

Supply Chain Management in a Public Hospital in Gauteng

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Declaration

I, Dhanmathie Cooper, declare that this thesis is my own work, the fieldwork, data collection and collation was done by me and that I am responsible for the discussion and conclusions reached in this study. This report was compiled from the research conducted between November 1014 and July 2015. This research report is submitted in the field of Monitoring and Evaluation as 50% fulfilment for the Degree of Master of Management. This report or part thereof has not been submitted in the past to any other university.

Dhanmathie Cooper

9 May 2016

Dedication

This study is dedicated to the patients who continue to use the services of public hospitals for their healthcare needs, and those dedicated hospital staff that work against all odds to deliver healthcare to their patients.

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I thank all those who made this thesis possible:

The public health sector and the private sector for their contribution

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My supervisor for his guidance throughout the process, and my son, Mahesh for his unwavering support throughout the years.

To my family and friends for their love, unwavering motivation and continuous support.

Abstract

The purpose of the study was to analyse the Supply Chain Management (SCM) approaches used in the Public Hospital Outpatients Pharmacy and compare the findings with successful supply chain practices from other industry sectors. The study of academic literature locates the unavailability of drugs in the public hospital pharmacies to the domino effect of the lack of governance and accountability in the public hospital. The data for the study was gathered from public and private hospitals in Gauteng, and large FMCG manufacturers and retailers. The study finds that the public sector adoption of SCM in the absence of a coherent technology and human resource support environment results in a lack of accountability and coherence across systems. The research study corroborated the view of academics and the interviewees that the unavailability of drugs in the public hospital is a multidimensional problem that has its roots in the lack of governance throughout the drug supply chain. It is a complex manifestation of policy, processes, practices, structure, people, communication and donor funding that contribute to the problem. Resolving the drug availability issues will require the 'whole supply chain re-engineering' with the added focus on developing the operational capability and capacity of the actors within the supply chain continuum.

Key Words: Distribution, demand, supply management, supply chain management, pharmaceutical supply chain management, supply chain practice, fast moving consumer goods distribution, monitoring and evaluation, performance management, change management, logistics, public hospital, private hospital, governance, accountability, results based management

Acronyms

3PL	Third Party Logistics
DC	Distribution Centre
EDL	Essential Drug List
FEFO	First to expire first out
FMCG	Fast moving consumer goods
GPPTC	Gauteng Province Pharmacological and Therapeutic Committee
GPDoH	Gauteng Province Department of Health
GWM&ES	Government-wide Monitoring and Evaluation System
HF	Health Facility
KPI	Key performance indicators
KZN	Kwa-Zulu-Natal
M&E	Monitoring and Evaluation
MSD	Medical Supply Depot
NAPPI	National Pharmaceutical Interface
NDoH	National Department of Health
NPO	Non-Profit Organisation
PMPU	Provincial Medicine Procurement Unit
POD	Proof of Delivery
PP	Public Pharmacies
PSCM	Pharmaceutical Supply Chain Management
RBM	Results Based Management
SIAPSP	Systems for Improved Access to Pharmaceuticals and Services Programme
SCM	Supply Chain Management
SKU	Stock Keeping Unit
SOP	Standing Operating Procedure
USAID	United States Agency for International Development

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Glossary of Terms

Block Grant

Referred to as revenue sharing whereby a lump sum is transferred by the national government to sub national government, to be spent at the discretion of sub national government. Can be referred to as unconditional grant.

Concurrent Responsibility

Is referred to as shared responsibility between national and sub national government.

Conditional Grants

Funds made available by national government departments to provincial and/or municipalities for specific outputs or outcomes. Can be a matching or non-matching grant. National treasury can withhold payments or relocate the grant for non-adherence to the specified conditions.

Conversion cost

Is the measure of the number of times that the product is touch in the distribution chain, the higher the touches the higher the cost incurred.

Cost to serve

Is the measure of the cost from the supplier warehouse to the final customer and translated on a cost-per-case basis.

Fast Moving Consumer Goods

Refers to essential and non-essential goods purchased frequently such as food, toiletries, soft drinks and disposable diapers amongst other products.

Gross to net

Is the measure of the list price less the discounts and other trade costs, often referred to as the net price that is realised by the supplier.

Known Value Item

Products that is critical to a retailer to maintain the image of a store in terms of providing customer value. Can drive store switching when the pricing is not aligned from a competitive perspective.

