliable and credible data collection so that subsequent constructive action can be taken.

Positivism

This philosophy is based on the idea that science is the only way to learn about the truth (Babbie & Mouton, 2011). Creswell (2013) observes that positivism adheres to the view that only 'factual' knowledge, gained through observation and measurement, is trustworthy. This philosophy limits the role of the researcher to data collection and interpretation in an objective way (Saunders *et al.*, 2016). Thus, positivist studies mean the researcher is detached and independent of the study. However, there are no provisions for human interest within this type of study (Creswell, 2013).

Interpretivism

According to Saunders *et al.* (2016: 144), the primary data generated via interpretivist studies is associated with a high level of validity. The reason for this is that data in such studies tends to be associated with high trustworthiness and honesty. This philosophy is based on a naturalistic approach to data collection such as interviews and observations (Creswell, 2012). Moreover, this approach integrates human interest into a study (Babbie & Mouton, 2011).

Realism

This approach centres on the idea of independence of reality from the human mind (Saunders *et al.*, 2016). Realism is based on a scientific approach to the creation of knowledge, namely, direct realism and critical realism (Babbie & Mouton, 2011). Direct realism portrays the world through personal human senses (Hair *et al.*, 2010) whereas critical realism contends that sensations and images of the real world can be deceptive as they do not necessarily portray the real world (Creswell, 2013).

The present study was conducted using the pragmatist philosophy since it is a value-driven study conducted in real life context. The outcomes of this research will inform future business practice at NHM-SA (Saunders *et al.*, 2016). The pragmatic approach was thus deemed the best-suited method to address the research problem. In addition, this philosophy enabled the study choice of research approach to be linked directly to the purpose and the nature of the research questions.

3.4. Research methodology

Research methodology defines the universal approach applied when conducting the research project (Leedy & Ormrod, 2013). The research methodology refers to the research tools, process and procedures used when conducting research.

3.4.1. Types of research

There are three types of research, namely, exploratory, descriptive and causal (Collins & Hussey, 2014).

Exploratory research

Burn and Bush (2010) define exploratory research as the process of gathering information in an informal and unstructured manner. Zikmund and Babin (2010) specify that exploratory research is a way of discovering ideas or clarifying unclear situations that could result in a positive potential business opportunity. These authors continue to say that exploratory research is used when little is known about a problem, hence its 'exploratory' nature. This method is often preferred when the study objective is to find a fundamental understanding of a phenomenon or to formulate a hypothesis (Burn & Bush 2010). Exploratory research is valuable in terms of finding out what is happening in order to ask questions, seek new insights and assess phenomena in a new light (Van Staden, 2011). Exploratory research is ideal as an initial step when a problem is broad and ill-defined (Creswell, 2013). Moreover, exploratory studies examine phenomena, perceptions, attitudes and ideas of specific social groups that have not been examined as intensely and consistently as other groups (Sue & Ritter, 2012).

Descriptive research

According to Zikmund, Babin, Carr and Griffin (2010), descriptive research is concerned with the relationship between two variables or the frequency with which something occurs. Burn and Bush (2010: 57) indicate that descriptive research addresses the "who, what, when, where and how?" questions of a study. These authors further contend that research that is descriptive in nature encompasses the collection of organised and well-structured statistical data that can be proven through the application of statistical testing techniques.

Causal research

Zikmund *et al.* (2010) indicates that “in causal research, the design is concerned with determining the cause and effect relationship between identified study variables”. Burns and Bush (2014) state that causal research answers the question “Why?” They further indicate that causal research is also experimental research because the researcher must physically conduct tests in order to arrive at an outcome.

Given these three types of research indicated, the present study was conducted using both exploratory and descriptive research methods. The theory of SCC was explored by utilising secondary approach extensive journal database as well as google scholar. Various academic thesis, scholarly articles, books, annual reports and the company website covering SCC related topics were used. The data gathered was analysed using descriptive and inferential statistics, which described the SCC initiatives, being implemented by NHM-SA and its international suppliers. Furthermore, the descriptive method allowed the researcher to deploy a number of variables and to describe, explain and validate the research findings.

3.5. Research approach and design

The research provides a strategy or a practical plan to answer questions regarding social problems (Neuman, 2011). A research design acts as the overall plan of methods used to collect and analyse data (Hair *et al.*, 2010). Creswell (2011) describes three types of research design, namely, quantitative, qualitative and mixed methods.

Any research study involves qualitative or quantitative analysis or a combination of both (Zikmund *et al.*, 2010). Qualitative research is known to be exploratory in nature and is based on small samples such as focus groups and in-depth interviews (Malhortra, 2010). Qualitative research is intended to disclose the range of perceptions and behaviours of respondents, with reference to specific issues and topics (Burns & Bush, 2014). A qualitative research approach elicits a participant’s account of meaning and yields descriptive data in the participant’s own spoken or written words (Cho & Lee, 2014).

Quantitative research is based on empirical data and presents numerical results; hence, it also possesses high validity and credibility (Ranganathan & Premkumar, 2012). Burns and Bush (2014) assert that quantitative research is specific. Therefore, it is the researcher's responsibility to know what information is exactly needed to fulfil the study purpose. One can conclude that quantitative research involves the collection of data in the form of numbers. Similarly, quantitative research relies on the use of statistical tools to analyse data. Moreover, quantitative research is aimed at measuring the social world objectively, and to test hypotheses. Therefore, the researcher should objectively evaluate numerical data and eliminate any possible research bias.

For the purpose of this research, a quantitative approach is used. The choice of this method was influenced by the research questions and objectives as it will enable the researcher to draw high-level conclusions on a broad set of research units. Quantitative studies employ strategies of inquiry for instance surveys and experiments to gather data using predetermined research instruments that yield statistical data (Creswell, 2009). Weathington, Cunningham and Pittenger (2012) indicate that quantitative research tests predetermined hypotheses that are formed based on existing theory.

Moreover, quantitative research is suitable for measuring perceptions, attitudes and behaviours. In this study, the quantitative method will allow the researcher to draw a conclusion on collaboration effectiveness with international suppliers based on their knowledge, experiences and perceptions with NHM-SA.

Table 3.1 compares qualitative and quantitative research approaches in business research.

Table 3.1: Qualitative vs quantitative studies

	Qualitative Approach	Quantitative Approach
Epistemological	Phenomenology	Positivism
Methods	Inductive	Deductive
Purpose	detailed descriptions of social reality are constructed	Cause and effect hypothesis concerning social reality
Analysis	Thematic	Statistical
Key Factor	Authenticity	Reliability
Language	Uses participant's natural language	Statistical results are numerous and concepts are converted in operational definitions
Suitability	Seeks to understand the phenomenon	Seeks to control the phenomenon
Research Methods	Observation types are modified to enrich understanding	Systematic, standardised
Design	Unique and flexible	Standardised with fixed procedures
Researcher	Involved	Detached
Unit of analysis	Concentrates on relationships between elements (Holistic)	Elements that form part of the whole (Atomistic)

Source: Adapted from Creswell, 2011; Collins & Hussey, 2014; Saunders, Lewis & Thornhill, 2016.

As indicated in the preceding section, this research will only use quantitative methods since this is deemed to be the most suitable approach in terms of answering the research questions and objectives of this study.

The study followed a deductive research reasoning. Deductive research involves the testing of a theoretical proposition by the use of a research strategy specifically designed for the purpose of its testing (Cho & Lee, 2014). According to Creswell (2013), the research approach is deductive when the hypothesis and theory are established, and a research strategy is designed to test the hypothesis. In this study, the deductive method allows the researcher to start his study with a theoretical framework and thereafter arrive at predictions based on this theoretical content about the empirical findings. These predictions are subsequently verified with collected data to validate their factual orientation.

3.6. Research strategy

A survey is defined as a research strategy involving the collection of data that is structured from a sizeable population (Saunders et al., 2016). Sue and Ritter (2012) equally indicate that surveys involve the well-structured method of collecting data from a sizeable population. A survey is also defined as a document containing a set of questions designed to prompt information appropriate for study analysis (Babbie & Mouton, 2011). Survey research involves collecting and analysing data from a few subjects or items that are considered to be representative of the entire group (Hair *et al.*, 2010). A survey usually focuses on vital facts such as respondents' opinions, beliefs, perceptions, motivations, attitudes and behaviour. In this study, a survey would be used to gauge the perceptions of international suppliers based on their collaborative efforts with NHM-SA. Similarly, a questionnaire was therefore designed to explore the international suppliers' perceptions, knowledge and attitudes to supply chain efficiencies and organisational performance that occurred as a result of collaborating with NHM-SA. Their perceptions allowed the researcher to draw conclusions about whether SCC results in supply chain efficiencies that ultimately enhance organisational performance.

An online survey research design was chosen because of its ability to answer designated questions and to meet the study objectives. An online survey allowed for the faster and more efficient collection of data on a wider geographic scale since the information was collected from multinational suppliers of NHM-SA. The online survey was the best method due to respondents having access to work email. The online research questionnaire is attached in Appendix A.

3.7. Research setting

The study was conducted with international suppliers of raw materials and finished goods for NHM-SA. NHM-SA falls under the Africa Oceania and Asia (AOA) region as per the geographic demarcation of the organisation. Based on the database created by the researcher, it was discovered that the company has a total number of 100 international suppliers of both raw materials and finished goods.

3.8. The population of the study

Neuman (2011: 341) defines a research population as “*the abstract idea of a large group of many cases from which a researcher draws a sample and to which the results from a sample are generalised*”. Babbie (2011) terms the research population as the subjects, which will be the focal point for drawing conclusions. For the purposes of this study, the researcher chose topic-specific experts with specialised job expertise and close involvement with NHM-SA concerning the supply of imported goods. As indicated earlier in section 1.6, a survey was administered to a purposively designated sample from a specific population recognised by the researcher. The selection criteria is identified in section 3.10.

The target population of this study comprised 100 international suppliers of NHM-SA. The accessible population included, but was not limited to, all of the following job descriptions: Intermarket supply planners, event managers, production managers, factory planners, finance controllers and customer service consultants. This population was chosen because of working directly with NHM-SA. Moreover, this population was directly involved in the supply of goods to NHM-SA.

Table 3.2 indicates the total number of NHM-SA international suppliers (population) per zone. Zone 1 and Zone 2 consists of European (EUR) and American (AMR) suppliers while, Zone 3 is made up of suppliers from Africa, Asia and Oceania (AOA).

Table 3.2: Population of NHM-SA international suppliers

Zone No:	Zone Name	Number of Suppliers
1	Europe (EUR)	54
2	America (AMR)	14
3	Africa, Asia, Oceania (AOA)	32
Total		100

Source: *Researcher's own compilation*

As stated previously, the identified population was considered as appropriate for this study since it is directly involved in the supply of goods to NHM-SA. Based on the survey responses, most of these suppliers had several years of experience working in international markets and with NHM-SA in particular. These suppliers are, therefore

considered to be in the best position to provide information and to answer the research questions of this study.

3.9. Target population

In cases where it is not feasible to study the entire population, a sample of the population is required (Creswell, 2014). The sub-group or part of the population that is selected is known as the target population (Saunders *et al.*, 2016).

After the creation of the supplier database, it emerged that the study population would consist of 100 international suppliers. Since the population of 100 was relatively feasible, it was possible to study the whole population instead of drawing a sample. Therefore, the sample included 100 international suppliers of NHM-SA for both raw materials and finished goods.

3.10. Sampling method and sampling criteria

Zhi (2014) indicates that probability and non-probability sampling are two types of sampling methods. Probability sampling affords an equal opportunity of every population member of being selected (Elliott & Valliant, 2017). Keiding and Louis (2016: 372) define non-probability sampling “*as a sampling technique where the samples gathered do not give all individuals in the population equal chances of being selected*”.

In this study, the population and the sample were the same. However, the selection criteria of the population ensured that knowledgeable and experienced participants with the capacity to provide meaningful information were chosen. For the purposes of this study, purposive sampling was achieved through a contact list of NHM-SA international suppliers, provided by NHM-SA imports planners of different categories.

Purposive sampling, also known as judgement sampling, is a non-probability sampling technique used to select a sample of units/subjects from a population (Etikan, Musa, & Alkassim, 2016). This technique allows a researcher to find respondents who are capacitated enough to provide the required information by virtue of their experience or knowledge (Robinson, 2014). Participants are thus specifically chosen based on the

qualities that they possess. Therefore, it is the researcher's duty to identify and select participants who are capable and knowledgeable about the phenomenon of interest (Saunders *et al.*, 2016). Respondents' readiness to partake and their capability to communicate opinions and experiences in an expressive, reflective and articulate manner is crucial in purposive sampling. The researcher consolidated international suppliers contact lists to create a single contact list and selected individuals who were then requested to take part in the study.

Specific selection criteria were applied to all subjects who were selected. International suppliers had to meet the following criteria:

- Supply goods to NHM-SA for at least the past 12 months;
- Be the international key contacts of NHM-SA;
- Be the main recipients of orders that are placed by NHM-SA; and
- Be involved in daily operations pertaining to the supply of goods to NHM-SA.

3.11. Data collection sources

The data collected for a study can stem from two different sources: primary or secondary (Sekaran & Bougie, 2013). Primary data is gathered through experiments, observations or interviews that are specifically designed for a study (Andrews, Higgins, Andrews & Lalor, 2012). Primary data involves the collection of information first-hand for the research problem at hand. In contrast, secondary data means using readily available printed data such as written reports, literature or internet sources (De Leeuw, Hox & Boevé, 2016). Secondary data thus refers to information that already exists.

For this study, primary data was collected through a web-based (online) survey. McDaniel and Gates (2010: 528) highlight that "*web survey software is a popular means of conducting online surveys*". After the completion of the pilot test on five international suppliers and all other necessary modifications, the questionnaire was administered directly to the purposively selected subjects. The survey was thus circulated to 100 international suppliers of NHM-SA. Of the 100 international suppliers, 91 completed the survey within the specified time, providing a response rate of 91 per cent. However, only 50 of the 91 responses were usable. The remaining 41 responses could not be used due to non-compliance with the minimum selection criteria

(answering more than 75% of the questions) that was set for the study. Babbie and Mouton (2011) indicate that a survey response rate with a minimum of 60 per cent is regarded as good. In this study, only participants who had answered more than 75 per cent of the questions were selected. However, only 50 respondents met this criterion, which meant that 57 per cent of respondents provided meaningful data. Some seminal authors (Fugard & Potts, 2015) (Creswell, 2014) (Delice, 2010) recommend minimum sample sizes of 50 cases in quantitative studies. Hence, the sample size for this study was considered to be suitable.

3.12. Research instrument for data collection

The online questionnaire was chosen as the study research instrument. The respondents accessed the online questionnaire through a link in the email invitation circulated to the purposively selected sample. After completing the questionnaire, respondents were requested to submit the completed questionnaire by clicking the 'submit' button at the end of the questionnaire. The online survey questions were formulated in accordance with the study objectives. The study questions were designed in house using literature.

The online research questionnaire contained two sections:

- **Section A** – This section requested the personal data of respondents in order to understand their demographics.
- **Section B** – This section consisted of 11 segments, namely: International Customer Information; Demand and Supply Planning; Import Operations; Management of Change; Communication; Cost improvement; Production Flexibility; Customer Relationship Management; Organisational Performance; Shipping Performance and Payment Information. These segments were designed to explore the collaborative relationships that exist between NHM-SA with its international suppliers. Each segment has its own questions. These questions were designed in house using the literature.

The research instrument used a five-point Likert-type scale, ranging from strongly disagree (0) to strongly agree (4) to score the respondents' level of agreement with the different statements. Based on their knowledge and experience of working with

NHM-SA, respondents were requested to indicate their levels of agreement with the questions or statements contained in Section B of the research questionnaire.

3.13. Research process

In this study, a database of NHM-SA international suppliers was created after the collection of their contact details from Intermarket Supply Planners (IMSP) of different organisational business units. IMSP are employed by NHM-SA and are involved in daily business operations of the company's imported goods. The IMSP is the main point of contact for international suppliers on behalf of NHM-SA. Their core task is to collaborate with NHM-SA suppliers in order to ensure supply for the organisation (NHM-SA). An email was sent to all identified respondents notifying them that NHM-SA would be conducting a survey and that their participation would be much appreciated. In this communication, the researcher also indicated the purpose of this study and how it was expected to benefit NHM-SA as well as its international suppliers.

3.14. Data collection procedure

This research was designed with one type of online survey that was suitable for international suppliers who are both affiliates and non-affiliates of NHM-SA. The link to the online survey was circulated to identified participants via an email, and it was indicated that the respondents could access the questionnaire during a three-month time window, from November 2017 to January 2018. During this period, the researcher sent weekly reminders to respondents reminding them to complete the survey.

3.15. Methods of data analysis

Collected data was organised and analysed in the following manner. The Statistical Package for Social Sciences (SPSS) version 25 was used for analysis of all survey close-ended questions. In addition, data were analysed through descriptive statistics. Both frequency and descriptive tables were created to display results in relation to the study questions. Participants who answered less than 75 per cent of the questions were discarded from the analysis on the premise that their responses were insufficient (Sue & Ritter, 2012). Therefore, respondents had to have answered at least 50 out of

67 (75%) questions to be included in the analysis. After the frequency tables were drawn, data was presented in bar graphs and interpreted. The interpretation of results is discussed in Chapter 4.

Statistically weighted means were calculated and analysed with reference to the research questions. The respondents' response options in the instrument were weighted as indicated in Table 3.3. The Likert-type scale was only used in Section B since Section A was based on demographical questions.

Table 3.3: Points allocation based on Likert-type rating scale

0 Points	1 Point	2 Points	3 Points	4 Points
Very Poor	Poor	Average	Good	Excellent
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Never	Hardly Ever	Sometimes	Most of the time	Always

Source: Researcher's own compilation (2018)

The minimum accepted points for the above items were 2.50. Any mean below 2.50 was rejected and regarded as un-prevalent and unpopular. The close-ended questions were analysed through the use of quantitative content analysis. The aim was to quantify developing concepts and characteristics. Weathington *et al.* (2012) indicate that content analysis is the method of analysing either written or verbal communication in a systematic way to quantify study variables quantitatively.

3.16. Study validity and reliability

Reliability and validity are considered significant aspects of research design (Oluwatayo, 2012). A well-designed research questionnaire elicits consistent responses (Wilson, 2010). In this study, the researcher applied the following guidelines for designing a robust questionnaire, as recommended by Sue and Ritter (2012):

- Precise terminology in phrasing questions;
- Clearly written questions, avoiding unnecessary jargon, cumbersome phrases or difficult words;

- Avoid making unjustified perceptions and assumptions about the respondents;
- Eliminate double barrel questions;
- Select a suitable response format; and
- Pre-test the study questionnaire.

3.16.1. Validity

The overall objective of the research is to define valid, new and reliable knowledge (Ranganathan & Premkumar, 2012). Inherent validity has to be built-in to the research process for a study to be deemed valid. Validity describes the extent to which a study measures what it is intended to measure (Hair et al., 2010). Zikmund and Babin (2010) describe validity as the extent to which a score signifies a concept or the correctness of the measure. These authors further indicate that a scale with perfect validity contains no measurement error. Higher validity means the purpose of measuring is fulfilled with a higher level of sureness (Williams & Vogt, 2012).

