THE IMPACT OF SUPPLY CHAIN MANAGEMENT POLICIES ON SERVICE DELIVERY WITHIN THE SOUTH AFRICAN POLICE SERVICE (SAPS) IN THE NORTHERN CAPE PROVINCE

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DECLARATION

I, Karabo Reply Makgari, student number _____, do hereby declare that this research submitted to the Central University of Technology, Free State, for the degree of Magister Technologiae: Business Administration, is my own independent work and has not been submitted by me at another university or faculty. I further cede the copyright of the thesis in favour of the Central University of Technology, Free State.

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ABSTRACT

After multi-party democracy replaced apartheid, the Government of South Africa formulated policies and legislations to aid the renewal of the governance and administrative systems of the country. Some of these new policies and legislations are the Public Finance Management Act (Act 1 of 1999), the Batho Pele Principles that are aimed at transforming service delivery in the public sector, the Supply Chain Management (SCM) Policy, and the White Paper on Policing. As well intentioned as these policies and legislations might be, there have still been many protests around the country condemning the poor service delivery in the public sector. The South African Police Service (SAPS) in particular has received its fair share of criticism. However, the SAPS has often blamed its perceived poor performance on inadequate resources despite the existence of a SCM policy that seeks to bring efficiency in the acquisition and deployment of resources for service delivery.

Therefore, this study delved into the internal structures of SAPS in the Northern Cape (NC) to ascertain if the SCM policy has been effective in addressing the logistics needs of the personnel (i.e. the internal stakeholders). If so, then internal service delivery has been effective. In addition, the study also gave SAPS NC the opportunity to assess the public's satisfaction with its service delivery (i.e. external service delivery). A mixed methods approach was used. Upon surveying 176 personnel, a statistical analysis of the data revealed that the SCM policy has largely enhanced both internal and external service delivery. However, the biggest challenge to implementing the policy is staffing inadequacy, as revealed by follow-up focus group discussions. In fact, about 12 out of the 15 challenges identified are attributable to the human factor. On the theoretical front, the study confirmed that performance management does enhance the effect of SCM on service delivery.

In order to deal with the challenge of the human factor, SAPS has to take a second look at its recruitment and training policies to come up with a comprehensive strategy for improving the quality and quantity of its human resource for service delivery. In

terms of theory development, it is recommended that a similar study be conducted to test the possibility that performance management is a moderating variable (rather than a mediating variable) in the model used for this study.

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CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

This chapter serves as an introduction to the entire study. Therefore, it discusses the general layout of the study in order to prepare the reader for the details in the chapters that follow. It begins by discussing the problem that necessitated the study by first giving the background to the problem, and then, stating the problem. This is followed by the significance of the study, and the aim and objectives, after which the research questions, theoretical framework, and the methodology are presented. The last three sections of the chapter are devoted to discussing the ethical considerations, limitations, and chapter outline of the study.

1.2 PROBLEM BACKGROUND

Since 1999, the South African government has adopted a number of measures to improve the service delivery capacity of government departments. For instance, the Public Finance Management Act (PFMA) (Act 1 of 1999) was promulgated to achieve efficient and systematic government machinery while financial accountability and procurement principles have also been established to promote clarity and effectiveness in supply chain management (National Treasury, 2015). In this regard, the roles and responsibilities of all managers and senior managers responsible for financial and supply chain management have been clarified, much as progressive governance measures have been put in place to regulate actors in the private and public sectors (Ambe & Badenhorst-Weiss, 2012:27). In general, the legislative framework of South Africa is continuously being strengthened to achieve a fair, transparent, equitable, competitive and cost-effective procurement regime that would enhance service delivery (for example, the Constitution of the Republic of South Africa Section 217 (1) 1996; PFMA 1999).

The concept of Supply Chain Management was introduced within the public sector as part of the series of budgetary and financial reforms that were initiated by Government in 2003 in its attempt to modernise the management of the public sector (Bizana et al., 2015:668). The majority of public sector institutions have commenced with a phased supply chain management implementation policy focused on addressing the inefficiencies in procurement, contract management, inventory/asset control and obsolescence planning in the public sector. It is, however, not clear to what extent this policy has improved service delivery.

A number of researchers have studied and reported on supply chain management, but from different contexts and sometimes different perspectives. For instance, Naude (2009) studied supply chain management problems experienced by South African automotive components manufacturing companies. However, this study concentrated too much on cost and pricing issues to the detriment of supply chain management policy matters. Lewis (2005), on the other hand, conducted a study on financial and supply chain management outcomes in Western Cape public hospitals. The emphasis of that research was on how supply chain management outcomes improved empowerment and equity in disadvantaged communities within the context of the Black Economic Empowerment (BEE) policy. Klemencic (2006) concentrated on the supply chain performance areas of the Danfoss District where the research sought to understand the strategies being used to achieve competitive advantage and simultaneously improve customer satisfaction. Casadesus and de Castro (2005) researched how quality can improve supply chain management. This research did not put much emphasis on supply chain management policies and whether or not they contributed to quality in supply chain management. However, the research of Ambe and Badenhorst-Weiss (2012) did put some emphasis on the South African Supply Chain Management (SCM) policy. However, their study focused on the challenges in implementing the policy in the public sector without necessarily looking at the policy's impact on service delivery. Seemingly, the only study that has come closest to addressing the subject of this research is the one by Bizana et al. (2015). That study looked at supply chain management as a contributory factor to local government

service delivery in South Africa. Even so, the context was local government rather than the South African Police Service (SAPS).

It can clearly be seen that the context and/or issues focused on, differed in each of the above studies. So, it can safely be said that whilst previous researches have been conducted on the issue of supply chain management, they do not appear to focus on the extent to which supply chain policies impact on service delivery, let alone in the SAPS. The only study that seems to have focused on this subject (i.e. Bizana et al., 2015) situated the study in local government instead of in the police service. Besides, that study depended heavily on qualitative data rather than quantitative data, thus making it an inductive study. Bearing in mind that no two organisations offer the same setting (context), it is reasonable to suggest that implementing the same supply chain management policy in different organisational settings may come up with varying challenges leading to different end results, such as service delivery consequences. It is therefore necessary to investigate how the implementation of supply management policies as prescribed by the PFMA, (Act 1 of 1999) has impacted on service delivery in SAPS using SAPS Northern Cape province (NC) as a case study.

1.3 PROBLEM STATEMENT

It is not known to what extent the existing supply management policy has improved or constrained service delivery in SAPS. However, the pervasive common perception is that always there is excuse from the police of inadequate resources when they have to attend to a particular situation affecting the community. For instance, the *Diamond Field Advertisement Newspaper* reported in its 6 November 2011 issue that residents of Windsorton felt disappointed about the police's failure to attend to their needs whilst two newly acquired vehicles remained unused for over two months. It is, therefore, important to determine how useful or otherwise the current procurement policy has been to service delivery in SAPS. For this reason, this study investigates the impact

of the Supply Chain Management (SCM) policy on service delivery within SAPS in the Northern Cape province.

1.4 SIGNIFICANCE OF THE STUDY

The value of this research lies primarily in the fact that a supply chain management policy is currently being implemented by all government institutions in South Africa which makes it possible for this research to assess its strengths and weaknesses in enhancing service delivery of government departments. Therefore, the study is significant to the extent that it assesses the impact of public policy on the well-being of citizens and lays bare the lessons learnt for the improvement of future policy-making across the globe. In the specific situation of South Africa, it is hoped that its findings will form the basis for improving the South African SCM policy to comply with international best practices so that it benefits not only government institutions, but ultimately the communities that they serve.

Secondly, the study offers the opportunity to delve into the internal structures of the South African Police Service (SAPS) to understand the processes involved in implementing a public policy and the challenges that may hinder the full realisation of the policy. In so doing, the study offers the opportunity to understand how the SCM policy is implemented in the context of law enforcement and whether SAPS NC is able to deliver on its mandate to its internal and external stakeholders. The study, therefore, sheds light on the internal workings of SAPS NC and the rigidities responsible for its inability to maximise service delivery to stakeholders. Understanding the situation of SAPS NC in this regard may serve as a guide to understand the implementation of the policy in the entire SAPS and other public sector organisations.

Lastly, the study helps to consolidate supply chain theory. This is because supply chain management is a discipline that is still emerging. As a result, theory development in the field is still in quite an embryonic stage (Harland et al., 2006; Chicksand et al., 2012). Therefore, the more studies are conducted to develop, confirm or shape its

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theory, the more the discipline becomes established and accepted in academia as a unified discipline with a coherent structure. This study hopes to contribute its widow's mite in this regard.

1.5 AIM AND OBJECTIVES

1.5.1 Aim of the Study
The overall aim of this study is to contribute to the understanding of how supply chain management policies enhance the service delivery capabilities of government departments.

1.5.2 Main objectives
The main objective is to assess the impact of the supply chain management policy on service delivery in the SAPS with specific focus on SAPS NC.

1.5.3 Subsidiary objectives
The following are the subsidiary objectives derived from the main objective of the study:

1. Research the concept of supply chain management and its theories.
2. From the literature, establish the relationship between supply chain management and service delivery.
3. Evaluate the effects of supply chain management on service delivery in the SAPS NC.
4. Understand the challenges faced in supply chain management in the SAPS NC.
5. Make recommendations on supply chain management practices that can better support service delivery in SAPS NC specifically and SAPS South Africa in general, with possible application in other public sector institutions.

1.6 RESEARCH QUESTIONS

The main research question is: *What is the impact of supply chain management policies on service delivery within SAPS in the Northern Cape province?*

The main research question is disaggregated into the following specific research questions.

1. What is the level of understanding of SAPS NC personnel of the key elements of Supply Chain Management?
2. What is the relationship between acquisition management and performance management?
3. What is the relationship between demand management and performance management?
4. What is the relationship between logistical management and performance management?
5. Does performance management explain service delivery? That is, does performance management mediate the effects of acquisition, demand, and logistical management on service delivery?
6. To what extent does supply chain management (acquisition, demand, and logistical management) relate directly with service delivery?
7. What are the challenges faced in implementing the supply chain policy in SAPS NC?

1.7 THEORETICAL FRAMEWORK

This study considers policy in general and supply chain management policy in particular as an instrument of development. Service delivery is used as a proxy for development in this study. Therefore, the theories underpinning this work are supply chain theory and service delivery theory. As the name suggests, supply chain implies some interconnectedness of activities (system of activities) in the supply process. Thus general systems theory becomes relevant in the chain of activities in the supply

process. General systems theory is based on the Aristotelian dictum that "The whole is more than the sum of parts" (Bertalanffy 1972:407). Supply chain management theory is therefore based on the general systems view of how the links in the chain can work together effectively to ensure customer satisfaction when delivery is made to the consumer (Mbanje & Lunga 2015:1) beyond what an unco-ordinated approach would have achieved.

Supply chain management is the identification, acquisition, access, positioning and management of resources and related capabilities an organisation needs or potentially needs in the attainment of its strategic objectives (Flynn 2006; Kruger et al., 2015:41). It integrates all activities and processes across functional and organisational boundaries in order to optimise customer value, and sharing of benefits by all participants in the chain (Walker & Jones, 2012:15; Irvine, 2015:143). Therefore, it can be concluded that supply chain management is directly linked to service delivery, and has an influence on service delivery by public institutions.

Service delivery can be viewed from either a private sector perspective or a public sector perspective. From a private sector perspective, service delivery is the actual delivery of a service and/or a product to a customer (Vargo & Lusch, 2004; Chen, Tsou & Huang, 2009:39; Lusch, 2011) whereas public sector service delivery is the provision of public activities, benefits, or satisfactions to the citizens (Overbeek et al. 2009; Batley & Mcloughlin, 2010; Schmied et al., 2010; Reddick & Turner, 2012). Thus public service delivery also invariably involves the provision of services or products by the government, to the citizens as mandated by acts of parliament (Fox & Meyer, 1995:118; Mcloughlin, 2015:343). Therefore, service delivery can either be tangible (products) or intangible (services). However, Mfomme and Barnes (2004) affirm that service delivery can also be internal or external, depending on whether the beneficiaries are internal or external stakeholders. Internal service delivery occurs when goods and services are delivered to internal stakeholders, whereas external service delivery is when goods and services are delivered to external stakeholders. In their view, internal service delivery is a prerequisite for the achievement of external

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service delivery. It is for this reason that this study places emphasis on internal service delivery (although external service delivery is also examined).

Policy is a body of rules and regulations which are usually found in acts, ordinances, or by-laws. The aim of policy is to provide guidelines to managers on how to account and manage (Goodman et al., 2007:111; Philips & Green, 2015). Consequently, this study expects the supply chain management (SCM) policy to provide the necessary guidelines to the managers of SAPS NC to identify, acquire, position, and manage resources in a way that service delivery is enhanced.

The primary objective of the SCM policy is to create an environment that enables government departments to manage the supply of goods, services, and works in a manner that is fair, equitable, transparent, competitive, and cost-effective, by: 1) adherence to relevant legislative and regulatory requirements within the framework of broader contemporary government priorities, and 2) implementing enhanced supply chain management functions to improve the role of supply chain management in improving service delivery (Department of Public Works, 2008:6). To achieve this objective, the policy categorises SCM into a number of components, key of which include: demand management, acquisition management, logistics management, and performance management (National Treasury, 2015:28). Demand management involves understanding what the needs of the end-user are, whereas acquisition management entails accessing the inputs to address the needs of the end-user. Logistics management addresses the physical flow of goods and services in the entire supply chain while performance management deals essentially with the controlling the processes of the supply chain to achieve its objectives.

To test if the SCM policy has had an impact on service delivery within this conceptual framework, this study expects performance management to mediate the effects of the various components of supply chain management (acquisition, demand, and logistical management) on service delivery so that there will be a significant positive relationship

between performance management and each of these components. If such relationships are found to exist and performance management in turn is found to have a significant positive relationship with service delivery, then supply chain management policy can be deemed to have impacted positively on service delivery. This study views this relationship as external service delivery. Internal service delivery is determined by testing the relationship between logistics management and performance management. This is because the various units of SAPS require logistics in order to deliver on their mandate to the general public. Therefore, the extent to which logistical management predicts performance management is measured to get a sense of internal service delivery.

1.8 METHODOLOGY

The study was conducted with a pragmatist world view. The methods and techniques used to unveil the truth were, therefore, both positivist and interpretivist in nature, with the positivist element dominating. As a result, the relationships between SCM components and service delivery were examined to answer five of the seven research questions (i.e. RQ2 to RQ6). Therefore, SCM is the independent variable while service delivery is the dependent variable.

The first part of the research, which was about finding answers for the first six research questions, was made possible by cross-sectional survey data collected from personnel of SAPS NC. The seventh research question, which was about the challenges encountered in implementing the SCM policy, was answered by analysing data collected from focus group discussions (FGDs). This was because, in the survey instrument, the item eliciting views on the implementation challenges was left open-ended to allow respondents the flexibility to list as many as possible. Therefore, after identifying the top 15 challenges from the survey data, it became necessary to take them back to the respondents for further discussion to gain a deeper understanding of them and the remedial measures necessary to contain them. Through a follow-up

measuring instrument distributed to participants of the FGDs, it also became possible to rank the top 15 challenges using statistical means. This means that a quantitative approach was used to address the first six research questions, whereas a qualitative approach helped provide an answer for the last research question (see section 1.6). This approach of mixing quantitative and qualitative methods is described by Creswell (2014:215) as a mixed methods approach. Full details of the methodology employed can be found in Chapter 4.

1.9 ETHICAL CONSIDERATIONS

In the context of research, *ethics* refers to the appropriateness of the researcher's behaviour in relation to the rights of those who become the subject of his work, or are affected by it (Kumar 2014:282). Most ethical issues in research fall into one of four categories namely, protection from harm, informed consent, right to privacy, and honesty with professional colleagues (Leedy and Omrod, 2010:107; Creswell 2014:92). This research was informed by these considerations from the conception stage to the point where findings are disseminated. For example, a letter was attached to the self-administered questionnaires to inform participants of the purpose of the research in order for them to make a decision as to whether they wanted to participate. Also the anonymity of respondents was preserved by using questionnaire identification numbers rather than respondents' details in the data- capturing process. Material borrowed from other works have been duly credited with citations and carried to the reference list while due process has been followed to maintain the integrity of the findings of this research. Ethical reporting has ensured that no falsification of authorship, evidence, data, findings, and conclusions has been incorporated. Both positive results and contrary findings were reported, and the researcher utilised multiple perspectives to avoid bias in the presentation.

1.10 LIMITATIONS OF THE STUDY

According to Kumar (2014:273), "limitations" are structural problems in relation to methodological aspects of a study; they are different from "problems", which are logistical difficulties in undertaking the research. It is, therefore, important to communicate any limitations that could affect the validity of the conclusions and generalisations of a study. The following are the limitations of this study:

1. The fact that a survey was used means that the findings of this study rely heavily on the responses of SAPS NC staff selected to provide information. Even though steps were taken to assure credibility in the process, the possibility of the respondents not responding truthfully could not be fully eliminated.

2. In addition, the staff may not be all-knowing, even though they were the target population of the study. Therefore, even if they intended to respond truthfully, there is still the challenge of cognitive limitation.

3. The researcher is a senior officer in SAPS NC; therefore, although his thorough understanding of the organisation might have helped greatly in the planning and execution of this research project, it is possible that this fact may have also influenced the responses of some participants.

4. Although a random sampling technique was used to draw the sample for this study, the results cannot be generalised to SAPS in all provinces of South Africa because the study defined its population as all staff of SAPS NC rather than all SAPS staff in all provinces of South Africa. Therefore, generalisation is limited to SAPS NC only.

1.11 CHAPTER OUTLINE

This study report has been structured into six chapters. Chapter 1 gives the overall introduction to the study whereas Chapter 2 and Chapter 3 serve as literature chapters. Chapter 2 focuses on reviewing literature on supply chain management whilst Chapter 3 tackles the literature on service delivery. Chapter 4 then presents the

methodology of the study, after which the results are presented and discussed in Chapter 5. The conclusions to the findings and recommendations for policy and further research are the subject of Chapter 6.

CHAPTER 2: SUPPLY CHAIN MANAGEMENT

2.1 INTRODUCTION

The notion that disparate parts can be harnessed to achieve a common purpose has been expressed in many disciplines. For instance, in religion, the Apostle Paul in his first letter to the early Christians in Corinth admonished them to value their diverse gifts as members of one church with a common purpose. In doing so, he used a metaphor in which he compared them to the different parts of the human body that need to play their respective roles in order to have the body (the church) function optimally (The Holy Bible, 1 Corinthians 12:12-26). In the field of philosophy, Aristotle had long before the early church aptly stated that "The whole is larger than the sum of its parts" (Friedman & Allen, 2011:4), again showing how unity of purpose can magnify the benefits of diversity if the different components work as a coherent unit instead of independent parts.

The quest to derive the superior benefits associated with diverse parts working as an organic whole in business circles, has seen several concepts and measures articulated, namely: vertical linkage, horizontal linkage, diversification, conglomeration, integration, and synergy. In order to enhance understanding of these concepts, however, it is necessary to, first of all, delineate the difference between the terms "sector" and "industry" which tend to be the frameworks in which the concepts are often discussed, albeit in an interchangeable manner (see for example, Medic et al., 2014; Goode et al., 2014; Bourlakis et al., 2014; Wang, 2015). The next section, therefore, discusses the twin concepts of sector and industry to enhance the understanding of the overall concept of supply chain. The chapter then moves on to look at what types of sectoral inter-relationships or linkages (i.e. vertical/horizontal linkages, diversification, integration) are possible in an economy and how they determine the type of linkages in supply chains. After that, the General Systems theory is discussed to prepare the ground for discussing the supply chain and its management as a system in the last few sections of the chapter.

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2.2 DIFFERENTIATION BETWEEN SECTOR AND INDUSTRY

In his pioneering work to highlight the need for Latin American economies to place emphasis on the sectors with the strongest interconnections to stimulate economic growth, Hirschmann (1958) employed a broad notion of "sector" to determine which sectors stimulate the strongest vertical linkages to enable the managers of the economy to place the most emphasis on those sectors. However, the usefulness of Hirschmann's (1958) idea has led it to being applied to most input-output inter-relations even if such relationships are not at the wider economy level as Hirschmann intended it to be. This, in turn, has led to the situation where the terms "sector" and "industry" are being used interchangeably in the literature as if they mean one and the same thing (see for example, Lean, 2001; Drejer, 2002; Pietroforte & Gregori, 2003; Mittal, 2007; Kula, 2008; Debaere, Lee & Park, 2010).

2.2.1 Sector

The stance that this study adopts is that a sector is a much broader concept than an industry and most often embodies aspects of a number of industries at the same stage of economic activity. This means that it tends to be coterminous with the stages of production within the general economy where the primary sector is responsible for extracting natural resources to produce raw materials, while the secondary sector is responsible for transforming the raw materials into intermediate and final goods through manufacturing and construction activities. The third stage of production in this scheme is the tertiary sector which is responsible for providing services (Roosaar et al. 2014:888; Urbancova & Hudakova, 2015:1046; Pinjaman & Aralas, 2015:34; Urbancova & Vnouckova, 2015:70; Alshehhi & Olah, 2017:40). This classification of the economy into sectors (depicted in Figure 2.1) better explains the vertical linkages that are thought to exist therein, with the primary sector producing raw materials for the secondary sector, and the secondary sector supplying goods for final consumption to the service sector which deploys it through distribution and retail to the final user. This may largely have informed Hirschmann's (1958) explanation of the inter-sectoral input-output potentials of an economy. Therefore, "sector" in this sense is a broad

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concept that horizontally embodies aspects of several industries in the same stage of production, i.e. primary or secondary or tertiary. As can be seen from Figure 2.1, aspects of Industry 1 and Industry 2, for instance, that have to do with primary production are embodied in Sector A whereas the aspects related to processing or construction and service delivery are contained in Sectors B and C respectively. In addition, the main activities of a sector can be viewed as its sub-sectors such that agriculture, mining, and forestry, for instance, are considered sub-sectors of Sector A (primary production).
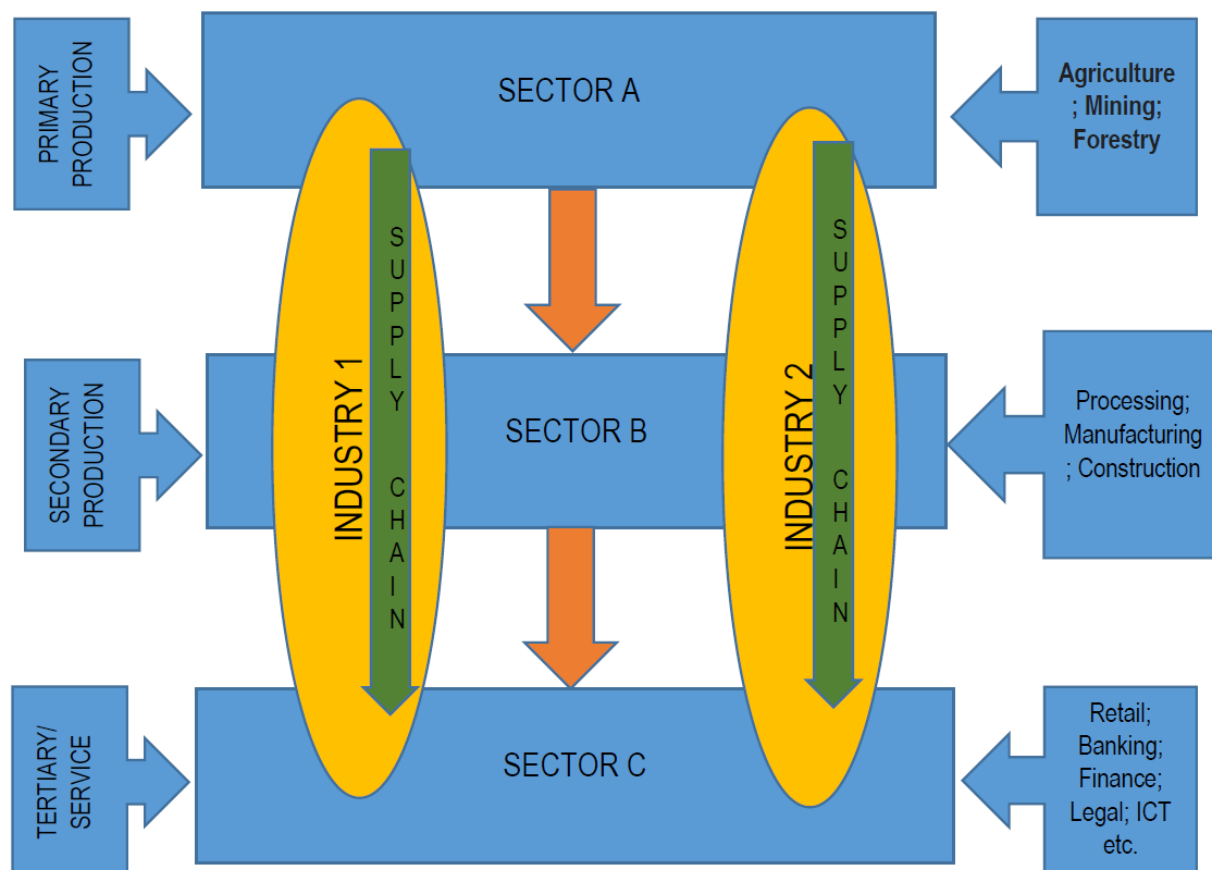
Figure 2.1: Diagrammatic Depiction of a Sector Versus an Industry

2.2.2 Industry

"Industry", on the other hand, vertically integrates aspects of the three basic sectors with respect to a sub-group of related products (Fort & Klimek, 2016), whereas a supply chain is an aspect of an industry dealing with the acquisition of raw materials,

processing and deployment of a specific product for the consumption of the final user. Thus a supply chain, unlike an industry, is linked to a specific product rather than a collection of products, but like an industry, it is also vertical in nature. Therefore, a supply chain is situated within an industry, while an industry contains a number of supply chains (Chan et al., 2007; Hoberg & Philips, 2012). Although a largely vertical phenomenon, a supply chain may have horizontal elements mainly within the industry of concern rather than across industries. This is by virtue of the fact that an industry contains several supply chains of related products whereas the degree of relatedness is minimised across industries. For instance, there are more likely to be horizontal relationships between the Industry 1 supply chain shown in Figure 2.1 with other supply chains in the same industry (not shown in the figure) than with the Industry 2 supply chain. With this understanding, this study views supply chain management as an industry level matter rather than a sector level one.

2.3 VERTICAL LINKAGES

Vertical linkage is a concept that expresses the input-output inter-relations that exist between the various sectors in the production chain of an economy (Liu et al. 2009:6). Hirschman (1958) first expressed the concept in the form of backward and forward linkages to highlight the need for Latin American economies to place emphasis on the sectors with the strongest interconnections to stimulate economic growth. But these economic ideas, as developed in his seminal work, *Strategy of Economic Development*, turned out to have general applicability (Drejer, 2002:3) and have subsequently been employed in tandem with Rasmussen dispersion indices to identify key sectors in an economy.

The Rasmussen dispersion indices were first presented in *Studies in Inter-Sectoral Relations*, the 1956 doctoral thesis of P. Norregaard Rasmussen (a Danish economist), which sought to measure the effects of price changes on inter-industry relations. But it is for the subsequent development of the index of the 'power of

dispersion' of an industry as a means for identifying key industries that Rasmussen has gained his fame. The index describes the relative extent to which an increase in final demand for the products of a given industry is dispersed throughout the total system of industries (Dejer, 2002:4). Therefore, while Hirschman's (1958) work provides the framework for analysing the forward and backward linkages that exist in an economy, Rasmussen's indices provide the means to actually measure these linkages.

2.3.1 Backward Linkages

Backward linkage measures the relative importance of a sector as user of the output of other sectors in the economy (Cai, Leung & Mak, n.d.). In Hirschmanian terms, its significance does not lie in merely indicating what proportion of the outputs of upstream activities constitute the input of a downstream activity, but whether the downstream activity has induced upstream sectors and sub-sectors to provide it with inputs. Thus backward linkage effects are related to derived demand to the extent that a given economic activity will stimulate other economic activities upstream to provide inputs (Hirschman, 1958:100).

2.3.2 Forward Linkages

On the contrary, forward linkage measures the relative importance of a sector or sub-sector as supplier to the other industries in the economy (Cai et al., n.d.). Therefore, unlike backward linkage effects that are related to stimulating input provision for a downstream activity, forward linkage effects are related to inducing output utilisation, i.e. the extent to which output from a given activity will stimulate new activities downstream that will employ it as inputs (Hirschman, 1958:100).

The interdependencies expressed in the vertical linkage concept and its sub-components of backward and forward linkages is, therefore, a representation of the intermediate production that takes place in the general economy when raw materials are transformed into intermediate goods and further on to final goods through the chain

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of sectors that add value at their respective stages (Badinger & Egger, 2008:1; Herger & McCorriston, 2014:4). However, in true Hirschmanian sense, the term 'linkage' goes beyond mere input-output relationships to indicate whether a particular activity has induced other economic activities upstream or downstream.

2.4 HORIZONTAL LINKAGES

Whereas vertical linkage generally indicates the input-output relationships that exist between the various sectors at different stages of value addition in an economy, horizontal linkage indicates the benefits that are derived at given stage of value addition as a result of the similarities or complementarities in activities, capabilities, and technology that participants at that stage of production share (Badinger & Egger, 2008; Liu et al. 2009:5; Bena & Li, 2011:3). Thus, unlike in vertical linkage where the output of one sector can serve as input to another sector downstream, in horizontal linkage the goods produced and the technology used are highly similar between producers; therefore, the benefits are derived from the learning opportunities available to producers (Guo & Guo, 2011:91; Li, 2011:3). According to Herger and McCorriston (2014:1), multinational enterprises (MNEs) tend to employ horizontal strategies to access foreign markets when they replicate their production activities abroad.