Matching Grant

The national government (grantor) matches the spend by allocating a percentage of Rand value spent by the sub national government. The funds can be capped at a maximum spend value, often referred as closed-ended funding.

MediKredit

Is an independent electronic system that facilitates the activity-based management and maintenance of medical claims through the management of the NAPPI codes.

NAPPI

Is a global standard electronic coding system owned by MediKredit that includes all healthcare and surgical products in South Africa. The NAPPI code facilitates the standardised electronic information exchange for medical consultative claims.

Public Value

Is created by the public organisation through the laws, regulations and other actions as deemed of value by the public themselves.

Results Based Management

RBM is a strategic planning tool that monitors the implementation process by means of feedback loops to deliver the desired outcome. The process comprises problem identification, inputs, activities, outputs, outcomes and impact.

Stock keeping Unit

SKU is a store's unique identity of a product to assist in the tracking the product flow through the system.

Chapter 1.

1.1 Introduction

This research explored the unavailability of drugs in the pharmacies in the public hospital Gauteng, South Africa.

For many South Africans, an immediate barometer of service delivery and public sector performance is experienced when they access the facilities provided by the public health sector. The health of the economy, rising costs and the shrinking job market underpin the inability of the citizens to provide for their own basic needs, making health care a state responsibility for the majority of the population.

This research topic was selected due to the public, media and non-governmental organisation focus on the unavailability of drugs in the public health facilities (Section27, 2013; Child, 2014b; Gonzalez, 2013; Health Systems Trust, 2012b; Health-e, 2014; Magubane, 2014; Section27, 2013; Malan, 2015; Pieterse, 2015; Rutter, 2015; Mkhize, 2015).

For users of the public health system the experience of their medical consultation and the availability of the prescribed medication before they leave the health facility provides the measure of service delivery at the local level. The on-going reports on the unavailability of drugs in public health facilities provided the impetus to conduct the research to determine whether the Supply Chain Management (SCM) process and practices contribute to the current stock unavailability (Child, 2014b; Gonzalez, 2013; Health Systems Trust, 2012b; Health-e, 2014; Magubane, 2014; Section27, 2013; Malan, 2015; Pieterse, 2015; Rutter, 2015; Mkhize, 2015).

1.1.1 Macro Landscape

Pre-1994 government legislation enforced designated living areas according to racial grouping. This resulted in inadequate service delivery in the historically designated 'black areas' or 'homelands'. After 1994, the repeal of

apartheid legislation enabled the migration of large numbers of people from 'homelands' and rural areas to the urban areas, placing enormous pressure on the urban infrastructure and quality of service delivery, including the ability to provide adequate health care at a time that the health system was experiencing high incidences of HIV and AIDS. The population shifts compounded the problems associated with the delivery of healthcare with 82.4% of the South African population being reliant on the state to provide for their healthcare needs including the provision of drugs (Health Systems Trust, 2013).

Research funded by the National Department of Health (NDoH) confirmed the reports by the media and independent research organisation on the unavailability of drugs in the public hospital. The National Baseline Facilities Audit (Health Systems Trust, 2012b) released in 2012 showed that the problem is a national one. The report was evaluated against six priority areas; patient safety and security, infection prevention and control, cleanliness, availability of medicines and supplies and waiting times. The NDoH determined the priority areas, and compliance refers to results achieved against the predetermined measures.

Figure 1 shows Gauteng achieving 68% and Northern Cape achieving only 43% compliance relating to the availability of drugs.

Table 1 Source (Health Systems Trust, 2012b). The availability of drugs in the public health facilities, by province.

National	E Cape	Gauteng	Free State	KZN	Limpopo	Mpumalanga	N Cape	North West	W Cape
54%	54%	68%	54%	56%	43%	46%	42%	51%	60%

It must be noted that the figures presented above are provincial averages and not specific to a particular health facility.

In order to address the unavailability of drugs in the public hospitals, the NDoH introduced the essential drugs list (EDL) and provided increased clinic

facilities to ease the burden on the public hospitals (DoH, 2012). Despite this measure, there remains a high level of drug unavailability in the clinic. This is attributed to poor service delivery, poor level of governance, lack of accountability and skills shortage that adversely impacts on the availability of drugs in the public health facilities (Barbazza & Tello, 2014; Speer, 2012).