Oluwatayo (2012) describes two categories of validity, namely internal and external validity. Internal validity refers to whether the study indicates causal relationships in the cases where they exist (Holland & Piper, 2016). Internal validity can be attained using two equal groups concerning dependent and all nuisance variables (Ficko & Boncina, 2014). Roe and Just (2009) state that in a study internal validity looks at the extent to design, enables the researcher to draw precise conclusions about the cause and effect relationships. They further indicate that it is the researcher's responsibility to eliminate any other possible explanations of any observed results in order to ensure the internal validity of the research. If one is not confident that the research findings can be applied beyond the narrow confines of a study, that study lacks internal validity. In this study, internal validity was ensured by means of existing questionnaires and the substantial theoretical framework from other related studies. External validity is interrelated with the width results and whether it is likely that the study results can be applied at other occurrences or in other situations than the ones actually being studied (Sundarakani *et al.*, 2010). The lack of random selection is a common threat to external validity.

According to Malhotra (2010), there are three types of validity, namely, face validity, construct validity and criterion validity. These three types of validity are explained in relation to the study in the following manner.

Face validity

Face validity refers to the relationship (similarities or correlation) between the researcher's explanation of concepts and his or her explanation of categories being measured (Leedy & Ormrod, 2013). According to Malhotra (2010), face validity encompasses a methodical but subjective evaluation of how well a scale measures the variable or construct of interest. Face validity is also an agreement that a scale, measure or question appears logically to precisely reveal what it was intended to measure (Saunders *et al.*, 2016). Similarly, face validity specifies whether the scale provides suitable coverage of the topic under study (Hair *et al.*, 2010) and whether it is based on the researcher's evaluation of a scale's capacity to measure what it is invented to measure (Creswell, 2014). In other words, the researcher uses his or her expert judgement to determine the validity of the study. For the purposes of this research, face validity determines whether a questionnaire, after a superficial assessment, looks valid at first glance for all selected respondents of the study who have to complete it. This indicates that face validity does not refer to what items of a questionnaire actually measure, but relatively what the researcher intends to measure on the first encounter. This means that each item or question on the measuring instrument should have its own logical link with study the objective.

In this study, the research questionnaire was submitted to the University of Johannesburg's STATKON services and to NHM-SA professionals to test the face validity through a review process. These experts also addressed the research content validity through a rigorous review of survey questions. Face validity was increased by conducting a pilot test in order to validate the representativeness and relevance of various items. Finally, the researcher attained content validity by compiling the constructs with the items gathered from other previous related studies such as the ones conducted by Simatupang and Sridharan (2018), Ramanathan (2014), Cao and Zhang (2011) and Baumann and Andraski (2010).

To verify face validity, the researcher reviewed the literature to find similar scales that were used by experts in the field. The researcher also consulted subject matter experts

(SMEs) and research methodologists. The SMEs has an in-depth knowledge of the specific area that is being studied while the research methodologist is an expert in the creation of the survey process (Sue & Ritter, 2012). The SMEs advised the researcher about the feasibility of achieving the intended study objectives through the usage of the online survey. Conversely, the methodologist helped to ensure that specific and measurable objectives were created for the study.

In the validation process of this study, hard copies of the questionnaire were printed out and given to both the Supply Chain Director and the Corporate Demand and Supply Planning Head of NHM-SA. Thereafter, the questionnaire was submitted to STATKON for further review.

Construct validity

Malhotra (2010) indicates that construct validity seeks to address the question of which characteristic or construct the scale is intending to measure. Construct validity relates to the number of assumptions underpinned by literature (theory) that is applicable to the concept (Sundarakani, *et al.*, 2010). In this study, relevant questionnaire items were established in accordance with the theoretical underpinnings of SCC management. Moreover, construct validity is tested using correlation analysis (for example in Figure 4.17). The fact that positive correlations were obtained, it implies that construct validity was good in this study.

Criterion validity

Zikmund *et al.* (2010: 308) classifies criterion validity as “*either concurrent or predictive validity, depending on the time sequence in which the measurement scale and criterion are interrelated*”. Williams and Vogt (2011) indicate that criterion validity is the measure’s capability to correlate with other established measures or similar constructs. Predictive validity was tested using regression analysis. The positive beta values (for example in Figure 4.20) testify that there is good predictive validity.

3.16.2. Reliability

Reliability looks at the degree of consistency levels within which a tool (instrument) measure the aspects of what it was initially designed to measure (Creswell, 2013). Saunders *et al.* (2016) further indicate that reliability is a true indicator of measuring internal consistency. Salkind (2012) mentions the terms stable, consistent, dependable, predictable, trustworthy and faithful as synonymous with reliability. Muijs

(2011) cautions that measurement error is likely to occur whenever researchers seek to measure something. Therefore, reliability refers to the magnitude to which the test score is free of any possible measurement error. Reliability indicates to what extent one will receive the same results should the study be repeated over some time (Malhotra, 2010) so, for instance, two or more researchers studying the same phenomenon that consists of similar purpose should be in a position to obtain approximately the same results (Hair *et al.*, 2010). Moreover, reliability measures must be free from random error (Malhotra, 2010).

The researcher paid careful attention to how the data was gathered, analysed and interpreted to strengthen the reliability of this study. The data was collected from relevant NHM-SA international suppliers, and the survey feedback was automatically captured in the system that was provided by STATKON. As a consequence, no information submitted by respondents was omitted and the analysis performed was highly reliable.

Although perfect reliability is seldom achieved, Salkind (2012) suggests the next procedures to increase the trustworthiness and reliability of measures, which were applied in this study:

- Eliminate unclear items;
- Standardise instructions;
- Increase the level of measurement;
- Maintain consistent scoring procedures;
- Minimise the effects of external events;
- Apply standard conditions under which the test is taken;
- Use replications, pilot studies and pre-tests;
- Moderate the degree of difficulty for the instrument; and
- Increase the number of observations or items, such as the use of multiple indicators of the variable.

In this study, the survey questions that were answered by respondents revealed a consistency in responses. The researcher also ensured the reliability of the study through the minimisation of data collector bias. The researcher and the STATKON consultant were the only ones with access to the survey administration, the online

survey and real-time monitoring of survey responses from respondents. The researcher standardised the survey conditions to respondents. Moreover, the researcher provided the necessary explanations and support required by respondents in order to complete the online survey.

Numerous procedures exist for establishing the validity and reliability of an instrument (Malhotra, 2010). These procedures include the alternate-form and test-retest methods and the split-half technique (Gratton & Jones, 2010). For the purposes of this research, a pilot study was conducted and the Cronbach's alpha coefficient (α) was utilised to assess the reliability of the measurement instrument (Creswell, 2014). In addition, the Cronbach's alpha coefficient was used to determine the reliability of the data collected by the researcher. A purposive sampling method was applied in this study. Similarly, the Likert-type scale questions were utilised in the research instrument. The Cronbach's alpha coefficient will be discussed in more detail in Chapter 4.

3.17. Pre-testing the questionnaire

During the pre-test, respondents were requested to complete the study questionnaire and to provide their views concerning identified issues such as the sequence of topics and questions, clarity of instructions and questions and anything that may potentially be confusing or difficult to understand (Hair *et al.*, 2010). The pre-testing of a survey helped the researcher to identify if:

- Respondents understood each item easily and clearly;
- Respondents interpreted each item in its original intended meaning;
- Survey items have a spontaneous relationship to the study intended goals and topic;
- Researcher's intent behind each item is clear to respondents who are well-informed about the subject;
- There is a need to rephrase certain questions;
- Respondents will not be willing to respond to some items;
- There is workability of the study proposed method for data analysis; and
- Questions are clear enough and can be easily understood.

Considering these principles, the researcher asked five international suppliers from different companies, including the Corporate Head of Demand and Supply Planning at NHM-SA to respond to the survey instrument and the proposed study questionnaire. The responses were grouped as follows: (i) clarity of questions, (ii) clarity of direction, (iii) constraints of response and (iv) relevance of the question to the study. Finally, the respondents were asked, “Are there any other additional questions and issues that you think should be included in this survey?” Results of the respondents’ responses were collected and analysed. After the piloted respondents completed the survey, the researcher organised telephonic interviews with each respondent to validate any challenges they may have encountered when completing the online survey. The questionnaire was also reviewed and approved by STATKON.

The pilot study thus enabled the researcher to identify and correct any shortcomings as well as generate useful feedback on the design, structure and flow of the questionnaire. Piloted respondents provided their input related to the elimination of duplicated questions, revision of unclear and ambiguous questions. The final questionnaire was submitted and approved by the NHM-SA Demand and Supply Planning Corporate Manager, the Supply Chain Director, the research supervisors and the STATKON consultant.

3.18. Study respondents

Due to the researcher’s employment at NHM-SA, the researcher had direct access to the IMSPs of the organisations. The researcher was thus able to consolidate the contact list of international suppliers as provided by the IMSPs. Initial contact was made to international suppliers through NHM-SA’s IMSPs.

The study participants emerged from the following countries: Germany, Korea, Netherlands, Japan, United States of America, Spain, United Kingdom, China, Austria, Belgium, Bulgaria, Vietnam, France, Philippines and Singapore.

3.19. Response rate

Irrespective of the sampling method used, researchers are confronted by the issue of non-responses to surveys. Craighead, Ketchen, Dunn and Hult (2011) are of the

opinion that non-responses would not add any value if the researcher could be certain that non-respondents were very similar to respondents on all relevant variables and that they would have given similar answers to the ones that were provided by respondents if they had taken part in the survey. Melnyk, Page, Wu and Burns (2012) indicate that non-responses occur because of reasons such as:

- Ineligibility to respond;
- Refusal to respond;
- Inability to locate participant; or
- Participant located, but unable to make contact.

The main shortcoming of a low response rate is that it limits the researcher from generalising the results of the questionnaire. Equally, low response rates make the final sample smaller, which indicates that there is less statistical power to test the hypothesis (Sue and Ritter, 2012). In this study, the researcher took the following initiatives to maximise the response rate:

- Questions were kept short and attractive;
- All participants were promised to receive study results; and
- Weekly follow-up emails were circulated to respondents as a reminder requesting them to complete the questionnaire.
- Real-time Skype sessions with respondents who had clarity seeking questions concerning a questionnaire were conducted.

For this study, the questionnaires were distributed to international suppliers of NHM-SA located in AOA, AMR and EUR as per the company's geographic demarcation of zones. The duration for survey completion was estimated to take 15 minutes on average. This was calculated during the pilot study phase.

3.20. Ethical considerations

Research ethics guide the researcher in terms of doing what is morally and legally right when conducting research (Mertens & Ginsberg, 2009). Research ethics play a critical role, especially when the research involves direct human contact (Coffey, 2010). Conducting research requires not only diligence and expertise but also trust, respect, integrity and honesty. This is done to protect the rights of respondents

(Weathington *et al.*, 2012). Confidentiality, anonymity, determination and informed consent were maintained to render this study as ethical.

A written consent to conduct this research was obtained from the company under investigation. As indicated in Chapter 1, NHM-SA (a fictitious name) provided informed consent on the proviso that anonymity would be guaranteed. The research participants were asked for informed consent and were offered the opportunity to partake or decline to be part of the study voluntarily. The invitation consisted of a cover page and a link to access the online survey. On the cover page, it was clearly indicated that participation in the survey was voluntary and necessary measures were put in place to protect the anonymity of all respondents. Furthermore, the researcher's contact details were provided in case respondents had any questions that needed to be addressed by the researcher.

The study participants were fully reassured that their answers would be treated with confidentiality. Furthermore, the researcher reiterated that the respondents' information would only be used for academic purposes and only for the purpose of this particular study. The findings of the study will be fully presented to the company that is being studied. Finally, the researcher respected the rights of respondents during the period of conducting this research.

Dantzker and Hunter (2011) indicate that avoiding harm, maintaining integrity and objectivity and protecting confidentiality are major requirements of a researcher when conducting research. To this end, all researchers, regardless of research design, technique, sampling or choice of method, are being subjected to the ethical considerations (Gratton & Jones, 2010). In this study, the following ethical aspects were taken into consideration:

- A detailed prescribed application was submitted to the Research Ethics Committee at the Department of Transport and Supply Chain Management (DTSCM) of the Johannesburg Business School (JBS) for approval. The approval was granted under the ethics clearance code **2017TSCM-008BM**.
- The anonymity of the respondents was ensured.
- Respondents were not subjected to any risk of embarrassment, stress or low self-esteem.

- Consent and approval for the research was obtained from the NHM-SA Director of Supply Chain and the Corporate Head of Demand and Supply Planning
- A written statement in the cover letter guaranteed the right to confidentiality and professional privacy of information obtained from respondents.

3.21. Conclusion

The purpose of this chapter was to define the study research methodology, elaborate on the sample selection, explain the procedures used in designing the instrument and gathering data and it also provides a detailed description of the statistical procedures used to analyse data.

This chapter fully described the study participants, the research design and the research methodology used to determine whether SCC is positively related to supply chain efficiencies, competitive advantage and organisational performance. Moreover, this chapter also discussed the techniques that were applied by the researcher in terms of ensuring that this study fully abide to ethical standards. The researcher also discussed study reliability and validity.

The next chapter discusses the procedures used to analyse study data and it presents the results of these analyses.

CHAPTER 4

Empirical Research Results: Analysis and Discussion

4.1. Introduction

The main research objective of this study is to investigate the role of collaboration with international suppliers in improving the organisational performance of NHM-SA in the South African FMCG industry.

This chapter presents the study analysis of data followed by the research findings of the study. The analysis of data was done to identify and explore the relationship between SCC, supply chain performance (efficiency) and organisational performance in the FMCG organisation. Each analysis interprets and answers the research questions. The normality tests were completed to ensure that both descriptive analyses and sample normality were performed for each study item. Conversely, this study was performed through the usage of two inferential analyses. These inferential analyses consist of the Pearson's correlation and the multiple regression. Furthermore, both these tests (correlation and multiple regression) were used to analyse further and explore the collaborative study relationships between dependent and independent variables.

4.2. Research analysis

To gain a profound understanding of this field research, the study followed both an exploratory and descriptive research designs. The studied literature enabled the researcher to compile the research questionnaire. Moreover, the collected empirical data were analysed in order to achieve the study research objectives. As indicated in chapter 3, an exploratory research approach enabled the researcher to gain a deeper understanding of the subject by examining the perceptions, attitudes and ideas of the study target population. Similarly, the study literature was explored by using secondary data sources. The descriptive statistics are used to analyse data gathered through the empirical field research. In this chapter, the results are presented by means of tables and figures. Lastly, the study analysis would be discussed in detail on the next sections of this chapter.

4.3. The demographic profile of respondents

The online questionnaire data were analysed using SPSS for windows version 25. The questionnaire was distributed to 100 purposively selected individuals (respondents), of which 91 completed the questionnaire. However, only 50 of the completed responses were usable, of which 58 per cent were completed by females, 40 per cent by males and 2 per cent did not disclose their gender. This gender split represents the configuration within the organisation. NHM-SA's annual report of 2016 shows that the company is committed to hiring more females across all levels of the organisation, especially into senior management positions. The majority of the respondents were senior employees (34%), followed by junior employees (20%), senior managers (16%), executive managers (14%), with both junior managers and managing directors at 8 per cent. Approximately 82 per cent of the respondents had more than 5 years of work experience, giving them sufficient knowledge to answer all survey questions. The majority of respondents had Master's degrees (44%), followed by Bachelor degrees (30%), Honours degrees (12%), certificates or diplomas (8%) and high school (6%). In terms of the company zones, 58 per cent of respondents were from Europe, followed by Africa, Asia and Oceania (32%) and America (14%). The profile of respondents is presented in Table 4.1.

Table 4.1: The demographic profile of respondents

Characteristics	Frequency	Percentage of respondents
Male	20	40
Female	29	58
Undisclosed	1	2
Total	50	100
Junior Employee	10	20
Senior Employee	17	34
Junior Manager	4	8
Senior Manager	8	16
Executive Manager	7	14
Managing Director	4	8
Total	50	100
1-5 years	14	28
6-10 years	9	18
11-15 years	9	18
16-20 years	10	20
21 or more years	6	12
Undisclosed	2	4
Total	50	100
High School	3	6
Certificate / Diploma	4	8
Bachelor degree	15	30
Honours degree	6	12
Master's degree	22	44
Total	50	100
Africa, Asia, Oceania	16	32
America	7	14
Europe	27	54
Total	50	100

As mentioned previously on section 3.11, the respondents were required to indicate, on a 5-point Likert-type scale, their level of agreement with a list of 67 supply chain collaborative initiative indicators or statements (see questionnaire in Appendix A) distributed over 11 segments (see Chapter 3, section 3.12). These indicators assessed the organisational performance that occurred because of NHM-SA and its international suppliers' collaborative efforts. The focus was on 11 variables, namely: international customer information sharing (ICI); demand and supply planning (DSP); import operations (IO); management of change (MC); communication (CO); cost

improvement (CI); production flexibility (PF); customer relationship management (CRM); organisational performance (OP); shipping performance (SP) and payment information (PI).

4.4. Preliminary analysis and normality test

To conduct the preliminary analysis, variables were explored through statistical techniques. Several analyses were performed to understand better and inspect the accuracy of data collected for the study. To test normality, the Kolmogorov-Smirnov Test and the Shapiro-Wilk tests (K-S) were conducted for each of the independent variables. Most of the independent variables returned a $p < 0.05$ indicating a violation of the normality (Razali & Wah, 2011). However, visual observation of the normal quantile-quantile (Q-Q plot) plot, Kurtosis and Skewness all revealed a normal distribution. The K-S test is less powerful for testing normality, and it cannot be used for discrete distributions (Saculinggan, & Balase, 2013). Razali and Wah (2011: 21), indicates that *“the Q-Q plot is the most commonly utilised and effective diagnostic tool for checking and assessing the normality of the data”*. According to Pallant (2016: 59), *“normality is described by a symmetrical, bell-shaped curve that has the greatest frequency of scores in the middle, with smaller frequencies towards the two extremes”*. The results of the normality test indicate that no major outliers were discovered in the findings and that all items fell within the acceptable normality range. Hereafter, the total sample size of $n = 50$ remained. The study’s normalised findings are presented in Table 4.2.

4.4.1. Descriptive statistics

The sample normality is interpreted from the values of the kurtosis and skewness tests (Corder & Foreman, 2014). Tabachnik and Fidell (2012: 73), states that *“values that fall within the range of -3 to +3 for the kurtosis test, and -2 to +2 for the skewness test are considered to be within the normal range”*. The normality test findings of the study are shown in detail in Table 4.2.