Using the operations of MNEs to explain the concept, Le and Pomfret (2008) give a three-point explanation of how the presence of MNEs in an industry can enrich horizontal linkages in terms of technology externalities that they could generate in favour of local firms. First, the product innovations and novel forms of organisation that MNEs deploy in the local market may be an eye-opener to local firms to the extent that they are able to observe and imitate these innovations. Second, to the extent that labour mobility is possible within the industry, labour turnover may disseminate technology from MNEs to other firms as workers trained or employed by MNEs move to domestic firms or start their own businesses. Thirdly, even if local firms are not able to imitate the technology introduced by MNEs, the competition generated by the

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presence of MNEs may induce domestic firms to introduce new products or new technology of their own to defend their market share, and to adopt new management methods to increase productivity.

Therefore, horizontal linkage is a concept that articulates the relationships that exists between actors within the same sector or level (intra-sector), unlike vertical linkage that expresses the relationships that exist between sectors or levels (inter-sector), with one sector serving as an input to the other (Badinger & Egger, 2008; Bai et al., 2009:258; Li, 2011). However, the need for there to be similarities in products and/or technologies for horizontal linkage to take place (Guo & Guo, 2011:91), means that horizontal linkages are more likely to occur across supply chains within the same industry than between supply chains in different industries (see Figure 2.1). This implies that any other type of linkage (horizontal or diagonal) that occurs outside an industry, from the perspective of Figure 2.1, amounts to diversification since moving out of one industry to other industries means a decreasing level of similarities in favour of an increasing level of dis-similarities.

2.5 DIVERSIFICATION

"Diversification of resources is a strategy found everywhere from the level of micro-organisms to that of giant Wall Street investment firms" (White et al. 2013:715). However, for the purpose of this study, the focus will be on diversification that has economic implications for humans, i.e. individuals, firms and nations.

To diversify essentially means to bring together units of different characteristics and functions to achieve a common purpose. Therefore, the term "diversification" emphasises the dis-similarities that exist in component parts functioning as an organic whole to achieve a purpose. Rather than being a weakness, the dis-similarities are the crux of diversification in the sense that they provide the glue for the diverse parts to

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bond together as a whole that exploits the complementarities among them in a more meaningful way than if these parts stand alone.

In the economic sphere of human life, the literature makes mention of *export* diversification (Agosin et al., 2011; Lim & Saborowski, 2011), *portfolio* diversification (Boyle et al., 2009; Kirby & Ostdiek, 2010), and f*irm or corporate* diversification (Hoechle et al., 2009).

2.5.1 Export Diversification

The goal of every economic policy instrument is to contribute to economic growth and equitable income distribution. Increase in exports plays a key role in economic growth, but if the export basket is tilted too heavily in favour of a few products or the destination of exports is concentrated on a few markets, the exporting country becomes vulnerable to external shocks. The purpose of export diversification is to minimise this vulnerability (Regolo, 2011; Kim, 2012:2). Therefore, export diversification is an international trade strategy adopted by a country to put a wide variety of goods on the export market rather than concentrating on a few favourite goods. It also means trading the exports on a wide variety of destination markets. Export diversification is, therefore, a change of focus from the conventional comparative advantage theory that stipulates that nations should produce and trade in goods for which, compared to other nations, they have abundant resources and know-how to produce (Agosin et al., 2011:2; Kim, 2012:6; Iwamoto & Nabeshima, 2012:5). Comparative advantage promotes concentration whereas export diversification promotes diversification in traded goods and markets. For developing countries, in particular, whose exports tend to be very susceptible to volatility, diversification will help them reduce their exposure to external shocks and improve their terms of trade to achieve faster economic growth (Regolo, 2011:2; Iwamoto & Nabeshima, 2012:5).

Export diversification, like other types of diversification, is intended to pool together the dis-similarities in a wide variety of component parts (export goods and markets) to

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achieve a common purpose (reduction in export vulnerability). This idea of bringing together dis-similar parts to reduce risk, is also reflected in portfolio diversification and conglomeration, the diversification strategies to be discussed next.

2.5.2 Portfolio Diversification

Portfolio diversification is an approach to investing in which investors seek the complementarities inherent in a collection (portfolio) of financial securities instead of the benefits of individual securities in isolation. This means evaluating individual securities in relation to their contribution to the investment characteristics of the whole portfolio. Portfolio diversification helps investors avoid disastrous outcomes by reducing the risk associated with their investments without necessarily decreasing the expected rate of return. This is because, by taking a diversified portfolio approach, investors can spread away some of the risk associated with the individual securities due to the complementarities that exist among them (CFAI, 2012c:282). In this way, the portfolio approach helps investors to avoid a potential disaster associated with investing in a single security. In addition to this, portfolios generally offer equivalent expected returns with lower overall volatility of returns. This simply means that, because portfolios reduce risk without causing any decrease in expected returns, they tend to increase the ratio of returns to risk compared to investing in a single security (CFAI, 2012c:284).

Sometimes, businesses seek to achieve the benefits of portfolio diversification by harnessing the complementarities in different firms rather than different financial securities. This is known as firm or corporate diversification, which is essentially about building a portfolio of firms rather than a portfolio of financial securities. Firm or corporate diversification, also known as conglomeration (Hoechle et al. 2009:2), is discussed under "Conglomeration" in the sub-section that follows.

2.5.3 Conglomeration

Conglomeration is the merging of firms that are neither horizontally related through the sharing of the same industry nor vertically connected through the supply chain (Herger & McCorriston, 2014:6; Chen & Ray, 2015:1). Conglomerates constitute diversification at the firm level rather than at the asset level. For these reasons they are also referred to as diversified firms (Ammann et al., 2011; Matvos & Seru, 2011; Hann et al., 2012). They are diversified because of the pooling of risks associated with bringing firms in unrelated industries into one entity (Hann et al. 2012:27). Conglomeration can be achieved through external diversification methods (i.e. mergers and acquisitions) and internal diversification means (i.e. research and development). According to the CFAI (2013:222), conglomerates became a preferred means by which companies sought to achieve superior performance in the 1960s. This was perhaps informed by the works of some renowned economists around that time (Markham, 2012:286).

First, Edwards (1955) had argued that because a conglomerate produces many products and operates across different markets, it need not regard a particular market as a separate unit for determining business policy. Rather, the multiplicity of resources and opportunities offered by the various business segments enables it to exploit, extend, or defend its power by tactics other than those that are traditionally associated with the idea of monopoly. For instance, a conglomerate firm could use revenues derived from one market to finance business policies in another, provided it earns above competitive returns in at least one market (Markham, 2012:287).

Second, Bower (1969) also hypothesised that where management has no vested interest in, or loyalties to, any one industry as pertains in conglomerates, it is likely to be unusually alert to profit opportunities wherever they exist. It is, therefore, unsurprising that conglomerate firms tend to employ multiple profit centres as a control device. The unlimited business horizon and the profit-centre approach result in an internal competition for resources that makes the conglomerate firm an especially appropriate instrument for allocating resources to their most productive uses (Markham, 2012:287). The Bower hypothesis is an improvement of Edwards' (1955)

argument in the sense that, in addition to the wide field of opportunities and profit maximisation that a conglomerate presents, it was also thought to enhance the efficient use of resources.

Third, other economists highlighting the general management rather than the divisional management of conglomerates (for example Nelson, 1959) developed the proposition that the highly diversified firm should be an appropriate instrument for promoting innovation. According to this proposition, successful research, especially basic research, will turn up a wide variety of inventions that a highly diversified firm is better positioned to utilise than a single-product firm. This is because a highly diversified firm is better situated to recognise and exploit the opportunities inherent in a wide range of unpredictable inventions and discoveries than a single-product firm. Although empirical data on this proposition is unsatisfactory, the results nonetheless point to a positive correlation between innovational activity and firm diversification (Markham, 2012:288).

With the above arguments made in support of conglomeration in the 1950s and 1960s, it was not surprising that conglomerates became a popular means by which firms sought to diversify away their risks in the 1960s. They are a further demonstration of the belief that integrating many parts – even if dis-similar – into one whole can yield better benefits than when the parts are operated separately.

2.6 INTEGRATION

Integration is the process of achieving unity of effort among the various sub-systems in the accomplishment of the organisation's task and includes both the co-operation and co-ordination of interests and actions (Friedman & Allen, 2011:6; Terjesen, Patel & Sanders, 2012:6). Therefore, it is what ensures the functioning of the diverse parts of the whole as one unit as it provides the interconnections between the component

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parts. Consequently, it plays a role similar to what links do in a chain. Without integration, the parts will function as stand-alone systems leading to a situation where the sum of the parts will be less than the whole. This is because the diverse parts as sub-systems cannot function in unison if there is nothing binding them together. Integration, therefore, is the critical factor that gears the efforts of the component parts towards the purpose of the whole. It is through integration that the whole becomes greater than the sum of the parts.

2.6.1 Determinants of Integration

Acknowledging the fact that organisations operate in an increasing relational context of environmental interconnectedness, Oliver (1990) identifies six broad determinants of inter-organisational relationships, namely: necessity, asymmetry, reciprocity, efficiency, stability, and legitimacy. Although each determinant is a separate and sufficient cause of relationship formation, these contingencies may interact or occur concurrently to cause an organisation to seek to build relationships with other organisations.

Necessity is when the need to meet legal or regulatory requirements causes an organisation to establish linkages with other organisations, whereas *asymmetry* arises when the inter-organisational relationship is prompted by the potential to exercise power or control over another organisation or its resources. Under *reciprocity*, inter-organisational relationships are thought to occur for the purpose of pursuing common or mutually beneficial goals or interests. As a result, co-operation, harmony, mutual support, and equity tend to be the hallmarks of relationships built on reciprocity. Also, potential partners in relationships based on reciprocity will anticipate the benefits of forming the relationship to far outweigh the disadvantages of forming the linkage.

When an inter-organisational relationship is prompted by an organisation's attempt to improve its internal input-output ratio, *efficiency* is said to be the driving force. Some incentives for establishing linkages for the purposes of improving *efficiency* may be

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the organisation's anticipation of increases in return on assets or reductions in unit costs, waste, or down-time. For its part, *stability* is when organisations form relationships to curb uncertainty in the external environment. Environmental uncertainty is generated by resource scarcity and by a lack of perfect knowledge about environmental fluctuations, availability of exchange partners, and available rates of exchange in an inter-organisational field. Therefore, forming linkages helps curtail the uncertainty surrounding these and so leads the organisation to achieve predictability in the decisions that it makes.

Finally, the need to enhance *legitimacy* is cited as a significant motive for organisations to interconnect. This is because as institutional environments impose pressures on organisations to justify their activities or outputs, they are motivated by these pressures to increase their *legitimacy* in order to appear in agreement with the prevailing norms, rules, beliefs, or expectations of external constituents. The establishment of inter-organisational relationships for purposes of increasing legitimacy can originate from an organisation's motives to demonstrate or improve its reputation, image, prestige, or congruence with prevailing norms in its institutional environment. In this regard, linkage formation will be directed especially towards organisations whose levels of legitimacy are perceived by the focal organisation to be considerably higher than its own (Oliver, 1990:246).

From the foregoing, *reciprocity* and *efficiency* seem to be the most likely determinants of supply chain integration since the main concern of the entities involved in such a relationship is often that of effort and resource co-ordination to mutually derive benefits over and above what would be the case if they worked in isolation (Labiad et al., 2014).

2.6.2 Synergy

Synergy is the additional value that is realised when two or more separate businesses are combined. This additional value ensures that the total value of the combined

business is greater than the sum of the values of the stand-alone businesses (Ayadi et al., 2011:2; Andreou et al., 2012:1223). In equation form this can be expressed as:

Value(A+B) > Value(A) + Value(B)

There are two types of synergy to be derived from the merging of firms: operating synergy and financial synergy. Operating synergy depends on the degree of relatedness between the merged firms while financial synergy depends on the extent of dis-similarity between them (Nahvandi & Malekzadeh, 1998:79; Hitt et al., 2009:5; Krug et al., 2015:37). Operating synergies arise from the economies of scale that are realized when similar operational functions are merged in such a manner that revenue is enhanced or cost is reduced. The revenue enhancement and cost reduction emanate from the efficiency gains that are achieved when the acquiring firm is able to improve the productivity of the target (acquired) firm and extract benefits from cost complementarities (Ayadi et al., 2011:2; Sufian et al., 2013:299). Thus operating synergies are derived if the best practices of the acquirer improve the best practices of the target.

Financial synergy, on the other hand, arises from the portfolio economies that are achieved when two or more firms are combined. The combination results in the pooling of risks associated with the individual firms so that cost of capital is lowered (Ayadi et al., 2011:2). Lower cost of capital means that the combined firm is able to borrow capital at a lower cost than the stand-alone firms. Therefore, with respect to financial synergy, the complementarities in the capital structures of the stand-alone firms is key to bringing about risk reduction when they are merged. The result is that the combined firm is able to raise finance at a lower cost than previously.

The implication of this for supply chain management is that value is more likely to be derived from operating synergies than from financial synergies. This is because, although supply chain involves inter- and intra-organisational harmonisation of functions, the effect of this harmonisation is to improve efficiency in operational

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activities rather than leading to the merging of the capital structures of the supply chain partners. Therefore, financial synergy, unlike operating synergy, is not likely to be a significant contributor to value in the supply chain process.

2.7 GENERAL SYSTEMS THEORY

"General Systems Theory is a logico-mathematical field whose task is the formulation and derivation of those general principles that are applicable to systems in general" (Bertalanffy, 1947:15, 1955:253). The crux of General Systems Theory is that the inter-relations of any component parts constituting a unit should be examined in addition to the component parts themselves in order to understand the full potential of the whole (unit). This is in contrast to the scientific approach of reductionism where complex phenomena are broken down into elementary parts and processes in order to isolate causal relationships among a few variables. General systems theory, then, consists of the scientific exploration of wholes and wholeness (Bertalanffy, 1972:415; Gifu, 2014:51; Rousseau et al., 2016).

The foundations of General Systems Theory appear to have been significantly influenced by von Bertalanffy who in the late 1920s proffered a way of studying living organisms in a systemic manner (Larsson, 2007:16; Zeilar & Savanovic, 2009:218; Chikere & Nwoka, 2015:3). In his own words,

"Since the fundamental character of the living thing is its organisation, the customary investigation of the single parts and processes cannot provide a complete explanation of the vital phenomena. This investigation gives us no information about the coordination of parts and processes. Thus the chief task of biology must be to discover the law of biological systems (at all levels of organisation). We believe that the attempts to find a foundation for theoretical biology point at a fundamental change in the world picture. This view, considered as a method of investigation, we shall call "organismic biology" and as an attempt at an explanation, "the system theory of the organism" (Bertalanffy, 1928).

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Accepted as something new in the biological discourse, the "organismic" approach later metamorphosed into the General Systems Theory where the term "organism" in the above quote applied equally to other organised entities such as social groups, personality, or technological devices (Needham, 1933; Valentinov, 2012:20).

A system is a set of interacting units or elements that form an integrated whole intended to perform some function (Oladapo, 2014:175). Therefore, it can also be expressed as any structure that exhibits *order*, *pattern*, and *purpose*. This simply means that anything that qualifies to be called a system should have (1) organisation, (2) continuity of identity, and (3) goal-directedness. Organisation is what brings order into a system by making the component parts work as an integrated unit, whereas continuity of identity means that the fundamental workings, purpose, and structure of the system largely remain constant over time despite some possible modifications in a changing environment. This ensures that pattern is preserved over time. Goal-directedness means that a system should be purpose-driven (Skyttner, 1996:17; Caddy & Helou, 2007:322; de Florio, 2015; Rousseau et al., 2016).

2.7.1 Axioms of the General Systems Theory

Axioms are basic assumptions underlying a theory which, in reality, are impossible to prove and hence must be accepted as value judgements. Like all theories, general systems theory also has axioms that aid in its rigorous elaboration (Skyttner, 1996:17; Prat et al., 2014). Those that are found to be relevant to supply chain management are discussed in this section.

2.7.1.1 Elementarism

A system is composed of interrelated parts or elements. These elements, in isolation, function as systems aimed at achieving specific goals of their own. In that way, the elements can be classified as sub-systems once they are components of a larger system. This is true of all systems – biological, mechanical, and social. Every system has a minimum of two elements, and these elements are interconnected (Larsson,

2007:23; Chikere & Nwoka, 2015:5; Kast & Rosenzweig, n.d). Without interconnection, elements will be stand-alone systems rather than sub-systems (Prat el al., 2014).

2.7.1.2 Holism, synergism, organicism, and gestalt

The axiom of holism expresses the superior benefits that a system stands to derive if its component parts function as an organic whole rather than stand-alone systems. It finds expression in the Aristotelian dictum that "the whole is more than the sum of its parts" (Friedman & Allen, 2011:4). This suggests that there is additional value that is derived from the linkages imposed on the parts by the system. Therefore, the system itself can be explained only as a totality. Holism is the opposite of elementarism, which views the total as the sum of its parts (Prat et al., 2014; de Florio, 2015).

2.7.1.3 Differentiation

In complex systems, specialised units perform specialised functions. This is a characteristic of all complex systems and may also be called specialisation or division of labour. Although specialisation leads to segmentation, it also creates a high degree of mutual interdependence among units (Friedman & Allen, 2011:4; Prat et al., 2014). Thus, differentiation promotes integration.

2.7.1.4 Open systems view

Systems can be open or closed. Open systems interact with their environments through the exchange of information, energy, or material. Biological and social systems are inherently open systems whereas mechanical systems may be open or closed. It is difficult, however, to strictly classify systems along the open-closed divide since systems are relatively closed or open (Larsson, 2007:23; Valentinov, 2012:14). Whether a system is closed or open is, therefore, a matter of degree.

2.7.1.5 Input-transformation-output model

The input-transformation-output axiom is synonymous with the open system which is viewed as a transformation model. In a dynamic relationship with its environment, it receives various inputs, transforms these inputs in some way, and exports outputs (Chikere & Nwoka, 2015:2), so this axiom views a system as a processor of sorts.

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2.7.1.6 System boundaries

Following naturally from the input-transformation-output axiom is the fact that systems have boundaries that separate them from their environments. Boundaries play a key role in the extent to which a system interacts with its environment and, as a result, help us understand the distinction between closed and open systems. The relatively closed system has rigid, impenetrable boundaries whereas the open system has permeable boundaries between itself and a broader supra-system or the environment. Boundaries are relatively easily defined in biological and physical systems but difficult to delineate in social systems, such as organisations (Walker et al. 2008:20; Friedman & Allen, 2011:8).

2.7.1.7 Regulation and feedback

The interrelated objects constituting the system must be regulated in some fashion so that its goals can be realised. Regulation implies that necessary deviations will be detected and corrected. Feedback is an important control measure in this regard. Feedback means that information concerning the outputs or the process of the system is fed back as an input into the system, perhaps leading to changes in the transformation process and/or future outputs. Feedback can be either positive or negative. Negative feedback is informational input that indicates that the system is deviating from a prescribed course and should re-adjust to a new equilibrium level (Friedman & Allen, 2011:8; Gifu, 2014:53; Chikere & Nwoka, 2015:4).

2.7.1.8 Hierarchy

This axiom emphasises the ranking arrangement among systems. This means that some systems are of higher order than others. For instance, a system is composed of sub-systems of a lower order and is also part of a supra-system of a higher order. This means that there are hierarchical relationships among sub-systems, systems, and supra-systems (Larsson, 2007:19; Zeilar & Savanovic, 2009:219).

2.7.1.9 Multiple goal-seeking

Biological and social systems appear to have the tendency of seeking multiple goals or purposes. This appears to be a matter of course as the components, when viewed from the stand-alone perspective, are systems in their own right geared toward the achievement of specific goals. Bringing these components into one systemic arrangement naturally gives rise to the pursuit of multiple objectives (Friedman & Allen, 2011:6; Prat et al. ,2014; Labiad et al., 2014:617).

2.7.1.10 Equifinality of open systems

In mechanistic systems, which tend to be more closed than open, there is a direct cause-and-effect relationship between the initial conditions and the final state. In biological and social systems, however, the situation is different because they tend to be more open than closed. In these systems, there are equally valid alternative ways of attaining the same objectives. Equifinality suggests that social organisations can accomplish their objectives with diverse inputs and with varying internal activities (conversion processes) (Walker et al., 2008:22).

2.7.2 Relationship between axioms and characteristics of a system

These axioms serve largely as further elaborations of the three characteristics of a system, namely: *order*, *pattern*, and *purpose,* with the majority of them appearing to emphasise the need for a system to have order. Based on the understanding gained in the previous section, all the axioms that were found to be related to organisation of the individual elements into an organic whole are identified as articulating the need for

order, whereas those stressing the need for a system to have an identifiable structure within its environment over time are seen as emphasising *pattern*. The only axiom that explicitly states the need for a system to be goal-directed is duly associated with the *purpose* characteristic of a system. Therefore, the key words used to group the various axioms under the three characteristics are the extent to which a particular axiom indicates 1) organisation, 2) form, and 3) goal-directedness. This was necessary as some of the axioms could have been grouped under more than one characteristic. For instance, the axiom of equifinality has aspects of the three characteristics embedded in it, but the explanation that it allows equally valid alternative ways of attaining the same objectives in open systems indicates the permanence of purpose which constitutes an integral part of the structure or form of the system. Therefore, equifinality is grouped under *pattern* because it is deemed largely to indicate the constancy of the purpose embedded in the overall structure. This linking of axioms to characteristics is shown in Table 2.1 below.

Table 2.1: Grouping of Axioms under Characteristics

Order	Pattern	Purpose
Elementarism	System boundaries	Multiple goal-seeking
Holism, synergism, organicism, & gestalt	Open/closed systems	
Differentiation	Equifinality of open systems	
Input-transformation-output model		
Regulation and feedback		
Hierarchy		

This grouping of axioms under characteristics is important for a number of reasons. First, it helps to bring some rigour to the rationalisation of the axioms to the extent that they help characterise a system (for example, equifinality seems to have a dual character and could have been grouped under *order*, but because it largely connotes constancy of structure, it was grouped under *pattern*). Second, it helps in identifying criteria that can be used in determining if a supply chain qualifies to be described as a system or not (later on in this chapter, the characteristics and axioms will constitute criteria employed to evaluate the "systemness" of a supply chain). Lastly, although the axioms and characteristics are discussed at the generic level, they set the tone for understanding the practicalities inherent in the supply chain when viewed as a system (for example, the axiom of regulation and feedback indicates that a conscious effort should be made for the supply chain to achieve its purpose, suggesting the need for management; the management implications of a supply chain are discussed later in this chapter).

2.8 THE NOTION OF SUPPLY CHAIN

According to Caddy and Helou (2007:320), there is not a unanimous definition of the concept "Supply Chain" owing to the fact that it is still an emerging area. What is agreed upon, however, is that a supply chain indicates the interconnectedness that exists among organisations involved in the provision of goods and services to end users (Walker & Jones, 2012:15; Irvine, 2015:143). This interconnectedness is informed by the need for supply chain participants to achieve a common purpose, which purpose is the derivation of value by the organisations involved as well as the end users (customers) of the good or service (Figueiredo et al., 2014:21). So value is a benefit that applies to both the supply chain organisations that make the product available on the market *and* the customers who make use of the product. For the participating organisations, value emanates from the synergies of harmonising strategy and operations whereas customers derive their value from the satisfaction that they derive from the product.

While the inter-firm linkages may portray supply chains as tangible in nature, a more detailed view shows that supply chains are composed of people, organisations, technological infrastructure, information flows, flows of physical goods, and flows of intangible services (Caddy & Helou, 2007:322; Oladapo, 2014:176). Therefore, supply chains have both tangible and intangible aspects.

2.8.1 Supply Chain Integration

Supply chain integration is the degree to which firms strategically collaborate with their supply chain partners and manage intra- and inter-organisational processes (Flynn, Huo & Zhao, 2010; Puche et al. ,2016:422). It is *a* process of re-defining and connecting entities through co-ordinating or sharing information and resources (Katunzi, 2011; Labiad et al., 2014). According to Terjesen et al., (2012:2), the benefits of supply chain integration lie in the facts that (1) it can help firms improve responsiveness to demand, (2) better allocate resources, and (3) reduce costs through improved process and distribution efficiency. In all these, co-ordination plays an important role, especially when inter-organisational information technology enables the sharing of large amounts of data, information, and knowledge along the supply chain (Labiad et al., 2014).

Supply chain integration can be achieved through enhanced customer, internal, and supplier integration efforts (Narasimhan, Swink & Viswanathan, 2010); therefore, it is sub-divided into *supplier integration*, *internal integration*, and *customer integration* (Droge, Vickery & Jacobs, 2012:251; Terjesen et al., 2012:8).

2.8.1.1 Supplier integration

Supplier integration is characterised by a co-operative relationship between the focal organisation (i.e. the buyer) and the upstream supplier. For this reason, it is also known as upstream integration. It often incorporates initiatives and programmes that foster and strengthen the linkages between buyer and supplier (Vijayasarathy, 2010) such

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as supplier development, just-in-time purchasing, and supplier partnering (Droge et al., 2012:251). Supplier development involves designing and implementing policies, procedures, and practices for assessing and improving supplier capability and performance in areas such as quality, design support, and delivery. Just-in-time purchasing facilitates integration through the use of highly co-ordinated deliveries from suppliers in support of an overall strategy. Supplier partnering initiatives bring all the participants in the product life cycle into the product development process early so that suppliers and customers can provide input to each other's processes (Droge et al., 2012:251).

2.8.1.2 Internal integration

Internal integration is the co-ordination of production activities within the focal organisation itself (Friedman & Allen, 2011:6). It entails the harmonisation of the interactions of all the relevant internal activities and functions of the organisation that have a bearing on the overall supply chain. Because the focal organisation is at the centre of the supply chain, internal integration therefore is the heartbeat of supply chain integration. This is because it interfaces upstream with supplier integration efforts in much the same way it does downstream with customer integration initiatives. According to Terjesen et al. (2012:8), internal integration is characterised by information network data, system-wide information technology integration, real-time search for inventory level and logistics-related operating data, production process data and inventory management integration, and constructing system-wide interactions.

2.8.1.3 Customer integration

Customer integration involves directing attention and resources toward understanding how products and processes interact with the customer's business and helping the customer become more competitive. As a result, it encompasses the forward flow of goods and services and the backward flow of information from customer to supplier. Its focus is, therefore, to engage the customer in decisions about products sold by the focal firm and the methods and strategies that improve co-ordination between the firm and the customer such as: (1) closer customer relationships through information

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sharing about how a firm can precisely determine and satisfy customer requirements, (2) improving responsiveness through lead-time responsiveness initiatives, and (3) facilitating operational integration across firm boundaries through product traceability strategies that tie source information to final product (Droge et al., 2012:251; Terjesen et al., 2012:8).

Therefore, integration is the degree to which firms collaborate with each other along the entire supply chain for mutually beneficial reasons. At the heart of this is the extent to which the supply chain partners are able to co-ordinate the processes surrounding the tangible and intangible aspects of the supply chain (Labiad et al., 2014).

2.9 THE DIFFERENTIATION-INTEGRATION DUALITY IN SUPPLY CHAINS

The systemic nature of supply chains introduces a dilemma as to whether to concentrate on internalising efforts within each element in the chain or place more emphasis on externalising efforts along the entire supply chain. Finding a good balance will determine the extent to which value is created for the supply chain partners. Internalisation of efforts at the sub-system level leads to differentiation whereas externalisation of efforts across the entire system leads to integration (Hoberg & Philips, 2012:4). Thus the supply chain as a system simultaneously promotes integration and differentiation. Integration in the sense that all supply chain partners as sub-systems of an organic whole are driven towards the common goal or goals of the supply chain as a system, and differentiation in the sense that the positioning of the various members at different stages of the supply chain naturally predispose them to perform functions that are unique to them and therefore different from those of other supply chain partners. As a result of this dichotomy, the overall value created by supply chains is attributable to differentiation synergies on one hand and integration synergies on the other.

2.9.1 Differentiation Synergies

Differentiation synergies come about when a supply chain partner intensifies its internal efforts to increase its value as a result of the supply chain relationship. This extra value can come from operating synergies or financial synergies or both. Operating synergies arise from the economies of scale due to cost reduction and revenue enhancement brought about by the supply chain relationship when it imposes efficiency requirements on the partner. Therefore, revenue enhancement and cost reduction emanate from the efficiency gains that are achieved when the supply chain relationship is able to improve the productivity of the organisation in question.

Financial synergies, on the other hand, arise from the portfolio economies that are achieved when the supply chain relationship forces a supply chain firm to acquire or merge with another firm to diversify its capital structure and thus lower its cost of capital (Nahvandi & Malekzadeh, 1998:79; Hitt et al., 2009:5; Ayadi et al., 2011:2; Sufian et al., 2013:299; Krug et al., 2015:37). Even if the supply chain relationship does not lead to the merging of the partner organisation with other organisations, financial synergies can still be derived if the supply chain relationship improves the reputation of the organisation in a way that it is able to raise capital from the financial markets at a lower cost than previously.

2.9.2 Integration Synergies

Integration synergies are derived from the degree of collaboration among the supply chain members. The collaboration can manifest in the joint planning of strategy, implementation, and monitoring and evaluation by the supply chain partners. In some cases, this will mean joint investment in infrastructure and activities that are considered to improve efficiency and so enhance the common good of all participants in the supply chain. Unlike differentiation synergies that arise from both operating and financial synergies, integration synergies can only arise from operating synergies. This is because in the supply chain setting, integration plays a similar role as a merger or acquisition; therefore, it is no longer necessary for supply chain partners to seek to merge or acquire each other. In that case, portfolio economies will not arise because

the capital structures of the member organisations cannot be merged, so there will not be financial synergies constituting part of integration synergies. Financial synergies that arise from being part of the supply chain is accounted for under differentiation synergies (discussed above) where any decision to merge with non-supply chain organisations as a result of the supply chain relationship is considered an individual decision of a particular organisation rather than the supply chain partners as a collective. This is because differentiation is an individual affair whereas integration is a collective affair. Therefore, integration synergies can only emanate from operating synergies.