The availability of drugs is a function of managing demand and supply, which is the core philosophy of SCM. The government introduced legislative, policy and guideline initiatives to implement SCM as a tool to improve the availability of drugs in the public health facilities. In order to understand the complexity of the unavailability of drugs in the public hospital, it is important to understand its evolution as an operational and strategic competency as practiced in the private sector.

1.1.2 Understanding Supply Chain Management

SCM is a process that allows for the efficient management of resources for the timeous delivery of customer service throughout the supply chain that starts with ascertaining the product demand, request for production of a product to the consumption of the product by the consumer. The adoption and evolution of SCM as an enterprise-wide process and has its inception in the FMCG quest for efficiencies and increased profitability. Initially SCM was internally focussed and progressed over time to include role players linked to the organisation. The following definition of SCM was adopted by the FMCG sector and has evolved as the complexity increased. At a basic level SCM was defined:

As an integrated process wherein a number of various business entities (i.e., suppliers, manufacturers, distributors, and retailers) work together in an effort to acquire raw materials, convert these raw materials into specified final products, and deliver these final products to the retailers (Beamon, 1998, 281).

The private sector redefined the SCM process to include all the FMCG partners associated with the entity:

Supply change management (SCM) is a holistic approach to the effective management of the interface between all the organisations involved, entailing the integration of both upstream and downstream process (Choy et al., 2008, 1999).

The pharmaceutical SCM (PSCM) was slow to adopt SCM as the sector believed its needs were unique because inventory management decisions were made throughout the system and it was better suited to processes that required a top-down and bottom-up approach (Kelle, Woosley, & Schneider, 2012a); and that the change from a centralised to a regional system that was greatly regulated in terms of quality and price as opposed to a market orientated system (Yu, Li, Shi, & Yu, 2010). The private pharmaceutical manufacturing sector experienced the benefits of SCM through the dual interaction in the FMCG and public health distribution of their products. This experience served as an example to the pharmaceutical manufacturers to experience the benefits of SCM. In an effort to address the unavailability of medicines in the health facilities government introduced legislation, policy and guidelines as early as 2000 to demonstrate the seriousness of its intention to adopt SCM principles.

1.1.3 Government Legislative Initiatives

The citizen activism in response to the non-delivery of health care in general and availability of drugs in particular has forced the government to fast track the legislation initiatives on the adoption of SCM (Child, 2014; Gonzalez, 2013; Health-e, 2010; Health-e, 2013; Health-e, 2014). Government has introduced legislation, policies and guidelines to implement SCM in public healthcare facilities (National Planning Commission, 2011; National Treasury, 2003; South Africa, Public Finance Management Act No 1 of 1999; South Africa: Act 108 of 1996: South Africa, National Health Act 61 of 2003)

Despite the efforts of the NDoH, the availability remains an issue as reflected in the newspaper article below that reflects the situation as published on the 11 June 2015 (Mkhize, 2015).

1.1.4 The Problem Statement

SCM as it is applied in the public hospital has not served to alleviate outpatient drug availability problem. Research confirms only 54% compliance on the availability of medicines at public hospitals (Department of Health, 2012:1).



Figure 1: (Star Newspaper, 11 June 2015 (Mkhize, 2015).

This means that, at a national level, the public health service pharmacies are out of stock almost as often as they are in stock. The growing citizen activism on health service delivery, and the unavailability of drugs are a source of concern for government and the Department of Health (Department of Health, 2013; Health-e, 2010; Health Systems Trust, 2012; Health-e, 2013; Musetha, 2013; Thom, 2013; Tuwani, 2013; Health-e, 2014).

The significance of the study is to contribute to the body of information generated by disparate sources including NGO's, media, the National Department of Health (NDoH) and the Provincial Health structures on the problem of drug unavailability in public hospitals. This study addressed the 'heart of the drug supply problem' by focussing on the operational dimension of supply chain management in a public hospital in Gauteng. The inclusion of multiple sectors added to the complexity in presenting the research findings on the study. It also provided clarity to determine the similarity and divergence in the public and private sector approach to SCM.

1.1.5 Knowledge Gap

The initial view of the researcher centred on stock loss as the key reason for the unavailability of drugs in the public hospital. There are a number of theories advanced for the drug supply issue and one that has gained traction amongst the stakeholders is the loss of drug stocks through mismanagement, corruption and theft, both petty or organised, throughout the supply chain (Bateman, 2013; Ombaka, 2009; Rachmania & Basri, 2013; Kachwee & Dieter, 2013). The literature further indicated that governance and accountability could only be managed through the implementation of performance measures derived from the practices and processes of SCM.