Table 4.2: Statistical Normality Test

	ICI	DSP	IO	MC	CI	OP	SP	PI
Mean	2.66	2.78	2.78	2.75	2.67	2.77	3.01	3.01
Median	2.57	2.84	3.00	3.00	3.00	3.00	3.00	3.00
Mode	2.29	3.00	3.00	2.00	3.00	2.00	3.00	3.00
Std. deviation	0.71	0.54	0.61	0.68	0.72	0.91	0.67	0.77
Skewness	-0.03	-0.12	0.01	-0.05	-0.41	-0.08	-0.38	-0.50
Kurtosis	-0.58	-0.03	-0.76	-1.01	0.36	-1.29	-0.86	-0.40

ICI = International Customer Information Sharing	PF = Production Flexibility
DSP = Demand and Supply Planning	CRM = Customer Relationship Management
IO = Imports Operations	OP = Organisational Performance
MC = Management of Change	SP = Shipping Performance
CO = Communication	PI = Payment Information
CI = Cost Improvement	

In this study, skewness seeks to assess whether the distribution of responses is deeply focussed on one end of the scale (Pallant, 2016). Based on skewness, all variables were included because they were all based on the Likert-type scale used in this study. Moreover, the cut-off values were within the kurtosis limits. Thus, all variables were kept to perform the study analysis. The overall results indicate that the distribution of the sample is normal. Consequently, the sample can be regarded as acceptable for normal distribution.

This section is going to present descriptive statistics for the following variables, namely, International Customer Information (**ICI**), Demand and Supply Planning (**DSP**), Import Operations (**IO**), Management of Change (**MC**), Communication (**CO**), Cost Improvement (**CI**), Production Flexibility (**PF**), Customer Relationship Management (**CRM**), Organisational Performance (**OP**), Shipping Performance (**SP**) and Payment Information (**PI**). The explanation of each variable would be discussed in detail in the following paragraphs.

International customer information (ICI) sharing

Based on the analysis, *the usage of the system to complete work-related tasks* was ranked as the most important activity for international customer information sharing (ICI) between NHM-SA and international suppliers, with a mean value of 2.80. This was followed by the *number of NPDI meetings attended by NHM-SA and its international suppliers*, which was ranked as the second important activity for ICI, with a mean value of 2.79. The *accuracy of NHM-SA visibility of system requirements* was ranked the third most significant activity to ICI, with a mean value of 2.72. *The number of NPDI meetings attended by NHM-SA with its producers* had a mean value of 2.71, and it was ranked as the fourth most important activity for ICI. The *accuracy of information for production and procurement* provided by NHM-SA was ranked as the sixth most important activity in ICI, with a mean value of 2.56. The activity perceived as least important in ICI was *the execution of work outside the system* which had a mean value of 2.35. The results are presented in Table 4.3.

Table 4.3: Mean values of international customer information sharing

International Customer Information Sharing		Mean	Standard deviation
ICI-1	The accuracy of information for production and procurement provided by NHM-SA	2.70	0.91
ICI-2	Number of meetings for the NPDI (New Product Development Introduction) process	2.71	0.90
ICI-3	Number of NPDI meetings attended by NHM-SA with its producers	2.79	0.86
ICI-4	How often work is done outside of the system	2.35	0.99
ICI-5	How often NHM-SA provides accurate system requirements	2.56	1.05
ICI-6	How often work is done inside the system	2.80	0.86
ICI-7	The accuracy of system visibility of NHM-SA requirements	2.72	0.97

Demand and supply planning (DSP)

The *extent to which international suppliers comply with the agreed minimum remaining shelf life of products dispatched to NHM-SA* was ranked as the most important activity for demand and supply planning (DSP) with a mean of 3.10. The second important activity for DSP was the *ability of international suppliers to provide a weekly dispatch*

plan (with the 18-months horizon) to NHM-SA, with a mean of 3.02. The timing of the dispatch plans created and provided together with the extent to which supply constraints such as labour strikes and factory shutdowns are communicated to NHM-SA by international suppliers was ranked as the third most important activity for DSP, with a mean value of 3.00. The fourth most essential activity to DSP was the accuracy of the dispatch plans created and provided by international suppliers to NHM-SA, with a mean value of 2.98. The timing of the load plans created and provided by international suppliers to NHM-SA was ranked as the fifth most important activity to DSP, with a mean of 2.94. The extent to which products loaded to NHM-SA matched the proposed load plans was ranked as the sixth most important activity to DSP and had a mean value of 2.90. Based on these responses, the activities that contributed the least to DSP were the timing of communication of demand plan changes by NHM-SA and international suppliers' presence of a contingency plan in order to ensure supply to NHM-SA, which had the mean values of 2.48 and 2.55 respectively. The results are shown in Table 4.4.

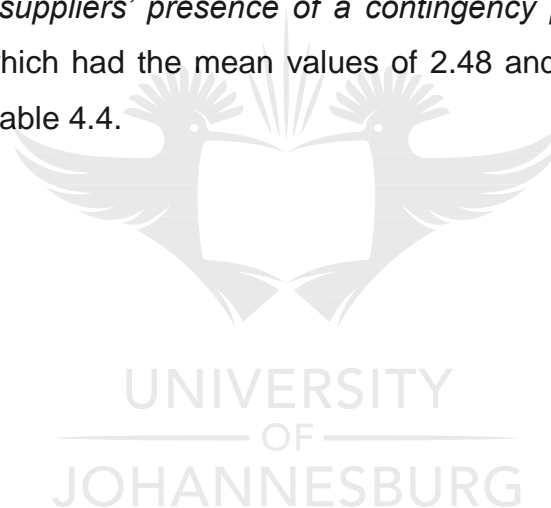


Table 4.4: Mean values of demand and supply planning

Demand and Supply Planning		Mean	Standard deviation
DSP-1	The timing of the dispatch plans created and provided by your company to NHM-SA	3.00	0.70
DSP-2	The timing of the load plans created and provided by your company to NHM-SA	2.94	0.63
DSP-3	The accuracy of the dispatch plans created and provided	2.98	0.72
DSP-4	The extent to which products loaded to NHM-SA match the proposed load plans	2.90	0.79
DSP-5	Provision of a weekly dispatch plan (with the 18 months horizon) to NHM-SA	3.02	0.80
DSP-6	Bi-annual review of the Stock Unbundler (Stock Policy) with NHM-SA	2.56	0.99
DSP-7	The extent to which your organisation complies with the stock cover policy agreed with NHM-SA	2.88	0.77
DSP-8	The extent to which your organisation's minimum run sizes meet the business needs of NHM-SA	2.70	0.86
DSP-9	The extent to which the production stability periods reflect the business needs of NHM-SA	2.74	0.75
DSP-10	The extent to which supply constraints such as labour strikes and factory shut downs are communicated NHM-SA	3.00	0.81
DSP-11	Presence of a contingency plan to ensure supply to NHM-SA	2.55	0.98
DSP-12	The timing of communication of demand plan changes by NHM-SA	2.48	1.04
DSP-13	The validity of product brief of each product dispatched to NHM-SA	2.68	0.91
DSP-14	The extent to which your company complies with an agreed minimum remaining shelf life for products dispatched to NHM-SA	3.10	0.74

Import Operations (IO)

The activity that contributed most significantly to import operations (IO) was *the efficiency of the mode of transportation used to supply products to NHM-SA*, which had a mean of 2.96. The second major contributor to IO was the *time taken to resolve inter-market supply (IMS) complaints raised by NHM-SA*, with a mean of 2.73. The *time taken to inform NHM-SA of any regulatory changes to documentation*, with a mean of 2.71, was ranked as the third most essential activity of IO. The *speed at which product returns by NHM-SA is executed* was ranked as the least contributing activity to IO and had a mean value of 2.64. The results are presented in Table 4.5.

Table 4.5: Mean values of import operations

Import Operations		Mean	Standard deviation
IO-1	The time it takes to inform NHM-SA concerning any regulatory changes of documentation	2.71	0.76
IO-2	The efficiency of the mode of transportation used to supply products to NHM-SA	2.96	0.58
IO-3	The speed at which product returns by NHM-SA is executed	2.64	0.79
IO-4	The time it takes to resolve Inter-Market Supply (IMS) complaints raised by NHM-SA	2.73	0.84

Management of change (MC)

Based on the analysis, the *time taken to communicate product discontinuations with NHM-SA* was ranked as the most important activity to the management of change (MC), with a mean of 2.83. This was followed by *international suppliers' time taken to communicate product source changes to NHM-SA*, with a mean of 2.81. The *discontinuation process of SKUs followed by NHM-SA* (e.g. master data being changed on time) was ranked as the third most significant contributor to MC, with a mean of 2.75. The *time taken by international suppliers to communicate product recipe changes to NHM-SA* had a mean value of 2.70 and was ranked as the fourth important activity to MC. The *speed with which NHM-SA extended and maintained the Intermarket market supply master data of the new SKU (Stock Keeping Unit) in the system* was ranked as the fifth most significant activity to MC, with a mean value 2.67. Lastly, the *time taken by NHM-SA to give notice of SKUs that were under discontinuation to international suppliers* was ranked as the least significant activity in MC, with a mean of 2.67. The results are shown in Table 4.6.

Table 4.6: Mean values of management of change

Management of Change		Mean	Standard deviation
MC-1	The time it takes to communicate product discontinuations with NHM-SA	2.83	0.83
MC-2	The time it takes to communicate product recipe changes with NHM-SA	2.70	0.81
MC-3	The time it takes to communicate product source changes with NHM-SA	2.81	0.77
MC-4	The speed with which NHM-SA extends and maintains the intermarket market supply master data of the new SKU (Stock Keeping Unit) in the system	2.67	0.80
MC-5	Time it takes NHM-SA to give a notice of SKU's under discontinuation	2.67	0.81
MC-6	Discontinuation process of SKU's followed by NHM-SA (e.g. Master data being changed on time)	2.75	0.86

Communication (CO)

The activity that contributes significantly to communication (CO) is the *presence of a clear point of contact at NHM-SA for all Intermarket supply issues*, which had a mean of 3.06. The second major contributor was the *quality of communication between NHM-SA and its international suppliers on supply constraints*, with a mean of 2.94. The *time taken by NHM-SA to communicate a change of resources (employees) for categories* was ranked third, with a mean of 2.92. The *presence of a back-up contact in situations where the usual NHM-SA contact was out of office* was ranked fourth, with a mean of 2.77. The *time taken by NHM-SA to share critical information* was ranked fifth, with a mean of 2.76. The *extent, to which international suppliers had to follow up when critical information was not shared by NHM-SA*, was ranked sixth and had a mean of 2.76. Finally, the *likelihood that international suppliers would get the information when they need it after contacting NHM-SA* ranked as the least significant activity to CO, with a mean of 2.74. The results are illustrated in Table 4.7.

Table 4.7: Mean values of communication

Communication		Mean	Standard Deviation
CO1	Quality of communication between your company and NHM-SA on supply constraints and issues	2.94	0.89
CO2	The time it takes NHM-SA to share critical information	2.76	0.89
CO3	The extent to which your organisation has to follow up when critical information is not shared	2.76	0.63
CO4	The likelihood that your company will get the information when you need it after contacting NHM-SA	2.74	0.78
CO5	Presence of a clear point of contact in NHM-SA for all Intermarket Supply related issues	3.06	0.79
CO6	The time it takes NHM-SA to communicate the change of resources (employees) for categories	2.92	0.90
CO7	Presence of a back-up contact in situations where the usual NHM-SA contact is out of office	2.77	0.97

Cost improvement (CI)

International suppliers' ability to look for opportunities to harmonise recipes and packaging of NHM-SA ranked as the most significant activity for cost improvement (CI), with a mean of 2.72. *International suppliers' ability to inform NHM-SA of possible recipe saving opportunities* was ranked as the second most significant activity for CI with a mean of 2.68. *International suppliers' ability to inform NHM-SA of possible opportunities to optimise the cost of operations* (such as product flow and inventory levels), was ranked as the third most essential activity to CI, with a mean of 2.65. *International suppliers' ability to share initiatives aimed at reducing production costs* (such as to reduce the number of production changeovers or their duration) with NHM-SA, was ranked as the least significant activity for CI, with a mean of 2.62. The results are illustrated in Table 4.8.

Table 4.8: Mean values of cost improvement

Cost improvement		Mean	Standard Deviation
CI-1	Our company informing NHM-SA of recipe saving opportunities	2.68	0.70
CI-2	Our company informing NHM-SA of possible opportunities to reduce the cost of operations (e.g. inventory levels or product flow)	2.65	0.86
CI-3	Our company sharing initiatives to reduce production costs (e.g. reducing the number of changeovers or their duration) with NHM-SA	2.62	0.92
CI-4	Our company looks for opportunities to harmonise recipes and packaging amongst different receivers	2.72	0.95

Production flexibility (PF)

The ability of *NHM-SA to work with its international suppliers in order to reduce the time taken to introduce new products* was ranked as the most important activity for production flexibility (PF), having a mean of 2.84. The ability of *international suppliers to notify NHM-SA of any expected factory shutdowns* was the second most significant activity for PF, with a mean of 2.76. The third most significant contributor to PF was *international suppliers' ability to change production volumes as per the request of NHM-SA rapidly*. Lastly, the least significant activity for PF was the ability of *international suppliers to notify NHM-SA about unexpected production delays*, which had a mean of 2.72. The results are illustrated in Table 4.9.

Table 4.9: Mean values of production flexibility

Production flexibility		Mean	Standard deviation
PF-1	Our company's ability to rapidly change production volumes as per NHM-SA requests	2.74	1.03
PF-2	The time it takes our company to notify NHM-SA concerning any expected factory shutdowns	2.84	0.89
PF-3	Our company notifying NHM-SA about unexpected production shutdowns	2.76	0.92
PF-4	Our company notifying NHM-SA about unexpected production delays	2.72	0.88

Customer relationship management (CRM)

The activity that contributes most significantly to customer relationship management (CRM) is the *extent to which international suppliers seek a long-term, stable relationship with NHM-SA*, which had a mean of 3.12. The second major contributor to CRM was the *use of systematic processes in order to handle customer (NHM-SA) complaints*, with a mean of 2.96. The *extent to which operational misunderstandings are addressed by NHM-SA and its international suppliers* was ranked third for CRM, with a mean of 2.82. *International suppliers' usage of the feedback given by NHM-SA in order to improve products, processes and relations* was ranked fourth for CRM, with a mean of 2.72. The *extent to which NHM-SA is involved in the development of new products by its international suppliers* was ranked fifth for CRM and had a mean of 2.66. Lastly, *international suppliers' ability to measure the service satisfaction levels of NHM-SA* was ranked as the least important activity for CRM and had a mean of 2.58. The results are presented in Table 4.10.

Table 4.10: Mean values of customer relationship management

Customer relationship management		Mean	Standard deviation
CRM-1	Our company's measurement of service satisfaction levels of NHM-SA	2.58	1.07
CRM-2	Use of NHM-SA feedback to improve products, processes and relations	2.72	0.71
CRM-3	A systematic process of handling customer complaints related to the quality of products	2.96	0.82
CRM-4	The extent to which misunderstandings between the international receiver and your company concerning the supply of products	2.82	0.78
CRM-5	The extent to which NHM-SA is involved in the development of new products	2.66	0.96
CRM-6	The extent to which your company seeks a long-term, stable relationship with NHM-SA	3.12	0.80

Organisational performance (OP)

The ability of *NHM-SA to work with its international suppliers to reduce the time taken to introduce new products* was ranked as the most important activity for organisational performance (OP), having a mean of 2.80. The ability of *NHM-SA to work with its international suppliers to reduce the working capital for finished goods* was ranked as the second most important activity to OP, with a mean of 2.75. The ability of *NHM-SA*

to work with its international suppliers to reduce the working capital for raw and packaged materials was ranked as the least important activity to OP, with a mean of 2.71. The results are illustrated in Table 4.11.

Table 4.11: Mean values of organisational performance

Organisational Performance		Mean	Standard deviation
OP-1	Working with NHM-SA has resulted in a reduction of our working capital for finished goods	2.75	0.91
OP-2	Working with NHM-SA has resulted in a reduction of our working capital for raw and packaging materials	2.71	1.01
OP-3	Working with NHM-SA has resulted in a reduction in time taken to introduce new products	2.80	0.94

Shipping performance (SP)

Products being dispatched to NHM-SA once there is a valid veterinary permit is an activity that contributes significantly to shipping performance (SP), with a mean of 3.21. The ability of *international suppliers to book shipping vessels that supply inventory to NHM-SA on time* was the second significant contributor to SP, with a mean of 3.10. *International suppliers' ability to share shipping documents before the ship docked in South Africa*, was ranked as the third most significant contributor to SP, with a mean of 3.02. The ability of *NHM-SA to share veterinary permits on time with its international suppliers for all applicable products*, as required by South African legislation, was ranked as the fourth most significant contributor to SP, with a mean of 2.98. *International suppliers' ability to share shipping documents to NHM-SA after the verification of their accuracy* was ranked as the second least significant activity for SP, with a mean of 2.96. Lastly, *shipping vessels with shorter lead times being used / given preference* were ranked as the least significant activity to SP, with a mean of 2.81. The results are illustrated in Table 4.12.

Table 4.12: Mean values of shipping performance

Shipping Performance		Mean	Standard deviation
SP-1	Shipping vessels to supply inventory to NHM-SA are booked on time	3.10	0.69
SP-2	Shipping documents are shared before the ship docks in South Africa	3.02	0.70
SP-3	Shipping documents are only sent to NHM-SA after the verification of their accuracy	2.96	0.86
SP-4	Veterinary permits are shared on time by NHM-SA for all applicable products, as required by South African legislation	2.98	0.97
SP-5	Products are only dispatched to NHM-SA once there is a valid veterinary permit	3.21	0.88
SP-6	Shipping vessels with shorter lead times are being used/given preference	2.81	1.02

Payment information (PI)

The ability of *international suppliers to share transfer prices quarterly with NHM-SA* was graded as the most significant aspect for payment information (PI), having a mean of 3.18. *International suppliers' ability to share transfer prices on time with NHM-SA* was ranked second to PI, with a mean of 3.11. The ability of *NHM-SA to pay its international suppliers on time and as per the agreed payment terms* was ranked as third significant to PI, with a mean of 2.93. NHM-SA's ability to pay its international suppliers as per the invoice amount was ranked fourth significant to PI, with a mean of 2.91. The ability of *international suppliers to issue credit notes to NHM-SA* was ranked as the fifth most important activity for PI and had a mean of 2.77. In Table 4.13, the results are presented.

Table 4.13: Mean values of payment information

Payment Information		Mean	Standard deviation
PI-1	Invoices are paid on time and as per the agreed payment terms by NHM-SA	2.93	0.89
PI-2	Payments are conducted as per the invoice by NHM-SA	2.91	0.80
PI-3	Payments credit notes are timeously issued for NHM-SA	2.77	1.05
PI-4	Transfer prices are shared quarterly with NHM-SA	3.18	0.90
PI-5	Transfer prices are shared on time with NHM-SA	3.11	0.96

Organisations usually collaborate to address any operational challenges that they may be facing. They, therefore, tend to collaborate around those challenges. According to Mathuramaytha (2011), in a study conducted in Thailand, it established that SCC had a positive effect on organisational performance due to its ability to optimise supply chain operations, which resulted in increased profitability for collaborating partners. Consequently, a study conducted by Simatupang and Sridharan (2018) found communication to be a key enabler to effective SCC. In this study, SP with a mean of 3.01, PI with a mean of 2.98 and CO with a mean of 2.85 are seemingly the best areas of collaboration between NHM-SA and its partners. Conversely, ICI with a mean of 2.66, CI with a mean of 2.67 and MC with a mean of 2.74 seemed to be the least positive areas of collaboration between NHM-SA and its partners.