Just as integration can be sub-divided into supplier integration, internal integration, and customer integration, integration synergies can be derived from all these three sub-divisions. This means that there can be supplier integration synergies, internal integration synergies, and customer integration synergies. Supplier integration synergies are derived from the operating synergies emanating from the economies of scale due to cost reduction brought by the co-operative relationship between the focal organisation and the upstream supplier. Internal integration synergies emanate from the operating synergies associated with the co-ordination of production activities within the focal organisation to the extent that efficiency is enhanced. Customer integration synergies are the result of operating synergies derived from directing attention and resources toward understanding how products and processes interact with the customer's business and helping the customer become more competitive to such an extent that cost is reduced and revenue is enhanced within the focal organisation.

2.10 THE SUPPLY CHAIN AS A SYSTEM

In order to better understand a supply chain as a system, it is appropriate to analyse it in terms of the three broad criteria applicable to a system, namely: definition, characteristics, and basic assumptions or axioms.

2.10.1 Evaluation by Definition

There is not an agreed--upon definition of a supply chain, but a multiplicity of definitions (Robinson & Malhotra, 2005:316; Caddy & Helou, 2007:320) which nonetheless point to the interconnectedness of diverse functions and entities to achieve a common purpose as far as supply chains are concerned. Some of these definitions are captured in Table 2.2.

Table 2.2: Selected Definitions of a Supply Chain

Author	Definition
Harland (1996)	A network of interconnected organisations involved in the provision of product and services to end users
Christopher (1998:15)	The supply chain is the network of organisations that are involved, through upstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.
Stevenson (1999)	A sequence of suppliers, warehouses, operations, and retail outlets
Simchi-Levi et al. (2000)	Integration of suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations and at the right time, in order to minimise system-wide costs while satisfying service level requirements.
Hugo, Badenhorst-Weiss & van Rooyen	A management philosophy aimed at integrating a network (or a web) of upstream linkages (sources of supply), internal linkages inside the firm and downstream linkages (distribution and ultimate customers) in performing specific processes and activities that will ultimately create and optimise value for the customer in the form of products and services which are specifically aimed at satisfying customer demand.
Pienaar & Vogt (2016:10)	The integrated managing and control of the flow of information, materials and services from the suppliers of the raw materials, through to the factories, warehouses and retailers, to the end users.

Comparing the above definitions of 'supply chain' to the definition of a system, it becomes apparent why a supply chain can be described as a system. A system was earlier defined as *"a set of interacting units or elements that form an integrated whole intended to perform some function"* (Skyttner, 1996:16). This notion is expressed in all the definitions of supply chain featured on the table through such key words phrases as "interconnected", "integration", "network", "sequence", "linkages", "satisfying service level requirements", "satisfying customers".

2.10.2 Evaluation by Characteristics

A direct fall-out from the definition of a system is the fact that a system displays three characteristics, namely: *order*, *pattern*, and *purpose*. For a supply chain to qualify to be classified as a system, therefore, it must meet the criteria of order, pattern, and purpose among others. A supply chain that has *order* has its component parts organised to work as an integrated unit rather than as disjointed parts or stand-alone systems. *Order* therefore brings organisation and harmony to the supply chain. It has already been shown in the previous section that supply chains are considered systems because of the orderly way their components are interconnected.

Pattern means a supply chain should exhibit continuity of identity or be predictable over a reasonable amount of time to qualify as a system. *Pattern* ensures that the supply chain maintains a given structure over a foreseeable time horizon despite adaptations to a changing environment. In this regard, it has been noted that varieties of supply chain structures exist, such as supply networks (in which there is a dominant or focal firm, but linkages between suppliers and customers with the dominant firm are not necessarily direct); supply wheel (in which a number of subservient organisations supply to a dominant master); funnel-shaped supply chain (in which a broad base of producers supply their products to a few buyers through a narrowing channel); and the classical or generic supply chain (that assumes sequential positioning from suppliers of raw materials through the focal organisation to the end-user) (Caddy & Helou, 2007:320; Mari et al., 2015). Although patterns do evolve over time, a supply chain should maintain its structure over a reasonable amount of time for it to be deemed a system.

Finally, a supply chain should also have *purpose* in order for it to be classified as a system. This means that because a system does not exist without an aim, a supply chain can also not exist without a goal. It is the purpose that drives the order and pattern of the system, as a result, goal-directedness is a crucial feature of any system.

Therefore, as a system, a supply chain should be purpose-driven or goal-directed (Skyttner, 1996:17; Caddy & Helou, 2007:322; Labiad et al., 2014:617). It is a well-known fact that supply chains are formed to first of all to deliver value to the end-user and the entities involved in the supply chain. This is evidenced in the definitions supplied in Table 2.2. Value, therefore, is the overriding purpose of a supply chain.

2.10.3 Evaluation by Axioms

Ten axioms of the general systems theory were previously discussed as having a bearing on the notion of supply chain as a system. These axioms were then linked to the three characteristics of a system (i.e. order, pattern, and purpose) to show that the axioms are merely indicators or further elaborations of the characteristics in question (see Sub-sections 2.7.1 and 2.7.2). Therefore, the fact that a supply chain can be classified as a system for fulfilling the helix of requirements (order, pattern, purpose) implies that the basic principles (axioms) of the general systems theory do apply to them also. As shown in Table 2.1, six axioms indicate order, three connote pattern, while one explicitly articulates the need for a system to be purpose-driven.

This means that a supply chain, once qualified to be described as a system using the three characteristics, automatically qualifies to be referred to as such using the axioms also. However, the same conclusion can be reached by subjecting the supply chain to the requirements of the individual axioms without necessarily linking them to the three characteristics. For instance, the axiom of elementarism stipulates the need for a system to have component parts that perform specific functions while that of input-transformation-output suggests the sequential value-addition nature of a system. It is obvious that a supply chain meets these two criteria of a system by virtue of the fact that it has firms and functions constituting its component parts (elementarism) and receives raw materials that it converts into finished goods for final use (input-transformation-output).

Therefore, the three-part discussion in this section shows that a supply chain can be classified as a system whether it is assessed by the definition, characteristics, or axioms of a system according to General Systems Theory.

2.11 THE VALUE CREATED BY SUPPLY CHAIN

The inter-linkages of several sub-systems into a system should result in a higher overall value than the sum of the individual values of the sub-systems working in isolation. This implies that the inter-linkages are expected to bring about extra value apart from the stand-alone values of the sub-systems. Therefore, as a system, a supply chain is also expected to bring about an incremental value that leads to a higher overall value than the sum of the stand-alone values. As previously discussed (see section 2.9), synergy is responsible for the additional value in the supply chain.

Parallels can be drawn between value creation in the supply chain and Hirschman's (1958) conceptualization of the inter-linkages of economic sectors. First, the supply chain, much as the Hirschmanian economy, acknowledges the input-transformation-output arrangement where raw materials are extracted from the primary sector, processed in the secondary sector, and distributed for final use in the tertiary (see Figure 2.1). Therefore, value addition largely requires vertical linkages. Second, just as Hirschman explained the vertical linkages between the economic sectors to mean the extent to which an economic activity is able to stimulate economic activity upstream (backward linkage) or downstream (forward linkage), inter-linkages in the supply chain also do not merely indicate the interdependencies among the supply chain partners, but also the extent to which the relationship leads to efficiency in each member organisation as well as along the length of the supply chain such that synergy is the result.

Therefore, the value created by supply chain is the additional value emanating from synergies associated with the inter-linkage of resources, efforts, and vision of the supply chain partners (de Figuieredo et al. 2014:21). This additional value leads to a higher overall value for the supply chain as a whole.

2.12 THE MANAGEMENT IMPLICATIONS OF SUPPLY CHAIN

Regulation and feedback is one of the axioms of the general systems theory. Although it largely indicates how a system should be organised and thus seems to connote order (see Sub-section 2.7.2), it is also purpose-oriented. This is because regulation and feedback ensure that the workings of the individual parts of the system are steered towards the overall goal of the system. Without regulation and feedback, the individual parts as specialised systems in their own right, are likely to work to achieve their stand-alone goals instead of the overall purpose of the larger system that they are supposed to belong to. Regulation and feedback therefore make it possible for the various parts to be oriented towards: 1) what the big picture of the entire system is, 2) the need for each part to gear itself towards the attainment of the overall purpose, and 3) the importance of monitoring and evaluating the performance of the system in order to forestall any deviations from the purpose. Therefore, through regulation and feedback, the component parts become sub-systems of the overall system (instead of stand-alone systems) and their sub-goals are consequently subsumed under the overall goal of the system.

The axiom of regulation and feedback therefore is essentially about managing the entire system to achieve its purpose. This, in supply chain parlance, can be reduced into managing functions in the three segments of the supply chain, namely: 1) upstream, 2) within the focal organisation, and 3) downstream of the supply chain. Upstream functions relate mainly to acquisition of raw materials from suppliers while those within the focal organisation are mainly about storage and transformation of raw materials into finished goods. Downstream management is mainly about deploying

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finished goods for the final use of the consumer. This general conceptualisation of the supply chain into three broad segments, has variously been depicted by authors as shown in Table 2.3 below.

Table 2.3: Components of Supply Chain Management

	Mbanje & Lunga (2015:8)	Kruger, Ramphal & Maritz (2015:45)	Pienaar & Vogt (2016:14)	De Villiers et al. (2015:8)
Upstream Managem	Purchasing; strategic sourcing; supplier development; supplier relationship management;	Purchasing & procurement; transport & [inbound]	Procurement; co-ordinating inbound trafffic	Supplier relationship management;
Internal Managem	New product/service development; manufacturing; product/service flow management; information flow management; supply chain strategy	Operations & production; materials & stock handling;	Materials handling; manufacturing inventory; manufacturing;	Product development & commercialization; manufacturing flow management
Downstream Management	Customer service and order fulfillment; client relationship management	Transport & [outbound] logistics; customer service	Finished goods inventory; order processing; transport; applied marketing (practical sales);	Demand management; customer relationship management; customer service management; order

The above table seems to confirm the notion that, merely having a system is not enough reason for its value to be greater than the sum of its part but that, regulation and feedback is necessary for the incremental value to be created. In the particular case of supply chain, it implies that management functions in the three segments of the supply chain need to be performed to either decrease costs and/or increase revenues in order for this extra value to be created. Therefore, in Hirschmanian terms, managing the supply chain amounts to stimulating efficient activity in the supply chain (rather than in the entire economy).

2.13 THE SOUTH AFRICAN SUPPLY CHAIN MANAGEMENT POLICY

The South African supply chain management policy is largely a service-based policy that views the supply chain as mainly delivering service or public goods to its clients instead of manufactured products as conceived in the conventional supply chain. Similar to the conventional supply chain, the *input-transformation-output* arrangement applies also under the policy, in the sense that inputs are acquired and then converted into the required service or public good for the use of the general public. For instance, the Department of Public Works can outsource engineering services as well as acquire road construction materials to construct a road (public good) that will benefit the general public in much the same way that the Department of Labour outsources expert advice (consultancy services) to enable it to deliver quality service to its clients. Therefore, the South African supply chain management policy is mainly about the delivery of service and public works to the general public. This is due to the fact that the main purpose of government is to deliver services and public goods to its citizenry (National Treasury, 2015:9). As a result, the transformation that takes place in this framework is not in the same sense as processing raw materials into a product as pertains under manufacturing.

The primary objective of the policy is to create an environment that enables government departments to manage the supply of goods, services, and works in a manner that is fair, equitable, transparent, competitive, and cost-effective, by: 1) adherence to relevant legislative and regulatory requirements within the framework of broader contemporary government priorities, and 2) implementing enhanced supply chain management functions to improve the role of supply chain management in improving service delivery (Department of Public Works, 2008:6). To achieve this objective, the policy categorises supply chain management into a number of components, key of which include: demand management, acquisition management, logistics management, and performance management (National Treasury, 2015:28). These components and how they relate to the theoretical ones in the preceding section, are discussed below.

2.13.1 Demand management

The policy identifies demand management as the beginning of the supply chain where needs assessment is done to determine the nature and specifications of goods or services to be acquired in order to deliver the agreed service to the end-user. Demand management, therefore, brings the departmental supply chain practitioner close to the end-user to ensure that value for money is achieved (National Treasury, 2004:10). In relation to theory, Moeti et al. (2007:129) state that demand management is the process whereby the future needs and critical delivery dates are determined and matched to the institution's budget. The objective of demand management is to ensure that the resources required, support the strategic objectives of the institution. It entails the determination of the needs by understanding future needs, identifying critical delivery dates, frequency of the need, linking the requirements of the need to the budget, doing expenditure analysis, based on past expenditures and determine the specifications (National Treasury, 2003:21). Therefore, in terms of the management components described in Table 2.3, demand management is the downstream function that loops back (feedback) to the beginning of the supply chain and thus, ensures circularity in the supply chain management process. It is by understanding the needs of clients or customers downstream that the appropriate mechanisms can be put in place to acquire the relevant inputs upstream.

2.13.2 Acquisition management

Acquisition management deals essentially with the steps taken to ensure efficiency and effectiveness in the procurement of the inputs. The purpose of acquisition management is to ensure that acquisition delegations are in place in the organisation, the market is assessed and a sourcing (procurement) strategy is determined, bid documents are compiled, bids are solicited, responses are received, responses are evaluated, assessed and awarded by the Bid Adjudication Committees (Department of Public Works, 2008:16). Therefore, in the context of the South African Supply Chain Management Policy, acquisition management deals with the decisions that have to be made in order to manage the acquisition of the required supplies, services and works

(National Treasury, 2004:28). The strategy of how the market is to be approached is outlined and the bid document would be compiled, attaching all necessary required documents and providing conditions. Bids are evaluated and recommended and contract documents would be compiled and signed (National Treasury, 2003: 22). Therefore, acquisition management is essentially about managing the input procurement process and as a result an upstream management function in terms of Table 2.3.

2.13.3 Logistics management

Logistics management is mainly about managing the physical flow in the supply chain, therefore its focus is the tangible aspect of the supply chain. Consequently, its purpose is to place orders against contracts for goods and services, receive and distribute goods, coding of items, setting of inventory levels and manage stores or warehouses where stock are kept, manage transport arrangements, and monitor vendor performance (Department of Public Works, 2008:19). Relating this to the classifications in Table 2.3, logistics management is a management function that makes the physical movement of goods and services possible in the supply chain. Therefore, it cuts through all the three segments of the supply chain as inputs flow from suppliers and end up with clients as end products.

2.13.4 Performance management

The main goal of performance management is to ensure that the supply chain works to achieve the purpose for which it was established. Therefore, supply chain performance management is based on a monitoring process to determine whether the proper processes have been followed and whether the desired objectives have been achieved (Department of Public Works, 2008:26). As a result, performance management in this context involves the following: 1) the extent to which the set goals are achieved; 2) whether norms and standards have been complied with; 3) the extent to which cost-saving approaches were adopted; and 4) whether material and construction standards meet international best practice (National Treasury, 2004:91).

In terms of the general systems theory, performance management appears to be in tandem with the axiom of regulation and feedback which stresses the need for open systems to be geared toward achieving the overall purpose through monitoring and feedback. Therefore, performance management is a crucial management function at the centre (inside the focal organisation) of the supply chain that impacts on both upstream and downstream management of the supply chain.

2.14 SUMMARY AND CONCLUSION

The concept of supply chain is one that is antithetical in the sense that it promotes the contrasting concepts of differentiation and integration at the same time. Differentiation arises from the fact that the individual parts of the chain are expected to be inward-looking enough to specialise in the performance of their respective functions to promote efficiency while integration emphasises the need for the component parts to be outward-looking and be driven towards an overall goal instead of operating as stand-alone systems. As a result, the supply chain as a system seeks to maximise the benefits of the similarities and dis-similarities of its component parts at the same time. In this differentiation-integration duality, efficiency and reciprocity seem to be the most likely determinants of collaboration in the supply chain. Inter- and intra-firm efficiency ensures that value is created over and above the sum of the individual values of component parts as stand-alone systems. This incremental value, also known as synergy, is what is responsible for making the whole greater than the sum of its parts; when that happens, it is to the mutual benefit of all the supply chain members (reciprocity).

Finally, a supply chain can be described as a system because it satisfies the characteristics and axioms of a system. In terms of *order*, a supply chain as a system is structured in hierarchical manner with the component parts subsuming their individual objectives under the overall goal of the whole. With regards to *pattern*, the

supply chain can still be viewed as a system because it tends to be largely vertical in nature and whatever form it assumes, tends to endure for a significant amount of time. The third characteristic of a system is *purpose*, which in the case of a supply chain is to create an incremental value that will make the whole greater than its sum of parts. This value creation process is expressed in the *input-transformation-output* axiom of a system also; which simply means that a system should exist to maximise the benefits of its members. This implies creating value for the end-user or customer in a way that stimulates and sustains their demand for the product such that firms involved in the supply chain can also derive their value. In the context of the South African Supply Chain Management (SCM) Policy, the value created for the end-user is what is referred to as service delivery, which is the subject of the next chapter.

CHAPTER 3: SERVICE DELIVERY

3.1 INTRODUCTION

In the previous chapter, the concept of supply chain was explored in detail. It was established that the purpose of a supply chain is to generate synergy that creates value over and above the total value that would have been created if the supply chain members had operated individually. In addition to this, the customer was identified as the primary target of value creation in the supply chain process. This is because by creating and delivering a product that satisfies the customer, customer value is created in a way that leads to customer loyalty. This, in turn, creates value for the supply chain partners. In terms of the South African Supply Chain Management (SCM) Policy, the intended value to be created for the public is service delivery. Therefore, this chapter explores the concept of service delivery. The chapter first takes a generic view of the concept and later adapts it to the South African Public Service in general and the South African Police Service (SAPS) in particular. This is achieved by first looking at service delivery in the private sector, followed by service delivery in the public sector, and the South African public service delivery system. This is followed by service delivery in the South African Police Service (SAPS). The last three sections of the chapter focus on defining service delivery as it relates to this study, followed by establishing the relationship between supply chain and service delivery with a summary and conclusion ending the chapter.

3.2 SERVICE DELIVERY IN THE PRIVATE SECTOR

The core business of firms naturally categorises them into manufacturing industries versus service industries (Lusch, 2011:14). Service industries are those that provide intangible products that can be difficult to perceive (Noor & Pitt, 2009:217), while manufacturing firms create goods that are tangible. Under this categorisation, the term

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"service delivery" is often associated with service organisations; especially public service organisations (see for example, Overbeek et al., 2009; Batley & Mcloughlin, 2010; Schmied et al., 2010; Reddick & Turner, 2012). However, Chen, Tsou and Huang (2009:39) use the term in a sense that suggests that it is not limited to the provision of services, but encompasses the delivery of both goods and services. This is inferred from their definition of service delivery as *"the actual delivery of a service and the delivery of services and products (i.e. a firm's goods) to the customer"*. In this vein, Vargo and Lusch (2004) define service as *"a process or the use of one's resources or competences for the benefit of another entity."* Lusch (2011:15) classifies "resources" in this regard into *operand resources* and *operant resources*. Operand resources are usually tangible and static, whereas operant resources are often intangible and dynamic and *act on* operand resources. Operand resources are best characterised as natural resources which often serve as raw materials for manufactured goods while skills, competencies, capabilities and knowledge, when applied, are examples of operant resources that feed into service. Thus, Vargo and Lusch's (2004) definition of service reinforces the notion that service delivery embraces both the delivery of goods and services.

Service delivery has three elements, namely: target market, service concept, and service delivery systems design (Ponsignon et al. 2011:325). "Target market" refers to who the right customer is, while "service concept" can be described as the mix of tangible and intangible aspects of what is being delivered to the customer. Finally, the "service system" is concerned with how the service concept is provided to the customers. It encompasses the structure (for example, facilities, equipment) and infrastructure (for example, skills, policies) to deliver the service concept. According to Ponsignon et al. (2011:324), the interactions of these three elements must lead to the successful deployment of business strategy so that value is created for both the customer and the organisation. This value can be determined in terms of customer satisfaction, retention, and overall profitability. Value is, therefore,co-created by the customer and the firm (Lusch 2011:15).

3.3 SERVICE DELIVERY IN THE PUBLIC SECTOR

In the context of this research, which is in the public sector, service delivery is defined as the provision of public activities, benefits, or satisfactions to citizens by public institutions which can be either tangible (products) or intangible (services) (Fox & Meyer, 1995:118). Consequently, the building blocks of service delivery in the public service of South Africa are explored in the following sections, using the three elements identified by Ponsignon et al. (2011).

3.4 THE SOUTH AFRICAN PUBLIC SERVICE DELIVERY SYSTEM

3.4.1 Target Market

The *Batho Pele White Paper* (the framework within which service delivery is supposed to be conducted in South Africa) clearly stipulates that people are at the heart of it all (Department of Public Service and Administration, 1997). The name "*Batho Pele*" itself means "people first" in the Sotho language of South Africa. Therefore, the government White Paper aptly identifies people as the target market of the public service of South Africa. As a result, the White Paper requires that all users of public services be consulted about their needs, priorities and standard of services required to enhance service delivery (Riekert 2001:84). Also, public officials will have to adjust to accommodate the requirements of the *Batho Pele White Paper* that members of the public are accepted as customers, and that the client or customer may be someone inside the organisation or outside of it. Furthermore, public employees are to view themselves as public servants rather than public officials.

Overall, the fundamental principles underlying the White Paper are: a) service to the people, and b) the customer concept. Service to the people means that a conducive environment for the delivery of services is created to enhance employees' capacity to deliver services efficiently and effectively. The said document further states that it is

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essential that the commitment, energy and skills for public servants be harnessed to tackle inefficient, outdated and bureaucratic practices, to simplify procedures and to identify new and more efficient and effective ways of delivering services. On the other hand, *customer concept* implies that service delivery is planned and executed to meet the expectations of the public which suggests a demand-driven rather than a supply-driven approach. Therefore, the White Paper conceives the target market as the citizenry, but with the understanding that quality services and products can best be delivered to the target market only when the supply-side constraints inherent in the public service are addressed – hence, the need to build the capacity of public service organisations.

3.4.2 Service Concept

Service is what is delivered to the customer; be it tangible, intangible or a combination of both. The tangible form of service delivery arises when services flow from physical goods to customers. In this situation, the service that the good provides to the customer is more important than merely possessing it. Examples of this would be a computer, a car, a washing machine, and a stove. On the other hand, the intangible form of service is the classic case of the customer benefiting from a non-good offering that addresses a need or a want (for example, legal advice). However, service concept is often expressed as a combination of tangible and intangible benefits flowing to the consumer. This is because the delivery of services often goes with the delivery of physical goods. For instance, the delivery of a car to a customer by an automobile company would be accompanied by an after-sales service, while health service delivery is a mixture of the care (intangible) and medication (tangible) administered to the patient (Schmied et al. ,2010; El Arifeen et al., 2012). Therefore, it is important for every organisation to spell out clearly what its service concept is.

In the context of the public service of South Africa, the service concept is expressed as the provision of a service or a good by the government, to the citizens as expected by the citizens and mandated by Acts of Parliament (Ile, 2010:51). Since most public services embody tangible aspects (for example, law enforcement contains physical

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infrastructure) and public goods provide services (for example, schools provide education), the service concept is invariably composed of tangible and intangible benefits flowing to the populace (Fox & Meyer, 1995:118; Mashamaite, 2014:232). Examples include sanitation, water, electricity, basic education, national identification, roads, law enforcement, and primary health care (Booysen, 2007:23; Dzansi & Dzansi, 2010:995).

3.4.3 Service Delivery Systems Design

According to Reddick and Turner (2012), the method by which service is delivered is a determinant of the value created for the customer and the organisation. In their investigation into channel choice and public service delivery in Canada, they compared service delivery through e-government and traditional service delivery, and noted that the different channels of service delivery provided different levels of satisfaction to beneficiaries. Similarly, Dholakia et al. (2009) show that when organisations have a policy for service support, they stand a good chance of creating value for their customers and themselves, especially when such organisations operate in industries where the products are complex and frequently evolving. According to them, *"Service support can be defined as the pre- and post-sale services provided to customers to assist them in (a) learning about product-related decisions, (b) learning to use the product, and (c) solving problems during its use"* (Dholkia et al., 2009:3).

However, the idea of service support is extended further by Pienaar and Vogt (2015:25) who refer to it as "customer service". In their view, customer service includes a wide variety of pre-transaction, transaction, and post-transaction activities such as a written statement of when ordered goods will be delivered, selecting transport service and technology, after-sale service and honouring warranty terms.

How the design of the system can maximise service delivery is also affirmed by Overbeek et al. (2009). According to them, government services delivered within an integrated framework best serve the needs of the public compared to the situation

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when these services are delivered disjointedly by the various government agencies. Indeed, they refer to service system design as "architecture" which, perhaps, emphasizss the point that service delivery needs a vehicle to carry it to the consumer. Thus, in the context of Ponsignon et al.'s (2011) conceptualisation of the service delivery system as encompassing the structure (for example facilities, equipment) and infrastructure (for example skills, policies) to deliver the service concept, it can be said that, while Overbeek et al. (2009) and Reddick and Turner's (2012) work serve as examples of structure, Dholkia et al. (2009) and Pienaar and Vogt (2015:25) portray how a policy of customer service (infrastructure) can increase the value of the service delivered. In line with Ponsignon's conceptualisation, therefore, the South African service delivery system is explored from the perspectives of legislation and policies (infrastructure), and bureaucracy (structure).

3.4.3.1 Legislations and policies as infrastructure for service delivery

According to Goodman et al. (2007:110), standing plans are required in every organisation to deal with issues or problems that recur frequently. These standing plans include policies, procedures, and rules which deal with specific issues on a day-to-day basis. Because public organisations derive their authority from the state, in their case, standing plans will include legislations. Therefore, the Constitution as the fundamental legislation of any sovereign territory is the source of all legislations and policies governing public service delivery in South Africa.

The South African Constitution demarcates three spheres of government (i.e. national, provincial, local) with varying amounts of deliberative, legislative, and executive powers assigned to each sphere. Apart from the powers, the Constitution also assigns duties to each sphere of government, which invariably boils down to delivering services to the public at the national, provincial, and local levels (Mashamaite, 2014:232). As an administrative vehicle is required to deliver these services to the citizenry (Nengwakhulu, 2009:344), the Public Service Act (103 of 1994) was promulgated to establish a public service that covers all three spheres of government. Therefore, the South African Public Administration is guided by the norms and

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principles outlined in the Constitution and operates from an environment different from that of private organisations (Mashamaite, 2014:232).

Key within the legal and policy framework of service delivery in South Africa is the *White Paper on Transforming Public Service Delivery*. This policy document, as its name suggests, sets out a practical agenda for transforming the delivery of public service based on eight principles known as the *Batho Pele* principles, which puts the people first. Therefore, the White Paper, aware of the formality and rigidity that tend to be associated with public sector organisations, makes a conscious effort to break down these barriers in order to make public service easily accessible to the citizenry. As a result, the 'customer' concept, which is a principle borrowed from the worldwide business slogan of "the customer comes first", has been adopted to characterise the new way and manner in which the public sector should deliver services to the citizenry (Department of Public Service and Administration, 1997).

In all eight principles for transforming public service delivery – the *Batho Pele* principles – are identified in the document, which are:

1. *Consultation:* Citizens should be consulted about the level and quality of the public services they receive and, wherever possible, should be given a choice about the services that are offered.

2. *Service Standards:* Citizens should be told what level and quality of public services they will receive so that they are aware of what to expect.

3. *Access:* All citizens should have equal access to the services to which they are entitled.

4. *Courtesy:* Citizens should be treated with courtesy and consideration.

5. *Information:* Citizens should be given full, accurate information about the public services they are entitled to receive.

6. *Openness and transparency:* Citizens should be told how national and provincial departments are run, how much they cost, and who is in charge.

7. *Redress:* If the promised standard of service is not delivered, citizens should be offered an apology, a full explanation and a speedy and effective remedy; and when complaints are made, citizens should receive a sympathetic, positive response.

8. *Value for money:* Public services should be provided economically and efficiently in order to give citizens the best possible value for money (Department of Public Service and Administration, 1997).

3.4.3.2 Bureaucracy as a structure for service delivery

In the framework of Ponsignon et al.'s (2011) conceptualisation of the service delivery system as encompassing the structure (for example facilities, equipment) and infrastructure (for example skills, policies) to deliver the service concept, the bureaucracy of the South African Public Administration Service is explored here as a structure for service delivery.

Bureaucracy is the type of organisation designed to accomplish large-scale administrative tasks by systematically co-ordinating the work of many individuals. The basic characteristics of bureaucratic organisation are specialization, a hierarchy of authority, a system of rules, and impersonality (Blau, 1956; Olsen, 2005:2). Bureaucracy is invariably the means through which government delivers services to the populace, and, therefore, plays a pivotal role in service delivery (Pepinsky et al., 2017).

In South Africa, the legislation that epitomises the country's bureaucracy is the Public Service Act (Republic of South Africa, 1994). The act provides for one single public service in South Africa. Although monolithic in nature, the South African public service is organised along the three-tier system of governance of the country. This means that

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public service administration takes place at the national, provincial, and the local government levels and constitutes all persons holding fixed positions or permanent additional appointments in the service, and the state educational institutions, excluding members of the National Defence Force, the South African Security Agency and the South African Police Intelligence (Mashamaite, 2014:232).

In line with the country's three-tier governance system, therefore, the public service of South Africa manifests in the ministries, departments, and agencies at the national, provincial, and municipal levels. The governance system itself is federal in conception, but substantially centralised in practice, with the country divided into nine provinces, each with its own elected parliament and government, but with limited fiscal independence from the central State. Underlying the nine provinces are 52 districts who support the efforts of 234 local municipalities that act as the fulcrum of local governance and administration (de Kadt & Lieberman, 2015:9).