The literature review identified the knowledge gap as the lack of SCM practices and processes that contributed to stock loss in the drug distribution chain (Figure 5). The international and local academic literature consulted for this study located the drug supply problem in the lack of governance and accountability (Chapter 2).

The focus of the study was on the SCM practices and processes in the public hospital pharmacy outpatients departments in relation to the acceptable industry SCM best practice. By understanding the operational aspect of SCM, greater understanding of the practice and processes that could be developed to address the problem of the unavailability of drugs in the public hospital.

1.1.6 Scope of the Study

SCM is a “discipline” (Croom, Romano, & Giannakis, 2000, 67), used to describe strategic inter-organisational coordination and collaboration (Cigolini, Cozzi, & Perona, 2004) while others refer to SCM as logistics management of demand and supply (Croom et al., 2000).

For the purposes of providing an understanding of the scope of the problem of drug unavailability in the public pharmacies, the following components of the supply chain system were considered: the role of governance, accountability and SCM principles and processes practiced in the public pharmacies; and the role of performance management that impacts on the

availability of drugs. The conceptual framework includes the enabling role of technology in the SCM process and explores the strategic contribution of monitoring and evaluation (M&E) in the SCM. During the research interviews it became apparent that the private hospitals could provide comparative information in terms of SCM practices and processes in this similar environment and was therefore included in the research sample.

1.1.7 Purpose Statement

The purpose of this study was to analyse the SCM approaches used in the Public Hospital Outpatients Pharmacy and compare the findings with successful supply chain practices from other industry sectors.

In order to contextualise the approaches used, a comparison was drawn between the SCM practices at the public hospital and those organisations that adopted industry best practice. The comparative organisations included the private hospitals, independent pharmacies, the pharmaceutical suppliers, distributors and retailers, and the FMCG manufacturers and distributors.

The overarching assumption that directed the study is that there are more differences than commonalities in the approach to SCM in the public and the private sectors. Understanding of SCM practices and processes and the level of implementation in managing stock availability in the private wholesale and retail sectors and the public and private hospitals and their distribution partners.

The themes that were to be addressed:

- a) Role of governance and accountability in relation to stock availability and stock management in the selected sectors
- b) Management of resources and performance measures
- c) Role of technology in SCM.

1.1.8 Research Question

What SCM approaches are used in the public hospital, and how do they compare to those used in comparative private sector industries?

1.2 Background to the Study

In order to understand the complexity of SCM it is important to understand the holistic definition of SCM as an enterprise-wide single-chain performance system that provides the link with strategy; identifies the supply chain and appropriate process to achieve the objectives; develops information systems that provide 'real-time data'; understands and meets demand; manages suppliers and other partners; creates appropriate relationships; and entrenches cross-functional supply chain capability companywide (Quinn, 1997; Lummus and Vokurka, 1999). This definition affirms the view that SCM is a process that touches the entire organisation.

There is no clear indication as regards the date of adoption of SCM in the public hospital. Initially the adoption of SCM in public hospitals was a stand-alone distribution function of the hospital procurement unit (Pharmaceutical Manufacturer, 13.10.14). The basic premise of providing the drugs worked because the number of patients seeking healthcare at public hospitals was controlled by the limited access based on racial lines (South Africa Act, 1910). Since 1994 public hospitals has been available to citizens regardless of race, which increased numbers of patients at public hospitals (Constitution of the Republic of South Africa, 1996). The population movement from rural to urban environments also added to the pressure on urban health facilities.

The principles of SCM adopted by the pharmaceutical private sector served as an example to redress the unavailability of drugs in the public health facilities. The legislative environment supported the SCM initiative of government, however, the implementation of SCM has not resulted in improvement in the availability of drugs in the public health sector (Knoetze, 2014; Malan, 2015a; Mkize, 2015; Pieter, 2015; Rutter, 2015b).

Blame is apportioned amongst the actors responsible for the availability of drugs in public hospitals, including the national procurement division, provincial health structures and suppliers, the flawed tender process, the capacity of tender suppliers, the public hospital, distribution centres, budget

constraints, timeous payment to suppliers, corruption, theft and fraud (Brinkerhoff, 2004; Deininger & Mpuga, 2004; Enyinda, Briggs, & Bachkar, 2009; Gonzalez, 2013; Holdt & Murphy, 2006; Lewis, 2006; Mail & Guardian, 2013; Vian, 2008).