Table 4.14 shows a summary of the study means and standard deviations computed for all items according to collaborative areas (variables). The overall score for each of the study area of collaboration (variable) was obtained by computing average responses appropriate to the items.

Table 4.14: Mean ranking of collaborative areas

Collaborative Areas	Mean	Standard deviation
Shipping Performance	3.01	0.85
Payment Information	2.98	0.92
Communication	2.85	0.84
Demand and Supply Planning	2.82	0.82
Customer Relationship Management	2.81	0.86
Production Flexibility	2.78	0.94
Import Operations	2.76	0.74
Organisational Performance	2.75	0.95
Management of Change	2.74	0.81
Cost Improvement	2.67	0.86
International Customer Information (Receiver)	2.66	0.93

Table 4.14 that shows the mean rankings of collaborative areas and it also indicates that the means of all computed items are above 2.5. Therefore, SCC initiatives are yielding positive results for NHM-SA and its partners as indicated in Table 4.14.

4.5. Reliability

The reliability test is identified as a method of checking and testing a scale’s internal consistency (Saunders *et al.*, 2016). A reliability test is therefore concerned with whether a scale indicates results that are free from random error (Creswell, 2014). Zikmund and Babin (2010: 248), indicates that “*a measure is only reliable if it indicates the extent to which it is without bias in ensuring consistent measurement across time and various items in the instrument*”. In this study, the reliability of the scale instrument was assessed through the usage of the Cronbach’s alpha coefficient test.

The Cronbach’s alpha coefficient for each area of collaboration (variable) was calculated to measure the internal consistency of the scales used in the survey. Ursachi, Horodnic and Zait (2015) indicate that a minimum level of 0.70 for the scale of variables is considered as being reliable and acceptable. This would mean the values that are closer to one indicate a higher internal consistency and the values that are closer to zero indicate a lower internal consistency (Saunders *et al.*, 2016). The Cronbach’s alpha values of each study variable are presented in Table 4.15.

Table 4.15: Cronbach’s alpha values

	Variable	Cronbach’s alpha	No. of Items
ICI	International Customer Information (Receiver)	0.87	7
DSP	Demand and Supply Planning	0.91	14
IO	Import Operations	0.76	4
MC	Management of Change	0.90	6
CO	Communication	0.92	7
CI	Cost Improvement	0.87	4
PF	Production Flexibility	0.91	4
CRM	Customer Relationship Management	0.84	6
OP	Organisational Performance	0.94	3
SP	Shipping Performance	0.88	6
PI	Payment Information	0.88	5

Table 4.15 indicates that the variables are highly reliable as they all have the overall Cronbach's alpha coefficient that is more than 0.7 (Field, 2013). Therefore, we can conclude that all items in this study are highly consistent and reliable (Mukaka, 2012; Muijs, 2011). The results in Table 4.15 also indicates a high degree of internal consistency for all of the eleven areas of collaboration scales. The Cronbach's alphas range between 0.76 and 0.94, all above our criteria of 0.70.

4.6. Correlation analysis

In this research, Pearson's correlation coefficient method was employed to examine the correlations between the variables. The collected samples were normally distributed, and as a result, parametric statistics techniques could be employed. To address the study objectives, the correlation coefficient matrices were tested using the Pearson's correlation matrix. The significance level of all study correlation coefficients was set at $p = 0.05$ (2-tailed). Pearson's correlation coefficients (r) range from -1 to +1 for the indication of negative or positive correlations. If the r value is 0, then it specifies that no relationship exists between two variables. Samuel and Okey (2015: 23) indicates that "*if the r value is -1, it can be specified as a negative correlation and if the r value is +1 then it can be interpreted as a perfect positive correlation*". Table 4.16 provides a guide for the strength of these relationships. Therefore, the sign of - or + indicates a negative or positive relationship respectively. A summary of the correlations for all variables excluding payment information is presented in Table 4.17. Based on the literature, payment information was not linked directly to collaboration. Similarly, the literature does not indicate that organisations collaborate in order to share payment information. Therefore, payment information is not an area of collaboration in this study. NHM-SA has an automated payment system where invoices are paid to international suppliers within 60 days after delivery. Moreover, payment information will be a redundant variable in terms of content validity. The literature supports all other variables. Hence, these variables were included based on their contribution to collaboration between NHM-SA and international suppliers. Refer to sections 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6 of the literature to view the theory that supports all other variables.

Table 4.16: Guideline of correlation matrix strength

r value		Strength of Correlation	
r = -0.10 to -0.29	Or	r = 0.10 to 0.29	Weak
r = -0.30 to -0.49	Or	r = 0.30 to 0.49	Medium
r = -0.50 to -1.00	Or	r = 0.50 to 1.00	Strong

Source: Samuel & Okey (2015: 23)

There is a strong positive correlation between *cost improvement (CI)* and *production flexibility (PF)* ($r = 0.82$). This result may be because international suppliers are able to meet the demand requirements of NHM-SA by taking into consideration the production-related efficiencies. For instance, international suppliers could be capitalising on the cost of operations such as reducing the number of unnecessary production changeovers. Consequently, international suppliers could also be producing to build stock in order to cater for planned factory shutdowns. However, there is a weak positive correlation between *international customer information (ICI)* and *production flexibility cost improvement* ($r = 0.26$). This could be because NHM-SA is not fully sharing information that could improve the production operations of its suppliers. For example, NHM-SA could be partially sharing of information that has a direct impact to production and procurements requirements of international suppliers such as future planned promotions. Despite the above-mentioned weak correlation, most factors exhibit strong positive correlations. The results are presented in Table 4.17.

Table 4.17: Correlation matrix results

	ICI	DSP	IO	MC	CO	CI	PF	CRM
ICI	1.00							
DSP	0.56	1.00						
IO	0.59	0.57	1.00					
MC	0.53	0.58	0.41	1.00				
CO	0.75	0.51	0.54	0.67	1.00			
CI	0.33	0.54	0.33	0.70	0.51	1.00		
PF	0.26	0.59	0.29	0.72	0.40	0.82	1.00	
CRM	0.45	0.56	0.46	0.73	0.71	0.69	0.66	1.00

4.7. Multiple regression

Multiple regression is used to explore the relationship between a dependent variable and a number of predictors or independent variables (Field, 2013). Moreover, multiple regression allows for a more sophisticated examination of the interrelationships between a set of variables (Pallant, 2016).

The following section highlights how the dependent variables correlate with independent variables. This is done by a way of a regression analysis, which examines the effects of independent variables on the dependent variable. Regression models are an econometrics approach that does not only show the association between variables but also the causality between variables (Field, 2013). For example, a regression model on value chain optimisation will not only show the association between these variables but will also indicate the extent to which changes in the dependent variable can be explained by the independent variables of the study (Pallant, 2016). In this study, we identified four models, which are related to the study objectives. These models include *communication*, *international customer information sharing*, *cost improvement and organisational performance*. Each of the models is presented in the following sections.

4.7.1. Regression model: Organisational performance

From Table 4.18, it is evident that the dependent variable, *organisational performance (OP)*, correlates strongly with *communication (CO)* at 0.67 and weakly with *production flexibility (PF)* at 0.18. This could be explained because communication between NHM-SA and its international suppliers fosters efficiency and effectiveness, which could reduce costs that might result in higher organisational performance. Fawcett *et al.* (2012) support this finding as they indicate that communication accelerate the organisational performance of all involved supply chain partners in the form of faster inventory turns, continuous process improvement, enhanced growth and competitiveness as well as faster and more responsive order fulfilment. Mafini and Muposhi (2017) also support this finding as they allude that communication reduces uncertainty, shortens new product development, procurement, order processing, demand and sales forecasting which ultimately results to the overall improved organisation performance.

Table 4.18: Correlation matrix based on organisational performance

	OP	ICI	IO	MC	CO	CI	PF	CRM	SP
OP	1,00								
ICI	0,53	1,00							
IO	0,37	0,59	1,00						
MC	0,48	0,53	0,41	1,00					
CO	0,67	0,74	0,54	0,67	1,00				
CI	0,39	0,33	0,33	0,70	0,51	1,00			
PF	0,18	0,26	0,29	0,72	0,40	0,82	1,00		
CRM	0,54	0,45	0,46	0,73	0,71	0,69	0,66	1,00	
SP	0,34	0,42	0,48	0,69	0,53	0,65	0,61	0,58	1,00

Model Summary: Organisational Performance

The R square (R^2) is also known as the coefficient of determination (Field, 2013). The R^2 seeks to measure the performance of a model in explaining the behaviour of dependent variables (Field, 2013). The R^2 square of this model is 0.469 as indicated in Table 4.19, which indicates that this model explains 46.9% of the variance in collaborating with international partners to organisational performance. The Durbin-Watson tests for autocorrelation in residuals from regression analysis (Akter, 2014). This test ranges in value from 0 to 4 (Field, 2013). Pallant (2016: 158) further indicates that “a value nearing 2 indicates no autocorrelation, a value nearing 0 indicates positive autocorrelation and a value towards 4 indicates a negative autocorrelation”. Based on this study, the Durbin-Watson is 1.687 as shown in Table 4.19. This value is closer to 2 and it indicates no autocorrelation.

Table 4.19: Organisational Performance: Model summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
1	.685 ^a	0,469	0,374	0,71662	1,687
a. Predictors: (Constant), Shipping performance, International customer Information sharing, Customer relationship management, Import operations, Cost improvement, Management of change, Communication					
b. Dependent Variable: Organisational performance					

Coefficients: Organisational Performance

In referring to Table 4.20, the largest standardised beta is 0.524, which is contributed by *communication (CO)*, followed by *customer relationship management (CRM)* which

has a beta coefficient of 0.135 for *organisational performance (OP)*. This specifies that communication has a stronger influence on the dependent variables compared to customer relationship management. Therefore, it is only communication makes a statistically significant exclusive contribution to the estimation of the dependent variable as its significant value is less than 0.05. However, other coefficients of *organisational performance (OP)*, namely, *international customer information Sharing (ICI)*, *imports operations (IO)*, *Management of change (MC)*, *cost improvement (CI)*, *customer relationship management (CRM)* and *shipping performance (SP)* are not significant. Only variables with significant values will be included in the equation.

Table 4.20: Organisational performance: Coefficients

Coefficients^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,162	0,592		0,273	0,786		
	International customer Information sharing)	0,131	0,246	0,102	0,533	0,597	0,369	2,712
	Import operations	-0,025	0,231	-0,017	-0,107	0,916	0,566	1,767
	Management of change	0,013	0,283	0,009	0,044	0,965	0,300	3,332
	Communication	0,682	0,295	0,524	2,315	0,026	0,265	3,768
	Cost improvement	0,066	0,235	0,052	0,280	0,781	0,390	2,567
	Customer relationship management	0,186	0,290	0,135	0,643	0,524	0,308	3,247
	Shipping performance	-0,119	0,243	-0,088	-0,489	0,627	0,424	2,359
a. Dependent Variable: Organisational performance								

The model explains changes in *organisational performance* as a result of changes in independent variables such as shipping performance, international customer information sharing, customer relationship management, import operations, cost improvement, management of change and communication. Independent variables effect on a dependent variable is uncertain. The study sought to assess the effects of identified independent variables on the dependent variable. This is because the study

is interested in finding out whether independent variables have a considerable effect on the dependent variables. The independent and dependent variables and a constant are the key components of the model. Based on the findings shown in Table 4.20, the multiple regression equation is estimated as follows:

$$\text{Organisational Performance (OP)} = 0.162 + \beta_1\text{CO}$$

Guns and Vanacker (2012: 1941) indicate that Tolerance “is an indicator of how much the variability of the specified independent variable is not explained by the other independent variables in the model”. Field (2013: 220) adds that “*if this value is very small (less than .10) it indicates that the multiple correlations with other variables is high, suggesting the possibility of multicollinearity*”. The Variance inflation factor (VIF) is the inverse of the Tolerance value (Pallant, 2016). The VIF value of above 10 or the tolerance value of less than .10 are cut-off points used to determine the presence of multicollinearity (Guns & Vanacker, 2012).

Based on Table 4.20, the values are satisfactory and imply no multicollinearity problem due to the Tolerance and VIF values that are within the acceptable range of 0.10 and 10 respectively.

4.7.2. Regression model: Cost improvement

In Table 4.21, *cost improvement (CI)*, which is the dependent variable, correlates strongly with *production flexibility (PF)*, at 0.82, and moderately with *international customer information (ICI)* and *imports operations (IO)*, at 0.33 for each variable. This could be because cost improvement initiatives between NHM-SA and its international suppliers are mainly driven by production efficiencies. Such efficiencies could reduce production costs that may result in higher organisational performance in terms of cost reduction. On the other hand, NHM-SA and its partners are still challenged in terms of sharing information that would yield positive results on cost improvement. Hudnukar, Jakhar and Rathod (2014) support this finding as they indicate that effective collaboration among supply chain partners results in operational production efficiencies.

Table 4.21: Correlation matrix based on cost improvement

	CI	ICI	IO	MC	CO	PF	CRM	SP
CI	1,00							
ICI	0,33	1,00						
IO	0,33	0,59	1,00					
MC	0,70	0,53	0,41	1,00				
CO	0,51	0,74	0,54	0,67	1,00			
PF	0,82	0,26	0,29	0,72	0,40	1,00		
CRM	0,69	0,45	0,46	0,73	0,71	0,66	1,00	
SP	0,65	0,42	0,48	0,69	0,53	0,61	0,58	1,00

Model Summary: Cost improvement

The R² square of the *cost improvement* model is 0.737 as indicated in Table 4.22. This indicates that the model explains 73.7% of the variance in collaborating with international partners to communication. Based on the study, the Durbin-Watson is 1.932 as shown in Table 4.22. This value is closer to 2 and it indicates no autocorrelation.

Table 4.22: Cost Improvement: Model summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
1	.858 ^a	0,737	0,689	0,40223	1,932
a. Predictors: (Constant), Shipping performance, International customer Information sharing, Production flexibility, Import operations, Customer relationship management, Management of change, Communication					
b. Dependent Variable: Cost improvement					

Coefficients: Cost improvement

In referring to Table 4.23, the largest standardised beta is 0.582, which is contributed by *production flexibility (PF)*, followed by *shipping performance (SP)* which has a beta coefficient of 0.178. This indicates that production flexibility has a stronger exclusive contribution in explaining the dependent variables compared to shipping performance. Only *production flexibility (PF)* makes a statistically significant contribution to the prediction of the study dependent variable, as its significant value is less than 0.05. Nevertheless, other coefficients of *cost improvement (CI)*, namely, *international customer information Sharing (ICI)*, *imports operations (IO)*, *management of change*

(MC), communication (CO), customer relationship management (CRM) and shipping performance (SP) are not significant. Only variables with significant values will be included in the equation. Based on the findings depicted in Table 4.23, the multiple regression equation is estimated as follows:

$$\text{Cost Improvement (CI)} = 0.064 + \beta_1 \text{PF}$$

Based on Table 4.23, the values are satisfactory and imply no multicollinearity problem due to the Tolerance and VIF values that are within the acceptable range of 0.10 and 10 respectively.

Table 4.23: Cost Improvement: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,064	0,332		0,193	0,848		
	International customer Information sharing	-0,034	0,138	-0,034	-0,250	0,804	0,369	2,708
	Import operations	-0,036	0,130	-0,030	-0,279	0,781	0,567	1,763
	Management of change	0,000	0,170	0,000	0,002	0,998	0,263	3,799
	Communication	0,116	0,170	0,112	0,684	0,498	0,251	3,990
	Production flexibility	0,507	0,117	0,582	4,323	0,000	0,372	2,686
	Customer relationship management	0,169	0,164	0,154	1,028	0,310	0,302	3,309
	Shipping performance	0,193	0,133	0,178	1,446	0,156	0,445	2,245

4.7.3. Regression model: Communication

In Table 4.24, communication (CO), which is the dependent variable, correlates strongly with international customer information sharing (ICI) at 0.74 and moderately with production flexibility (PF) at 0.40. This could be because communication between NHM-SA and its international suppliers fosters information sharing for the purpose of improving organisational performance for all involved parties. On the other hand, NHM-SA and its partners are still behind in terms of effectively communicating information, which would yield positive results to cost as a result of production flexibility. This could be because of international suppliers' restricted production

changeovers in order to fully meet the supply requirements of NHM-SA. This result supports the one of Seo *et al.* (2016) who indicates that communication plays a significant role in timely decisions making of how goods and information can be effectively provided in the most practical way. Mafini and Muposhi (2017) also support this result as they state that communication within supply chain incorporates transparent information sharing on inventory management, procurement, order processing, demand and sales forecasting which further results to improved organisational performance.

Table 4.24: Correlation matrix based on communication

	CO	ICI	IO	MC	PF	CI	CRM	SP
CO	1,00							
ICI	0,74	1,00						
IO	0,54	0,59	1,00					
MC	0,67	0,53	0,41	1,00				
PF	0,40	0,26	0,29	0,72	1,00			
CI	0,51	0,33	0,33	0,70	0,82	1,00		
CRM	0,71	0,45	0,46	0,73	0,66	0,69	1,00	
SP	0,53	0,42	0,48	0,69	0,61	0,65	0,58	1,00

Model Summary: Communication

The R square of the communication model is 0.752 as indicated in Table 4.25, which indicates that this model explains 75.2% of the variance in collaborating with international partners to communication. Based on the study, the Durbin-Watson is 2.270 as shown in Table 4.25. This value is closer to 2, and it indicates no autocorrelation.

Table 4.25: Communication: Model summary

Model Summary^b					
Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson
1	.867 ^a	0,752	0,708	0,37602	2,270
a. Predictors: (Constant), Shipping performance, International customer Information sharing, Production flexibility, Import operations, Customer relationship management, Management of change, Cost improvement					
b. Dependent Variable: Communication					

Coefficients: Communication

As indicated in Table 4.26, the largest standardised beta is 0.454, which is contributed by *International customer Information sharing (ICI)*, followed by *customer relationship management (CRM)* which has a beta coefficient of 0.423. This indicates that International customer Information sharing has a stronger exceptional contribution in clarifying the dependent variables compared to customer relationship management. Both these independent variables (*ICI and CRM*) makes a significant contribution to the prediction of the dependent variable (*CO*), as their value of significant is less than 0.05. Nonetheless, other coefficients of communication (*CO*), namely, *imports operations (IO)*, *management of change (MC)*, *production flexibility (PF)*, *cost improvement (CI)* and *shipping performance (SP)* are not significant. Hence, they have no influence on the dependent variable. Based on the findings depicted in Table 4.26, the estimated equation of multiple regression is as follows:

$$\text{Communication (CO)} = - 0.018 + \beta_1\text{ICI} + \beta_2\text{CRM}$$

Based on Table 4.26, the values are satisfactory and imply no multicollinearity problem due to the Tolerance and VIF values that are within the acceptable range of 0.10 and 10 respectively.