3.5 SERVICE DELIVERY IN THE SOUTH AFRICAN POLICE SERVICE

The way service delivery is conducted in the South African Police Service is the subject of discussion in this section. Service delivery in the South African Police Service is approached from three perspectives, namely: scope, framework, and types of service delivery. Under *scope*, the span of service delivery, in terms of who benefits from the services delivered by the South African Police Service, is discussed; under framework, the key policies and legislations guiding service delivery in the South African Police Service are discussed. The third leg of this section discusses the types of services delivered by the South African Police Service.

3.5.1 Scope of service delivery in the South African Police Service

Although the White Paper on Policing (Civilian Secretariat for Police, 2016:7) envisages a police service that reduces crime and builds safer communities, that does

not mean that service delivery is only outward-looking without addressing the internal issues of the South African Police Service itself. As much as the White Paper on Policing requires the safety of the general public to be its paramount concern, it also takes cognisance of the fact that the internal workings of the Police Service have to be above reproach in other fields for quality services to be delivered to the general public. Therefore, the scope of service delivery of the South African Police Service is both internal and external. Internal service delivery takes place when services are delivered to the internal stakeholders, whereas external service delivery is what happens when the South African Police Service carries out its mandate to its external stakeholders, i.e. the general public. The staff, units, and departments within the service constitute internal stakeholders whereas the communities they serve constitute the external stakeholders (Mofomme & Barnes, 2004).

3.5.2 Framework of service delivery in the South African Police Service

The main national policies or legislations guiding service delivery in the South African Police Service are the Constitution, the National Development Plan, and the *Batho Pele* principles (Mofomme & Barnes, 2004). These three policy instruments give rise to the White Paper on Policing (2016), which provides further details on how policing should be organised and conducted in the Republic of South Africa.

To begin with, the Constitution, in section 205(3), states that, *"The objects of the police service are to prevent, combat and investigate crime, to maintain public order, to protect and secure the inhabitants of the Republic and their property, and to uphold and enforce the law"* (Republic of South Africa, 1996). This means that the Constitution as the fundamental law of the land, recognises the important role of policing in promoting public safety and peace. It therefore, devotes a considerable amount of space to clearly demarcate a role for a national police service and the kind of services that are expected to be rendered to the general public.

The National Development Plan, for its part, reinforces the spirit and letter of the constitutional provision by re-emphasising the form of policing that is required in a democratic South Africa (Civilian Secretariat for Policing, 2016:11). It denotes "Building Safer Communities" as a key objective, and establishes the vision of public safety as, *"In 2030, people living in South Africa feel safe at home, at school and at work, and they enjoy a community life free of fear. Women walk freely in the streets and children play safely outside"* (National Planning Commission, 2012). Setting a specific vision for public safety, therefore, shows that the National Development Plan also considers policing as an important tool for national development.

The final key national policy influencing service delivery in the police service is the set of principles called *Batho Pele*. These principles were previously discussed under the section examining legislations and policies as infrastructure for service delivery in the South African public service as a whole. In this section, a snap analysis is made to relate the *Batho Pele* principles to service delivery in the South African Police Service.

The eight *Batho Pele* principles as they apply to the public service as a whole, apply in equal measure to the South African Police Service. The overarching message of the eight principles is the customer concept, which suggests that the people must come first in the type of service delivered, the way and manner it is delivered, how promptly it is delivered, and how cost-effectively it is delivered. The principles identify customers as both internal and external to the organisation and stipulates an equal application of the principles to both groups of customers (Department of Public Service and Administration, 1997). Therefore, in pursuing these principles in its day-to-day functions, the South African Police Service always seeks to attain internal and external quality in its service delivery to both groups of stakeholders (Mfomme & Barnes, 2004:11).

From the point of view of this study, provisions of the constitution, the National Development Plan, and the *Batho Pele* principles are the key national policies or

legislations that provide the framework for service delivery in the South African Police Service. These three documents give rise to the White Paper on Policing which aims at reducing crime and building safer communities as called for by the National Development Plan. It seeks to achieve this through a demilitarised, professional, accountable, ethical, and community-centred police service that respects human rights (Civilian Secretariat for Police, 2016).

3.5.3 Types of services delivered by the South African Police Service

The services delivered by the South African Police Service can be towards its internal stakeholders or external stakeholders. The service delivery can also be tangible or intangible or a combination of both. Therefore, service delivery can be characterised by either the scope (mode) of delivery or the types of services delivered. It has already been established in the two preceding sections that scope of service delivery in the South African Police Service is both internal and external. This section explores the types of services delivered in the same organisation.

The White Paper on Policing re-iterates the provision in section 205(3) of the Constitution of the Republic of South Africa that states that, "The objects of the police service are to prevent, combat and investigate crime, to maintain public order, to protect and secure the inhabitants of the Republic and their property, and to uphold and enforce the law" (Civilian Secretariat for Police, 2016:10). These objects are invariably the services that the police service is expected to deliver to the South African populace. Therefore, the Police Service's service delivery to its external stakeholders is based on these services.

However, service delivery to external stakeholders will not be optimal if internal stakeholders of the Police Service are not well resourced. As the internal stakeholders of the South African Police Service (SAPS) are invariably its employees, it must ensure that adequate services are delivered to them in a way that makes it possible for them to deliver on their mandate to the general public (Mfomme & Barnes, 2004). The

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employees need to understand the service concept, the service system, and the target market in order for them to effectively deliver services to the general public. Therefore, internal service delivery hinges on making employees understand the service concept, the service system, and the target market which can largely be achieved through training and information sharing. It also involves providing adequate resources for the employees to carry out their mandate. The service concept is the mandate (i.e. prevent, combat and investigate crime) that the Constitution and the White Paper on policing expect of the police service, the service system are the policies and infrastructure that aid in the execution of the mandate, and the target market is the general public. If employees gain a thorough understanding of these elements of service delivery, they are able to serve their external stakeholders better. The aim of internal service delivery is to make them gain this understanding as well as provide employees the resources to carry out their duties.

3.6 DEFINITION OF SERVICE DELIVERY IN THIS STUDY

Following the argument from the preceding section, service delivery in this study refers to internal service delivery. This comprises the services delivered by the South African Police Service through training, information sharing, and resource provision to its employees in a way that enables them carry out the Service's mandate to the general public. With specific reference to the South African Police Service in the Northern Cape Province, the focus of this study, service delivery is defined as the services delivered by the supply and procurement side (Physical Resources Division) to its internal clients (Operations Division) in order for personnel to carry out their duties.

3.7 RELATIONSHIP BETWEEN SUPPLY CHAIN AND SERVICE DELIVERY

As stated earlier, the study seeks to determine the extent to which the implementation of the supply chain management policy (the independent variable) impacts on service

delivery (dependent variable). The conceptual framework below depicts this relationship.
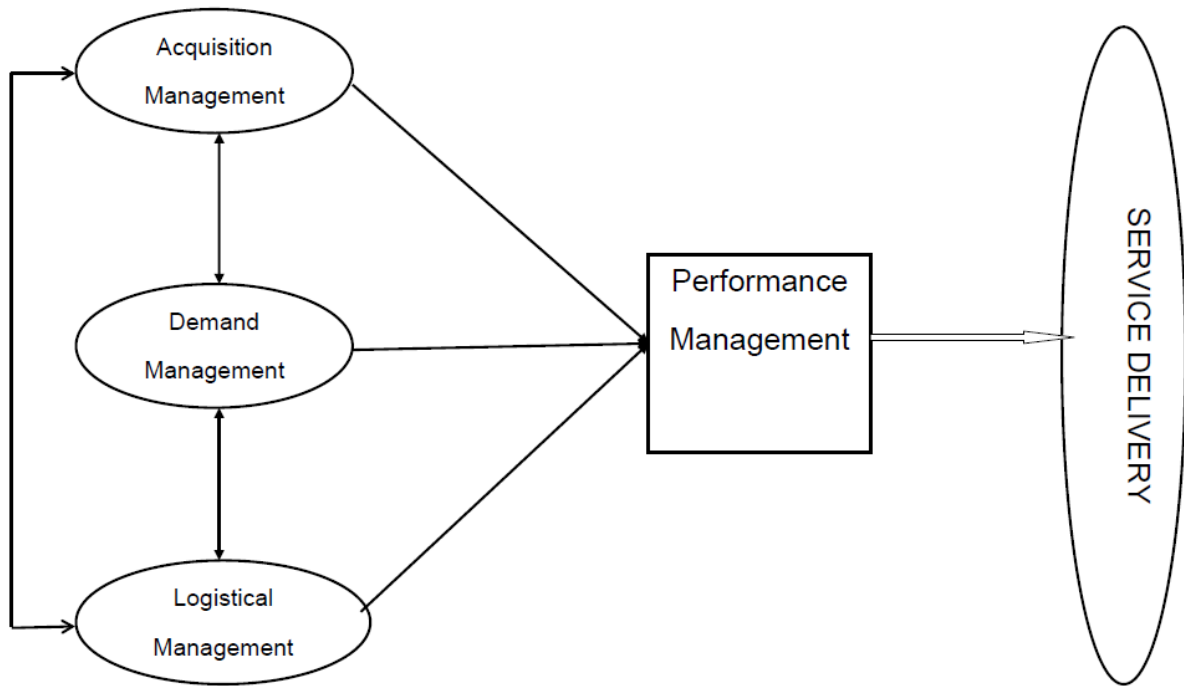
Figure 3.1: Conceptual Framework

Supply chain management is the identification, acquisition, access, positioning and management of resources and related capabilities an organisation needs or potentially needs in the attainment of its strategic objectives (Flynn 2006). Hugo and Badenhorst-Weiss (2006:3) argue further that supply chain management integrates all activities and processes across functional and organisational boundaries in order to optimise customer value, and sharing of benefits by all participants in the chain. Therefore, it can be concluded that supply chain management is directly linked to service delivery, and has an influence on the service delivery by public institutions.

As shown in Figure 3.1 above, supply chain management is made up of acquisition management, demand management, logistical management and performance management. Performance management serves as the filter or 'black box' through

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which the other three components are harmonised to achieve service delivery. The components of supply chain management have already been explained in detail in Chapter 2.

Fox and Meyer (1995:118) define service delivery as the provision of public activities, benefits, or satisfactions to citizen. This is actually the provision of a service or product by the government, to the citizens as expected by the citizens and mandated by Acts of Parliament. Therefore, service delivery can be either tangible (products) or intangible (services). Policy is a body of rules and regulations which are usually found in acts, ordinances, or by-laws. The aim of policy is to provide guidelines to managers on how to account and manage.

To test if the supply chain management policy has had an impact on service delivery within this conceptual framework, this study expects performance management to mediate the effects of the various components of supply chain management (acquisition, demand, and logistical management) on service delivery in such a way that there will be a significant positive relationship between performance management and each of these components. If such relationships are found to exist and performance management in turn is found to have a significant positive relationship with service delivery, then supply chain management policy can be deemed to have impacted positively on service delivery. The relationship between logistical management and performance management is also critical in this framework as it signifies the first stage of service delivery. This is because service delivery to the general public requires an appropriate deployment and management of logistics within the police service. Therefore, the extent to which logistical management predicts performance management is measured to get a first sense of internal service delivery.

3.8 SUMMARY AND CONCLUSION

Service delivery is a generic concept that has three dimensions: a) target market, b) service concept, and c) service system. *Target market* refers to who the right customer

is, while *service concept* can be described as the mix of tangible and intangible aspects of what is being delivered to the customer. Finally, *service system* is concerned with how the service concept is provided to the customers. It encompasses the structure (for example facilities, equipment) and infrastructure (for example skills, policies) to deliver the service concept. Although this characterisation of the concept is more associated with the private sector, it can be applied in equal measure to the public sector as well. This chapter, therefore, identified the citizenry as the target market of the South African public service delivery system with the service concept being the mix of goods and services that are supposed to be delivered to them (citizenry). The service system comprises the bureaucracy, legislations, policies, and skills that enable the public service to deliver service to the public in a valuable manner.

With respect to the South African Police Service, the service concept is the mandate (i.e. prevent, combat and investigate crime) that the Constitution and the White Paper on policing expect of the Police Service while the service system are the policies and infrastructure that aid in the execution of the mandate. The target market is the general public. However, in order to deliver valuable service to the public, the Police Service must first cater for its internal stakeholders. This gives rise to internal service delivery. Internal service delivery takes place when one section, unit or department of the Police Service delivers service to another section, unit or department so that it can fulfil its mandate to the public.

Internal service delivery is the focus of this study. With specific reference to the South African Police Service in the Northern Cape province, which is the focus of this study, service delivery is defined as the services delivered by the supply and procurement side (Physical Resources Division) to its internal clients (Operations Division) in order for personnel of the latter to carry out their duties to the public. It is for this reason that this study seeks to determine how the supply chain management processes influence this service delivery. The next chapter will discuss the methods that will be used to

find out the relationship that exists between supply chain management (SCM) and service delivery.

CHAPTER 4: METHODOLOGY

4.1 INTRODUCTION

The previous two chapters were dedicated to reviewing literature on the two broad variables of this study (i.e. supply chain management and service delivery). Chapter 2 showed that supply chain management (SCM) in the context of this study boils down to demand management, acquisition management, logistical management and performance management while Chapter 3 revealed that service delivery has three components, namely: target market, service concept, and service delivery systems. This breakdown of the broad variables into components, made it possible to articulate a conceptual framework towards the end of the Chapter 3, which depicted SCM as the independent variable with service delivery being the dependent variable. This chapter takes the discussion further by specifying the methodology employed in testing the relationships between variables as well as answering other research questions posed at the beginning of this study.

Methodology is the logic dealing with the principles underlying the organisation and conduct of scientific enquiry (Mackenzie & Knipe, 2006:4). While the terms "methodology" and "methods" are sometimes used interchangeably, the two terms are by no means the same. This is because methodology is a much broader concept than methods is. Methodology is the broad conceptualisation of a research linked to the paradigm or theoretical framework while method refers to systematic modes, procedures or tools used for collection and analysis of data (Somekh & Lewin, 2005:346; Walter, 2006:35; Bitzer, 2017:8). Therefore, methods are a sub-set of methodology. In this light, this chapter discusses the broad conceptualisation of the study as related to the paradigm and the methods appropriate for gathering and analysing data within this broad framework.

According to Wohlin and Aurum (2015), research has three phases: a) the strategy phase, where the philosophical worldview is established; b) the tactical phase, where methodological (design) choices are made to fit the philosophical orientation of the research; and c) the operational phase, where specific methods for data collection, analysis and reporting are decided upon. This study views the first two phases (i.e. strategy and tactical) as constituting the paradigm. Consequently, the next section and its sub-sections (i.e. research philosophy and research design) address the paradigmatic issues of this study while the remaining sections (i.e. population and sampling, measuring instrument, assurance of credibility, variables in the study, data collection, data analysis) concern themselves with the methods aspect.

4.2 RESEARCH PARADIGM

A paradigm may be defined as a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research or the philosophical intent or motivation for undertaking a study (Mackenzie & Knipe, 2006:3). A paradigm is simply a belief system (or theory) that guides the way we do things, or more formally establishes a set of practices. This can range from thought patterns to action.

Paradigms can be characterised through their: ontology (What is reality?), epistemology (How do you know something?) and methodology (How do you go about finding out?). These characteristics create a holistic view of how we view knowledge, how we see ourselves in relation to this knowledge, and the methodological strategies we use to uncover it (Bryman et al., 2017:19). In this study, the methodological strategies are referred to as research design. According to Creswell (2014:19), research designs are types of enquiry strategies within the overall approach (paradigm) that provide specific direction for procedures in a research. Therefore, a research paradigm is made up of the research philosophy and the research design.

4.2.1 Research Philosophy

Research philosophy consists of ontology and epistemology. Ontology influences the selection of the research objective and the research questions while the epistemology influences how the research is conducted (Graue, 2015:5). Research philosophy is a crucial element of a research paradigm as it indicates the researcher's belief about reality and the means to unveil it. As a result, research philosophy provides an early signal of the direction of a research in terms of design and methods (Hesse-Biber & Leavy, 2011:4).

4.2.1.1 Ontology

Ontology is the philosophical study of the nature of being, becoming, existence or reality, as well as the basic categories of being and their relations. Traditionally listed as a part of the major branch of philosophy known as metaphysics, ontology deals with questions concerning what entities may be grouped, related within a hierarchy, and sub-divided according to similarities and differences. Ontology then is concerned with the nature of reality or existence, which is apart from the nature of any existent object. It addresses the question of "What is out there to know about?". In the social sciences, ontology concerns the question, "What is the nature of social reality?" (Kant, 2014:68). Ontology, therefore, suggests the existence of reality independent of human beings' knowledge of it.

Blaikie (2007:13) distinguishes between idealist and realist ontological positions where idealism assumes an external world (reality) that has no independent existence apart from human thought, whereas realism holds that both natural and social phenomena are assumed to have an existence that is independent of the activities of the human observer. In line with this reasoning, Furlong and Marsh (in Marsh & Stoker, 2010:185), identify two main ontological positions, namely: "foundationalism/objectivism/realism" which supports the notion of an external world independent of people's knowledge of it, and "anti-foundationalism/ constructivism/relativism" which views the world as a socially constructed entity. For this reason, some scholars (for example Grix, 2002:177; Bryman & Bell, 2011:15-21;

Wright et al., 2016:97) view "objectivism" and "constructivism/subjectivism) as ontological positions, and "positivism/post-positivism" and "interpretivism" as epistemological positions.

A third ontological position is pragmatism, which straddles the objectivism-subjectivism dichotomy. Pragmatism focuses on the "what" and "how" of the research problem without taking a position in the ontological divide (Mackenzie & Knipe, 2006:4). Its main purpose is to find what works in solving the research problem, so it applies approaches across the ontological divide to understand the problem. With the research problem as its central focus, pragmatism inspires research designs, data collection and analysis methods that place results above loyalty to either the objectivist world view or the subjectivist world view (Creswell, 2014:10). This is because the connections that are posited to exist between a particular research philosophy (ontology and epistemology) and its concomitant research design and method are best thought of as tendencies rather than as definitive connections. What is true is that, there is a distinctive mix of ontology, epistemology and methods in either of the two opposing philosophical world views (i.e. objectivism and subjectivism) (Bryman & Bell, 2011:614). Therefore, pragmatism is what pertains in the natural world as there is no pure objectivist world view or pure subjectivist world view; so researchers should consciously adopt measures that employ tools from both sides of the ontological divide in the research process (Onwuegbuzie & Leech, 2005).

4.2.1.2 Epistemology

Epistemology studies the theory of knowledge, how knowledge is derived (for example, by reason or experience, which may both take various forms), and the reliability and validity of knowledge claims (Kant, 2014:70). Epistemology concerns itself with two main questions. The first one relates to whether an observer or researcher can identify objective or real relations between social phenomena. Answering this question entails a return to ontology, that is, whether reality exists independent of the observer or researcher. The second question concerns how the researcher can identify real relations between social phenomena, if the first question

is answered in the affirmative. Furthermore, the second question raises an important and related issue of whether a researcher can establish real relations between phenomena by means of direct or indirect observation. The answers to all these questions influence a researcher's epistemological position (Marsh & Stoker, 2010:186).

The distinction that lies between ontology and epistemology is, therefore, that ontology deals with "what is out there to know about", whereas epistemology concerns itself with "what and how can we know about it?" (Grix, 2002:175; Marsh & Stoker, 2010:11; Wright et al., 2016:97). The ontological question has an implicit question of whether what is out there to be known (reality) exists independent of the human being (researcher). If the answer is in the affirmative, then that reality is objective, which leads to an epistemological position where the researcher can identify objective or real relations between social phenomena (positivism/post-positivism). If, on the contrary, the answer is negative, then the reality is subjective or socially constructed. In that case, the epistemological orientation of the researcher becomes one in which relations between social phenomena become constructed (interpretivism).

Positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond (Bryman & Bell, 2011:16). Post-positivism represents the thinking after positivism, challenging the traditional (natural science) notion of the absolute truth of knowledge and recognising that researchers cannot be positive about their knowledge claims when studying the behaviour and actions of human beings. Therefore, although largely objective, post-positivism does accommodate some subjective elements (Creswell, 2014:7). Interpretivism is the contrast to the positivist/post-positivist orthodoxy that has dominated scientific thinking for a considerable amount of time. It emphasises the need for a strategy that respects the difference between people as the focus of research of the social scientist versus the objects of research of the natural scientist in order to make it possible for the social scientist to grasp the subjective meaning of social action (Bryman & Bell, 2011:17).

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Since ontological claims about the social world logically precede epistemological claims concerning what can be known about the social world, it implies that ontology has primacy over epistemology even though the two concepts are logically related. Hence epistemology is dependent on ontology. Therefore, an objectivist ontological world view will lead to a positivist/post-positivist epistemological position with a subjectivist ontology leading to an interpretivist epistemological orientation. In the same vein, a pragmatist world view will lead to an amalgamation of post-positivist and interpretivist epistemologies. Once the ontological and epistemological positions are aligned, they will inform the methodological (design) choices (Grix, 2002; Hay, 2007:118; Johnston, 2014; Bryman et al., 2017:20).

4.2.2 Research design

Research design is the aspect of the research paradigm that links the research philosophy to the methods part of the research. More specifically, it is the plan that moves the research process from the underlying philosophical assumptions to specifying the selection of respondents, the data-gathering techniques to be used and the data analysis to be done (Maree, 2008:70; Bitzer, 2017:7). It constitutes the tactical phase of the research process. The tactical phase involves decisions on how to operationalise research activities in terms of how to approach the research question more specifically. It focuses on selecting the actual process and methodology to use to achieve the research goal (Wohlin & Aurum, 2015). According to Welman et al. (2005:53), a research design is the plan according to which research participants are obtained and data collected from them in order to reach conclusions about the research problem. Therefore, in deciding on what the design of a research should be, a researcher needs to find answers to questions such as, "What procedures should be adopted to find answers to the research questions?"; "How will I carry out the tasks needed to complete the different components of the research process?"; "What should I do and what should I not do in the process of undertaking the study?"; "What approach will I be using?" (i.e. Will the study be qualitative or quantitative?); and "What will be the assumptions and limitations?" (English, 2010:294; Kumar, 2014:122).

According to Creswell (2014:5), the design of a research can employ a method that requires quantitative or qualitative data or a method that requires a mixture of quantitative and qualitative data, depending on the philosophical worldview of the researcher. Where the world view is objectivist, the offshoot will be a design that employs quantitative data while a subjectivist or constructivist world view will lead to a design that uses qualitative data. By the same reasoning, a pragmatist research philosophy will lead to a design that uses both quantitative and qualitative data (mixed methods). Each of these broad research designs consists of specific designs that the researchers can employ. Examples of specific designs using quantitative data include, surveys, experiments, and quasi-experiments with examples of those using qualitative data being, ethnographies, grounded theory, narrative research, and phenomenological research. Mixed methods design combines elements of quantitative and qualitative designs to achieve its goals. Maree et al. (2008:2060) further indicate that mixed research methods allows for contextual interpretations, the use of multiple methods and flexibility in choosing the best strategies to address the research question. However, as a hybrid design, the extent to which one parent design (i.e. quantitative or qualitative) dominates and whether the tools of one parent design is applied before the other in the research process, help to differentiate among the various mixed method designs. Where the quantitative techniques dominate, the design will tend to be more explanatory and where the qualitative techniques dominate, the research will tend to be more exploratory. Where there is a parity in the application of techniques in the sense that the researcher converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem, the design will tend to be convergent.

In terms of which parent design's tools are applied first, a specific design can either be classified as either sequential or parallel. A sequential mixed methods design is one in which one parent design's tools are applied before the other's whereas a parallel mixed methods design is one in which the tools of the quantitative and qualitative designs are applied concurrently. Therefore, a mixed method design can

be "explanatory sequential", "exploratory sequential" or "convergent parallel". Explanatory sequential mixed methods design is one in which the researcher first conducts quantitative research, analyses the results and then builds on the results to explain them in more detail with qualitative research (Creswell, 2014:15).

This study has a mixed methods design which can best be described as explanatory sequential in the sense that the first part involves a survey to collect and analyse quantitative data using close-ended questions on the measurement instrument. However, a key question on that instrument that sought to know the challenges faced in implementing the supply chain management (SCM) policy in the South African Police Service (SAPS) was left open to allow the participants flexibility to list all the possible challenges that they encountered in implementing the policy. The responses given by the participants necessitated follow-up focus group discussions (FGDs) to ascertain the top 15 challenges by ranking. According to Bryman et al. (2017:232), focus group discussion (FGD) "is a qualitative method that is concerned with studying how participants express their views and perspectives on an issue as members of a group. The moderator or facilitator is expected to guide a fairly unstructured discussion without being too intrusive."

4.2.2.1 Survey

A survey provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. Surveys include cross-sectional research and longitudinal studies using questionnaires or structured interviews for data collection – with the intent of generalising from the sample to the population so that inferences can be made about some characteristic, attitude, or behaviour of this population (Creswell, 2014:13). In a cross-sectional survey, data is collected at one point in time whereas in a longitudinal survey, data is collected over time. With an objectivist philosophical inclination, a survey would be the preferred mode of data collection if the researcher's considerations are: economy of the design; rapid turn-around in data collection; and efficiency in identifying attributes of a large population from a small group of individuals (Fowler, 2009; Meyer et al., 2015:199). A

survey can be administered by mail, telephone, the internet, face-to-face (personal interviews), or group administration (Fowler, 2009; Fink, 2012; Sue & Ritter, 2012; Martinez-Gomez et al., 2017).

The survey part of this study has a cross-sectional design with data collected around the same time. The reasons for choosing a survey are the same as those mentioned in the preceding paragraph (for example, generalising from a sample to population; quick turn-around time; economy of the design). The method of data collection used in this survey was by mail where questionnaires were sent to respondents for self-completion and return to the researcher within a given time frame. Despite its disadvantages, a self-administration survey has certain advantages that made it the most suitable survey design for this research. Compared to face-to-face surveys, self-administration surveys help to minimise interviewer bias, enhance anonymity to respondents, and significantly reduce the questionnaire administration costs associated with the use of enumerators in face-to-face surveys (Krumpal, 2013:2034; Hoeyi, 2016:75).

However, self-administration survey has its own disadvantages that were given a serious thought in this research. Two major disadvantages that were taken into consideration were the fact that: a) self-administration surveys tend to remove any sense of accountability for one's answers, thus reducing participant motivation to provide accurate answers; and b) response rate tends to be low owing to the lack of sense of accountability engendered by the complete anonymity provided by this survey method. Therefore, this research took steps to address these concerns. First, the respondents of the survey are internal stakeholders (employees) of the South African Police Service (SAPS), therefore they felt an obligation to respond faithfully and accurately on a subject that concerned them. This was further enhanced by the preliminary information provided by the researcher to respondents. Second, because the respondents are employees of SAPS just as the researcher is, it was easy for the researcher to follow-up on respondents who had delayed in sending back their responses. As a result, there was no problem with response rate.

4.2.2.2 Focus group discussions

Focus group discussions (FGDs) "are a form of strategy in qualitative research in which attitudes, opinions or perceptions towards an issue, product, service or programme are explored through a free and open discussion between members of a group and the researcher" (Kumar, 2014:156). The discussion is facilitated by the researcher who raises issues or asks questions that stimulate discussion among members of the group. Focus groups have evolved from the focused interview where participants are selected because they are known to have been involved in a particular situation that is the focus of discussion. Focus group discussion (FGD) has become a popular method to examine the ways in which people, working together, construe research topics. The technique also allows the researcher to develop an understanding about why people feel the way they do. Unlike an individual interview, where the interviewee is asked to provide reasons for holding a particular view, in the focus group people can probe each other's reasons for holding a certain view, thus leading to a harmonisation of views. Focus groups make it possible for the researcher to study how participants collectively make sense of a phenomenon and construct meanings around it (Bryman et al., 2017:232). Finally, its low cost makes it a popular method for finding information in almost every professional area and academic field (Kumar, 2014:156). It was for these reasons that focus group discussions (FGDs) were used as a follow-up technique to gain further insights into some aspects of the study (for example, the challenges experienced in implementing the supply chain management policy).

4.3 POPULATION AND SAMPLE

This section discusses the population and the sampling method. As a mixed methods research, there was the need to draw a sample for the deductive part, and another for the inductive part. These are discussed in the sub-sections that follow.

4.3.1 Population

A population encompasses the total collection of all units of analysis about which the researcher wishes to make specific conclusions. A unit of analysis may be an individual, a group, an organisation, a human product, event, or the conditions they are exposed to. Therefore, a population is a count of all the units of analysis that are the focus of the study (Welman et al., 2005:52). With respect to this study, the units of analysis are the individual staff members of the South African Police Service (SAPS) in the Northern Cape province who have, as a matter of course, been exposed to the implementation of the Supply Chain Management (SCM) policy. Consequently, the population for this study is all staff members of the SAPS NC. The staff strength of the SAPS NC is 7 307, which is also the population size of this study. With a highly formalised organisational structure, identifying individuals in the population was fairly easy as the nominal roll (staff list) came in handy as a very reliable sampling frame. According to Bryman et al. (2017:171), an unreliable sampling frame can lead to non-sampling error which can compromise the results of a study. A sampling frame is a complete list in which each unit of analysis is mentioned only once and from which the sample will be selected (Welman et al., 2005:57; Bryman et al., 2017:170).

4.3.2 Sample for the Survey

Sampling is defined as a process used to select a portion of the population for the study whereas a census involves studying all members of the population (Bryman et al., 2017:171). However, a census becomes very difficult or even impossible to conduct where the population is very large and/or very difficult to access owing to time and financial constraints. Therefore, in a fairly large population, drawing a representative sample is an efficient way of learning about the entire population using a sub-set of the entire universe. A representative sample is one that has been drawn using one of several random techniques whereas an unrepresentative sample or non-probability sample is one that has been selected using a non-random sampling method. A sampling technique is described as random when each member of the population has an equal chance of being selected whereas in a non-random technique, members may not have not equal chance of being selected. Unlike with a probability or random sampling method, findings from a non-probability or non-random

sample can only be confined to the sample in question and can never be extrapolated to the whole population (Welman et al., 2005:55-56; Maree, 2008:172; Kumar, 2014:234).