SCM is a discipline that impacts on the 'whole health entity' in terms of structure, people and processes and is not a 'piece-meal' stand-alone initiative (Bigdell et al., 2013; Lumus & Vokurka, 1999). The mandatory preconditions for the successful implementation of SCM comprised the following enabling factors: a clearly defined authorising environment, resource and human capacity building, process mapping the collaborative relationships at all levels, performance management, real time information driven by technology and system-wide communications (Lumus & Vokurka, 1999; Hult, Ketchen, & Nichols, 2003; Jung, Chen, & Jeong, 2008; Sousa, Liu, Papageorgiou, & Shah, 2011).

The private sector approach of efficiency and cost containment were, initially adopted by the fast moving consumer goods (FMCG) companies to improve efficiencies and profitability (Blanchard, Comm, & Mathaisel, 2008; Walton, 2004; Chen & Paulraj, 2004). The success in the FMCG sector was facilitated by the ability to make informed decisions based on real-time information that facilitated the tracking and the management of the product movement throughout the supply chain process. The benefits of the FMCG approach to SCM is captured in the statement by Annie Lennox on the Desert Islands Discs Radio programme cited by Hayford, Privor-Dumm, & Levine:

Why can we distribute Coca-Cola all around the world, but we can't seem to get medication to save a child from something as simple as diarrhea? (Annie Lennox, 2008 cited in Hayford et al., 2011, 3)

1.2.1 Supply Chain Management and the Public Health Sector

The quest for profit in the private sector and the manufacturer-driven focus on efficiencies and cost-containment fast-tracked the adoption of supply chain management principles in the course of 'doing business'. The fundamental philosophy of efficiency and profitability drives the private sector

entities to continuously reinvent themselves and adopt best practice in terms of structure, people, processes and product delivery mechanisms.

In the public sector the delivery of public value to the citizens is not accorded focus and dedication (Jager, du Plooy, & Ayadi, 2010; Levesque et al., 2006; Kachwee and Hartmann, 2013; Rachmania & Basri, 2013; Ribeiro et al., 2013; Saouadogo & Compaore, 2010; Tetteh, 2009; Van Der Geest, 1982; Van der Wees et al., 2014). The persistence of the drug supply problem can be seen from the volume of media, and online releases by the South African Health News Service that provides updates on the unavailability of drugs, nationally (Gonzalez, 2013; Health-e, 2010; Health-e, 2013; Health-e, 2014; Musetha, 2013; Mahlangu, 2013; Mahlangu, 2013; Thom, 2013; Tuwani, 2013; Malan, 2015; Mkhize, 2015; Pieterse, 2015; Rutter, 2015).

1.2.2 Location of Study

The selection of Gauteng as the location of the research proposal is based on the proximity of the hospital to the researcher and the high demand for drugs through the outpatient sections of the public hospital located in the most densely populated Province in South Africa. Gauteng is the smallest of the nine provinces comprising 17,010 square kilometres (1.39% of total of square kilometres) supporting the largest population of 13.2 million (24.04%) the total 55 million people (*Statistics S A : Closing in on 55 million mark: A growing population with changing needs*, 2015).

In Gauteng, 24.5 million patients visited a clinic or hospital outpatient department during the 2009/2010. During the period 2007/2008 to 2013/2014 the number of outpatient dispensary patient visits in the Gauteng Province increased from 578 599 to 1 291 215 visits, representing an increase of 123%. The increased demand for drugs in the public hospital places enormous pressure on the public hospitals to provide an acceptable level of healthcare, including the availability of drugs for the patients.

1.2.3 The Public Hospital

The public hospital selected for this study supports a large outpatient base with 750 outpatients requiring antiretroviral drugs per day. This figure excludes outpatients requiring drugs for other illnesses. To address the increased patient demand the hospital, in partnership with USAID has implemented the automatic dispensing unit for dispensing, loading and storing medicines (Section 27, 2013; Zwane, 2013). While this system is effective once the drugs are in stock at the hospital, there is no indication of the role of supply chain management plays in ascertaining the demand levels to allow for the optimal functioning of the automated dispensing system. The general view in the public hospital is that the government-wide monitoring and evaluation (GWM&ES) will provide the demand and supply information to manage SCM in the public hospital.