Table 4.26: Communication: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-0,018	0,311		-0,057	0,955		
	International customer Information sharing	0,447	0,108	0,454	4,154	0,000	0,532	1,880
	Import operations	0,020	0,121	0,018	0,167	0,868	0,566	1,765
	Management of change	0,216	0,155	0,212	1,396	0,171	0,276	3,618
	Production flexibility	-0,215	0,129	-0,257	-1,673	0,102	0,270	3,707
	Cost improvement	0,102	0,149	0,106	0,684	0,498	0,267	3,752
	Customer relationship management	0,448	0,138	0,423	3,246	0,002	0,374	2,676
	Shipping performance	0,025	0,128	0,024	0,194	0,847	0,423	2,363

4.7.4. Regression model: International customer information sharing

In Table 4.27, *international customer information sharing (ICI)*, which is the dependent variable, correlates strongly with *communication (CO)*, at 0.74 and weakly with *production flexibility (PF)*, at 0.26. This could be because information sharing between NHM-SA and its partners fosters communication for improving organisational performance of all involved parties. On the other hand, NHM-SA and its partners are still behind in terms of effectively sharing information that would yield positive results in production flexibility. This could be because of trust issues that prevent international suppliers from sharing production yields information with NHM-SA. This finding supports the one of Parody *et al.* (2017) who indicates that organisations collaborate to share accurate, relevant, confidential and complete information in a timely manner with involved supply chain partners. Cheng (2011) also supports this finding as he states that information sharing has a major influence in terms reducing supply chain related costs and achieving competitive advantage, which ultimately improves the organisational performance of all involved supply chain partners.

Table 4.27: Correlation matrix based on International customer information sharing

	ICI	OP	IO	MC	CO	CI	PF	CRM	SP
ICI	1,00								
OP	0,53	1,00							
IO	0,59	0,37	1,00						
MC	0,53	0,48	0,41	1,00					
CO	0,74	0,67	0,54	0,67	1,00				
CI	0,33	0,39	0,33	0,70	0,51	1,00			
PF	0,26	0,18	0,29	0,72	0,40	0,82	1,00		
CRM	0,45	0,54	0,46	0,73	0,71	0,69	0,66	1,00	
SP	0,42	0,34	0,48	0,69	0,53	0,65	0,61	0,58	1,00

Model Summary: International Customer Information Sharing

The R square of the international customer information sharing model is 0.634 as presented in Table 4.28, which indicates that a model explains 63.4% of the variance in collaborating with international partners to international customer Information sharing. Based on the study, the Durbin-Watson is 2.250 as shown in Table 4.28. This value is closer to 2 and it indicates no autocorrelation.

Table 4.28: International customer Information sharing: Model summary

Model Summary ^b						
Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Durbin-Watson	
1	.796 ^a	0,634	0,557	0,47038	2,250	
a. Predictors: (Constant), Shipping performance, Organisational performance, Import operations, Production flexibility, Communication, Customer relationship management, Management of change, Cost improvement						
b. Dependent Variable: International customer information sharing						

Coefficients: International Customer Information Sharing

Table 4.29 indicates that the largest standardised beta is 0.641, which is contributed by *communication (CO)*, followed by *Imports operations (IO)* which has a beta coefficient of 0.284. This indicates that communication has a stronger exceptional contribution in enlightening the dependent variables compared to imports operations.

Both these independent variables (*CO* and *IO*) makes an essential contribution to the prediction of the dependent variable (*ICI*), as their value of significance is less than 0.05. However, other coefficients of *International Customer Information Sharing (ICI)*, namely, *organisational performance (OP)*, *management of change (MC)*, *cost improvement (CI)*, *production flexibility (PF)*, *customer relationship management (CRM)* and *shipping performance (SP)* are not significant. Based on the findings presented in Table 4.29, the estimated multiple regression equation is as follows:

$$\text{International Customer Information sharing (ICI)} = 0.197 + \beta_1\text{CO} + \beta_2\text{IO}$$

Based on Table 4.29, the values are satisfactory and imply no multicollinearity problem due to the Tolerance and VIF values that are within the acceptable range of 0.10 and 10 respectively.

Table 4.29: International customer Information sharing: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,197	0,388		0,509	0,614		
	Organisational performance	0,061	0,113	0,078	0,539	0,593	0,460	2,173
	Import operations	0,330	0,142	0,284	2,329	0,025	0,647	1,547
	Management of change	0,177	0,199	0,171	0,893	0,378	0,263	3,802
	Communication	0,651	0,179	0,641	3,630	0,001	0,309	3,237
	Cost improvement	-0,073	0,194	-0,074	-0,377	0,708	0,247	4,056
	Production flexibility	0,024	0,180	0,028	0,135	0,894	0,217	4,614
	Customer relationship management	-0,267	0,194	-0,248	-1,381	0,175	0,298	3,357
	Shipping performance	-0,027	0,160	-0,026	-0,170	0,866	0,421	2,373

4.8. Regression models conclusion

Organisational performance (*OP*) as a dependent variable was regressed against independent variables: *SP*, *DSP*, *ICI*, *CRM*, *IO*, *CI*, *MC* and *CO*. The aim of this regression was to support the secondary study objective (1) which is to examine the influence of SCC on organisational performance at NHM-SA.

Communication (*CO*) as a dependent variable was regressed against independent variables: *ICI, IO, MC, PF, CI, CRM and SP*. The aim of this regression was to support the secondary study objective (2) which is to determine the effect of communication between NHM-SA and its collaborating partners on organisational performance.

Cost improvement (*CI*) as a dependent variable was regressed against independent variables: *SP, ICI, PF, IO, CRM, MC and CO*. The aim of this regression was to support the secondary study objective (3) which is to establish the impact of SCC on supply chain efficiencies for NHM-SA and its partners.

International customer information sharing (*ICO*) as a dependent variable was regressed against independent variables: *OP, IO, MC, CO, CI, PF, CRM and SP*. The aim of this regression was to support the secondary study objective (4) which is to establish the effect of information sharing between NHM-SA and its collaborating partners on organisational performance.

4.9. Validity test

The main objective of conducting a validity test is to determine whether the questions in the research questionnaire are tapping into the right concept (Sekaran & Bougie, 2013). All of the models indicated previously were used to assess the validity of the research instrument, and all of them proved to be significantly valid. Moreover, the coefficient of determination (R^2) value for all of the models was examined and found to be significant, confirming the model validity. Conversely, correlations were used to test for construct validity and regression analysis were used to test for prediction.

4.10. Extent of collaboration

This section covers the extent of collaboration between NHM-SA and its international partners. Collaboration is rated as either high, moderate or low. Table 4.30 provides

a summary of the levels of collaboration and its associated strength, ranging from 0 per cent to 100 per cent. The collaboration practices that are directly linked to the study objectives will be discussed in detail in the next paragraphs.

Table 4.30: Extent of collaboration

Level of collaboration	Strength of collaboration
High	61% – 100% respondents' agreement
Moderate	51% – 60% respondents' agreement
Low	Less than 50% of respondents' agreement

Source: Adapted from the author

Collaboration practices - International customer information sharing

The respondents' rankings of existing collaboration practices for international customer information sharing are illustrated in Figure 4.1. The international suppliers were asked to indicate the extent of NHM-SA's information sharing based on their experiences. Figure 4.1 shows that the respondents generally agreed that *collaborating with NHM-SA has resulted in improved information sharing*. The greatest number of positive responses (good and excellent) were recorded for the statements frequency with which work is done through the usage of the system and the accuracy of NHM-SA system visibility of requirements. However, some international suppliers doubted the extent of system requirements (2% very poor, 16% poor, and 26% neutral); number of meetings for the new product development and introduction (NPD) with partners (8% poor and 33% neutral); the accuracy of information provided by NHM-SA for production and procurement purposes (2% very poor, 6% poor and 30% neutral) and the number of meetings attended by NHM-SA with its producers (6% poor and 30% very poor).

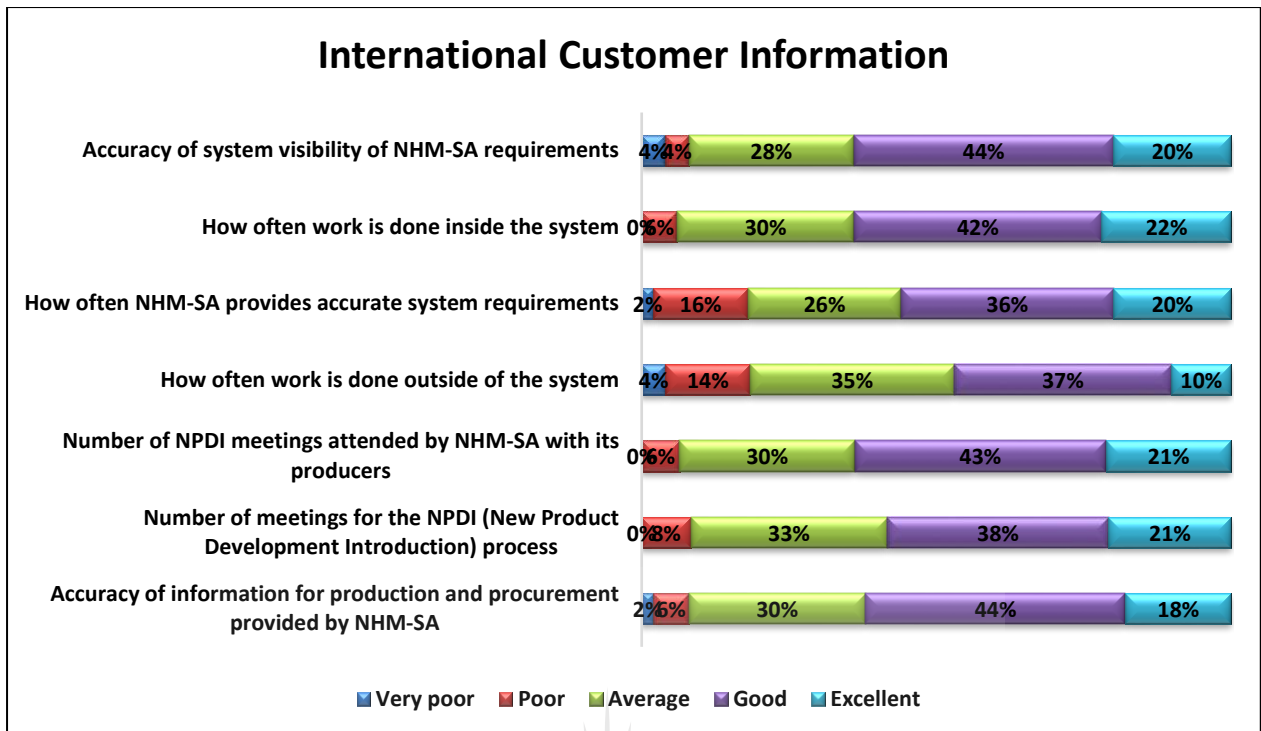


Figure 4.1: International customer information

Source: Calculated from the survey results

Collaboration practices – Demand and Supply Planning

Figure 4.2 illustrates the respondents' rankings of existing collaboration practices concerning demand and supply information sharing. The international suppliers were asked to indicate the extent of NHM-SA's demand and supply information collaborating practices based on their experiences. Figure 4.2 shows that the respondents generally agreed that *collaborating with NHM-SA resulted in improved demand and supply planning practices*. The greatest number of positive responses (good and excellent) were recorded for the statements 'extent to which international suppliers comply with the agreed minimum remaining shelf life for products being dispatched to NHM-SA; international suppliers provision of weekly dispatch plans with 18 months horizon to NHM-SA; accuracy of load plans created and provided; timing of load plans created and provided to NHM-SA by its partners; timing of dispatch plans created and provided to NHM-SA by its partners; extent to which supply constraints such as labour strikes and factory shut downs are communicated to NHM-SA by its international suppliers; extent to which international suppliers complies with NHM-SA's agreed stock cover policy; partners production stability periods reflect the business

needs of NHM-SA and international suppliers minimum run sizes that meet the business needs of NHM-SA. However, some international suppliers doubted the timing of communication for demand plan changes by NHM-SA; the bi-annual review of stock cover policy (2% very poor, 12% poor and 32% neutral); presence of a contingency plan to ensure supply to NHM-SA (18% poor and 24% neutral) and the validity of briefs for each product dispatched to NHM-SA.

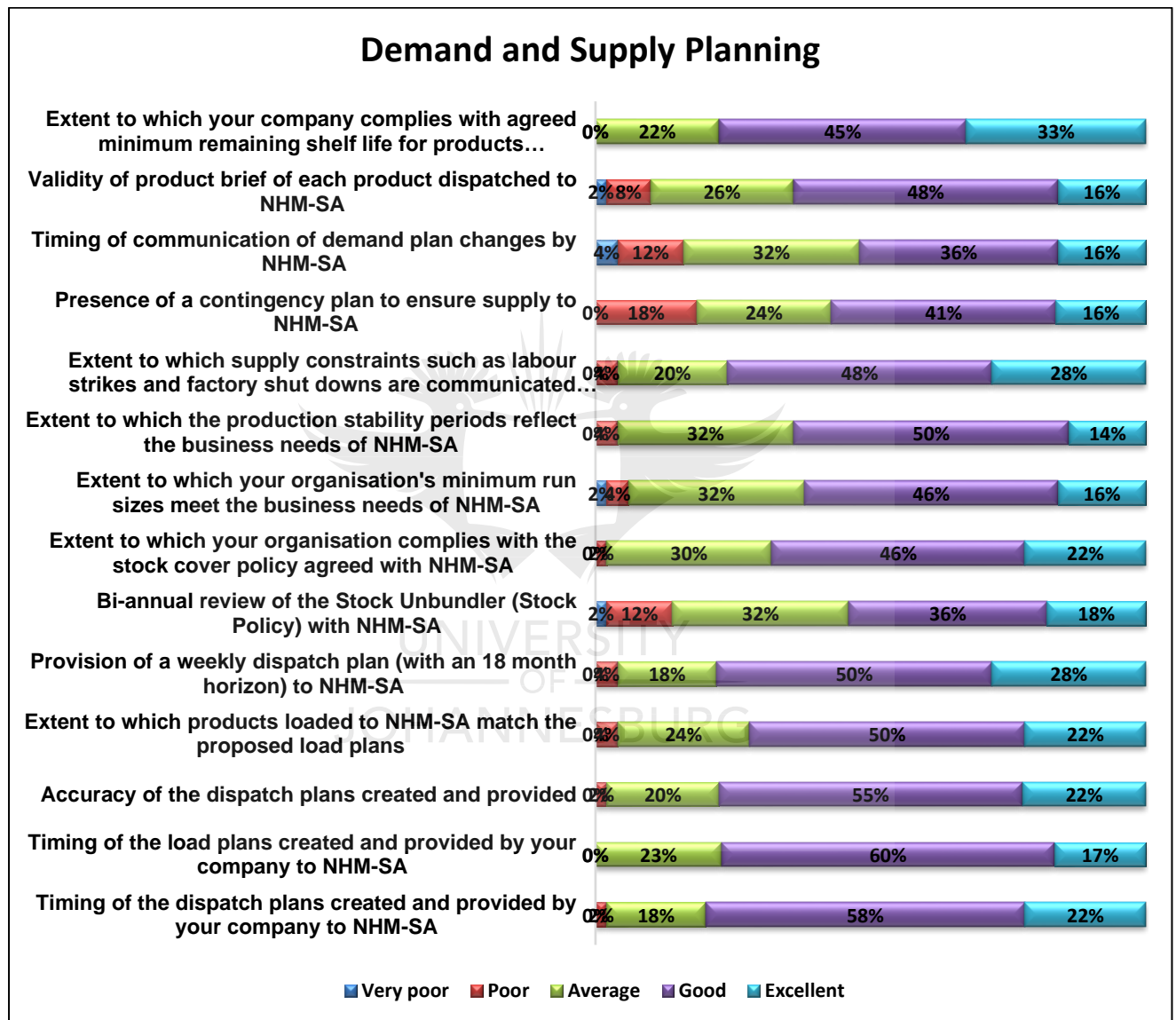


Figure 4.2: Demand and supply planning

Source: Calculated from the survey results

Collaboration practices – Import Operations

Figure 4.3 illustrates the results of the evaluation of import operational practices. Time taken to resolve IMS complaints raised by NHM-SA and the speed at which product returns by NHM-SA is executed were indicated as being at 61 per cent and 58 per cent respectively. The use of the efficient mode of transportation to supply products to NHM-SA was well established as the majority (81%) of respondents agreed and strongly agreed with these statements. Finally, the time taken to inform NHM-SA concerning any regulatory changes in shipping documentation was shown to be at 65 per cent. In summary, *most international suppliers agreed that collaborating with NHM-SA improved their import operations.*

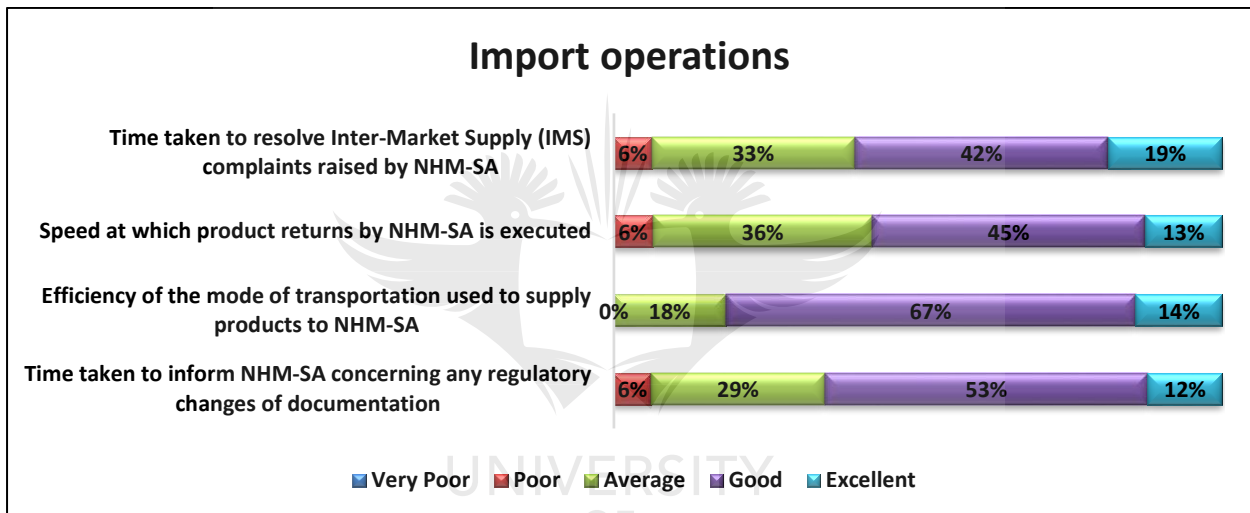


Figure 4.3: Imports operations

Source: Calculated from the survey results

Collaboration practices – Management of change

Figure 4.4 illustrates the results on the evaluation of the management of change. Essentially, 61 per cent (40% good and 21% excellent) of the respondents indicated that the stock keeping unit (SKU) discontinuation process followed by NHM-SA was well established. Similarly, 59 per cent (44% good and 15% excellent) of respondents positively indicated that NHM-SA gave them sufficient notice in terms of time for SKUs that were under discontinuation. Equally, 59 per cent (45% good and 14% excellent) of the respondents positively indicated that NHM-SA extended and maintained the IMS master data of new SKUs in the system on time. Only 64 per cent (45% good and