This study employed a probability sampling technique called simple random sampling. Systematic sampling, stratified random sampling, and multi-stage cluster sampling are the other probability sampling techniques (Bryman et al., 2017:173). According to Welman et al. (2005:59-60), as long as the population is not too large and there exists a reliable sampling frame, simple random sampling is the most attractive technique to employ because of its simplicity and the fact that it does not favour one unit of analysis over another. For this reason, simple random sampling was the preferred method of sampling in this study. Specifically, the sample was selected by drawing names randomly from the nominal roll of police personnel in the Northern Cape province which led to the selection of 176 participants in the first instance. The randomness reflected in how the participants cut across the divisions of the SAPS (i.e. Operational Services versus Support Services), rank (i.e. Commissioned officers versus Non-Commissioned officers), and gender (i.e. female versus male).

Although, selecting 176 persons out of a total population of 7 307 might seem inadequate (i.e. only 2.4 percent of the population), the homogeneity of the population made it possible to extract useful information from the barest minimum of the entire population. According to Bryman et al. (2017:177), high sample sizes only become necessary when there is the need to measure the variations associated with the different segments of a very large and heterogeneous population (such as pertains in national populations); but where the population is homogeneous (as in the case of a company or an organisation), a minimum sample size is enough to reveal the patterns in the phenomenon that the researcher is investigating. In fact, the central limit theorem stipulates a sample size of 30 or greater in order for a sample to represent its population adequately (CFAI, 2012a:556). Therefore, selecting 176 employees to constitute the sample of this study was more than adequate.

4.3.3 Sample for the Focus Group Discussions

Sample size and sampling technique do not play a significant role in inductive studies as they do in deductive studies, because in an inductive study, useful information can be obtained from just one information-rich individual (Kumar, 2014:241). Nonetheless, the method used to select participants for an inductive study still needs to be elaborated in the methods section of the study (Creswell, 2014:183).

The size of a focus group can range from as little as three people in a group to as many as 20 people in a group. There is no hard and fast rule about what the lower limit or upper limit of a focus group should be; what matters is the ability of the members of the group to provide the information that the researcher requires (Bryman et al., 2017:233). Therefore, in selecting individuals to constitute a group, the researcher must ensure that they are information-rich (Bryman et al., 2017:185). Doing so means purposive sampling, which is a non-probability sampling technique. In addition, drawing the sample purposefully makes it possible for the researcher to minimise the time and cost associated with data gathering as the researcher will neither have to make use of many participants in a group nor hold discussions with many groups in other to gain an understanding of the phenomenon under investigation (Creswell, 2014:224; Bryman et al., 2017:186).

The focus group discussions (FGDs) for this study were conducted according to the geographical demarcations of the SAPS NC. These geographical demarcations are known as clusters, of which there are five, namely: a) Pixley Ka Seme; b) Frances Baard; c) ZF Mcgawe; d) Namakwa; and e) JTG clusters. In each cluster, 14 personnel who were respondents in the survey part of this study and were viewed as being very useful in providing information on the challenges faced in implementing the Supply Chain Management (SCM) policy were purposefully selected to constitute the focus group. These individuals cut across rank, gender, and the departmental divides of the organisation.

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The focus group discussions were held from 9 to 13 May 2016. Prior to that, the researcher had met the main supervisor of the study to agree on a programme for conducting the focus group discussions as well as administer a follow-up questionnaire that will enable the participants rank the top 15 challenges identified in the first (i.e. survey) part of the study. The programme and measuring instrument (questionnaire) for this stage of the study are attached to this report as Appendices B and C respectively.

In each focus group, the researcher provided an update on the survey stage of the study and the purpose of the focus group discussion. The top 15 challenges identified in the survey were then presented to the group after which they were allowed to express their views on the authenticity of the challenges. In all cases, group members unanimously agreed to the top 15 challenges as captured in the first stage of the study. The researcher then went on to engage the group members to suggest remedies for the identified challenges (these remedies are captured in the recommendations chapter of this study). After all these, a follow-up measuring instrument containing close-ended questions on the top 15 challenges were distributed to 10 out of 14 persons in each cluster for immediate completion and return to the researcher. This resulted in 50 completed questionnaires at this stage of the study.

4.4 MEASURING INSTRUMENT

"A research instrument is a survey, questionnaire, test, scale, rating, or tool designed to measure the variable(s), characteristic (s), or information of interest, often a behavioural or psychological characteristic. Research instruments can be helpful tools to your research study (Pierce, 2009)." There were two measuring instruments used in this study: a) the questionnaire for the first part of the study (i.e. the survey); and b)

the follow-up instrument administered during the focus group discussions. These two instruments are discussed in this section.

4.4.1 Sections in the Questionnaire for the Survey

The questionnaire for the survey (attached as Appendix A) had seven sections to collect data on demographics, service system, service concept, value, supply chain components, the supply chain management (SCM) policy, and the challenges experienced in implementing the policy. The section on the supply chain components was sub-divided into demand management, acquisition management, logistics management, and performance management. Each section is described in more detail below.

Section 1, Demographic Data: This section contained four items that asked respondents to provide their personal details in relation to the SAPS.

Section 2, Service System: This section contained seven items, Questions 1 to 7 (Q1 to Q7), and respondents were asked to indicate the extent to which the service delivery of SAPS NC meets the needs of clients. The question was on a five-point Likert-type scale ranging from "Not at all" (1) to "To a great extent" (5).

Section 3, Service Concept: The six items in this section (Q8a to Q8f) sought to measure the extent to which the responsibilities of the SAPS as defined by statutes are considered relevant by respondents. Again, respondents were asked to answer on a five-point Likert-type scale ranging from "Not at all" (1) to "To a great extent" (5).

Section 4, Value: The six items in this section (Q9a to Q9f) were a follow-up to those in section 3. The items sought responses concerning the extent to which respondents were satisfied with the way SAPS carried out the responsibilities described in section 3. The questions were posed on a five-point Likert-type scale ranging from "Not at all" (1) to "To a great extent" (5).

Section 5, Supply Chain Management Elements: There were 27 items in this section. The first four (Q10a-Q10d) asked respondents to indicate the extent to which

they understood the elements or components of supply chain management. The remaining 23 items (Q11a-Q24g) then sought to know the extent to which the various components of the supply chain management policy (i.e. demand management, acquisition management, logistical management, and performance management) have been implemented in SAPS NC. The questions were posed on the five-point scale ranging from "Not at all" (1) to "To a great deal" (5).

Section 6, Supply Chain Management Policy: Using three items, this section asked respondents to indicate the extent to which they found the supply chain management (SCM) policy relevant to current circumstances in the procurement of goods and services in SAPS NC. Again, the same five-point scale was employed.

Section 7, Challenges: This was the last section in the questionnaire and the only item here was left open to give respondents the flexibility to come up with as many challenges as possible. The only question posed in this section was, "What have been the challenges in implementing the supply chain management policy in SAPS NC?" The variety of challenges identified necessitated their pruning down to the top 15 challenges which were sent back to selected respondents for focus group discussions.

4.4.2 Sections in the Follow-up Instrument for the Focus Group Discussions

Although focus group discussion (FGD) is a method for gathering qualitative data in inductive research, which puts emphasis on meaning rather than quantification, there still exists an element of quantification in the gathering and analysis of qualitative data as far as inductive studies are concerned. This is because in an effort to determine what the prominent themes in qualitative data are, the number of times they occur in the coding process are taken into consideration, which is quantification of sorts. Secondly, researchers often make use of quasi-quantification terms such as 'many', 'frequently', 'rarely', 'often', and 'some' in order to make claims of the relative frequency of the phenomenon being referred to in an inductive research. Such terms are a tacit admission that making sense of qualitative data involves a certain amount of quantification. Lastly, the widespread use of brief sequences of conversation, snippets from interview transcripts and accounts of encounters between people provides little sense of the prevalence of whatever phenomenon that such items of

evidence are supposed to indicate. As a result, some researchers undertake a limited amount of quantification of qualitative data to inject greater precision into estimates of frequency or prevalence than can be derived from quasi-quantification terms or personal snippets (Bryman et al., 2017:61). In this light, the follow-up instrument for the focus group discussions was designed to allow for the easy quantification of the responses of the participants in order to rank the top 15 challenges identified in the survey part of the study. As a result, close-ended questions on a five-point Likert-like scale were used.

The instrument was structured as follows:

Please indicate the extent to which the following constitute a challenge to the implementation of the supply chain management policy:

	Challenge	Not at all				A great deal
1.	Lack of resources	1	2	3	4	5
2.	Inadequate skills or training	1	2	3	4	5
3.	Inadequate staffing or personnel	1	2	3	4	5
4.	Slow response time of suppliers	1	2	3	4	5
5.	Interpretation/understanding of policies	1	2	3	4	5
6.	Inconsistency in planning & budget alignment	1	2	3	4	5
7.	Inadequate monitoring & evaluation	1	2	3	4	5
8.	Incorrect (top-down) SCM structure	1	2	3	4	5
9.	Lack of support	1	2	3	4	5
10.	Inadequate communication/information on policies	1	2	3	4	5
11.	Lack of commitment by managers	1	2	3	4	5
12.	Poor quality of supplies/specifications not met	1	2	3	4	5
13.	Non-compliance with policies and regulations	1	2	3	4	5
14.	Irregular update of policies	1	2	3	4	5
15.	Unethical conduct	1	2	3	4	5

4.5 ASSURANCE OF CREDIBILITY

For the findings of a study to be credible, it must be both valid and reliable (Davis, 2005:184). Validity is the degree to which the research findings accurately represent what is really happening in the situation, while reliability relates to the consistency of the findings. An effect or test is valid if it measures what the researcher thinks or claims it does (Welman et al., 2005:142; Creswell, 2014: 160; Kumar, 2014:216). A number of measures can be taken to ensure credibility such as reviewing literature to make sure that the variables being tested are well grounded in theory; pre-testing the measuring instrument to ensure its effectiveness in measuring what is supposed to measure; and minimising errors in the research process (Hoeyi, 2016:80-82). These steps were taken to assure the credibility of the findings of this research.

4.5.1 Literature Review on Variables

In Chapter 2, a literature review was conducted on supply chain management, which is the broad independent variable. The literature review revealed four components of SCM as being relevant to this study, namely: acquisition management, demand management, logistical management, and performance management. It was found that performance management tends to act as the mediating variable ('black box') that enhances the impact of the other three components on service delivery. The literature review in this chapter also yielded the indicators that could be used to measure the various components of supply chain management. These indicators became very useful in serving as questionnaire items during the survey stage of the study. These items are discussed in detail in section 4.6 below (i.e. Variables in the Study).

In addition to this, Chapter 3 reviewed literature on the broad dependent variable, that is, service delivery. The review revealed service delivery as having three components, namely: target market, service concept, and service delivery systems design. The indicators that measure these components were also revealed and just as in the case of supply chain management (SCM), the indicators came in handy in the construction of the questionnaire for the survey. Details of these are also discussed in section 4.6

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(i.e. Variables in the Study). Therefore, in a nutshell, the literature reviews ensured that the content of the survey instrument was informed by theory, thus, enhancing validity.

4.5.2 Pre-testing of the Survey Instrument

It is important to test out a research instrument before using it for actual data collection. Doing so will determine if the items contained in the instrument are properly understood by respondents in the way conceived by the researcher and whether different respondents interpret the items differently. Therefore, pre-testing a questionnaire necessitates an actual field test of the instrument to ensure that any misunderstandings in the questionnaire items are rectified prior to the actual data collection. This will ensure that the instrument ultimately measures what it is intended to measure (Kumar, 2014:191). With this understanding, the survey instrument of this study was pre-tested in the SAPS of the Free State and North West provinces in October 2015. These two provinces share borders with the study area (i.e. the Northern Cape province) and have similar socio-cultural characteristics as it does, so providing the appropriate environment for testing the questionnaire.

The actual pre-testing did not reveal any need to adjust the content of the measuring instrument as the respondents seemed satisfied with the structure and terminology used. This may be attributed to the thorough literature review conducted to identify the questionnaire items and the useful comments received from the study supervisor during the design stage of the instrument.

4.5.3 Minimising Errors in the Research Process

There are two sets of errors in the research process that can compromise the findings, namely: sampling error and non-sampling error. Sampling error arises from drawing a sample rather than conducting a census (i.e. surveying the entire population). Non-sampling error, on the other hand, arises from the data collection and processing procedures. Non-sampling error is made up of specification error, coverage error, non-

response error, measurement error, and processing error (Banda, 2003:5; Lee et al., 2011:88). According to Biemer (2010:818), it is important to identify which of these constitute major sources of error so that the necessary steps are taken to neutralise their effect to the largest extent possible. Furthermore, Senecal and Fink (2014:146) assert that the best way to minimise sampling error is to employ larger random samples. In this study, sampling error was minimised by employing a large enough random sample (n = 176) (see section 4.3.2 for the study's sampling method). Also, the pre-testing of the questionnaire revealed that specification error was not an issue whereas coverage and non-response errors were also kept to the minimum by the fact that the study was conducted in the same organisation within a particular province to which the researcher belongs. The researcher's inside knowledge of the organisation made it possible for him to gain the confidence and co-operation of the participants in a way that made it possible for him to deploy the appropriate strategies to optimise both coverage and response rates. Therefore, the errors of concern were measurement and processing errors.

4.5.3.1 Minimising measurement error

Measurement error may arise from the interviewer, the respondent, the questionnaire or the wording of the questionnaire items. However, interviewer-related errors occur only in face-to-face and telephone surveys, which naturally require an intermediary to pose the questions on the questionnaire to the respondent (Tourangeau et al., 2000; Bryman et al., 2011:202). In surveys that do not require the intervention of an interviewer, interviewer error will not arise. In this vein, interviewer error was not an issue in this study as the survey instrument was self-administered. Similarly, a pre-testing of the questionnaire revealed that the structure of the questionnaire and the wording of the questionnaire items posed no problem at all to the respondents. Therefore, the design of the questionnaire and the wording of its items also seemed to have minimised the potential for measurement error. With all these sources of measurement error neutralised, the only source left to address was the one associated with the respondent.

Measurement errors emanating from respondents may manifest in the form of inaccurate answers to retrospective questions because of recall and retrieval problems, difficulty interpreting question meaning, or difficulty mapping responses onto the available answer options. In addition, social desirability bias may systematically bias responses to some survey questions (Tourangeau et al., 2000; Johnson & Van de Vijver, 2003; Hoeyi, 2016:85). To minimise these errors, Podsakoff et al. (2012:551) suggest: simple, specific, and concise questions; defining ambiguous or unfamiliar terms; and labelling every point on the response scale. These measures were adopted in this study in addition to the actual field test of the questionnaire prior to the actual data collection. All these measures were aimed at reducing respondent-related measurement errors.

4.5.3.2 Minimising processing error

Processing error is a post-data collection problem that may arise from data editing, weighting construction, and estimation procedures (Groves et al., 2004). Measures taken to minimise these error are embedded in the discussion in the data analysis section (section 4.7) of this chapter which touches on how the data was edited and the statistical procedures adopted.

In a nutshell, reviewing the literature to ensure that the questionnaire items are grounded in literature; pre-testing the questionnaire prior to the actual data collection; and making a conscious effort to minimise errors in the research process were specific steps that this study took to assure the credibility of the findings. As a credible study has to be both reliable and valid (Davis, 2005:184), it implies that the measures were taken to enhance the reliability and validity of the study. This is made explicit in the sub-sections that follow.

4.5.4 Face and Content Validity

The measures that this study took ensured face and content validity. Face validity has to do with the logical link between the questionnaire items and the objectives of the

study whereas content validity measures the extent to which different items of the instrument cover various aspects of the issue. Content validity is also judged by the extent to which the items measure what they are supposed to measure as judged by the researcher, readers, and experts in the field (Kumar, 2014:214). The comprehensive literature review undertaken on the broad variables (for example, Hirschmann,1958; Christopher; 1998; Mofomme & Barnes, 2004; Lusch, 2011; Ponsignon et al., 2011; Mbanje & Lunga, 2015; Pienaar & Vogt, 2016) resulted in the operational definitions for supply chain management and service delivery. This, in turn, made it possible to identify questionnaire items for measurement purposes. Also, the pre-testing of the questionnaire on similar populations (i.e. Free State and North West provinces) outside the study locale (i.e. Northern Cape province) helped reinforce the usefulness of the measurement instrument to measure what it was supposed to measure as pre-test respondents did not suggest any changes to the structure of the questionnaire or any of its items. In this way, face and content validity were guaranteed.

4.5.5 Reliability

Reliability indicates the extent to which an instrument is able to produce the same or similar results under same or similar conditions, irrespective of when the instrument is administered, which particular version of it is used, or who is applying it (Welman et al., 2005:145; Field, 2012:673; Kumar, 2014:215). Reliability, therefore, indicates the consistency with which an instrument produces results, and can be measured using either external consistency methods or internal consistency methods. External consistency methods require the comparison of the findings of two or more independent studies in order to judge the reliability of the instrument whereas internal consistency methods measure the degree to which the items in the questionnaire measure the phenomenon, regardless of their number.

Owing to time and resource constraints, this study focused on measuring internal consistency rather than external consistency. This is because *Cronbach's alpha*, which is the internal consistency measure employed, can be statistically derived from

the data collected and so it is much easier and less costly to arrive at than measuring external consistency. Cronbach's alpha shows the degree to which all the items in a measurement or test measure the same attribute. The more appropriate content an instrument covers, the higher its internal consistency will be (Diener et al., 2012:4; Kumar, 2014:218; Hoeyi, 2016:89). Although internal consistency was the focus of this study, the external consistency of the instrument will be revealed in future when other researchers use it to conduct similar studies.

In terms of the inductive aspect of this study, credibility was assured by: a) the fact that the FGDs were derived from the survey and therefore, assurance of credibility in the survey naturally influences the credibility of findings of the FGDs; b) using members of FGDs to check the accuracy of the findings by taking the final report or aspects of it back to them for validation; c) the researcher spending prolonged time in the field in order to develop an in-depth understanding of the phenomenon under study in order to convey it in a credible manner to his readers (this researcher works in the Supply Chain Unit of SAP NC and so is well embedded into the field); and d) using peer de-briefing as a mechanism to identify peers to review and ask questions about the inductive study so that the account will resonate with people other than the researcher (by so doing the accuracy of the account is enhanced). According to Creswell (2014:201), although credibility of findings in inductive studies does not bear the same connotations as they do in deductive studies, adhering to measures such as those just described should enhance the researcher's ability to assess the accuracy of findings as well as convince readers of that accuracy.

4.6 VARIABLES IN THE STUDY

The variables of every study are implied in the aim, objectives, research questions and/or hypotheses which are normally stated in the proposal or the introduction of the actual study. Although, the readership of the study may be hinted of the variables at that early stage, Creswell (2014:161) advises researchers to make them explicit in their Methods chapter by linking the variables to the research questions/hypotheses

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and the instrument items. According to him, this enables the reader to understand how the data collection links to the variables and research questions or hypotheses. Therefore, the connections that exist between the variables, research questions, and questionnaire items in this study are presented in Table 4.1.

Table 4.1: Variables, Research Questions, and Questionnaire Items

Variable Name	Research Question	Questionnaire Item
Personnel's understanding of SCM elements	**RQ1:** What is the level of understanding of SAPS NC personnel of the key elements of Supply Chain Management?	See Questions 10.a to 10.d under SCM components section of Appendix A.
Acquisition management and performance management relationship	**RQ2:** What is the relationship between acquisition management and performance management?	See Questions 12 to 16 versus Questions 24.a to 24.g
Demand management and performance management relationship	**RQ3:** What is the relationship between demand management and performance management?	See Questions 11.a to 11.e versus Questions 24.a to 24.g
Logistical management and performance management relationship	**RQ4:** What is the relationship between logistical management and performance management?	See Questions 17 to 23 versus Questions 24.a to 24.g
Performance management and service delivery relationship	**RQ5:** Does performance management explain service delivery? (i.e. Does performance management mediate the effects of acquisition, demand, and logistical management on service delivery?)	See Questions 24.a to 24.g versus Questions 1 to 9.f
Direct relationship between SCM and service delivery	**RQ6:** To what extent does supply chain management (acquisition, demand, and logistical management) relate directly with service delivery?	See Questions 11 to 23 versus Questions 1 to 9.f
SCM policy implementation challenges	**RQ7:** What are the challenges faced in implementing the supply chain policy in SAPS NC?	See Question 26 (Appendix A) and follow-up FGDs (Appendix C)

Table 4.1 shows, for example, that SCM as a broad variable has four components, namely: acquisition management, demand management, logistical management, and performance management and that Research Question 2 to Research Question 4 (RQ2 – RQ4) are testing the relationship between each of the other components (i.e.

acquisition, demand, and logistical management) and performance management, which is considered the mediating variable, whereas RQ6 is dedicated to testing any direct relationships they may have with service delivery (if performance management is not mediating). The third column of the table shows the questionnaire items that enable the measurement of these relationships. Therefore, Table 4.1 is useful in linking the questionnaire items to the variables and research questions.

4.7 DATA COLLECTION

English et al. (2010:295) state that research typically includes an empirical component concerning the gathering of data, which will be analysed so that the research question(s) may eventually be answered. According to Maree et al. (2008:78), data collection is done through social interaction with participants, field studies, participant observation and semi-structured interviews.

The nature of this study required that qualitative and quantitative data collection methods were applied through self-administered questionnaires and FGDs. The self-administered questionnaires were accompanied by a covering letter explaining the reasons for gathering the data and assuring respondents that confidentiality will be preserved. Based on the sampling technique discussed in section 4.3, data collection was undertaken from February to March 2016. Follow-up FGDs were then undertaken in May 2016 to gain a deeper understanding of what the top 15 challenges facing the implementation of the SCM policy are.

4.8 DATA ANALYSIS

Once the data has been gathered, it has to be analysed in such a way that the research question can be answered. Data analysis is a process whereby researchers extract some form of explanation, understanding or interpretation from the data collected of the people and situations that they are investigating (Maree et al., 2008:99). However,

before the actual analysis can be done, the data has to be first cleaned or prepared. Therefore, data analysis occurs in two stages: data preparation and statistical treatment (English et al., 2010:309). These are discussed in the two sub-sections that follow.

4.8.1 Data preparation

After its collection, the preparation of the data involved checking the returned questionnaires for errors and omissions to eliminate those that were unusable. The data was then captured into Microsoft Excel to facilitate further checking and editing after which it was then exported into the Statistical Program for Social Sciences (SPSS) to be subjected to the necessary statistical procedures and treatment.

4.8.2 Statistical procedures and treatment

Statistical procedures and treatment normally involve processing the data into useful information at two levels: descriptive statistics and inferential statistics. There are three reasons why statistical analysis is conducted at these levels. First, there is the need to gain a first impression of the nature of the data, so it is necessary to first compute the descriptive statistics to achieve that purpose (CFAI, 2012a:343). Second, where the intention of the study is to generalise the findings in the sample to the population, conscious steps have to be taken to design the research in a way that allows inferential analysis (Salkind, 2015:7). Lastly, some studies contain research questions that require both descriptive and inferential answers therefore, organising the data at those two levels will go a long way in finding appropriate answers for the research questions (Creswell, 2014:147). For these reasons, statistical procedures and treatment in this study involved the computation of both descriptive and inferential statistics.

4.8.3 Descriptive statistics

Descriptive statistics aid in organising and describing the characteristics of a set of data. They are the first tools used to explore the data in order for the researcher to get an indication of what the data set "looks like" (Salkind, 2015:6). By consolidating a mass of numerical details, descriptive statistics turn data into information and so make

it possible for the researcher to describe important aspects of large data sets (CFAI, 2012a:343). Describing a data set will often involve frequency counts and percentages, measures of central tendency, and measures of variability, which are all descriptive statistics (Creswell, 2014:163; Salkind, 2015:6).

The descriptive statistics employed in this study are frequency counts, frequency percentages, means, and standard deviations. Frequency counts and percentages were computed from demographic data to summarise the demographic characteristics of the respondents. In order to find answers for the descriptive research questions (RQ1 and RQ7) summary statistics involving all the descriptive statistics mentioned earlier were computed. Summary statistics were also computed for the inferential research questions (i.e. RQ2 to RQ6) prior to conducting the inferential analysis. Finally, the data gathered from the follow-up FGDs were also subjected to descriptive analysis, so that descriptive statistics featured in all stages of the statistical treatment of the data.

4.8.4 Inferential statistics

Inferential analysis is necessitated by the fact that sample data – rather than data from the entire population – is employed to understand a phenomenon occurring in the population. For the sample to adequately represent the population, a random sampling technique has to be used to draw the sample. A random sample makes it possible to generalise the findings to the entire population (Bryman et al., 2017:168). Generalising the findings from a representative sample to the entire population means inferential analysis (CFAI, 2012a:343). The particular statistical treatment needed to achieve inferential analysis is to compute inferential statistics from the sample data collected.

Conscious of the fact that inferential analysis will be required, this study right from the outset ensured that a random sampling technique was employed to select respondents for the survey (see section 4.3). This made it useful to compute inferential statistics at the data analysis stage. Inferential statistics make it possible to extend

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findings from a sample to a population. Inferential statistics are often an extension of descriptive statistics (Salkind, 2015:7). The analytic techniques used to generate inferential statistics in this study are normality test, correlation analysis, and regression analysis. These techniques and their associated statistics are discussed below.

Table 4.2: Variables, Research Questions, and Statistical Treatment

Variable Name	Research Question	Statistical Treatment
Personnel's understanding of SCM elements	**RQ1:** What is the level of understanding of SAPS NC personnel of the key elements of Supply Chain Management?	*Descriptive Statistics:* Counts, means, and mean percentages
Acquisition management and performance management relationship	**RQ2:** What is the relationship between acquisition management and performance management?	*Descriptive Statistics:* Frequency counts and percentages
		Inferential Statistics: Normality test (Kolmogorov-Smirnov statistic); correlation analysis (Spearman's rho); p-value
Demand management and performance management relationship	**RQ3:** What is the relationship between demand management and performance management?	*Descriptive Statistics:* Frequency counts and percentages
		Inferential Statistics: Normality test (Kolmogorov-Smirnov statistic); correlation analysis (Spearman's rho); p-value
Logistical management and performance management relationship	**RQ4:** What is the relationship between logistical management and performance management?	*Descriptive Statistics:* Frequency counts and percentages
		Inferential Statistics: Normality test (Kolmogorov-Smirnov statistic); correlation analysis (Spearman's rho); regression analysis (β coefficients & R^2); p-value
Performance management and service delivery relationship	**RQ5:** Does performance management explain service delivery? (i.e. Does performance management mediate the effects of acquisition, demand, and logistical management on service delivery?)	*Descriptive Statistics:* Frequency counts and percentages
		Inferential Statistics: Normality test (Kolmogorov-Smirnov statistic); correlation analysis (Spearman's rho); regression analysis (β coefficients & R^2); p-value
Direct relationship between SCM and service delivery	**RQ6:** To what extent does supply chain management (acquisition, demand, and logistical management) relate directly with service delivery?	*Descriptive Statistics:* Frequency counts and percentages
		Inferential Statistics: Normality test (Kolmogorov-Smirnov statistic); correlation analysis (Spearman's rho); regression analysis (β coefficients & R^2); p-value
SCM policy implementation challenges	**RQ7:** What are the challenges faced in implementing the supply chain policy in SAPS NC?	Descriptive Statistics: Frequency counts; frequency percentages; means; mean percentages.

4.8.4.1 Normality test

Inferential analysis can be done by either conducting parametric or non-parametric tests on the data collected. Parametric statistics assume that sample data comes from a population that follows a probability distribution based on a fixed set of parameters, whereas non-parametric statistics conversely assume that the parameter set is not fixed, and can increase or decrease if new relevant information is collected. A key assumption that will necessitate a parametric test rather than a non-parametric one is normality. The assumption of normality is met when the data from a random sample is normally distributed (Yin et al., 2011:637). Normally distributed data have a symmetric bell-shaped curve, which has highest frequency in the middle, with lower frequencies towards the extremes. If a parametric test is used while the assumption of normality is violated, interpretation and inference may not be reliable or valid (Razali & Wah, 2011:21; Field, 2012:132). Therefore, where the normality assumption is violated, it is better to use non-parametric analysis to draw inferences from the sample.

To determine if parametric analysis or non-parametric analysis should be used to draw inferences from the sample, this study did a numerical check where the Kolmogorov-Smirnov (KS) test statistic was computed. According to Field (2012:144), the KS test compares the scores in the sample to a normally distributed set of scores with the same mean and standard deviation. If the test is non-significant (i.e. $p > 0.05$) then the sample is not significantly different from a normal distribution (i.e. it is probably normal). If, however, the test is significant ($p < 0.05$) then the distribution in question is significantly different from a normal distribution (i.e. it is non-normal).

4.8.4.2 Correlation analysis

Correlations are always used to make judgements about the strength of relationship between variables. Sometimes they are used descriptively to see only whether variables are related; at other times they are used inferentially to extend a conclusion to a population based on findings in a sample (Salkind, 2015:83). When they are used descriptively, only the magnitude and sign of the correlation coefficient (r) matter,

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whereas using them inferentially will require significance testing of the correlation coefficient. Correlation coefficient is a numerical index that reflects the relationship between two variables (Field, 2012:170; Salkind, 2015:81). This index can range from negative one to positive one (i.e. $-1 \leq r \leq +1$). A correlation coefficient less than zero indicates a negative linear relationship between the two variables, whereas a correlation coefficient greater than zero indicates a positive relationship. A correlation coefficient of zero indicates no linear relationship between the two variables (CFAI, 2012b:267).