19% excellent) of the respondents positively communicated the change of supply source with NHM-SA on time. Conversely, 64 per cent (51% good and 13% excellent) positively indicated that collaborating with NHM-SA enabled them to make timeous changes in product recipes. Finally, 67 per cent of respondents positively indicated that collaborating with NHM-SA enabled them to communicate products that were about to be discontinued to NHM-SA. Although most of the above points were positive, it should be noted that some of the respondents remained neutral for these statements. This is a concern since the neutral (average) statements became the second dominant option after 'good' for all statements. This suggests that some of the respondents believed that the management of change was not well established. Despite this, *most of the respondents indicated that collaborating with NHM-SA positively influenced the management of change.*

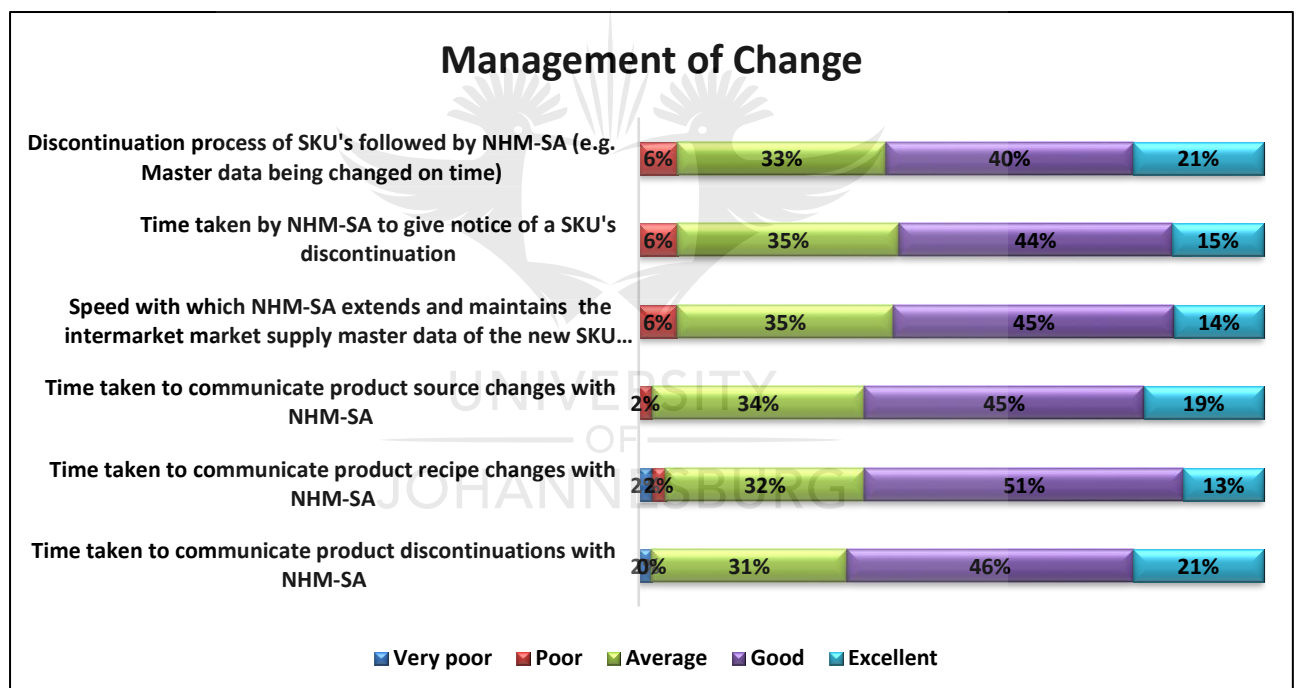


Figure 4.4: Management of change

Source: Calculated from the survey results

Collaboration practices - Communication

The respondents' rankings of existing collaboration practices with partners' based on communication are presented in Figure 4.5. *The results indicate that the respondents positively rated all the statements on the nature of communication with collaborating*

partners. In particular, the extent to which international suppliers have to follow-up in order to receive critical information ranked as common and well-established practice (68% of respondents rated this statement as good). Similarly, international suppliers were able to obtain required information after contacting NHM-SA was perceived as a well-established practice as 66 per cent (52% good and 14% excellent) of respondents rated this statement as good. However, some statements yielded neutral responses that ranged from 22 per cent to 30 per cent that suggests that some of the respondents perceived these statements not to be well-established practices. Respondents rated the presence of a back-up contact in situations where the usual contact was out of office as poor at 13 per cent. This was the most poorly rated statement.

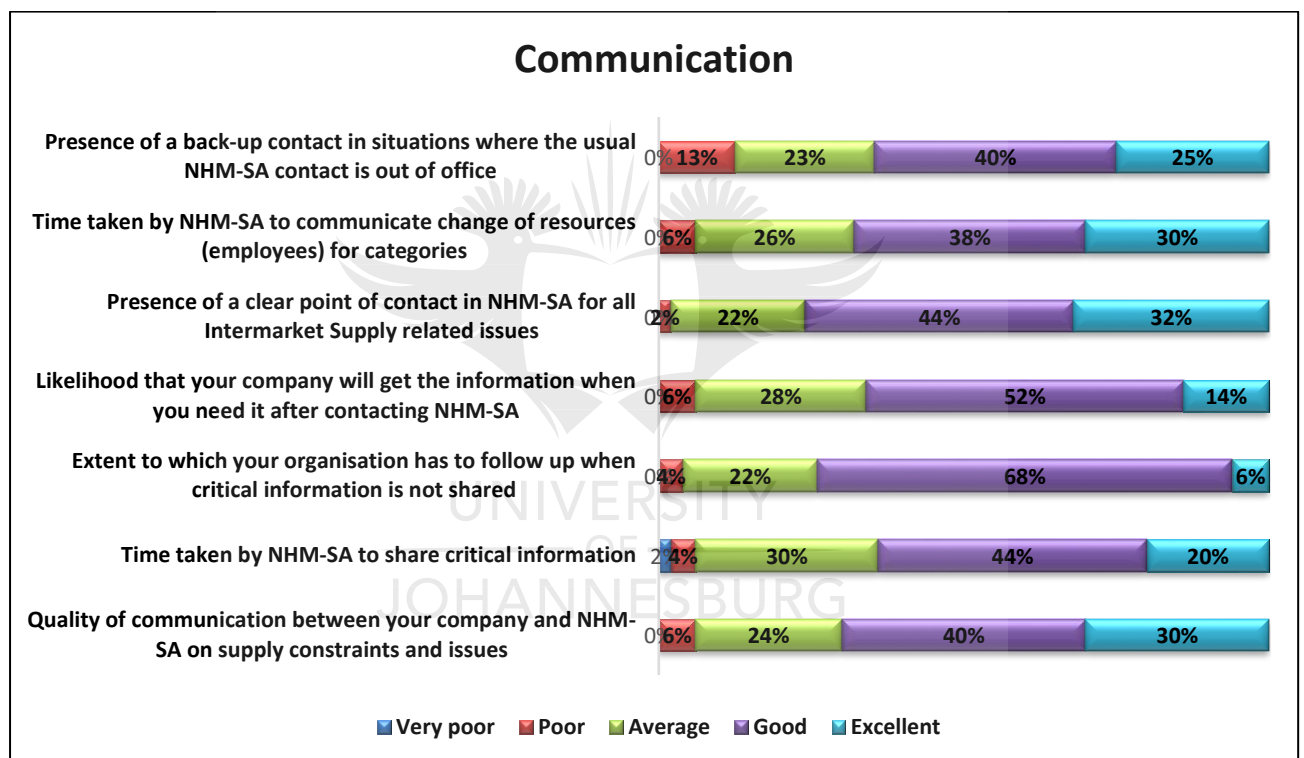


Figure 4.5: Communication

Source: Calculated from the survey results

Collaboration practices – Cost improvement

The assessment on the nature of cost improvement by collaborating partners revealed that 66 per cent (47% good and 19% excellent) of the respondents positively responded that collaborating with NHM-SA enabled them to look for opportunities of harmonising production recipes and packaging (refer to Figure 4.6). In the same way,

60 per cent (45% good and 15% excellent) positively indicated that working with NHM-SA enabled them to reduce production costs. However, there is still more work that has to be done by NHM-SA and its collaborating partners in order to realise the positive impact to cost improvement, as 30 per cent of the respondents were neutral about these statements. Nonetheless, 57 per cent (40% good and 17% excellent) of the respondents positively indicated there was a positive impact on cost improvement in terms of reducing the cost of operations when working with NHM-SA. However, 35 per cent of respondents were neutral about this statement. NHM-SA and its collaborating partners are not fully capitalising on the possible opportunities aimed at reducing the cost of operations. Only 64 per cent (55% good and 9% excellent) positively indicated that international suppliers timeously informed NHM-SA of recipe saving opportunities. Equally, this statement was also not well-established, as 32 per cent of respondents remained neutral. In summary, *respondents positively agreed that collaborating with NHM-SA enabled them to identify more production-related cost improvement opportunities.*

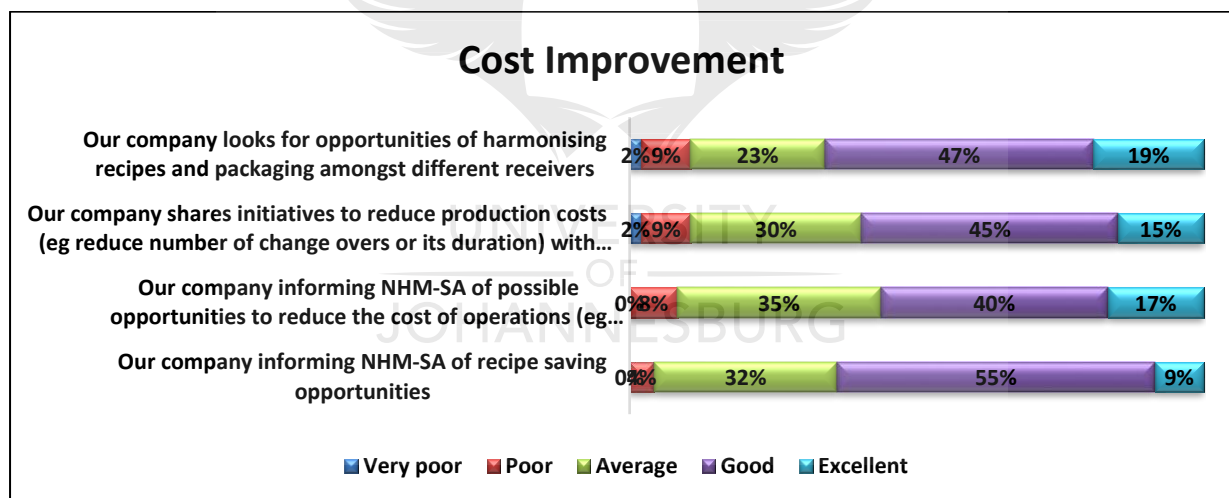


Figure 4.6: Cost improvement

Source: Calculated from the survey results

Collaboration practices – Production flexibility

Figure 4.7 illustrates the results of the evaluation of the current collaboration practices on production flexibility. The evaluation revealed that the notification of production delays is shared with NHM-SA. Essentially, 64 per cent (46% good and 18% excellent) of respondents totally agreed with this statement. In the same vein, 66 per cent (46%

good and 20% excellent) of the respondents indicated that collaborating with NHM-SA has enabled them to notify its partner about unexpected production shutdowns timeously. Equally, 68 per cent (44% good and 24% excellent) of respondents indicated that collaborating with NHM-SA enabled them to timeously share information concerning factory shutdowns. Furthermore, 62 per cent (36% good and 26% excellent) of the respondents indicated that collaborating with NHM-SA enabled them to rapidly change production volumes as per the requirements of NHM-SA. Generally, *respondents indicated that collaborating with NHM-SA enabled them to achieve positive gains in production flexibility.*

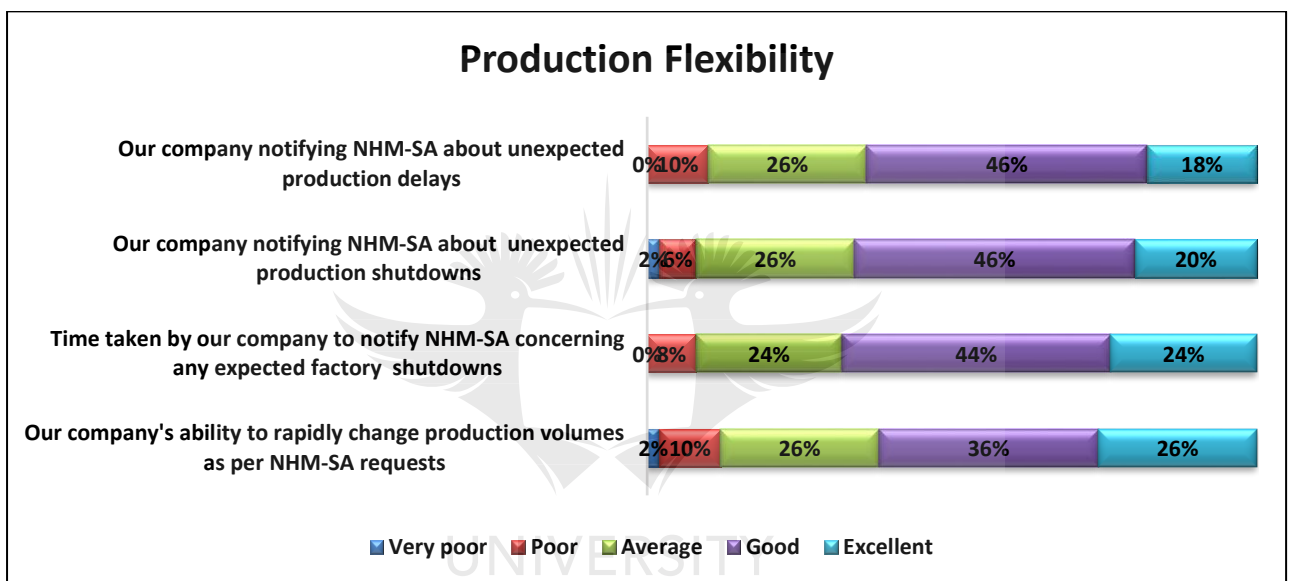


Figure 4.7: Production flexibility

Source: Calculated from the survey results

Collaboration practices – Customer relationship management

The assessment of the nature of customer relationship management with collaborating partners for NHM-SA is revealed in Figure 4.8. The study revealed that 82 per cent (48% good and 34% excellent) of international suppliers indicated that they collaborated to seek a long-term, stable and progressive relationship with NHM-SA. Equally, 69 per cent positively indicated that NHM-SA was highly involved in the development of new products. Moreover, 67 per cent (49% good and 18% excellent) of international suppliers positively indicated that collaborating with NHM-SA has been a driving force in terms of resolving misunderstandings concerning the supply of products. Ultimately, 73 per cent (46% strongly agreed and, 27% agreed) of

respondents strongly indicated that joining forces with NHM-SA has enhanced the systematic process of handling customer complaints related to the quality of products. Similarly, 66 per cent (55% good and 11% excellent) of international suppliers used the feedback that was given by NHM-SA to improve products, processes and relations. Only 59 per cent (38% good and 21% excellent) of respondents indicated that they measured the service satisfaction levels of NHM-SA. This average result is a major concern as it shows that there is only an average alignment of service satisfaction levels. Furthermore, 17 per cent of respondents negatively specified that the measurement of service satisfaction levels was not well-established. *All of the above attributes emerged as positive as they indicate that NHM-SA and its collaborating partners had improved customer relationship management.* However, more work still needs to be done to ensure that CRM is well-established due to the high number of neutral responses given by respondents for all of the statements.

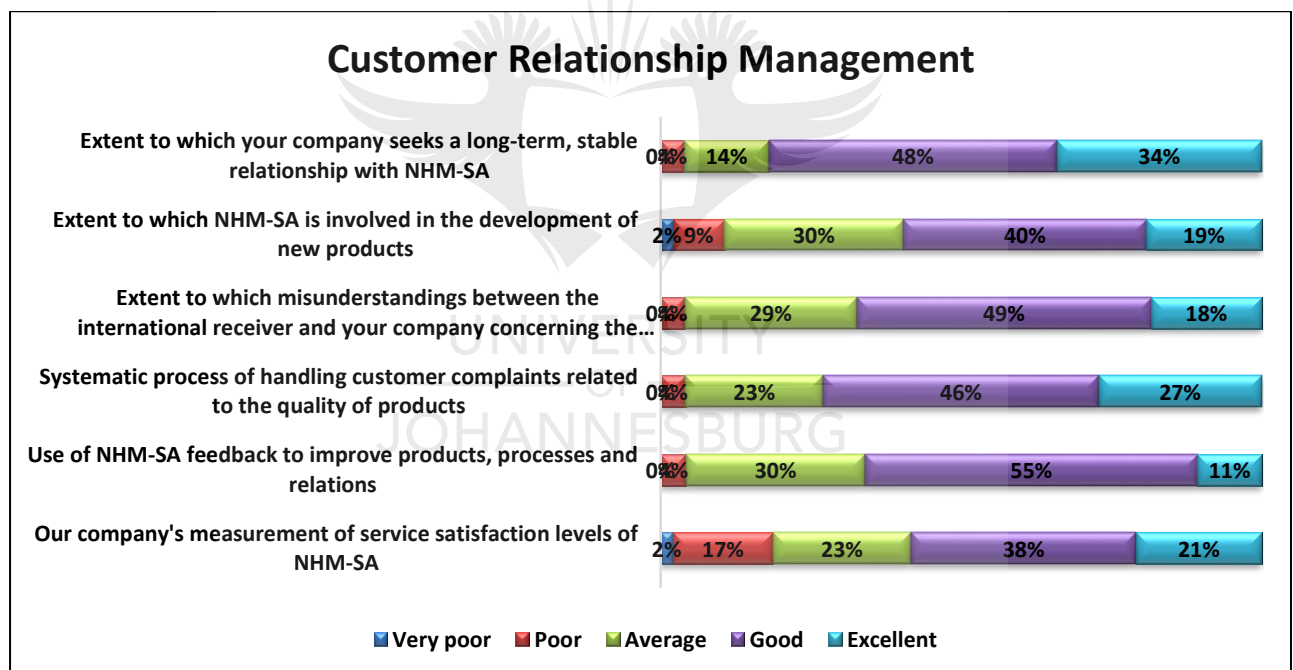


Figure 4.8: Customer relationship management

Source: Calculated from the survey results

Collaboration practices – Organisational performance

Working with NHM-SA to reduce the time taken to introduce new products was not well executed. Figure 4.9 indicates that 43 per cent of respondents were neutral about this statement. Only 53 per cent of respondents agreed and strongly agreed with this

statement. Similarly, working with NHM-SA to reduce working capital for raw and packaging materials was not well executed as 38 per cent of study respondents were neutral. Only 52 per cent of respondents both agreed and strongly agreed with this statement. Conversely, 38 per cent of respondents were neutral that collaborating with NHM-SA has resulted in the reduction of their working capital for finished goods. Nevertheless, 56 per cent of respondents agreed and strongly agreed that collaborating with NHM-SA has reduced their working capital for finished goods. Overall, *international suppliers agreed that their organisational performance had moderately improved because of collaborating with NHM-SA.*