Although the magnitude of the correlation coefficient lends itself to easy interpretation in descriptive analysis, when conducting inferential analysis, it is appropriate to gain confidence in its statistical significance by assessing whether the apparent relationship is not due to chance. If it is established that the relationship is not due to chance, then the information can be used to make predictions about the relationship between the variables in the entire population (CFAI, 2012b:281; Field, 2012:171).

The significance test of the correlation coefficient is a Student's t-test that checks if r is significantly different from zero. Like most test statistics, the t-test statistic is the ratio of variance explained by the model and the variance not explained by the model (i.e. variance explained by the model ÷ variance not explained by the model). The rationale behind this ratio is that if a model is good, then it should be able to explain more variance than it cannot and, thus, confirm a hypothesis as good explanation for the data observed (Field, 2012:52). In t-test terms, this means that r is significantly different from zero, and that the relationship between the two variables is not due to chance. If the t-test proves r to be significantly different from zero, then there is a relationship between the two variables. If, however, the test finds r not to be significantly different from zero, then there is no relationship between the two variables (i.e. any seeming relationship is due to chance).

In making this decision, the *p*-value is required. The *p*-value is the smallest level of significance at which a null hypothesis can be rejected (CFAI, 2012a:600). It is also the probability of erroneously failing to reject a null hypothesis when it ought to be rejected. In the case of the *t*-test, the null hypothesis being tested is whether *r* is different from zero (i.e. H_0: $r = 0$). If the *p*-value is smaller than the significance level at which the test is being conducted (for example, 5% or 0.05), then the probability that the observed effect is due to chance is even smaller than the threshold set by the significance level, which thus strengthens the case for the null hypothesis of "no effect" (i.e. H_0: $r = 0$) to be rejected (Davis & Pecar, 2013:251). The smaller the *p*-value, the stronger the evidence against the null hypothesis and in favour of the alternative hypothesis (CFAI, 2012a:628).

In this study, correlation analysis and its associated statistics were used to test relationships in five out of the seven research questions (i.e. RQ2 to RQ6).

4.8.4.3 Regression analysis

Although correlation indicates whether or not there is a relationship between two variables and how strong the relationship is, it does not indicate the direction of the relationship (i.e. whether *x* affects *y* or *y* affects *x*). To determine which of two variables affect, predict, or explain the other, regression analysis is required. However, the relationship has to be linear in order for regression analysis to be applied (CFAI, 2012b:285). In this regard, correlation analysis is a useful precursor for testing the linearity of a relationship subsequent to which regression analysis can be applied to determine its direction. Nonetheless, regression on its own is able to measure the size of a relationship (Render et al., 2012:136).

In regression analysis, the variable that influences the other is the predictor or explanatory or independent variable whereas the one being influenced is the outcome or dependent variable. Estimating the relationship between these two sets of variables yields regression coefficients (β_i) that indicate the magnitude of relationship between

the predictor variable(s) and the outcome variable. Another coefficient yielded is the intercept (β_0), which is the point at which the regression line crosses the vertical axis (Field, 2012:199).

To determine whether the relationship is not due to chance, its statistical significance can be tested using Student's t-test. This is achieved by testing if the coefficient is statistically different from zero. If the test finds the coefficient to be statistically different from zero (i.e. $\beta_i \neq 0$), then a relationship exists between the two variables, and thus, the null hypothesis of no relationship (i.e. $\beta = 0$) is rejected. If, on the other hand, the coefficient is found not to be statistically different from zero, then no relationship exists between the two variables (CFAI, 2012b:295; Field, 2012:204). Therefore, Student's t-test was used to test the significance of the regression coefficients in Research Questions 4, 5 and 6 (i.e. RQ4, RQ5 and RQ6). These three research questions went beyond just measuring the relationships between variables to finding out if the assumed independent variables did indeed predict the dependent ones. For instance, apart from finding out if there is a relationship between logistical management and performance management, Research Question 4 (RQ4) also sought to find out if logistical management does predict performance management. This is because the police have often blamed their perceived under-performance on logistical constraints. Therefore, a regression analysis helps determine if the deployment of logistics is having any influence on performance management. If so, then internal service delivery has taken place and any poor service delivery to the general public is not attributable to logistical constraints, but to other reasons (See Table 4.2 and Questionnaire items 17 to 24.g in Appendix A). For its part, Research Question 5 (RQ5) sought to predict service delivery as a whole using performance management as a mediating variable whereas in Research Question 6 (RQ6), acquisition management, demand management, and logistical management were each used to directly predict service delivery without having performance management as a mediating variable.

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4.9 GENERALISABILITY OF RESULTS

To generalise from a sample to a population, a representative sample has to be drawn, and inferential analysis conducted on the sample data to draw conclusions that can be extrapolated to the entire population (Salkind, 2015:7). A representative sample means using random means to draw members of the sample from the population (Bryman et al., 2017:168). In this study, simple random sampling was the sampling method employed and non-parametric analysis was the inferential analysis approach adopted. Therefore, findings in the sample can be generalised to the population. Since, however, the population in this case is defined as all police personnel in the Northern Cape province (see section 4.3.1), the findings can only be extended to that province and not to all police personnel in all provinces of South Africa (see Bryman et al., 2017:181).

4.10 CONCLUSION

The aim of this chapter was to lay out the logic underlying the principles and techniques used to organise and execute this work. To achieve this aim, the chapter has shown that the study has a pragmatic ontological orientation. This means that both the objectivist and subjectivist world views are at play; thus, leading to a mixed methods approach. However, the objectivist element dominates the subjectivist element. Therefore, the methodology was more deductive than inductive as measuring relationships between variables was central to answering five out of the seven research questions. A survey made it possible to use quantitative means to provide answers to all the research questions (whether descriptive or inferential). However, the last research question (RQ7: challenges of the SCM policy) was structured to be an open-ended item on the survey instrument (see Appendix A and Table 4.2). This made it necessary to conduct follow-up focus group discussions (FGDs) to probe further on the challenges identified as well as to rank them. Since FGD is a subjectivist means of collecting data, that aspect of the study became inductive. However, the data collected at that stage was subjected to some quantification through the

computation of descriptive statistics. The results of these two stages of analysis are presented and discussed in the next chapter (Chapter 5).

CHAPTER 5: RESULTS AND DISCUSSION

5.1 INTRODUCTION

The previous chapter laid out the logic behind the principles that guided data collection and analysis in this study. It showed that, although this study has an objectivist world view to a great extent, there is an aspect of it that is subjectivist in nature. Therefore, a pragmatist philosophical orientation was required in the way that the research was laid out and executed. This led to the use of a mixed methods approach to gather and analyse both quantitative and qualitative data with the quantitative element dominating the qualitative aspect.

In this chapter, the results of the data analysis are presented and discussed. The discussion involves the comparison of the results to the findings of prior studies in order to determine the extent to which this study helps shape existing theory. The presentation of the results is done in two stages. First, preliminary results involving response rate, credibility of the measuring instrument, normality of the data, and descriptive statistics are presented and discussed in the first four sections. Then in the next seven sections, the results (as they answer the seven research questions) are presented and discussed in relation to findings of other studies (each section discusses one research question in the original order in which they were posed). A summary and conclusion then completes the chapter.

5.2 RESPONSE RATE

A total of 176 questionnaires were randomly distributed to all categories of personnel of SAPS NC. Of this number, 174 questionnaires were returned with all being found useful for analysis. This gave a response rate of 98.86%. In survey research, high response rates are a preliminary indication of representativeness as the response bias (the effect of non-response on survey estimates) often associated with low response

rates is minimised when response rates are high (Creswell, 2014:162). That said, low response rates (i.e. below 50%) do not necessarily compromise the findings of a research as long as they do not introduce a bias into the representativeness of the sample. Therefore, where the response rate is low, but the respondents reflect the attributes of the population well enough, the credibility of the findings are not likely to be compromised (Bryman & Bell, 2011:236; Johnson & Wislar, 2012:1805). In any case, this study has a high enough response rate to rule out the problem of response bias. This high response rate is attributable to the fact that a pre-testing of the questionnaire was undertaken to identify and correct any weaknesses in the data collection process. Secondly, the researcher's good knowledge of the population enabled him to plan and organise the process in a way that led to the very high response rate.

5.3 CREDIBILITY OF MEASURING INSTRUMENT

The credibility of a measuring instrument comes down to its reliability and validity (Field, 2012:11). Reliability is the degree to which a measuring instrument produces same or similar results under same or similar conditions on two or more trial, whereas validity is its ability to produce results that reflect the phenomenon that is being measured (Diener et al., 2012). The results of the reliability and validity tests reported in this section are essentially about the survey instrument used in the first phase of the study (see Appendix A). The credibility of the follow-up measuring instrument used to rank the challenges encountered in implementing the Supply Chain Management (SCM) policy (see Appendix B) is de-emphasised in this discussion because, first, its credibility is dependent on the main (survey) instrument, and second, validity and credibility do not have the same connotations in qualitative research as they do in quantitative research (Creswell, 2014:201). Focus group discussions (FGDs) were the means of data collection in the follow-up phase, thus rendering it inductive (qualitative) in approach.

In order to determine the reliability and validity of the measuring instrument, the questionnaire items in the various sections were constructed into eight broad variables. The broad variables constructed were given the same names as the section headings in the questionnaire (i.e. service system; service concept; value; demand management; acquisition management; logistical management; performance management; and service delivery). The section headed, "SCM Policy" (i.e. Q25a, Q25b, and Q25c) was left out of the construction because it has no direct bearing on the research questions of the study.

5.3.1 Reliability

The eight broad variables were constructed by summing up the responses of all the items relating to each specific broad variable (see Appendix A). However, the construction of the variable "Service delivery", did not include the responses of the items under "Service concept". This is because the items under "Value" are virtually the same as those under "Service concept". The difference between the two, though, is that whereas the items under "Service concept" indicate intention, under "Value" they indicate a realisation or achievement of the intention. Therefore, in constructing the variable "Service delivery", which is more about reality than intention, "Service concept" was substituted with "Value". Thus, the construction came to be represented mathematically as:

Service Delivery = Service System + Value.

Given that the creation of these variables involves summing up responses of the relevant questions, Cronbach's alpha coefficients had to be calculated to determine whether or not the variables are reliable. A Cronbach's alpha coefficient is used to test the internal consistency of a measurement or test. It shows the degree to which all the items in a measurement or test measure the same attribute (Hoeyi, 2016:89). The more appropriate content an instrument covers, the higher its internal consistency will be (Diener et al., 2012:4; Kumar, 2014:218). The coefficients are presented in Table 5.1 below.

Table 5.1: Cronbach's Alpha Coefficients

Variables	Cronbach's Alpha	N of Items
Service system	0.667	7
Service concept	0.977	6
Value	0.968	6
Demand management	0.959	5
Acquisition management	0.944	5
Logistic management	0.966	7
Performance management	0.969	7
Service delivery	0.849	13

A Cronbach's alpha coefficient that is above 0.6 indicates a reliable variable – although these guidelines do differ from researcher to researcher (Field, 2012:675; Khan et al., 2012:3; De Smedt et al., 2013:2295). The table above shows that all the constructed variables have Cronbach's alpha coefficients that are above 0.6, which means that these variables are reliably reflected by their respective questionnaire items and can be used for further statistical analysis.

5.3.2 Validity

The type of methodological procedures adopted can lead to different types of validity (intended and unintended) being achieved in a study. *Face* and *content validity* can be attained if the researcher puts in place measures (for example, literature review; pre-testing of questionnaire; minimising measurement error) to ensure that there is a logical link between the questionnaire items and the objectives in addition to the items adequately covering the various aspects of the phenomenon being investigated (Kumar, 2014:214). A content-valid instrument that is reliable will often lead to measurement or construct validity (Bryman et al., 2011:42). *Construct validity* is the degree to which an instrument measures the intended construct rather than irrelevant constructs or measurement errors (Welman et al., 2005:142; Field, 2012:11). Although this study did not employ any statistical means to directly measure construct validity, the rigorous methods employed to select questionnaire items as well as reduce measurement error did reflect in the stability of the measurement instrument as shown

by the very high Cronbach's alpha coefficients (close to 1) for most of the variables in Table 5.1. This provides a hint of construct validity.

Other forms of validity achieved in this study (albeit unintentionally) are internal validity, external validity, and ecological validity. *Internal validity* is concerned with whether a conclusion that incorporates a causal relationship between two variables holds water, whereas *external validity* concerns itself with whether the results of a study can be generalised beyond the specific research context. For its part, *ecological validity* is concerned with whether or not social scientific findings are applicable to people's every day, natural social settings (Bryman et al., 2011:42-43). In this study, *internal validity* was measured when regression analysis was used to test causality in Research Questions 4, 5, and 6 (i.e. RQ4 to RQ6). The details of this are provided in sections 5.9, 5.10, and 5.11. *External validity* deals with the generalisability of results, which is influenced by whether or not a random sampling method was used, and inferential analysis conducted on the sample data to draw conclusions that can be extrapolated to the entire population (Salkind, 2015:7; Bryman, 2017:168). This study achieved *external validity* by using simple random sampling to select 176 members of SAPS NC to respond to the questionnaire and, in addition, conducted inferential analysis on the data collected to draw conclusions that are generalizable to all police personnel in the Northern Cape (see section 4.9 of Chapter 4). *Ecological validity* was achieved through: a) the researcher's practical understanding of the subject organisation and thus, identifying a research problem that resonates with his colleagues (the researcher is an employee of SAPS NC); b) pre-testing the questionnaire; and, c) sending the findings back to respondents for comments in the form of a validation workshop. In all cases, employees that were contacted overwhelmingly indicated their support for the research's objectives and findings. Salient aspects of the conclusions of the validation workshop will be discussed in the next chapter (i.e. Chapter 6) alongside conclusions that will emerge from the inferential results that follow later in this chapter (i.e. sections 5.6 to 5.12).

Therefore, with its reliability and validity assured, the measuring instrument is deemed relevant in collecting data that can lead to credible results. However, the contamination of findings of a research can also occur at the data analysis stage (Hoeyi, 2016:85). One major source of error at the analysis stage is the researcher's incorrect assumption(s) about the distribution of the data and, as a result, using the wrong statistical tools to analyse the data. Such a mistake often borders on the researcher assuming normal distribution of a data set and consequently, using the applicable normal distribution statistical tools to conduct the analysis when the distribution, in fact, is non-normal (Field, 2012:132). Such a false assumption may lead to findings that are incredible, even if the measuring instrument is designed to measure the phenomenon accurately. Therefore, prior to analysing the data, it is important to test the normality of its distribution in order to determine what statistical tools are appropriate for its treatment (Ahad et al., 2011:637). This is the purpose of the next section.

5.4 NORMALITY TEST

A normality test seeks to determine whether a data set is normally distributed. This is because the analytical tools to be used depend on whether the variables are normally distributed. If the variables are normally distributed, parametric tests should be used, whereas if the variables are not normally distributed, non-parametric tests should be the preferred option (Razali & Wah, 2011:21). An example of a parametric test is the Pearson correlation coefficient (r) which is used for testing the relationships between variables on continuous scales, whereas an example of a non-parametric test is the Spearman's rank (ρ) correlation coefficient, which is also a test for significant relationships between categorical variables (CFAI, 2012a:622-623). The normality test used in this study is the Kolmogorov-Smirnov (KS) test which determines whether or not the constructed variables are normally distributed. The results are presented in the table below.

Table 5.2: Normality Test Results

Variables	KS Statistic*	*p*-value
Service system	0.109	0.000
Service concept	0.188	0.000
Value	0.229	0.000
Demand management	0.162	0.000
Acquisition management	0.171	0.000
Logistic management	0.162	0.000
Performance management	0.179	0.000
Supply chain management	0.218	0.000
Service delivery	0.115	0.000

According to Field (2012:144), the KS test compares the scores in the sample to a normally distributed set of scores with the same mean and standard deviation. If the test is non-significant ($p > 0.05$) then the sample is not significantly different from a normal distribution (i.e. it is probably normal). If, however, the test is significant ($p < 0.05$), then the distribution in question is significantly different from a normal distribution (i.e. it is non-normal). Therefore, in order to conclude from the KS test results in Table 5.2, we look at the *p*-values provided by the test. Each *p*-value is compared with the significance level of 0.05. From the results above, all the variables have *p*-values that are below 0.05. This indicates that all of these variables are not normally distributed. Because these variables are not normally distributed, it means that they have a skewed distribution that will likely render the results of any parametric test invalid. Therefore, non-parametric tests are used for inferential analysis regarding Research Questions 2 to 6 (i.e. RQ2-RQ6). Details of this can be found in sections 5.6 to 5.11 of this chapter.

5.5 DESCRIPTIVE STATISTICS

The descriptive statistics of this study are presented in two ways. First is the descriptive statistics involving the demographic data, with the second one being the summary statistics pertaining to the research questions of the study. This section

describes the descriptive statistics regarding the demographic data. In sections 5.6 and 5.12 involving descriptive research questions (i.e. RQ1 and RQ7), only descriptive statistics are used to find answers to the research questions, whereas in the remaining research questions (i.e. RQ2 to RQ6) which are inferential in nature, descriptive statistics are first used to summarise the data prior to computing the inferential statistics. Therefore, apart from the statistics describing the demographics in this section, descriptive statistics can also be found in the results presented in the other sections also (i.e. sections 5.6 to 5.12).

Table 5.3 shows the descriptive statistics of the demographic data collected in the study. The statistics are in the form of frequency counts and frequency percentages on the four variables measured under the demographic data section of the survey instrument (i.e. tenure, section, gender, and age).

Table 5.3: Frequency Table on Demographics

Variables	Categories	Frequency	Percent
Tenure	1 - 5 years	19	10.9%
	6 - 10 years	45	25.9%
	11 - 20 years	58	33.3%
	21 - 30 years	38	21.8%
	Over 30 years	14	8.0%
Section	Operational service	54	31.0%
	Support services	120	69.0%
Gender	Male	87	50.0%
	Female	87	50.0%
Age	19 - 25 years	3	1.7%
	26 - 30 years	12	6.9%
	31 - 40 years	75	43.1%
	41 - 50 years	63	36.2%
	Over 50 years	21	12.1%

Table 5.3 shows that 155 out of the 174 respondents have been in the organisation for six or more years with only 19 having a tenure of less than six years. This is derived from the frequency counts under "Tenure". This translates into a frequency percentage

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of 89.08% of respondents having a tenure of six or more years with the remaining 10.92% having a tenure of less than six years. This means that the overwhelming majority of respondents of the survey have been in the organisation for a long enough period to understand the phenomenon that is being measured (i.e. the impact of the supply chain management policy on service delivery) given that the implementation of the Supply Chain Management (SCM) policy began in 2003 (National Treasury, 2004:2; Bizana et al., 2015:668).

In terms of organisational sections, 69% of the respondents came from support services with the remaining 31% coming from operational service. Operational service is the aspect of the South African Police Service (SAPS) that is involved in law enforcement while support services are the departments and units that provide various forms of services that enable the operational section to carry out its law enforcement duties. One of such support services is the supply chain management unit that supports with the procurement and deployment of logistics. It is worthy of note that the supply chain management unit does not provide support to the operational section only, but to other support units also. Therefore, the quest to understand the extent to which the SCM policy has affected internal service delivery applies to the support services as they do the operational service. Hence, the seeming disproportionately high percentage of respondents from support services may not be an issue of major concern.

Another statistic of note in Table 5.3 is gender, which shows parity in the proportion of respondents that are male or female (i.e. 50% female and 50% male). This is significant in the sense that there is probably a balanced reflection of gender perspectives in the results of this study. Gender balance is a useful way to ensure the accommodation of varied views in problem analysis and the concomitant formulation of solutions (Waylen, 2014). This parity in respondent gender is significant because the work force profile report of the SAPS NC shows the actual gender disaggregation of staff to be 39.64% female and 60.36% male in the Northern Cape (SAPS NC, 2018).

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Therefore, this study went out of its way to achieve gender balance in the selection of the sample, even if this was achieved randomly.

Having dealt with the demographics, the results pertaining to the research questions of the study are now presented and discussed in the next seven sections. To facilitate the understanding of the discussions, the research questions are recalled and linked to the sections as shown in Table 5.4 below. They are given a code to reflect the order in which they were posed. Therefore, "RQ1", for instance, means Research Question 1.

Table 5.4: Research Questions and Results According to Sections

Code	Research Question	Section
RQ1	What is the level of understanding of SAPS NC officials of the key elements of Supply Chain Management?	5.6
RQ2	What is the relationship between acquisition management and performance management?	5.7
RQ3	What is the relationship between demand management and performance management?	5.8
RQ4	What is the relationship between logistics management and performance management?	5.9
RQ5	Does performance management explain service delivery? That is, does performance management mediate the effects of acquisition, demand, and logistical management on service delivery?	5.10
RQ6	To what extent does supply chain management (acquisition, demand, and logistical management) relate directly with service delivery?	5.11
RQ7	What are the challenges faced in implementing the supply chain policy in SAPS NC?	5.12

5.6 SAPS OFFICIALS' UNDERSTANDING OF KEY ELEMENTS OF SCM POLICY

As can be seen from Table 5.4, the first research question tested the understanding of SAPS NC personnel of the key elements of the Supply Chain Management (SCM) policy. This question is a descriptive research question and so does not require inferential analysis to derive an answer for it. All that is required is a descriptive analysis (see Sections 4.8.3 and 5.5). Therefore, the analytical method employed was the computation of mean scores and the mean score percentages for the various variables. The results are shown in Table 5.5 below.

Table 5.5: Descriptive Statistics on SAPS NC Officials' Understanding of SCM

Supply chain policy components	Mean	Mean %
Demand Management	3.27	65.4%
Acquisition Management	3.36	67.1%
Logistics Management	3.49	69.8%
Performance Management	3.39	67.7%

The results show that SAPS NC personnel have a good understanding of the key elements of the supply chain management policy. This is shown by the mean score of above 3 for all of the variables shown in the table. On an interval scale of 1 to 5 such as the one used in this study (see Appendix A), a score of 3 translates approximately into a percentage of 60% (i.e. 3/6 x 100 = 60%). Therefore, unsurprisingly, the mean score percentages shown in Table 5.5 are all above 60% because all the mean scores are above 3 – although the Statistical Package for Social Sciences (SPSS) software used to analyse the data computes a weighted mean rather than an arithmetic mean. A weighted mean may deviate from an arithmetic mean sometimes if there is more weight on the upper side or lower side of the measurement (CFAI, 2012a:367).

The results in Table 5.5. are significant because a good understanding of a policy is the first step to its correct implementation (National Treasury, 2004:22; Ambe & Badenhorst-Weiss, 2012:1103). As the SCM policy is expected to improve service

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delivery (Bizana et al., 2015), a good understanding of its key elements is a first step to achieving that. The ensuing sections present results in this regard.

Since the KS test showed that the variables are not normally distributed, the Spearman's *rho* correlation coefficient test is used to test all relationships mentioned in Research Questions 2 to 6 (i.e. RQ2 to RQ6). However, in RQ4 to RQ6, regression analysis is used in addition to Spearman's *rho* correlation coefficient to test the causal relationships between the variables. For practical reasons, the results involving the correlation relationships between performance management and each of the three components of supply chain management (SCM) are presented in one table (i.e. Table 5.8) under the section discussing the relationship between acquisition management and performance management (section 5.7). The next two sections (i.e. sections 5.8 and 5.9) then provide further details on the relationships between performance management and the other two SCM components (demand management and logistics management) respectively.

5.7 ACQUISITION MANAGEMENT AND PERFORMANCE MANAGEMENT

Prior to discussing the relationship between acquisition management and performance management, the summary statistics of both variables are first presented in Tables 5.6 and 5.7 below.

Table 5.6: Summary Statistics of Acquisition Management

Acquisition Management	Mean	Std. Deviation
To what extent have responsibilities to acquire resources for service delivery been delegated among officers of the NC SAPS (i.e. are there sufficient checks and balances in the acquisition process?)	3.178	0.972
Is there a procurement strategy in place?	3.276	1.011
How regularly does SAPS access the market to develop or update their procurement strategy?	3.080	0.970
How often does SAPS do competitive bidding to acquire goods and services?	3.224	0.944
To what extent will you describe the bid adjudication committee of SAPS NC as competent and independent?	3.144	0.948

Table 5.7: Summary Statistics of Performance Management

Performance Management	Mean	Std. Deviation
Compliance to uniform standards	3.155	1.056
Cost efficiency (reduced costs)	3.149	0.980
Improved financial management	3.144	1.001
Improved productivity	3.155	0.964
Improved skills	3.138	0.999
Reduced contract breaches	3.218	0.967
Effective delivery of goods and services	3.172	1.011

The summary statistics in Tables 5.6 and 5.7 show that the acquisition management and performance management components of the supply chain management (SCM) policy have been implemented reasonably well in SAPS NC. This is because the mean scores for all the items under each of these two broad variables are above 3. On the five-point interval scale used in this study, a score of 3 amounts to 60% rating (i.e. 3/5 x 100 = 60%). Therefore, mean scores of above 3 indicate above 60% rating.

Returning to the substantive issue of whether or not acquisition management has a relationship with performance management or not, Spearman's rank correlation test was used. The test was conducted simultaneously to determine the relationships

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between each of the other three SCM components and performance management. That is, the correlation tests aimed to determine whether or not there is a relationship between performance management (PM) and each of the following variables: acquisition management (AM), demand management (DM) and logistics management (LM). If there is a positive relationship between 2 variables, the correlation coefficient will be positive and its value will range between 0 and 1. The closer the value is to 1 the stronger the relationship between the 2 variables. Whereas, if there is a negative relationship the correlation coefficient will be negative and its value will range between -1 and 0. The closer the value is to -1 the stronger the relationship between the 2 variables.

For interpretations and conclusions on whether the two variables are correlated, the *p*-value is used. The *p*-value is compared to a significance level of 0.05. If the *p*-value is less than 0.05 we conclude that a significant relationship exists between the variables, whereas if it is greater than 0.05, there is no significant relationship between the variables. It is important to highlight that all correlation coefficients are interdependency measures that do not express a causal relationship between two variables. The correlation coefficients are presented in the table below.

Table 5.8: Correlation between PM Versus AM, DM, and LM Respectively

Variables	Performance management	
	Correlation Coefficient	p-value
Acquisition management (AM)	0.690	0.000
Demand management (DM)	0.653	0.000
Logistics management (LM)	0.709	0.000

The results above show that all the *p*-values for the correlation coefficients are less than 0.05. This means that there are statistically significant relationships between performance management and each of the three variables of SCM: acquisition management (AM), demand management (DM), and logistics management (LM).

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The correlation coefficient between performance management and acquisition management is 0.69 and the *p*-value is 0.000. This indicates that there is a significant positive relationship between performance management and acquisition management. This means that high performance management is associated with high acquisition management. Acquisition management deals essentially with the steps taken to ensure efficiency in the procurement of the inputs whereas supply chain performance management is based on a monitoring process to determine whether the proper processes have been followed and whether the desired objectives have been achieved (Department of Public Works, 2008). Therefore, the significant positive correlation coefficient confirms the existing theory that there is a positive relationship between, not only performance management and acquisition management, but between performance management and all other components of supply chain management (Rosado, 2015).

5.8 DEMAND MANAGEMENT AND PERFORMANCE MANAGEMENT

The SCM policy identifies demand management as the beginning of the supply chain where needs assessment is done to determine the nature and specifications of goods or services to be acquired in order to deliver the agreed service to the end-user. Therefore, demand management brings the departmental supply chain practitioner close to the end-user to ensure that value for money is achieved (National Treasury, 2004:10).

Table 5.9: Summary Statistics for Demand Management

Demand Management	Mean	Std. Deviation
Correct price	3.191	1.002
Correct time	3.029	0.985
Correct place	3.197	1.004
Correct quantity	3.197	1.044
Correct quality	3.116	1.022

The discussion on demand management is in relation to the results presented in Tables 5.8 and 5.9. Table 5.9 presents the descriptive statistics of this variable in the form of summary statistics whereas Table 5.8 shows the results of correlation test. Table 5.9 shows that demand management is proceeding reasonably well given that the mean scores are all above 3 on the five-point interval scale.

With respect to the relationship between the two variables, Table 5.8 shows that the correlation coefficient between performance management (PM) and demand management (DM) is 0.653 and the p-value is 0.000. This indicates that there is a significant positive relationship between performance management and demand management. This means that high performance management is associated with high demand management; again, confirming the critical role that performance management plays in supply chain management (Stefanovic, 2014).

5.9 LOGISTICS MANAGEMENT AND PERFORMANCE MANAGEMENT

Logistics management is mainly about managing the physical flow in the supply chain. Therefore, its focus is the tangible aspect of the supply chain. Consequently, its purpose is to place orders against contracts for goods and services, receive and distribute goods, coding of items, setting of inventory levels and manage stores or warehouses where stock are kept, manage transport arrangements, and monitor vendor performance (Department of Public Works, 2008:19).

Table 5.10: Summary Statistics of Logistics Management

Logistic management	Mean	Std. Deviation
To what degree are orders placed in a timely manner for goods and services?	3.213	0.953
To what extent are orders placed in the right quantity?	3.299	0.969
To what extent are orders placed to the correct specifications?	3.282	0.935
Are goods received in a timely manner?	3.052	1.010
Are goods distributed in a timely manner?	3.121	1.060
Are inventory levels set correctly to avoid shortages?	3.138	1.055
Are stores and warehouse space employed efficiently?	2.971	1.072

Table 5.10 shows the summary statistics for logistics management. As in the previous cases, the mean scores are above 3 except for the item on the efficient use of store and warehouse space which registers a score just below 3 (i.e. 2.971). However, this is made up for by the considerably higher mean scores registered on the items under logistics management compared to the mean scores of the items under the other broad variables (for example, demand management).