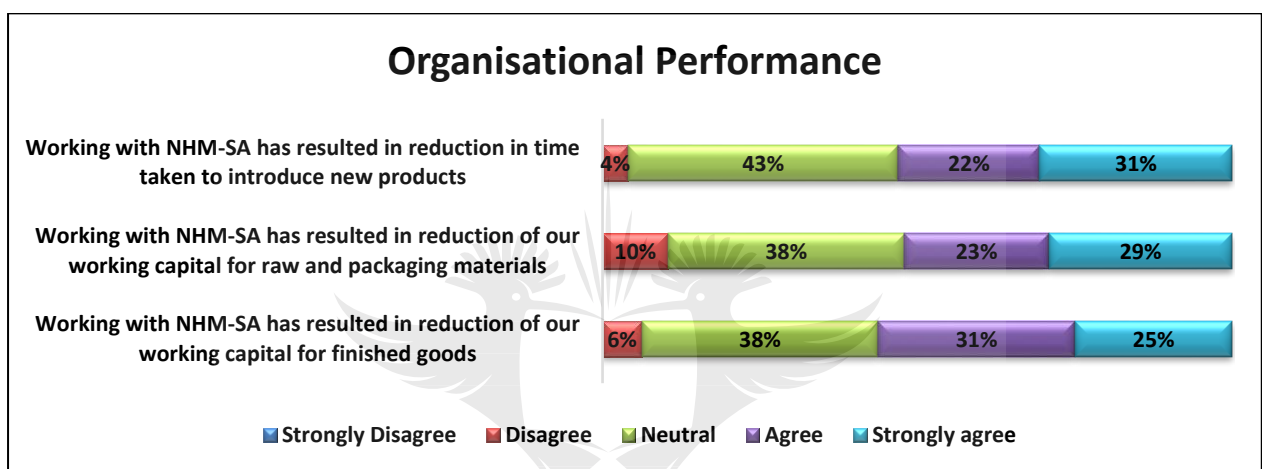


Figure 4.9: Organisational performance

Source: Calculated from the survey results

Collaboration practices – Shipping performance

The respondents' rankings of existing collaboration practices with regards to their impact on shipping performance are shown in Figure 4.10. The results reveal that the respondents positively rated all the statements. In particular, international suppliers indicated that the necessary documents are shared before the shipping vessel's estimated time of arrival (ETA) in South Africa. This was ranked as a common and well-established practice at 82 per cent (58% and 23% of respondents rated this statement as good and excellent respectively). Similarly, the timeous booking of shipping vessels that supply inventory and the dispatch of products once a valid veterinary permit was in place were perceived as well-established practices as 81 per cent (52% good and 29% excellent) of respondents positively rated these statements

as good and excellent respectively. However, shipping vessels with shorter lead times were not being given preference, as 31 per cent of respondents remained neutral about this statement. This implies that in some instances the receipt of goods took longer than anticipated for NHM-SA. In summary, *SCC has enabled NHM-SA and its international partners to improve their shipping performance.*

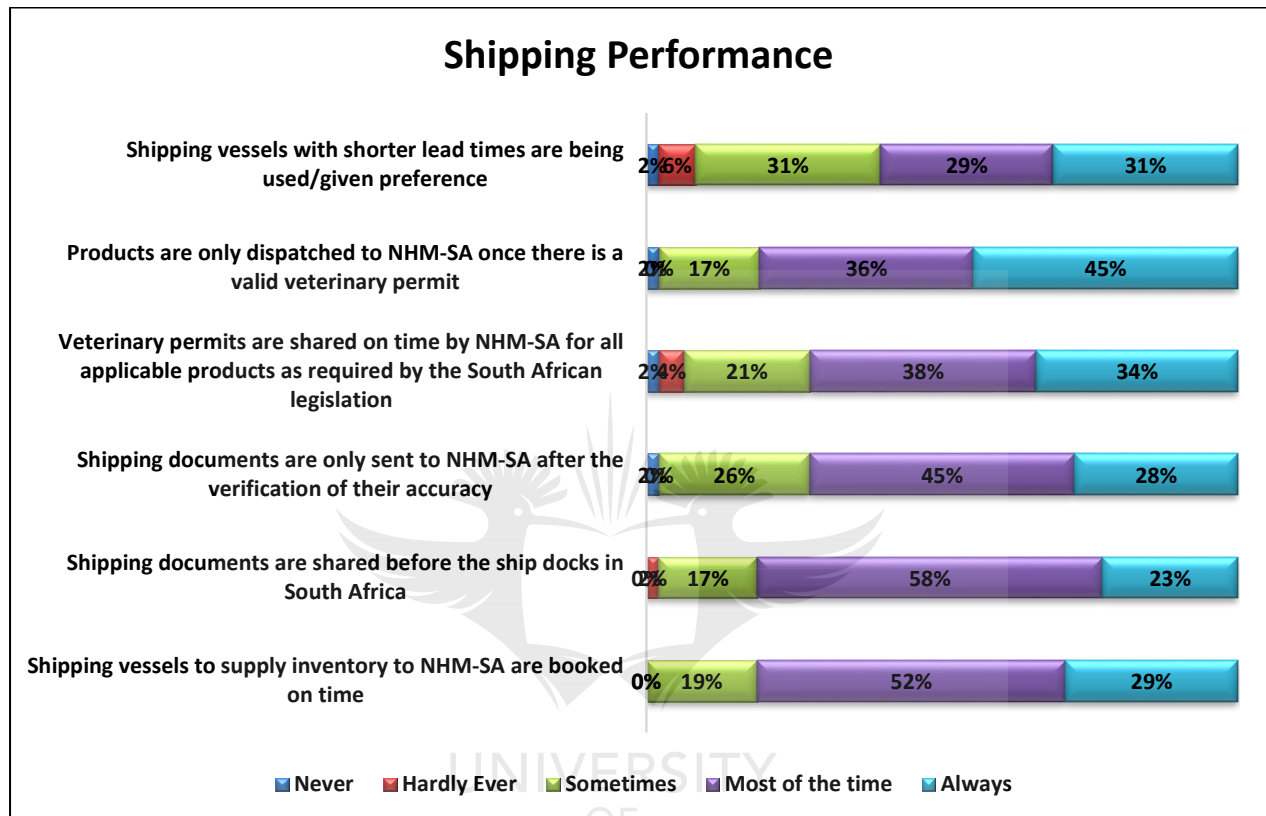


Figure 4.10: Shipping performance

Source: Calculated from the survey results

Collaboration practices – Payment information

Figure 4.11 illustrates the results of the evaluation of existing payment information of NHM-SA to its international suppliers. International suppliers shared transfer prices timeously and every quarter with NHM-SA as 75 per cent and 77 per cent of respondents respectively supported this statement by indicating that this was done most of the time. Only 65 per cent of international suppliers agreed and strongly agreed that the credit notes were issued on time. However, this process was still not particularly well-established as 27 per cent of respondents were neutral about this statement. NHM-SA was doing well in terms of paying its suppliers as per the invoice

value as 73 per cent of respondents agreed with this statement. Conversely, 71 per cent of international suppliers also agreed and strongly agreed that NHM-SA paid its invoices according to the agreed payment terms. In summary, *collaborating with international suppliers has enabled NHM-SA to improve its payment process.*

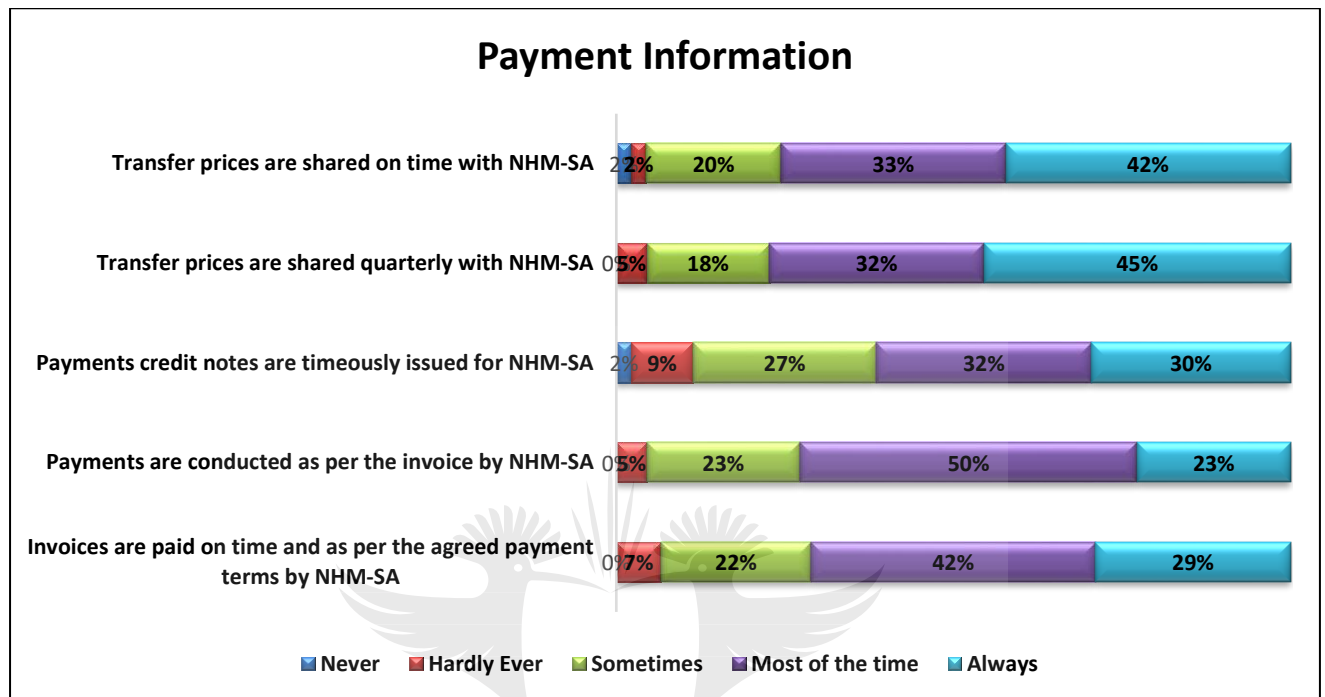


Figure 4.11: Payment information

Source: Calculated from the survey results

4.11. Summary

In this chapter, data analysis was conducted. The chapter started with descriptive analysis, which looked at the normality, reliability and validity tests to ensure that data was reliable and valid. The Kolmogorov-Smirnov Test and the Shapiro Wilk Test conducted indicated that the majority of independent variables were out of normality. However, the visual observation of the Q-Q plot, Kurtosis and Skewness revealed a normal distribution. The Cronbach's alpha coefficient tests confirmed the reliability of the adopted instrument. From the results, communication, cost improvement and information sharing were significant variables in predicting that SCC improved organisational performance. Multiple regression analysis was utilised to determine the most significant variables and the best predictor in order to understand SCC influence to organisational performance.

The next chapter outlines the potential managerial implications, and it provides the conclusion of the study.



CHAPTER 5

Conclusion and Managerial Implications

5.1. Introduction

The preceding chapter provided a comprehensive analysis of the empirical data gathered for the study. Finally, this chapter will present the conclusion and managerial implications of this study. Subsequently, the study's contribution to the body of knowledge and suggestions for future research will be discussed in this chapter.

5.2. Research Objectives

The main (primary) objective of this study was to investigate the role of collaboration with international suppliers in improving the organisational performance of NHM-SA in the South African FMCG industry. A case study of NHM-SA was utilised to answer the primary research question. This primary objective was achieved.

The secondary objectives were set out as follows:

- To examine the influence of SCC on organisational performance at NHM-SA.
- To determine the effect of communication between NHM-SA and its collaborating partners on organisational performance.
- To establish the impact of SCC on supply chain efficiencies for NHM-SA and its partners.
- To establish the effect of information sharing between NHM-SA and its collaborating partners on organisational performance.

To achieve the objectives of this study, an exploratory approach was undertaken to obtain an in-depth and deeper understanding of SCC impact in the contemporary South African FMCG industry. An extensive literature search together with study findings yielded proof that SCC leads to enhanced organisational performance of collaborating partners (NHM-SA and its international suppliers), improved communication between NHM-SA and its collaborating partners, attainment of supply chain efficiencies for NHM-SA and its partners and Improved information sharing

between NHM-SA and its collaborating partners. Therefore, the primary together with the secondary objectives of this study were achieved.

5.3. Overview of the literature review

The intense global competition has resulted in dynamic and complex supply chains. Organisations seek mechanisms to continuously achieve supply chain efficiencies through the optimisation of their supply chain operations. Therefore, supply chain collaborations have become one of the fundamental drivers and enablers of efficiencies for involved partners. These efficiencies are expected to enhance the organisational performance in the form of maximised profitability.

Chapter 2, which formed the literature review of the study, provide a detailed account of the SCC concept. The review commenced with a definition of SCC (Ali & Shukran, 2016; Cao & Zhang, 2011), emphasising the need for organisations to work together in order to optimise the cost of operations and maximise profitability (Simatupang & Sridharan, 2018). This focus was used to develop the primary objective of the study. Supply chain collaboration attributes were identified: incentive alignment, communication, information sharing and decision synchronisation. These attributes led to the deeper analysis of SCC benefits as well as its disadvantages. Although SCC benefits by far outweighed its disadvantages, it was discovered that SCC was not an automatic process and its success depended on the full commitment of all involved partners (Chowdhury, 2012; Nyaga *et al.*, 2010).

In order to support the success of SCC, potential enablers and resistors were also scrutinised in relation to the South African FMCG industry (Ralston *et al.*, 2017) (Asree *et al.*, 2016). This led to the description of case examples of FMCG organisations that had successfully benefited from their supply chain operations through the implementation of SCC initiatives (Fawcett *et al.*, 2012) (Romano, 2011) (Ramanathan *et al.*, 2011). The literature review concluded with the SCC framework, which indicated that successful SCC should have the potential to enhance organisational performance by optimising supply chain operations and maximising profitability (Ince & Ozkan, 2015; Piboonrungraj, 2013).

5.4. Review of research methodology and design

Chapter 3 provided a comprehensive review of the research design and methodology. This chapter also provided a detailed description in terms of how empirical research was conducted and analysed. In this study, an inductive research approach that is both exploratory and descriptive in nature was undertaken. Moreover, a case study research design was used, describing NHM-SA, a fictitious name of a company (NHM-SA) that operates in the FCMG industry. Furthermore, the study evidence was presented using a quantitative approach. The data was gathered using an online web-based survey circulated via an email to all purposively selected respondents of NHM-SA. Prior to the survey being circulated to respondents, STATKON (a statistical consultation at the University of Johannesburg), was consulted to provide assistance with meaningful guidance on survey design. The data gathered from purposively selected respondents was captured and analysed through the use of SPSS for Windows version 25. Consequently, the data were subjected to descriptive analysis, normality testing, frequencies, custom tables and a reliability test. This study was cross-sectional in nature as it is conducted for a specific period and for a particular phenomenon. Finally, data were collected using literature studies and empirical field research.

5.5. Study limitations

Limitations of the research are usually associated with the research method employed (Zikmund & Babin, 2010). This study was limited to only one organisation, in this case, NHM-SA. This resulted in a limitation in terms of collecting data due to the limited number of NHM-SA's international suppliers. The scope of this study was thus limited to 100 international suppliers of NHM's raw and finished goods. This meant that the generalisability of the study results was weak due to the small study population (Bartlett, Denyse & Baines, 2014; Creswell, 2014; Yin, 2012). Secondly, the study was limited to the perceptions of international suppliers based on their collaborative experiences with NHM-SA (De Vaus, 2013). The geographical distance, international time differences as well as busy schedules of respondents resulted in difficulty in collecting information by the researcher, especially where the researcher had to make follow-ups to respondents using real-time technology such as Skype.

Although this study followed the survey design method recommended by Sue and Ritter (2012) in an attempt to capture a higher response rate, the researcher nonetheless encountered some issues, notably, insufficient and incomplete survey responses.

5.6. Study contribution

The succeeding section will discuss how the study contributes to theory and practice.

5.6.1. Theory

Outlined below are the theoretical contributions of the study:

- Supply chain collaboration is context-based; therefore the study contributed to the body of knowledge in the South African context about collaborating with international suppliers in the FMCG industry.
- Few SCC studies exist in the FMCG industry; therefore this study will add more knowledge to the FMCG industry.
- Supply chain collaboration operational efficiencies in the FMCG industry were identified.
- New impediments to supplier collaboration performance were identified from the suppliers' perspective.
- The study is useful to the FMCG industry given the intense competition requiring agile, collaborative supply chain for successful players.

5.6.2. Practice

Outlined below are the practical contributions of the study:

- South African FMCG companies will gain a deeper understanding of international suppliers' expectations in order to implement successful supply chains through collaboration.
- South African FMCG companies which have not yet engaged in supplier collaboration initiatives will be advised by the study in terms of how to implement successful SCC.
- The study provides a guideline for implementing successful SCC in the FMCG industry for all involved partners to realise positive supply chain performance

and operational efficiencies that would result in enhanced overall organisational performance.

- The study provides advice to supply chain partners (both national and international) on key collaborative areas that have the potential for making SCC a success.

5.7. Suggestions for future research

This study provided several insights into collaborative relationships within one organisation and its international suppliers. An interesting extension of this research would be to conduct this study within multiple organisations operating in the FMCG industry with their international suppliers. Identifying any differences between international suppliers such as those of raw, finished goods and service providers may establish collaborative advantages and other associated operational efficiencies.

It would be valuable for forthcoming studies to compare NHM-SA supply chain operational efficiencies of imported goods by collaborating with international suppliers when compared to other strong global competitors, such as Unilever.

Due to the nature of the FMCG industry, differing partnerships, geographies or regulations yield differing results. In the contemporary global economic landscape, organisations interact with partners irrespective of their geographic locations. Therefore, future research could expand the scope of this study to include other FMCG companies with different geographic origins in order to assess various factors such as the level technology diffusion in other countries that may affect the results. Furthermore, other geographic areas where these organisations operate may consist of different organisational cultures, values or situations that could have an influence on the way in which collaborative relationships are viewed and perceived by collaborating partners.

5.8. Managerial implications

The results for *international customer information sharing* revealed that the provision of accurate system requirements showed low collaboration. This was further demonstrated by the low accuracy of information shared by NHM-SA for production

and procurement purposes to its partners. It is recommended that management invest in workforce system training, upskilling and development. Similarly, management could invest in common information sharing with partners to facilitate full integration with international suppliers (Pisa & Heyns, 2017). Moreover, the number of meetings for NPDI projects was rated very low. Management could ensure that a series of regular meetings are scheduled between all partners. Management should furthermore conduct anonymous surveys with its workforce and business partners to gauge their opinion on what business processes and procedures were working and which were not working well in order to implement improvements (De Vaus, 2013; Burton & Mazerolle, 2011; Fowler, 2009).

The results for ***demand as supply planning information sharing*** revealed that the rankings for the timing of communication of demand plan changes by NHM-SA showed limited collaboration. Accurate information sharing reduces uncertainty in SCC (Chen *et al.*, 2013). Management could invest in implementing collaborative projects with its partners for the purpose of ensuring that the system parameters are correctly set up to trigger demand plan changes automatically. Management would also need to make sure that information concerning major demand changes such as stock on hand, future forecast and promotions are shared in real time with international suppliers in order to increase partners' competitiveness.

Pradabwong, Braziotis, Pawar and Tannock (2015) indicate that information sharing helps to improve inventory levels, product or service quality and supply chain performance, which ultimately improves organisational performance of collaborating partners. Furthermore, the bi-annual review of stock cover policy was rated very low, which indicates that there are weak contingency plans in place to ensure full supply to NHM-SA. It is suggested that the management identify the potential suppliers that would be able to supply similar products in case of the current international suppliers being unable to supply the required products on time in full (OTIF). This will enable NHM-SA to ensure on-shelf availability (OSA) to its customers, thereby increasing organisational and operational performance.

The speed with which product returns are executed, and the time taken to resolve intermarket market supply (IMS) complaints rated very low for import operations. It is recommended that management collaboratively create standard operating procedures

(SOPs) that will ensure the availability of detailed information regarding the delivery of products that do not conform to agreed quality service levels. The availability of guidelines ensures for accountability and actions to be taken to partners who deliver products and services that do not conform to the agreed service levels. Furthermore, these SOPs will provide clear guidelines in terms of the actions that have to be taken for non-conforming suppliers. For instance, such collaboration could enable NHM-SA to decompose damaged inventory on behalf of its international suppliers rather than sending it back to them. This will allow NHM-SA international suppliers to avoid transportation costs and other reverse logistics costs of non-saleable inventory, which will further increase the organisational performance of the supply chain (Mai *et al.*, 2012; Fugate, Davis-Sramek & Goldsby, 2009).

The results for **management of change** revealed that the time taken to notify international suppliers concerning SKUs that are to be discontinued indicated limited operational collaboration. The speed at which NHM-SA extends and maintains IMS master data of new SKUs in the system was slow. Management of NHM-SA could share the historical and anticipated future sales data, which would allow its international suppliers to have full visibility of the sales activities of NHM-SA. However, this necessitates high levels of trust to be existing across all involved supply chain partners. Successful collaboration is characterised by high levels of trust and the protection of sensitive information (D'Amours & Rönnqvist, 2013). Consequently, organisations that are willing to share information undoubtedly stand a chance to gain enormously from collaboration (Chen *et al.*, 2013). Furthermore, such collaboration would enable international suppliers to easily plan the procurement of both raw materials and finished goods since it is one of the areas that is characterised by low collaboration for NHM-SA. The informational and operational collaboration will have a major direct impact on the organisational performance for NHM-SA and its partners (Handfield, Cousins, Lawson & Petersen, 2015) (Gumboh & Gichira, 2015) (Hasan, Eckert & Earl, 2012). For instance, collaborating partners will avoid write-off costs associated with obsolete raw materials and packaging stock.

The availability of a back-up contact during times where the usual contact is out of office rated very low for communication. Information sharing and communication are viewed as a starting point to effective SCC (Chen *et al.*, 2013). Management could include operational employees who are involved in daily activities in strategic

discussions where key decisions are being taken such as the price negotiation process. This will enable operational employees to collaborate easily and share information with each other. Furthermore, information concerning each SKU's performance could also be shared during this time. Such information could involve each SKU's demand plan accuracy (DPA), stock-outs and sales history. The improved DPA will allow NHM-SA to increase sales through better in-stocks of the right products. Moreover, improved DPA will allow NHM-SA to stock less inventory of slowly moving products. This will lead to increased gross margin, better service to customers, lower inventory holding costs, lower operating costs, improved working capital, reduction of inventory write-off costs, higher profitability, and ultimately, higher shareholder value.

The results for **cost improvement** revealed that the level of sharing possible opportunities in order to reduce the cost of operations showed limited collaboration. It is recommended that management establish joint performance measures with partners to measure the same indicators. For instance, international suppliers can measure the case fill rate (CFR) of NHM-SA, which is the same measure that NHM-SA uses to gauge the satisfaction levels of its major customers such as Shoprite, Massmart, Spar and Woolworths. Furthermore, management would also need to define collaboration objectives and responsibilities with its partners clearly. Finally, management would have to openly communicate to their operational teams the anticipated gains and losses that can be attained from collaborative initiatives. This would indicate that all partners must be committed to the successful implementation of collaborative initiatives as risks and rewards attained from collaborative initiatives are to be shared equally.

The results revealed average collaboration for **operational and organisational performance**. This indicates that NHM-SA and its partners still have some work to do in terms of collaborating with agility for the purpose of reducing the time taken to introduce new products, reduce working capital for raw material, packaging materials and finished goods. The management of NHM-SA could provide full visibility on working capital performance to its partners and its entire working capital cycle. Furthermore, management could develop similar key performance indicators (KPIs) in terms of managing and measuring its working capital such as having a similar method to calculate stock holding targets.

The results for **shipping performance** revealed that there is a low collaboration between NHM-SA and its partners. Shipping vessels with shorter lead times are not given preference. The reason being NHM-SA and its partners individually negotiate shipping rates with shipping companies instead of negotiating collaboratively. For instance, shipping vessels from North, East and Western Europe have longer ETAs to South African ports due to transshipments that take place in Belgium. These vessels have ETAs that are 10 to 15 days longer when compared to other direct vessels. Management could collaboratively sign operating contracts with shipping companies that have shorter lead times and make use of direct shipping lines in order to improve the transit time of sea-freighted goods. This will enable these partners to capitalise on shorter lead times, which will have a positive impact on-shelf availability (OSA). Furthermore, shorter lead times will enable NHM-SA to improve its customer order fulfilment (COF) and CFR. On the other hand, partners (international suppliers) will have better cash flow since NHM-SA only pays its international suppliers after the physical receipt of inventory. Furthermore, the collaboration on shipping lines by NHM-SA and its partners would result in more buying power in terms of better shipping rates negotiation with shipping companies due to the expected increased tonnage that has to be shipped. This will ultimately result in positive organisational performance in terms of profitability for NHM-SA and its partners.

5.9. Conclusion

This study provided a deeper understanding of the interrelationships between organisational performance, SCC, operational efficiencies and collaborative advantages. Supply chain collaboration has been recognised as a critical factor for achieving business development, success, collaborative advantage and enhanced organisational performance. The research established and confirmed that there are positive collaborative relationships between SCC, operational efficiencies, information sharing and organisational performance.

The building of strong collaborative relationships between organisations rather than individual working can lead to a major competitive advantage, resulting in improved organisational performance (Simatupang & Sridharan, 2018; Talavera, 2013; Mathuramaytha, 2011). Therefore, competition is no longer between individual

organisations but between well-coordinated and collaborated chains. Supply chain collaboration enables supply chain partners to leverage resources in the entire network. Moreover, SCC enables organisations to compete more effectively in a volatile, uncertain, complex and ambiguous (VUCA) business environment. Therefore, SCC is a major source of lasting competitive advantage in this intensely competitive global economic landscape. In SCC, information sharing and enhanced communication reduce uncertainty. Consequently, information sharing is the starting point for successful SCC.

Collaborative initiatives deepen supply chain partners' understanding of the entire supply chain environment. New knowledge is generated through collaborative research, joint process innovation and product design, which enhances supply chain capability in terms of responding promptly to environmental changes. This research implies that SCC provides a key mechanism for organisational performance and operational efficiencies. Successful SCC results in greater benefits to supply chain partners than those obtained individually. Therefore, it is imperative for managers to build and manage SCC. Benefits that accrue as a result of collaborative initiatives should be shared equally by all involved partners.

Managers have a greater responsibility to identify, implement and capitalise on SCC initiatives with involved supply chain partners in order to improve overall organisational performance. Consequently, this study provided managers with a clear understanding of how FMCG companies can improve their performance through the implementation of SCC initiatives.

Finally, this study can be helpful to organisational managers in terms of enhancing their understanding of both internal and inter-organisational development, close gaps and find ways of managing and improving their SCC activities in order to achieve higher organisational supply chain performance.

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Appendices

Appendix A: Questionnaire

Dear Sir / Madam

I am an Intermarket Supply Planner for NHM-SA and I am inviting you to participate in a survey entitled: "Supply chain collaboration and organisational performance in the fast moving consumer goods industry."

The purpose of this research is to: (1) Collaborate with international partners in order to enrich the organisational performance through supply chain efficiencies, (2) create awareness of the power of collaboration for intermarket supply planning through fostering supply chain operations that are beneficial to supply chain partners in the context of the FMCG industry and (3) improve our supply operations. By sharing your experience of working with NHM-SA you can make an important contribution to our understanding of the role of collaboration in achieving an efficient supply chain.

Your participation is voluntary and your response will be anonymous (you do not have to provide your name or contact details and there will be no way to connect your response to you personally) and the information you provide will be kept strictly confidential (it will not be shared with anyone else and data will be analysed in aggregated format). Ensuring your anonymity and confidentiality means you can provide full and honest answers without fear of prejudice. There is no loss of benefit or penalty for non-participation in this study. You are more than welcome to withdraw at any time and without providing any reasons. The completion of this survey would take you approximately 15 minutes.

If you have any questions concerning the survey, please do not hesitate to contact me on the details provided below:

Researcher's name: Mr Nkanyiso Hadebe
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Navigating the survey

The questionnaire has five pages. Please try and complete the question in a single visit. Please note the following regarding accessing and navigating the questionnaire:

- (1) You will only have one opportunity to fill out the questionnaire.
- (2) When you click on 'Submit' on the final page your response will be saved and you will not be able to access the questionnaire again.
- (3) You can complete part of the questionnaire, browse away, and return to the questionnaire later.
- (4) However, if you browse away but have not answered all the questions on the active page nor selected 'Next' you will lose the information on that page; so please complete a page and select 'Next' before browsing away.
- (5) Once you have completed a page and moved to the next page you will not be able to access the previous page again; so please ensure you are satisfied with your responses before continuing to a new page.

Section 1

This section of the questionnaire refers to background or biographical information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to compare groups of respondents. Once again, we assure you that your response will remain anonymous. Your co-operation is appreciated.

Q1 - Please indicate your gender	
Male	
Female	

Q2 - Please indicate your level of Management	
Junior employee	
Senior Employee	
Junior Manager	
Senior Manager	
Executive Manager	
Managing Director	

Q3 -Years of Experience	
1-5 years	
6-10 years	
11-15 years	
16-20 years	
21 or more years	

Q4 - Please indicate your highest educational qualification	
High School	
Certificate / Diploma	
Bachelors degree	
Honours degree	
Master's degree	
PhD	
Other (please specify) _	

Q5 - Please indicate your highest educational qualification	
High School	
Certificate / Diploma	
Bachelors degree	
Honours degree	
Master's degree	
PhD	

Q6 - Please indicate your Region	
Africa, Asia, Oceania	
America	
Europe	

Section 2

This section consist a total number of 11 sub sections. The following sections will cover the attributes that you have with NHM-SA based on your experience. Please use the scale provided to answer each question.

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 2 - International Customer Information (Receiver)	Very poor	Poor	Average	Good	Excellent
2.1	The accuracy of information for production and procurement provided by NHM-SA	0	1	2	3	4
2.2	The number of meetings for the NPDI (New Product Development Introduction) process	0	1	2	3	4
2.3	Number of NPDI meetings attended by NHM-SA with its producers	0	1	2	3	4
2.4	How often work is done outside of the system	0	1	2	3	4
2.5	How often NHM-SA provides accurate system requirements	0	1	2	3	4
2.6	How often work is done inside the system	0	1	2	3	4
2.7	The accuracy of system visibility of NHM-SA requirements	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 3 - Demand and Supply Planning	Very poor	Poor	Average	Good	Excellent
3.1	The timing of the dispatch plans created and provided by your company to NHM-SA	0	1	2	3	4
3.2	The timing of the load plans created and provided by your company to NHM-SA	0	1	2	3	4
3.3	The accuracy of the dispatch plans created and provided...	0	1	2	3	4
3.4	The extent to which products loaded to NHM-SA match the proposed load plans	0	1	2	3	4
3.5	Provision of a weekly dispatch plan (with the 18-months horizon) to NHM-SA	0	1	2	3	4
3.6	Bi-annual review of the Stock Unbundler (Stock Policy) with NHM-SA	0	1	2	3	4
3.7	The extent to which your organisation complies with the stock cover policy agreed with NHM-SA	0	1	2	3	4
3.8	The extent to which your organisation's minimum run sizes meet the business needs of NHM-SA	0	1	2	3	4
3.9	The extent to which the production stability periods reflect the business needs of NHM-SA	0	1	2	3	4
3.10	The extent to which supply constraints such as labour strikes and factory shut downs are communicated to NHM-SA	0	1	2	3	4
3.11	Presence of a contingency plan to ensure supply to NHM-SA	0	1	2	3	4
3.12	The timing of communication of demand plan changes by NHM-SA	0	1	2	3	4
3.13	The validity of product brief of each product dispatched to NHM-SA	0	1	2	3	4
3.14	The extent to which your company complies with an agreed minimum remaining shelf life for products dispatched to NHM-SA	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 4 - Import Operations	Very poor	Poor	Average	Good	Excellent
4.1	The time it takes to inform NHM-SA concerning any regulatory changes of documentation	0	1	2	3	4
4.2	The efficiency of the mode of transportation used to supply products to NHM-SA	0	1	2	3	4
4.3	The speed at which product returns by NHM-SA is executed	0	1	2	3	4
4.4	The time it takes to resolve Inter-Market Supply (IMS) complaints raised by NHM-SA	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 5 - Management of Change	Very poor	Poor	Average	Good	Excellent
5.1	The time it takes to communicate product discontinuations with NHM-SA	0	1	2	3	4
5.2	The time it takes to communicate product recipe changes with NHM-SA	0	1	2	3	4
5.3	The time it takes to communicate product source changes with NHM-SA	0	1	2	3	4
5.4	The speed with which NHM-SA extends and maintains the intermarket market supply master data of the new SKU (Stock Keeping Unit) in the system	0	1	2	3	4
5.5	The time it takes NHM-SA to give notice of a SKU's discontinuation	0	1	2	3	4
5.6	Discontinuation process of SKU's followed by NHM-SA (e.g. Master data being changed on time)	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 6 - Communication	Very poor	Poor	Average	Good	Excellent
6.1	Quality of communication between your company and NHM-SA on supply constraints and issues	0	1	2	3	4
6.2	The time it takes NHM-SA to share critical information	0	1	2	3	4
6.3	The extent to which your organisation has to follow up when critical information is not shared	0	1	2	3	4
6.4	The likelihood that your company will get the information when you need it after contacting NHM-SA	0	1	2	3	4
6.5	Presence of a clear point of contact in NHM-SA for all Intermarket Supply related issues	0	1	2	3	4
6.6	The time it takes NHM-SA to communicate the change of resources (employees) for categories	0	1	2	3	4
6.7	Presence of a back-up contact in situations where the usual NHM-SA contact is out of office	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 7 - Cost improvement	Very poor	Poor	Average	Good	Excellent
7.1	Our company informing NHM-SA of recipe saving opportunities	0	1	2	3	4
7.2	Our company informing NHM-SA of possible opportunities to reduce the cost of operations (e.g. inventory levels or product flow)	0	1	2	3	4
7.3	Our company sharing initiatives to reduce production costs (e.g. reducing the number of changeovers or their duration) with NHM-SA	0	1	2	3	4
7.4	Our company looks for opportunities to harmonise recipes and packaging amongst different receivers	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 8 - Production Flexibility	Very poor	Poor	Average	Good	Excellent
8.1	Our company's ability to rapidly change production volumes as per NHM-SA requests	0	1	2	3	4
8.2	The time it takes our company to notify NHM-SA concerning any expected factory shutdowns	0	1	2	3	4
8.3	Our company notifying NHM-SA about unexpected production shutdowns	0	1	2	3	4
8.4	Our company notifying NHM-SA about unexpected production delays	0	1	2	3	4

Thinking about your relationship with NHM-SA over the past 8 months, please rate the quality of each of the following attributes:

Code	Section 9 - Customer Relationship Management	Very poor	Poor	Average	Good	Excellent
9.1	Our company's measurement of service satisfaction levels of NHM-SA	0	1	2	3	4
9.2	Use of NHM-SA feedback to improve products, processes and relations	0	1	2	3	4
9.3	A systematic process of handling customer complaints related to the quality of products	0	1	2	3	4
9.4	The extent to which misunderstandings between the international receiver and your company concerning the supply of products	0	1	2	3	4
9.5	The extent to which NHM-SA is involved in the development of new products	0	1	2	3	4
9.6	The extent to which your company seeks a long-term, stable relationship with NHM-SA	0	1	2	3	4

For each statement, please rate the extent of your agreement or disagreement

Code	Section 10 - Organisational Performance	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
10.1	Working with NHM-SA has resulted in a reduction of our working capital for finished goods	0	1	2	3	4
10.2	Working with NHM-SA has resulted in a reduction of our working capital for raw and packaging materials	0	1	2	3	4
10.3	Working with NHM-SA has resulted in a reduction in time taken to introduce new products	0	1	2	3	4

For each statement, please rate how often each outcome occurs.

Code	Section 11 - Shipping Performance	Never	Hardly Ever	Sometimes	Most of the time	Always
11.1	Shipping vessels to supply inventory to NHM-SA are booked on time	0	1	2	3	4
11.2	Shipping documents are shared before the Ship docks in the South Africa ports	0	1	2	3	4
11.3	Shipping documents are only sent to NHM-SA after the verification of their accuracy.	0	1	2	3	4
11.4	Veterinary permits are shared on time by NHM-SA for all applicable products, as required by South African legislation	0	1	2	3	4
11.5	Products are only dispatched to NHM-SA once there is a valid veterinary permit	0	1	2	3	4
11.6	Shipping vessels with shorter lead times are being used/given preference	0	1	2	3	4

For each statement, please rate how often each outcome occurs.

Code	Section 12 - Payment Information	Never	Hardly Ever	Sometimes	Most of the time	Always
12.1	Invoices are paid on time and as per the agreed payment terms by NHM-SA	0	1	2	3	4
12.2	Payments are conducted as per the invoice by NHM-SA	0	1	2	3	4
12.3	Payments credit notes are timeously issued for NHM-SA	0	1	2	3	4
12.4	Transfer Prices are shared quarterly with NHM-SA.	0	1	2	3	4
12.5	Transfer prices are shared on time with NHM-SA	0	1	2	3	4

Thank you for your participation