As logistics are also required by internal stakeholders, its management within an organisation is a good indicator of internal service delivery. Therefore, the relationship between performance management and logistics management in this study is tested at two level. First, the correlation relationship is tested, and second, a regression analysis is conducted to determine if logistics management explains performance management. If logistics management is found to explain performance management, then internal service delivery has taken place in SAPS NC as far as the SCM policy is concerned. This is because the police have often blamed their perceived under-performance on logistical constraints. Therefore, a regression analysis helps determine if the deployment of logistics is having any influence on performance management. If so, then internal service delivery has taken place and any poor service delivery to the general public is not attributable to logistical constraints, but to other reasons (see Table 4.2 and Questionnaire items 17 to 24.g in Appendix A).

Table 5.8 shows that the correlation coefficient between performance management and logistics management is 0.709 and the *p*-value is 0.000. This indicates that there is a significant positive relationship between performance management and logistics management. This means that high performance management is associated with high logistics management.

Regarding the extent to which logistics management explains performance management, Table 5.11 below presents the results.

Table 5.11: Logistics Management as a Predictor of Performance Management

DV: PM	Coefficients			t statistic	p-value
	Unstandardised	**Std. Error**	**Standardised**		
Intercept	5.029	1.094		4.598	0.000
LM	0.775	0.048	0.779	16.283	0.000
R Square	0.607				

The coefficient of logistics management (LM) is 0.775 with a *p*-value of 0.000. The *p*-value is below the significance level of 0.05, meaning that logistics management significantly explains or predicts performance management (PM). The standardised coefficient shows that improving logistics management by one standard deviation leads to an improvement of performance management by 0.779 standard deviation. The R square value of 0.607 shows that about 60.7% of the variation in performance management (PM) is explained by logistics management (LM). All these show that logistics management has a significant influence on performance management. This means that as far as logistics management is concerned, supply chain management has had a positive impact on internal service delivery because logistics are made available to the various units of SAPS NC reasonably well enough for them to carry out their duties. This finding is at variance with the conclusion Mofomme and Barnes (2004) arrived at when they conducted a similar study into the quality of service delivered by the SAPS in the North Rand, Gauteng. In their study, they used the *Batho*

Pele principles to assess the quality of service delivered to internal stakeholders (i.e. employees) and external stakeholders (i.e. customers or clients) alike. Given that the *Batho Pele* principles inform service delivery in all government ministries, departments, and agencies (Department of Public Service and Administration 1997; Mbacke, 2014) and by implication the Supply Chain Management (SCM) policy, they naturally inform the way the supply chain management unit of SAPS NC delivers service to its stakeholders also. Therefore, the internal service delivery achieved in SAPS NC has to do with quality also. This gives a basis for comparing this study's finding on internal service delivery with Mfomme and Barnes's (2004) finding, which shows that there is internal service delivery in SAPS NC whereas the same could not be said of SAPS in the North Rand, perhaps because the SCM policy had just been implemented for only one year at the time.

5.10 PERFORMANCE MANAGEMENT AND SERVICE DELIVERY

Having presented the summary statistics of performance management while discussing its relationship with acquisition management in Section 5.7 (see Table 5.7), this section first presents the summary statistics on service delivery prior to discussing the relationship between it and performance management. The summary statistics of the various components of service delivery (i.e. service system; service concept; value) are shown in Tables 5.12 to 5.14.

Table 5.12: Summary Statistics of Service System

Service System	Mean	Std. Deviation
To what extent does the Police Service cover all communities in the Northern Cape?	3.236	0.871
How often does the SAPS NC conduct customer satisfaction surveys to measure the populace's satisfaction with their services?	2.741	0.978
To what extent is the populace satisfied with their services?	2.856	0.845
Are you aware of the customer service policy of the SAPS NC?	3.069	1.078
To what degree is the SAPS NC equipped with the necessary facilities and equipment to respond to the needs of the community?	3.224	3.247
To what extent does the staff of SAPS NC Supply Chain Management (SCM) display competency in their work?	3.391	0.960
How will you describe the leadership of the SAPS NC in terms of resource allocation?	3.063	1.081

Table 5.13: Summary Statistics of Service Concept

Service Concept	Mean	Std. Deviation
Prevent crime?	3.885	1.064
Combat crime?	3.937	1.032
Investigate crime?	3.931	1.089
Maintain Public order?	3.914	1.069
Protect and secure inhabitants of the Province and their property?	3.954	1.008
Uphold and enforce the law?	3.983	1.000

Table 5.14: Summary Statistics of Value

Value	Mean	Std. Deviation
Crime prevention	3.155	0.902
Combating crime	3.167	0.867
Investigation of crime	3.086	0.918
Maintaining Public order	3.213	0.922
Protecting and securing inhabitants and their property	3.195	0.871
Upholding and enforcing the law	3.213	0.857

A close look at Tables 5.13 and 5.14 shows a remarkable similarity between their items. This is because service concept defines the combination of tangible and intangible products that ought to be delivered to the customer (Schmied et al., 2010; El Arifeen et al., 2012) whereas value is the realisation of the service concept. Thus, when the service concept is put into action, it transforms into realised benefit or value to the customer. Although the main focus of this study is to assess the extent to which the SCM policy has impacted on internal service delivery, the "Value" section of the survey instrument gave SAPS NC personnel an opportunity to do an introspection on the extent to which they think they have delivered on their core mandate to the general public (see Appendix A). Therefore, it is significant to note that whereas the respondents scored the items highly (i.e. mean scores of close to 4) under "Service Concept" (Table 5.13), they were less enthusiastic to score them that highly under "Value" (i.e. mean scores range from 3.086 to 3.213 on Table 5.14). This means that respondents were more convinced about the extent to which the items measure service concept than the extent to which SAPS NC has delivered on those items to the general public – even though a mean score of 3 and above generally indicates a good rating.

In addition to this, the only items with a mean score of less than 3 on Table 5.12 (Service System) are those measuring how frequently SAPS NC conducts customer satisfaction and the extent to which the populace is satisfied with its services. The implication of all these is that SAPS NC's internal stakeholders (personnel) seem to think that there is room for improvement in service delivery to external stakeholders in the Northern Cape Province even though there is a reasonable amount of external service delivery. This finding aligns with a similar one by Maboa (2018), who evaluated service delivery in the Germiston Police Station and found the need to improve customer service in that police station as paramount.

To determine whether or not performance management explains service delivery, a correlation test and a regression analysis were done. The correlation test aimed to determine whether or not there is a relationship between performance management

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and service delivery whereas the purpose of the regression analysis was to determine if a causal relationship exists between the two variables when performance management mediates the effects of the other SCM variables on service delivery.

Table 5.15: Regressing Service Delivery on Performance Management

Service Delivery	Correlation Coefficient	0.520	p-value	0.000
	Unstandardised Coefficient	**Standardised Coefficient**	**t -statistic**	**p-value**
Intercept	22.066	-	9.750	0.000
Performance Management	0.838	0.545	8.528	0.000
R Square	0.297			

The results above show that the *p*-value for the correlation coefficient is less than 0.05. This means that there is a statistically significant relationship between performance management and service delivery. The correlation coefficient between performance management and service delivery is 0.52 and the *p*-value is 0.000. This indicates that there is a significant positive relationship between performance management and service delivery. This means that high performance management is associated with high service delivery.

After determining that there is a significant correlation between performance management and service delivery, a regression equation was estimated with service delivery as a dependent variable and performance management as an independent variable. This regression was done to determine the extent to which performance management alone (as a mediating variable) explains service delivery. The results are reported in Table 5.15 above.

The *p*-value for the coefficient of performance management is below 0.05, which means that performance management has a significant impact on service delivery. The unstandardised coefficient of performance management is 0.838. The positive coefficient means that a unit improvement in performance management leads to 0.838

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improvement in service delivery. The standardised coefficient indicates by how many standard deviations service delivery will improve if performance management is improved by one standard deviation (Field, 2012:239). The result indicates that a standard deviation increase in performance management leads to 0.545 increase in service delivery. The R square value of 0.297 means that about 29.7% of the variation in service delivery is explained by performance management. Again, this shows the important role that performance management plays in supply chain management (see Stefanovic, 2014; Rosado, 2015) and its potential to enhance the impact of supply chain management (SCM) on service delivery.

The extent to which performance management mediates the impact of SCM on service delivery will be determined in the next section (i.e. section 5.11) when the direct relationships between each of the other three components of SCM (i.e. acquisition management, demand management, and logistics management) and service delivery are tested and the results compared with the results of the indirect relationship measured in this section. The comparison will involve the R squares and standardised coefficients of the two scenarios.

5.11 DIRECT RELATIONSHIPS BETWEEN SCM AND SERVICE DELIVERY

To determine the extent to which supply chain management (i.e. each of acquisition, demand, and logistical management) relates directly with service delivery, a correlation test and a regression analysis is done. The correlation test aims to determine whether or not there is a direct relationship between supply chain management (acquisition, demand, and logistical management) and service delivery without the mediating influence of performance management. As before, the relationships are tested at two levels. First, the correlations are determined in Table 5.16 to be followed by the results of regression analysis to determine causal relationships in Table 5.17.

Table 5.16: – Correlation Coefficients of AM, DM, LM Versus Service Delivery

Variables	Service delivery	
	Correlation Coefficient	p-value
Acquisition management (AM)	0.576	0.000
Demand management (DM)	0.490	0.000
Logistics management (LM)	0.552	0.000

The results above show that all the *p*-values for the correlation coefficients are less than 0.05. This means that there are statistically significant relationships between service delivery and each of the other component of SCM: acquisition management, demand management, and logistics management. For instance, the correlation coefficient between acquisition management and service delivery is 0.576 and the *p*-value is 0.000. This shows that there is a significant positive relationship between acquisition management and service delivery. In fact, there is a significant positive relationship between each of the SCM components and service delivery. This means that an increase in any one of them is associated with high service delivery.

Having determined that there are significant correlations between service delivery and each of the SCM components (i.e. acquisition management, demand management and logistics management), a regression equation is now estimated with service delivery as a dependent variable and acquisition management, demand management and logistics management as independent variables. This regression is done so as to determine whether or not acquisition management, demand management and logistics management have an impact on service delivery. The results are reported in Table 5.17 below.

Table 5.17: Regressing Service Delivery on AM, DM, and LM

DV: Service Delivery	Coefficients		t-statistic	p-value
	Unstandardised	Standardised		
Intercept	15.384	-	6.409	0.000
Acquisition Magt. (AM)	0.523	0.232	2.681	0.008
Demand Magt. (DM)	0.361	0.171	2.268	0.025
Logistics Magt. (LM)	0.510	0.333	3.944	0.000
Adjusted R Square	0.403			
*DV = dependent variable				

The *p*-values for the all the coefficients are below 0.05 which means that acquisition management, demand management and logistics management have a significant impact on service delivery. The coefficient of acquisition management is 0.523. The positive coefficient means that a unit's improvement in acquisition management leads to 0.523 improvement in service delivery holding the other variables constant. Similarly, the coefficient of demand management means that improving demand management by one unit leads to 0.361 improvement in service delivery holding the other variables constant. A similar interpretation can be given to the coefficient of logistics management of 0.510.

The R square value of 0.403 means that about 40.3% of the variation in service delivery is explained by acquisition management, demand management and logistics management. The standardised coefficients indicate that, all things being equal, logistics management (0.333) has the highest impact on service delivery, followed by acquisition management (0.232) and lastly, demand management (0.171). The results under this section concur with Bizana et al.'s (2015) findings that the various components of SCM each have an impact on service delivery, although there is room for improvement.

However, this study – unlike Bizana et al.'s (2015) study – measured both the direct and indirect relationships that acquisition management, demand management, and logistics have with service delivery. The indirect relationships were tested with

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performance management as a mediating variable, whereas the direct relationships were tested without a mediating variable. Comparing the regression results in Table 5.15 (indirect relationship) and Table 5.17 (direct relationships), suggests that performance management does indeed play a mediating role in the model. This can be inferred by comparing the standardised regression coefficients of the SCM variables, and R squares in the two tables. The comparison of R squares shows that whereas performance management alone is responsible for almost 30% of the variation in service delivery (i.e. R square = 0.297), acquisition management, demand management, and logistics management together are responsible for 40.3% variation in service delivery. In terms of standardised coefficients, performance management has a value of 0.545 whereas those of the other three variables range from 0.171 to 0.333. This means that the partial contribution of performance management to service delivery is much higher than those of the other variables. All these give a hint of its mediating role in the model, which seems to align with Wadongo's (2014) finding that performance management mediates the relationships between several predictor variables and organisational effectiveness. According to Rahmawati (2017:77), performance management is the means through which employee objectives are synchronised with organisational objectives to improve the performance of an organisation. Therefore, it is a matter of course that in a model testing how the SCM policy has improved the effectiveness of SAPS NC in delivering service to its stakeholders, performance management will seem to emerge as the mediating variable.

5.12 CHALLENGES IN IMPLEMENTING THE SCM POLICY

This section answers the last research question (i.e. *RQ7:* What are the challenges faced in implementing the Supply Chain Management policy in SAPS NC?). As explained in the previous chapter, the section that sought to elicit responses to this question was left open-ended in the survey instrument to allow for flexibility in the answers. This led to a vast number and variety of challenges being listed by respondents, which were consolidated and tallied to identify the top 15 challenges.

These top 15 challenges were then taken back to respondents for confirmation and ranking in focus group discussions (see sections 4.2.2.2, 4.3.3, and 4.4.2 of Chapter 4 for details). The results of the ranking are presented in Table 5.18 below.

Table 5.18: Descriptive Statistics of Focus Group Discussions

Variables	Mean	Mean percentages
Inadequate staffing or personnel	3.56	71.2%
Slow response time of suppliers	3.48	69.6%
Lack of support	3.42	68.4%
Inconsistency in planning & budget alignment	3.20	64.0%
Lack of commitment by managers	3.16	63.2%
Inadequate communication/information on policies	3.12	62.4%
Inadequate skills or training	3.10	62.0%
Inadequate monitoring & evaluation	3.10	62.0%
Poor quality of supplies/specifications not met	3.10	62.0%
Lack of resources	3.06	61.2%
Incorrect (top-down) SCM structure	3.04	60.8%
Interpretation/understanding of policies	3.02	60.4%
Non-compliance with policies and regulations	3.02	60.4%
Unethical conduct	2.88	57.6%
Irregular update of policies	2.82	56.4%

As the ranking was done on a five-point interval scale, using either the mean scores or mean percentages to interpret the results in Table 5.18 will lead to the same conclusion. The table shows the biggest challenge to implementing the SCM policy in SAPS NC to be inadequate staffing (mean percentage = 71.2%) followed by slow response time of suppliers (mean percentage = 69.6%), and then lack of support (mean percentage = 68.4%). It is worthy of note that these three challenges have mean percentages around 70% whereas the fourth biggest challenge (i.e. inconsistency in planning & budget alignment) falls several percentage points behind (i.e. mean percentage = 64%). This shows that the participants were reasonably convinced in identifying those challenges as the top three challenges. Similarly, (Maboa, 2018) found inadequate staffing as the most pressing challenge to service delivery in the Germiston Police Station. This seems unsurprising because in contrasting the characteristics of public sector supply chain management (SCM) to

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those of the private sector, Ambe and Badenhorst-Weiss (2011:84) imputed lower staffing and competency levels to the public sector compared to the private sector.

In addition, the fact that lack of skills or training (mean percentage = 62%) features among the top 15 challenges further accentuates the human resource problem that the implementation of the SCM policy faces in SAPS NC. A number of researchers (for example, Lau, 2009; Gomez-Cedeno et al., 2015; Flothmann, 2017) emphasise the crucial role that the human factor plays in supply chain management for which reason staffing and skills issues should not be taken lightly. Unfortunately, SAPS NC seems to be missing the opportunity to use training to close the staffing and skills gap for a better implementation of the SCM policy.

5.13 SUMMARY AND CONCLUSION

This chapter set out to present the results of the study. This was done by first presenting the descriptive statistics on the demographics, to be followed by the presentation of summary statistics and inferential results to answer each of the seven research questions. Among others, the demographic results showed that the views of the respondents can be trusted because there was an equal representation of male and female employees in the sample as well as staff who have been in the organisation reasonably long enough to understand the phenomenon being measured.

With regards to the research questions, the results showed that SAPS NC staff have a good understanding of the SCM policy and that logistics management has a significant positive impact on performance management. This means that the unit responsible for supply chain management in SAPS NC is able to acquire and deploy resources reasonably well enough for the other units, particularly the operations section, to perform their functions. Also, performance management as a mediating variable has a significant positive impact on service delivery. Where it does not act as a mediating variable, the other variables of SCM (i.e. acquisition management,

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demand management, and logistical management) still have a direct influence on service delivery.

However, the results seem to show that including performance management in the model as a mediator results in a higher impact. Whether or not performance management mediates the relationship, the positive impact of SCM on service delivery suggests that the implementation of the SCM policy by SAPS NC has had a positive influence on service delivery to its external stakeholders. Nonetheless, a comparison of the summary statistics in Tables 5.13 and 5.14 shows some hesitance by respondents to fully acknowledge the impact of the policy on external service delivery. This implies there is room for improvement in the implementation of the policy.

Inability to realise the full benefits of a policy may be due to implementation challenges (Ambe & Badenhorst-Weiss, 2011; Donohue & Bornman, 2014). Therefore, the study did its best to identify the challenges of the SCM policy. The top 15 challenges identified can be found in Table 5.18. The biggest challenge is inadequate staffing, followed by slow response time of suppliers, and then lack of support. However, the fact that inadequate training or skills also features among the top 15 challenges suggests that SAPS NC is not adequately employing training or skills development to minimise the influence of the staffing challenge for a better implementation of the policy.

In a nutshell, it can be concluded that the SCM policy has had a positive impact on both internal and external service delivery in SAPS NC, but the impact can be increased if the implementation challenges are addressed – especially the ones concerning human resources (i.e. staffing and training). In the next chapter, the conclusions based on the findings in this chapter will be drawn after which the implications and recommendations for practice and theory will be stated. The views expressed by participants during the focus group discussions and validation workshop will be mingled into the discussion in that chapter.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

In the previous chapter, the results of the study were presented and discussed. The results showed that the supply chain management (SCM) policy has had a positive impact on both internal and external service delivery, even though there is room for improvement. Based on these results, this chapter presents the conclusions and recommendations of the study. The conclusions are presented in two parts: first, a recapitulation of the literature review is done to highlight the salient points; and second, conclusions are drawn based on the empirical findings in the previous chapter. The implications of the findings for policy are then discussed, after which recommendations for future research are made. These are then followed by a discussion of the limitations of the study. The final conclusion of the study ends the chapter.

6.2 RECAPITULATION OF LITERATURE REVIEW

Creswell (2014:30) emphasises the need for a researcher to revisit the literature at the end of the study to use it deductively as a framework for the research questions or hypotheses if the study undertaken has an objectivist world view. Therefore, as this study has a mix of objectivist and subjectivist world views, but with the objectivist element dominating, this section presents the salient points that the literature review yielded to provide a framework for understanding the findings from which the conclusions are drawn.

6.2.1 Supply Chain Management
In Chapter 2, a comprehensive literature review was undertaken on supply chain management. That chapter revealed that using a Hirschmanian perspective (see Hirschman, 1958), a supply chain is largely vertical in shape and that the extent to which the supply chain serves the needs of the customer determines the extent to which the supply chain partners derive their incremental value. This incremental value

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emanates from the synergies associated with the integration and differentiation efforts of the supply chain partners (Ayadi et al., 2011; Droge et al., 2012; Terjesen et al., 2012; Krug et al., 2015). In order to maximise this incremental value, there is the need for the supply chain as a system to be managed to work towards that common goal. This involves managing efforts upstream, internally (i.e. within the focal organisation), and downstream (Narasimhan et al., 2010). In terms of the SCM policy of South Africa, this boils down mainly to demand management, acquisition management, logistics management, and performance management (National Treasury, 2004; Ambe & Badenhorst-Weiss, 2011). Therefore, managing the supply chain (i.e. demand, acquisition, logistics, and performance) should aim at satisfying the customer in order for an incremental value to be generated for the partners in the supply chain of the South African public service. This invariably means the SCM policy should lead to service delivery to the public.

6.2.2 Service Delivery

Chapter 3 concentrated on reviewing literature on service delivery. The review showed that service delivery has three components, namely: target market, service concept, and service delivery system. "Target market" refers to who the right customer is while "service concept" can be described as the mix of tangible and intangible aspects of what is being delivered to the customer. Finally, the "service system" is concerned with how the service concept is provided to the customers. It encompasses the structure (for example, facilities, equipment) and infrastructure (for example, skills, policies) to deliver the service concept (Ponsignon et al., 2011:324).

With respect to the South African Police Service (SAPS), the general public was found to be its target market with its service concept being law enforcement (i.e. prevent, investigate, and combat crime; maintain public order) (Republic of South Africa, 1996). Its service system is made up of a bureaucracy that cuts across the three tiers of government (i.e. national, provincial, and municipal) to the community level as well as legislations (for example, Constitution of the Republic of South Africa 1996) and policies (for example, White Paper on Policing 2016) that determine how it delivers

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service to the general public. However, in the quest to serve the general public, the SAPS must first ensure service delivery to its internal stakeholders (i.e. staff). For instance, the supply chain management unit must ensure that the necessary logistics are supplied to the operational unit for its members to perform law enforcement duties to the general public. Therefore, service delivery can be to either internal or external stakeholders (Mofomme & Barnes, 2004).

6.3 CONCLUSIONS BASED ON EMPIRICAL FINDINGS

The empirical findings were presented in Chapter 5, but this section re-states the results and draws conclusions based on the research questions of the study.

6.3.1 SAPS NC Officials' Understanding of Key Elements of SCM Policy
RQ1: What is the level of understanding of SAPS NC officials of the key elements of Supply Chain Management?

On the question of SAPS NC officials' understanding of the key elements of the SCM policy, the results in Table 5.5 showed that the level of understanding is considerable good (i.e. mean percentages for the four components range from 67.1% to 69.8%). In terms of mean scores, the results ranged from 3.27 to 3.49 on the five-point interval scale used in the survey.

Conclusion: SAPS NC officials understand the key elements of the SCM policy considerably well.

6.3.2 Acquisition Management and Performance Management
RQ2: What is the relationship between acquisition management and performance management?

To answer this question, a Spearman's rank correlation analysis was conducted. From Table 5.8, the correlation coefficient between performance management and

acquisition management is 0.69 and the *p*-value is 0.000. This indicates that there is a significant positive relationship between performance management and acquisition management. This means that high performance management is associated with high acquisition management.

Conclusion: There is a significant positive relationship between acquisition management and performance management.

6.3.3 Demand Management and Performance Management

RQ3: What is the relationship between demand management and performance management?

The answer to this question was also found through a Spearman's correlation analysis. The results of this appear on Table 5.8 that shows a correlation coefficient of 0.653 and p-value of 0.000. These results indicate a significant positive relationship between demand management and performance management. This means that high performance management is associated with high demand management.

Conclusion: There is a significant positive relationship between demand management and performance management.

6.3.4 Logistics Management and Performance Management

RQ4: What is the relationship between logistics management and performance management?

The study measured the relationship between logistics management and performance management at two levels. The first level was a correlation analysis with the second level being a regression analysis. The regression analysis sought to determine if logistics management explains performance management. If logistics management explains service delivery, then internal service delivery has taken place.

Table 5.8 showed that the correlation coefficient between performance management and logistics management is 0.709 and the p-value is 0.000. This indicates that there is a significant positive relationship between performance management and logistics management. This means that high performance management is associated with high logistics management.

Regarding the extent to which logistics management explains performance management, Table 5.11 showed that the coefficient of logistics management (LM) is 0.775 with a p-value of 0.000. The p-value is below the significance level of 0.05, meaning that logistics management significantly explains or predicts performance management (PM). The standardised coefficient shows that improving logistics management by one standard deviation leads to an improvement of performance management by 0.779 standard deviation. The R square value of 0.607 shows that about 60.7% of the variation in performance management (PM) is explained by logistics management (LM). All these show that logistics management has a significant influence on performance management. This means that as far as logistics management is concerned, supply chain management has had a positive impact on internal service delivery because logistics are made available to the various units of SAPS NC reasonably well enough for them to carry out their duties.

Conclusion: There is a significant positive relationship between logistics management and performance management with logistics management explaining performance management. This means that the deployment of logistics has an impact on performance. Therefore, there has been internal service delivery to a large extent.

6.3.5 Performance Management and Service Delivery
RQ5: Does performance management explain service delivery? That is, does performance management mediate the effects of acquisition, demand, and logistical management on service delivery?

To determine whether or not performance management explains service delivery, a correlation test and a regression analysis were done. The correlation test aimed to determine whether or not there is a relationship between performance management and service delivery whereas the purpose of the regression analysis was to determine if a causal relationship exists between the two variables when performance management mediates the effects of the other SCM variables on service delivery.

Table 5.15 showed a statistically significant relationship between the two variables both in terms of correlation analysis (correlation coefficient = 0.52; *p*-value = 0.000) and regression analysis (unstandardised coefficient = 0.838; standardised coefficient = 0.545; *p*-value = 0.000). The R square value was 0.297 meaning that about 29.7% of the variation in service delivery is explained by performance management.

The extent to which performance management mediates the impact of SCM on service delivery was determined by comparing the regression results in Table 5.15 (indirect relationship) with those in Table 5.17 (direct relationship). The comparison suggested that performance management does indeed play a mediating role in the model. This was inferred by comparing the standardised regression coefficients of the SCM variables, and R squares in the two tables. The comparison of R squares showed that whereas performance management alone is responsible for almost 30% of the variation in service delivery (i.e. R square = 0.297), acquisition management, demand management, and logistics management together are responsible for 40.3% variation in service delivery. In terms of standardised coefficients, performance management has a value of 0.545 whereas those of the other three variables range from 0.171 to 0.333. This means that the partial contribution of performance management to service delivery is much higher than those of the other variables. All these give a hint of its mediating role in the model.

Conclusion: Performance management explains service delivery and therefore, seems to mediate the effects of acquisition management, demand management, and logistics management on service delivery.

6.3.6 Direct Relationship Between SCM and Service Delivery

RQ6: To what extent does supply chain management (acquisition, demand, and logistical management) relate directly with service delivery?

To determine the extent to which supply chain management (i.e. each of acquisition, demand, and logistical management) relates directly with service delivery, a correlation test and a regression analysis were done. The correlation test showed a statistically significant positive relationship between each of the SCM components (i.e. acquisition management, demand management, and logistics management) and service delivery. Their correlation coefficients ranged from 0.49 to 0.576 with each of their *p*-values being 0.000 (see Table 5.16).

In the regression analysis, the *p*-value of each of the SCM variables was less than 0.05 and their unstandardised coefficients ranged from 0.361 to 0.523. Their standardised coefficients ranged from 0.171 to 0.333 (see Table 5.17). These show that acquisition management, demand management, and logistics management have a direct positive impact on service delivery (i.e. when performance management does not mediate the relationship). The R square of 40.3% means that the three variables together explain 40.3% of the variation in service delivery.

Conclusion: Where performance management does not mediate the relationship, acquisition management, demand management, and logistics management still have a direct effect on service delivery even though the absence of performance management seems to reduce the effect.

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6.3.7 Challenges in Implementing the SCM Policy
RQ7: What are the challenges faced in implementing the supply chain policy in SAPS NC?

Table 5.18 showed 15 challenges as the most pressing of the many challenges identified by the respondents. Of these, the biggest challenge is inadequate staffing (mean percentage = 71.2%) followed by slow response time of suppliers (mean percentage = 69.6%), and then lack of support (mean percentage = 68.4%). In addition, lack of skills (mean percentage = 62%) features among the top 15 challenges thus giving emphasis to the significant role that the human resource plays as an obstacle to the implementation of the SCM policy.

The study, however, did not merely identify and rank the challenges but went on to probe why participants considered them as challenges as well as what the proposed remedies are. The probe for a deeper understanding of the challenges took place during the focus group discussions (FGDs), whereas the proposed remedies came out of the validation workshop. The details of these are attached as Appendices D and E respectively. However, the highlights of these two documents are discussed next before drawing a conclusion for this section. The discussion involves: a) re-stating the challenge, b) explaining why it is considered a challenge, and c) how it can be remedied.

6.3.7.1 Lack of resources
Lack of resources is the tenth biggest challenge (see Table 5.18). The focus groups explained lack of resources as mainly a transportation problem. According to them stations are not able to attend to complaints on time mainly because of shortage of vehicles. In their view, vehicles are the responsibility of the transport section.

Remedies

- Analyse the current resources in terms of functionality and ensure optimal use of what is available. During budgetary planning, ensure that the most critical

resources form part of the plan. The utilisation of resources should also be monitored to ensure that there is no misuse of available resources.

- Compile demand plan on time.
- To ensure that there are enough resources for personnel to perform their duties to the fullest, purchase or request for more vehicles, equipment, stationery etc.

6.3.7.2 Inadequate skills or training

Inadequate skills or training ranked as the seventh challenge together with inadequate monitoring & evaluation, and poor quality of supplies/specifications not met. According to the FGDs, inadequate skills or training poses a challenge because staff members that are not being offered official and accredited training (for example, leadership course and formal procurement training) pose a risk of not knowing or having the necessary skills to perform critical functions.

Remedies

- In the absence of a training budget, identify members/components with the necessary skills that are required and arrange in-service training for members who need skills development. Identifying mentors for members can also ensure that skills and knowledge is transferred;
- Get skilled people for the work, train the persons in the job and keep them in that environment;
- Comprehensive training programme on the organisational plan, procedures and policies;
- Provide workshops and in-service training; monitor progress and apply intervention where needed;
- Training, work sessions or courses must be in place or arranged for members who do not have skills or training in their work environment. This will motivate them and encourage them to do their work effectively and efficiently.

6.3.7.3 Inadequate staffing or personnel

Inadequate staffing or personnel is the biggest challenge to the implementation of the SCM policy in SAPS NC. The FGDs identified this as a challenge because inadequate staffing makes the segregation of duties difficult leading to a situation where one person has to perform the tasks of two or more people. This, in turn, leads to a break-

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down of the controls and checks and balances that segregation of duties promotes. This exposes the organisation to corrupt practices.

Remedies

- The structure of the unit must be revisited and HRM must be involved in order to identify the reason for inadequate staffing for personnel and how that can be addressed;
- Attract more skilled personnel (external advertisement of posts);
- A request must be sent to the recruitment section to advertise posts or to allocate members. Utilise all the staff members on hand as much as possible.
- Management must prioritise its goals, organise a work list and define the problems
- Keep communication clear to avoid duplication in work environment and power delegation.

6.3.7.4 Slow response time of suppliers

Slow response time of suppliers is the second biggest challenge (see Table 5.18). According to the FGDs, some matters are regarded as urgent, but the registered suppliers are often unavailable to respond quickly to requests. They do not even seem to read the faxes sent to them.

Remedies

- Regular meetings with suppliers should be held to highlight the challenges in terms of response time. Suppliers should take note of instructions that SAPS needs to adhere to and urged to stay within time frames. Agree to acceptable time frames and enforce that consistently;
- Train the suppliers on the importance of turnaround time;
- Cancel orders and obtain new suppliers that can deliver on time, collect stock from supplier rather than wait for the delivery to be done in the office.

6.3.7.5 Interpretation/understanding of policies

This challenge ranked twelfth on the list. The focus groups considered this as a challenge because when the head office distributed the new policy, they did not have an initiative to ensure that all the provinces had a common understanding on its interpretation. This caused a major confusion among staff at the lower levels.

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Remedies

- To ensure that all members are aware of policies and understand them, section heads can be tasked to study the policies relevant to their environment and present them during office meetings where deliberations can take place to ensure that everybody has the same understanding of the content of policies and their implementation. One policy per week should be discussed and focused on to prevent information overload and ensure that specific focus is given to a specific area;
- The policies must be understandable in the environment, policies should be read and inputs given;
- Provide workshops and in-service training. Monitor progress and apply intervention where needed.

6.3.7.6 Inconsistency in planning & budget alignment

This is the fourth biggest challenge. FGDs considered it a challenge because poor understanding of budget/financial management processes cause officials to deviate from their own demand plans and end up sourcing goods that were not originally planned for.

Remedies

- Taking into account that there are emerging priorities during the budget cycle that require the re-alignment of priorities and budget, it is important to ensure annually that the identified priorities of the component is aligned with the available budget. In SAPS it happens that the priorities are identified before that budget is distributed. However, every component should go back to their priorities after the budget distribution to determine if it will still be feasible;
- Plan beforehand, know the Public Financial Management Act (PFMA) and the early warning system;
- Optimise the organisational plan and stay focus;
- Shift funds for emergency cases only and cut cost on unnecessary purchases;
- A demand management section must be in place in order to consolidate the demand of the unit for the financial year so that the funds can be reserved for the needs of the component.

6.3.7.7 Inadequate monitoring and evaluation

Inadequate monitoring and evaluation was one of the three challenges that ranked seventh (the other two are inadequate skills or training and poor quality of supplies/specifications not met). By a challenge, the FGDs were referring to the poor command and control that lead to some processes not being followed, thus resulting in audit queries.

Remedies

- Monitoring should be done continuously. It cannot be seen as something that is done on a monthly or quarterly basis only. The difference between monitoring and evaluation should be understood by all members. When members as well as management do continuous monitoring, it will ensure that as soon as a deficiency is identified, corrective measures can be implemented to avoid targets not being achieved;
- There should be training in monitoring and evaluation, it should be in time and in place. Plans should be in place for regular monitoring and evaluation;
- There should be regular oversight inspections of the organisation.

6.3.7.8 Incorrect (top-down) SCM structure

Incorrect (top-down) SCM structure emerged as the eleventh biggest challenge. By incorrect (top-down) SCM structure, the FGDs were referring to the fact that the bottom-up emphasis of supply chain management is being neglected in favour of a top-down approach. This leads to poor supply chain management as most commanders take on tasks that are the responsibilities of other sections.

Remedies

- The structure is currently determined from top to down. Before signing the structuring, management should obtain inputs from the lower levels where the impact of the structure is the biggest. It is true that National determines policy and structure, however the impact of the policy and structure is felt at the grassroots by the foot soldiers;
- The structure should be changed so that information should flow from the lowest level to the highest and vice versa;
- Only specialised people must be placed in the SCM structure;
- A work study should be done to re-locate personnel where they are needed according to the structure.

- A work study must be executed to identify the reason for the incorrect structure;
- There should be proper placing of personnel as well as clear and detailed job descriptions.

6.3.7.9 Lack of commitment by managers

Lack of commitment by managers is the fifth biggest challenge according to the ranking on Table 5.18. The focus groups found it a challenge because lack of commitment by managers leads to the poor functioning of SCM in general (i.e. non-compliance to command and control) and the appointment of incompetent or not-yet-ready commanders.

Remedies

- Managers should take responsibility and accountability for their environment and provide guidance to their staff members to ensure optimal functioning of the environment;
- Every position in an organisation affects the bottom line. If managers don't know this, they could be working against the goal of the team by their time-wasting tactics or just doing the minimum needed to get by.
- Managers should be trained to acquire or improve managerial and leadership skills;
- Implement reward systems. Apply team building skills;
- Share and delegate, reward good behaviour, inspire trust.

6.3.7.10 Poor quality of suppliers/specifications not met

This challenge was ranked seventh alongside inadequate skills or training and inadequate monitoring & evaluation (see Table 5.18). FGDs considered it a problem because when the quality of suppliers is poor or specifications are not met, service delivery of the organisation is hampered because of the poor quality of products delivered by suppliers.

Remedies

- A database with suppliers who do not meet specifications or who delivered poor quality products should be kept and these suppliers should not be allowed to form part of the quotation process in future;

- Specifications must be clear and understandable to all suppliers. When suppliers deliver goods they must first be checked by the person receiving them before signing. If the qualities of the goods are not up to the required standard, they must not be accepted; they must be sent back to the supplier. The supplier must be informed in writing regarding the poor quality of the goods;
- Managers should give specifications to suppliers and stick to them.

6.3.7.11 Non-compliance with policies and regulations

Non-compliance with policies and regulations placed thirteenth on the table of challenges. It was considered a challenge because, in the view of the focus groups, it can create an unstable environment that leads to a situation where staff members get implicated in corrupt activities.

Remedies

- SAPS disciplinary regulations should be implemented consistently;
- Regular workshops on policies and regulations for members;
- Monitor progress and apply intervention where needed. If this fails, apply discipline management;
- Promote full transparency;

6.3.7.12 Unethical conduct

Unethical conduct ranked fourteenth among the challenges. According to the FGDs, unethical conduct constitutes a challenge because it harms the image of an organisation.

Remedies

- SAPS disciplinary regulations should be implemented consistently;
- An offending member must be called in, talked to and asked to state the reason for the unethical conduct and be reminded of the policies and steps that can be taken against him/her if such a behaviour continues;
- Organise workshops for members on company's ethical standards;
- Apply discipline management of shifting the person out of the environment;
- Encourage open communication;
- Relevant members who violate the ethical standards must be given warnings or disciplined according to the violation.

6.3.7.13 Lack of support

Lack of support is the third biggest challenge. The focus groups viewed it as a challenge because lack of support often means no guidance being given to staff by their managers. At times, it means managers not caring about equitable distribution of workload. This results in some members being overloaded with work leading to high turnover rate and ineffective knowledge transfer. Other times, lack of support takes the form of political interference that results in failure to meet departmental goals.

Remedies

- Depending on where the lack of support is emanating from, the next level (as per protocol) can be requested to intervene should it become evident that the immediate supervisor/commander is not supporting the members. It is important to identify what is causing the lack of support and address any problems to prevent unnecessary conflict in the component. Effective functioning of a component needs committed managers;
- There should always be feedback and support from both managers and staff;
- Support regular team building amongst the members;
- If the Commander identifies any lack of support in his/her section, a section meeting must be called or a team building session must be arranged to talk to the members and motivate them because in the work place, managers and staff need each other in order for the department or company to succeed and move forward;
- Address the lack of support with a one-on-one consultation. Ensure that all parties have the freedom of sharing their frustrations. An agreement should be reached among parties on how the goal of the organisation will be reached. Any deviation should be discussed to a logical conclusion;
- Balance monitoring & allow staff to perform.

6.3.7.14 Inadequate communication/information on policies

Inadequate communication/information on policies is the sixth biggest challenge that the implementation of the SCM policy faces in SAPS NC. The FGDs revealed this challenge to take the form of outdated information or information of little use being circulated to members. This hampers performance.

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Remedies

- Current and new policies should be circulated constantly to keep members up to date and remind them of the working procedures and processes within the environment. Communication should not only be in the form of emails but can also include lectures by subject experts during office meetings;
- Policies are available and must be communicated to the lowest level by all commanders. The members and personnel must update themselves with the policies;
- Promotion of policy lectures;
- Encourage meetings with managers on a regular basis and monitor the outcome of the meetings to ensure complaints are addressed. Make use of social media such as WhatsApp groups. Use emails more because they are faster than sending mails through the post. Implement internal policies with circulars;
- If there is any important information or any amendments on policies, the members must be made aware so that they can perform their duties according to the policies of the organisation.

6.3.7.15 Irregular update of policies

This is the least among the 15 challenges. It occupies the fifteenth position on Table 5.18. According to the FGDs, when policies are not updated regularly, staff carry on performing tasks that may no longer be relevant to the clients, leading to unnecessary maladministration.

Remedies

- Inputs for updating of policies should be submitted to National when deficiencies are identified;
- Policies must be updated on a regular basis for the growth of the organisation and to give more knowledge to the employees;
- Policies must be revised to determine whether the purpose and goal of the policy is still being met.

Conclusion: There are 15 major challenges to the implementation of the SCM policy in SAPS NC. The biggest challenge is inadequate staffing, followed by slow response time of suppliers, and then, lack of support.

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6.4 POLICY IMPLICATIONS AND RECOMMENDATIONS

This study has identified issues that have implications for policy. First, a supply chain is a system that involves many component parts working to achieve a common goal. That goal is to deliver valuable goods and services to the customer in ways that makes him or her satisfied. Satisfied customers will generate incremental value for the supply chain partners when they patronise the goods and services delivered by the supply chain. This incremental value is what is often referred to as synergy (Ayadi et al., 2011:2; Andreou et al., 2012:1223). Therefore, the Aristotelian dictum that "The whole is larger than the sum of its parts" (Friedman & Allen, 2011:4) aptly describes the extra value that is generated when supply chain partners work together as a system rather than as stand-alone systems. Paradoxically, the incremental value does not emanate from the collaborative efforts of the partners only, but also from the ability of each member to be different and specialised in their roles. Thus, synergy results from the differentiation and integration of the supply chain members' roles. Optimisation of this differentiation-integration duality in the supply chain requires management (Terjesen et al., 2011; Hoberg & Philips, 2012).

Supply chain management involves managing activities upstream, within the focal organisation, and downstream (Vijayasarathy, 2010; Friedman & Allen, 2011; Droge et al., 2012; Terjesen et al., 2012). Effective management requires a strong human resource base (Ambe & Badenhorst-Weiss, 2012; Nel et al., 2013:4). Contrary to this, the results of this study have revealed the human factor as the main stumbling block to the implementation of the SCM policy in SAPS NC. In fact, about 12 out of the 15 challenges identified have to do with the human resource – whether the inadequacy is expressed in terms of numbers, skills, attitudes or ethics.

Secondly, delivering valuable goods and services to customers can be termed as service delivery (Chen et al., 2009:39)). Service delivery has three components,

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namely: target market, service concept, and service delivery system (Ponsignon et al. 2011:325). "Target market" refers to who the right customer is while "service concept" can be described as the mix of tangible and intangible aspects of what is being delivered to the customer. Finally, the "service system" is concerned with how the service concept is provided to the customers. It encompasses the structure (for example, facilities, equipment) and infrastructure (for example, skills, policies) to deliver the service concept (Ponsignon et al., 2011:325). The *Batho Pele White Paper* makes it clear that the citizenry is the *target market* of the public service of South Africa (Department of Public Service and Administration, 1997). For the South African Police Service (SAPS) specifically, the *service concept* involves the prevention, combatting and investigation of crime as well as maintenance of public order; protection and security of the citizens and their property, and law enforcement (Republic of South Africa, 1996). Finally, the study identified bureaucracy, legislations, statutes, policies, and skills as the major elements of the *service system* of SAPS. Even though service delivery in SAPS appears to conform to this categorical trilogy, the empirical results show that there is room for improvement. For instance, the results in Table 5.12 show an honest admission by personnel of SAPS NC that the public is not particularly satisfied with its service delivery (mean score = 2.856). In addition to this, SAPS NC does not appear to be in the habit of conducting regular customer satisfaction surveys (mean score = 2.741; see Table 5.12). Therefore, SAPS NC still has some work to do to improve service delivery.

Lastly, three of the challenges hindering the implementation of the SCM policy appear to be structural rather than human in nature. These challenges are: a) slow response time of suppliers, b) lack of resources, and c) incorrect (top-down) SCM structure. Although participants of the validation workshop proposed remedies for these challenges (see section 6.3 above), it is still prudent to look at them holistically so that an overall strategy (rather than a piecemeal approach) can be evolved to tackle them. This is because dealing with structural issues normally requires the revision or formulation of policies (Howlett & Mukherjee, 2014). In the light of these implications for policy, the following recommendations are made.

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6.4.1 Recruitment and Training

Staff recruitment and maintenance is an important human resource function. Once staff are recruited, it is necessary for the organisation to continuously train them in order for them to be better skilled to deal with the changing requirements of their jobs as well as develop in their career (Nel et al., 2013:148). Therefore, in respect of the challenge of inadequate staffing identified by this study, a three-part recommendation is offered as follows. First, SAPS NC should take steps to improve the quantity and quality of staff through recruitment. This means the organisation has to do a workforce audit to determine where the gaps are so that it can put a mechanism in place to recruit more staff. While doing that, SAPS NC should also put in place a plan to tackle the quality side of the staffing problem in the medium to long time. Addressing the quality side of the challenge may involve taking a second look at the entry requirements for recruiting the various categories of staff into the service and making a case to the head office of the organisation. This can lead to increasing the minimum requirements so that higher calibre staff are recruited in future. Second, it is recommended that management/soft skills training (for example, ethics, communication, policy framework) is incorporated into all entry-level training programmes for staff of all categories. This will help the staff to have a more holistic understanding of the organisation and have better working relationships with their subordinates, peers, and superiors from the very beginning of their career. Third, more emphasis should be given to in-service training to continuously update personnel on new policies and ways of working. Subject matter specialists can be brought in from universities and other external bodies to support in this regard.

6.4.2 Improving Service Delivery

Although SAPS NC seems to be doing well in delivering service to its internal and external stakeholders, there is still room for improvement. This is evidenced by the results that show that more needs to be done in the area of external service delivery especially. Therefore, it is recommended that SAPS NC steps up its effort to improve service delivery to the public as the perception of public satisfaction with service delivery showed a relatively low mean score (mean score = 2.88). Additionally, SAPS

NC should conduct public satisfaction surveys more frequently than currently in order to constantly gauge the mood of the general public with respect to its performance. This is because the study results in Table 5.12 showed that the organisation is not doing very well in this aspect also (mean score = 2.741). It is hoped that implementing this recommendation jointly with the other recommendations discussed in this section will go a long way to improve SAPS NC's service delivery to its stakeholders.

6.4.3 Addressing the Structural Issues

The recommendations given in the two preceding sub-sections are in relation to the 12 of the 15 challenges that were deemed to be due more to the human factor than anything else. The remaining three challenges identified by the study were viewed as more structural than human. The three challenges were, a) slow response time of suppliers, b) lack of resources, and c) incorrect (top-down) structure. This sub-section addresses these challenges. Therefore, the recommendation offered here is also in three parts.

In terms of slow response time of suppliers, it is recommended that SAPS NC distinguishes between ordinary suppliers and emergency suppliers. This is because using the same approach to make ordinary and urgent requests may be responsible for the suppliers' attitude of treating all requests as 'business as usual' (see section 6.3.7.4). Therefore, segregating the emergency suppliers from ordinary suppliers will go a long way in addressing this problem. An emergency supplier who has been well educated on the new approach will not confuse an urgent request with an ordinary request. Second, an audit should be conducted into the capacity of the transport section as well as the procedures that guide the request for vehicles to address the challenge of lack of resources (section 6.3.7.1 had identified this challenge to be mainly about transport). Such an audit will help the organisation understand what capacity and procedural gaps need to be filled to address the challenge. The same can be done for other resources. Lastly, the top hierarchy should be given more training on supply chain management in relation to the structure of the organisation so they can understand the important role that the bottom-up approach plays in the

efficient working of any supply chain management system. In addition, SAPS should consider formulating a policy that emphasises a bottom-up approach when it comes to supply chain management (see section 6.3.7.8 for additional remedies).

6.5 RECOMMENDATIONS FOR FURTHER RESEARCH

This study sought to understand the relationship between the SCM policy and service delivery in SAPS NC. Much work has already been done on either of these broad variables (for example, Mofomme & Barnes, 2004; Robinson & Malhotra, 2005; Ambe & Badenhorst-Weiss, 2011; Ambe & Badenhorst-Weiss, 2012; Lusch, 2011; Reddick & Turner, 2012; Mashamaite, 2014), whereas very little work has been done on the relationship between the two. It was this gap that necessitated this study. Much as this study has done its best to help improve understanding in this regard, there is still a lot more to be known. Therefore, based on lessons from this study, the following suggestions are made for further research.

6.5.1 The Moderating Role of Performance Management

In this study, performance management was assumed to play the role of a mediating variable. However, given that performance management is often aimed at keeping organisational plans on track so that intended results are achieved (Hvidman & Andersen, 2013), there is the possibility that performance management acts as an enhancer of results. In other words, the absence of performance management can diminish impact whereas its presence can magnify it. If that is the case, then performance management may be playing a moderating (rather than a mediating) role in the model. To determine this, it is recommended that a study is conducted to statistical test the moderating role of performance management in the model.

6.5.2 Employing all the SCM Components as Independent Variables

The emergent nature of supply chain as a discipline has led to a situation where its components have been described in varied ways (Chicksand et al., 2012). This makes

it difficult to identify the key elements of supply chain management. However, having the Supply Chain Management (SCM) policy of South Africa as its reference point made it much easier for this study to identify the key elements used in the model. After comparing the components as defined by the SCM policy with other definitions in a rigorous literature review, this study found demand management, acquisition management, logistics management, and performance management as the key elements that deserved to be used as the independent variables of the model. Doing so meant that disposal management and risk management which are also components of the SCM policy (see National Treasury, 2004; National Treasury, 2015), were left out. Any future study should therefore include all components of the SCM policy. This will help to determine if there is any significant increase in the explanatory power of the model if the independent variables are increased beyond those used in this model.

6.6 LIMITATIONS OF THE STUDY

The limitations of this study were previously stated in Chapter 1, but a recapitulation is necessary here.

1. The fact that a survey was used means that the findings of this study rely heavily on the responses of SAPS NC staff selected to provide information. Even though steps were taken to assure credibility in the process, the possibility of the respondents not responding truthfully could not be fully eliminated.

2. In addition, the staff may not be all knowing even though they were the target population of the study. Therefore, even if they intended to respond truthfully, there is still the challenge of cognitive limitation.

3. The researcher is a senior officer in SAPS NC; therefore, although his thorough understanding of the organisation might have helped greatly in the planning and execution of this research project, it is possible that this fact may have also influenced the responses of some participants.

4. Although a random sampling technique was used to draw the sample for this study, the results cannot be generalised to SAPS in all provinces of South Africa

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because they study defined its population as all staff of SAPS NC rather than all SAPS staff in all provinces of South Africa. Therefore, generalisation is limited to SAPS NC only.

6.7 CONCLUSION

This study set out to investigate the extent to which the supply chain management policy has affected service delivery within SAPS NC. The results showed a positive impact being made on service delivery to both internal and external stakeholders. However, 15 challenges were identified to be militating against the implementation of the SCM policy. According to the respondents, these challenges are minimising the impact of the SCM policy on service delivery. The biggest challenge is inadequate staffing or personnel, followed by slow response time of suppliers, and then, lack of support. The human factor is responsible for about 12 out of the 15 challenges. Therefore, there is the need for SAPS to take a comprehensive look at its recruitment and training policies to increase the quality and quantity of its staff. This may involve increasing the minimum educational requirements for recruiting the various categories of staff as well as intensifying the on-the-job training of staff. This, together with other policy recommendations made in this chapter, will go a long way to help the organisation to increase service delivery to its stakeholders. To sum up, it can be concluded that the SCM policy has had a positive impact on service delivery, but there is still room for improvement.

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APPENDIX A: SURVEY INSTRUMENT

PROVINCIAL SUPPLY CHAIN MANAGEMENT: NORTHERN CAPE: CLIENT SURVEY 2015.

At each question, encircle or tick alongside your chosen answer. Unless otherwise stated. **Mark only one answer:**

1. **How many years have you been in the employ of the South African Police**

   Service?

1	2	3	4	5
1-5 years	6-10 years	11-20 years	21-30 years	Over 30 years

2. **In which section are you working?**

Operational service	1
Support services	2

3. Indicate your gender?

Male	1
Female	2

4. What is your age group?

19-25	1
26-30	2
31-40	3
41-50	4
Over 50	5

RESPONDENT NUMBER	

| Provide answers to the following questions about SAPS Northern Cape. |

SERVICE SYSTEM

		Not at all				To a great extent	
1	To what extent does the Police Services cover all communities in the Northern Cape?	1	2	3	4	5	
2	How often does the SAPS conduct customer satisfaction surveys to measure the populace's satisfaction with their services?	1	2	3	4	5	
3	To what extent is the populace satisfied with their services?	1	2	3	4	5	
4	Are you aware of the customer service policy of the NC SAPS?	1	2	3	4	5	
5	To what degree is the NC SAPS equipped with the necessary facilities and equipment to respond to the needs of the community?	1	2	3	4	5	
6	To what extent does the staff of NC SAPS Supply Chain Management (SCM) display competency in their work?	1	2	3	4	5	
		Very weak				Very strong	
7	How will you describe the leadership of the NC SAPS in terms of Resource allocation?	1	2	3	4	5	

SERVICE CONCEPT

| 8. To what extent do you agree that the following are the responsibility of the police: |

		Not at all				To a great extent	
(a)	Prevent crime?	1	2	3	4	5	
(b)	Combat crime?	1	2	3	4	5	
(c)	Investigate crime?	1	2	3	4	5	
(d)	Maintain Public order?	1	2	3	4	5	
(e)	Protect and secure inhabitants of the Province and their property?	1	2	3	4	5	
(f)	Uphold and enforce the law?	1	2	3	4	5	

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	VALUE						
9. Indicate the degree to which you are satisfied with NC SAPS provision of the following service							
		Not at all				To a great extent	
(a)	Crime prevention	1	2	3	4	5	
(b)	Combatting crime	1	2	3	4	5	
(c)	Investigation of crime	1	2	3	4	5	
(d)	Maintaining Public order	1	2	3	4	5	
(e)	Protecting and securing inhabitants and their property	1	2	3	4	5	
(f)	Upholding and enforcing the law	1	2	3	4	5	
	SUPPLY CHAIN POLICY COMPONENTS						
10. To what extent do you understand the following components of the Supply Chain Management Policy?							
		Not at all				A great deal	
(a)	Demand Management						
(b)	Acquisition Management						
(c)	Logistics Management						
(d)	Performance Management						
	DEMAND MANAGEMENT						
11. To what extent do resources delivered in order to fulfil the needs of service delivery at SAPS Northern Cape meet the following requirements?							
		Not at all				To a great extent	
(a)	Correct price	1	2	3	4	5	
(b)	Correct time	1	2	3	4	5	
(c)	Correct place	1	2	3	4	5	
(d)	Correct quantity	1	2	3	4	5	
(e)	Correct quality	1	2	3	4	5	

	ACQUISITION MANAGEMENT						
		Not at all				To a great extent	
12	To what extent have responsibilities to acquire resources for service delivery been delegated among officers of the NC SAPS (i.e are there sufficient checks and balances in the acquisition process?)	1	2	3	4	5	
13	Is there a procurement strategy in place?	1	2	3	4	5	
14	How regularly does SAPS access the market to develop or update their procurement strategy?	1	2	3	4	5	
15	How often does SAPS do competitive bidding to acquire goods and services?	1	2	3	4	5	
16	To what extent will you describe the bid adjudication committee of SAPS NC as competent and independent?	1	2	3	4	5	
	LOGISTICS MANAGEMENT						
		Not at all				To a great extent	
17	To what degree are orders placed in a timely manner for goods and services?	1	2	3	4	5	
18	To what extent are orders placed in the right quantity?	1	2	3	4	5	
19	To what extent are orders placed to the correct specifications?	1	2	3	4	5	
20	Are goods received in a timely manner?	1	2	3	4	5	
21	Are goods distributed in a timely manner?	1	2	3	4	5	
22	Are inventory levels set rightly to avoid shortages?	1	2	3	4	5	
23	Are stores and warehouse space employed efficiently?	1	2	3	4	5	

	PERFORMANCE MANAGEMENT						
24. To what extent has the Supply Chain Management policy led to the following?
		Not at all				To a great extent	
(a)	Compliance to uniform standards	1	2	3	4	5	
(b)	Cost efficiency (reduced costs)	1	2	3	4	5	
(c)	Improved financial management	1	2	3	4	5	
(d)	Improved productivity	1	2	3	4	5	
(e)	Improved skills	1	2	3	4	5	
(f)	Reduced contract breaches	1	2	3	4	5	
(g)	Effective delivery of goods and services	1	2	3	4	5	
SCM POLICY
25. Indicate the extent to which Government policy on supply chain management is relevant to current circumstances in procurement of goods and services within SAPS NC?
		Not at all				To a great extent	
(a)	Does it meet organizational needs?	1	2	3	4	5	
(b)	Is the policy outdated?	1	2	3	4	5	
(c)	Does the policy need review?	1	2	3	4	5	

CHALLENGES
26. What have been the challenges in implementing the supply chain management policy in SAPS NC?
(a)
(b)
(c)
(d)
(e)
(f)

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THANK YOU FOR YOUR TIME!

APPENDIX B: LETTER OF INTRODUCTION

Dear SAPS Member

During your interaction with the Provincial Supply Chain Management Practitioners you must have probably noticed strengths as well as challenges of our component.

The information is extremely valuable to Provincial Supply Chain Management.

We would appreciate if you can share your experience with us by completing the attached questionnaires. Help us build Supply Chain Management.

After completing the questionnaires, please return it to Provincial Supply Chain Management. You may e-mail or fax the completed questionnaires to the following number: **Fax 053 831 2257** or email *NC Prov Head SCM-Secretary*

We will appreciate your response on or before **tuesday20 October 2015.**

Thank you for your co-operation.

APPENDIX C

INSTRUMENT FOR GATHERING FURTHER DATA ON CHALLENGES IN IMPLEMENTING SUPPLY CHAIN MANAGEMENT POLICIES IN SOUTH AFRICAN POLICE SERVICE IN NORTHERN CAPE PROVINCE DURING FOCUS GROUP DISCUSSIONS

Please indicate the extent to which the following constitute a challenge to the implementation of the supply chain management policy:

	Challenge	Not at all				A great deal
1.	Lack of resources	1	2	3	4	5
2.	Inadequate skills or training	1	2	3	4	5
3.	Inadequate staffing or personnel	1	2	3	4	5
4.	Slow response time of suppliers	1	2	3	4	5
5.	Interpretation/understanding of policies	1	2	3	4	5
6.	Inconsistency in planning & budget alignment	1	2	3	4	5
7.	Inadequate monitoring & evaluation	1	2	3	4	5
8.	Incorrect (top-down) SCM structure	1	2	3	4	5
9.	Lack of support	1	2	3	4	5
10.	Inadequate communication/information on policies	1	2	3	4	5
11.	Lack of commitment by managers	1	2	3	4	5
12.	Poor quality of supplies/specifications not met	1	2	3	4	5
13.	Non-compliance with policies and regulations	1	2	3	4	5
14.	Irregular update of policies	1	2	3	4	5
15.	Unethical conduct	1	2	3	4	5

THANK YOU

APPENDIX D: EXPLANATION OF CHALLENGES

1. Lack of resources

   The station cannot attend to complaints on time due to the shortages of vehicles; therefore it poses the pressure on transport as the custodian of the vehicles.

2. Inadequate skills or training

   Members that are not being offered an official and accredited poses a risk of not knowing having the necessary skills for example leadership course, formal procurement processes.

3. Inadequate staffing of personnel

   A high as members cannot comply to segregation of duties and corruption easily happen.

4. Slow response time of suppliers

   Some matters are regarded as urgent and you will find the suppliers that are registered not available when urgently needed or they don't even read faxes as provided on the company profile.

5. Interpretation/ understanding of policies

   When Head office distribute the new policy, they don't make an initiative to make sure that all the Provinces are talking the same language on policy interpretation and that causes major confusion to the members at lower levels.

6. Inconsistency in planning & budget alignment

   The poor understanding of budget/ financial management when coming to demand processes, officials end up deviating from their own demand plan and end up sourcing goods that were not initially planned for on their demand requests.

7. Inadequate monitoring & evaluation

   Poor command and control lead to some processes not being followed and that also lead to audit queries.

8. Incorrect (Top down) SCM structure

It leads to poor management of SCM as most commanders will do double the taskings that were supposed to be done by other sections for example Procurement & Contract Management forced to do PAS functions that are actually supposed to be functions of Logistics management.

9. Lack of commitment by managers

    This leads to poor functioning of SCM in general (non-compliance to command & Control), appointment of incompetent or not yet ready commanders.

10. Poor quality of suppliers/ specifications not met

    Hampers the organisations service delivery processes when delivering the poor quality product (inferior products).

11. Non compliances with policies and regulation

    Create unstable environment as at some stages will also lead to members being implicated in corrupt activities.

12. Unethical conduct

    Hams the image of the organisations