1.3 Monitoring and Evaluation: the Panacea for Efficiency and Effectiveness of Public Sector Performance.

Government has embarked on numerous initiatives to address service delivery, and one of the government-wide initiatives is the implementation of government-wide monitoring and evaluation (GWM&ES). M&E is considered a “powerful public management tool that can be used to improve the way governments and organisations achieve results” (Gorgens & Kusek, 2011: 2). Monitoring is defined as “a continuous function that uses the systematic collection of data on specified indicators” (Gorgens & Kusek, 2011:2) to help measure objectives and evaluation is defined as “ a systematic and objective assessment of an ongoing or completed project ... implementation and results” (Gorgens & Kusek, 2011:2). However M&E can only function in an environment that functions on well-defined processes and practices, without it, it is not the panacea to effective and efficient service delivery. Effective monitoring and evaluation is dependent on identifying the measurable performance indicators ‘that measure output and outcomes’. Identifying the performance indicators forms the basis of results based management (RBM). RBM is a management strategy focussing on performance and achievements of outputs, outcomes and impacts (UNAIDS, 2008).

The performance indicators can only be determined by understanding the root cause of the problem and proposing the remedial steps that need to be taken. And it is these remedial steps that are then monitored and evaluated to plot the progress of the activity or programme. While this study is not based on M&E as such, it represents a vital step in the implementation of an M&E programme. The significance of this study informs the thinking that the success of SCM is an operational capability and capacity requirement within the supply chain continuum that requires 'real time', on going monitoring and evaluation to improve the unavailability of drugs in the outpatient section of the public hospital.

1.4 The Construct of the Thesis

The introduction to the study provided a brief overview of the context, purpose and significance of the research study. The chapter introduced the drug SCM problem in the public sector, and thereby directed the literature review search. Chapter 2 presents a comprehensive literature review on supply chain management in the public and private health sectors, the pharmaceutical sector and the fast moving consumer goods sector (FMCG).

The key concepts identify the conceptual framework and the resultant choice of the research methodology and design are presented in Chapter 3. The data collected during the research is documented in Chapter 4 with the discussion on the results of research interviews presented in Chapter 5. The conclusion and recommendations is presented in Chapter 6. The conclusion derived from the research is contained in Chapter 7. The references cited in this research study wrap up this research study in Chapter 8.

2 Chapter 2: Literature Review

2.1 Contextual Relevance

The purpose of this study was to analyse the SCM approaches used in the Public Hospital Outpatients Pharmacy and compare the findings with successful supply chain practices from other industry sectors.

Chapter 1 tracks the evolution of SCM as a business principle in the private sector led by the FMCG industry. The adoption of SCM in the pharmaceutical sector followed as pharmaceutical suppliers interacted with the FMCG retailers on the supply of Schedule 0 pharmaceutical product lines. In South Africa, the public sector was slow to embrace SCM and continue to struggle with the implementation of the processes and practices of SCM.

The purpose of this chapter is to ascertain the body of literature available to inform the analysis of the drug SCM in public sector hospital. This study includes the private sector comprising the private hospitals, pharmaceutical and the FMCG sector. The comparison of the SCM practices and processes across multiple SCM sectors provides a comparative landscape to understand the unavailability of drugs in the public sector. The public sector acknowledges the importance of adopting the SCM approach to the drug distribution, however, efficient and effective supply chain management is dependent on the adoption of clearly defined practices and processes that contribute to the implementation across the supply chain continuum.

The scope of the problems associated with the unavailability of drugs to outpatients at public hospitals is not a linear or one-dimensional issue associated with the delivery of stock (Kelle, Woosley, & Schneider, 2012). It is a complex proposition that requires an enterprise-wide combination of collaboration, interdependencies and interrelationships, both internal and external to the organisation (Bigdell, Maryam, Otto & Kotzab, 2003; Hult, Ketchen, & Arrfelt, 2007; Jacobs, Bart, Tomson, Goran, Laing, Richard, Ghaffar, Abdul, Dujardin, Bruno, & Damme, 2013; Tan, 2001).

For the purposes of providing an understanding of the scope of the problem of drug availability in the public pharmacies, the following components of the supply chain system emerged from the literature review presented in this chapter: the role of governance and accountability (Barbazzza & Tello, 2014); Speer, 2012b) the SCM processes and its impact on performance management (Hult et al., 2007; Otto & Kotzab, 2003 ;Van der Wees et al., 2014). The literature review indicates that an in-depth study on any one component listed above cannot yield a coherent proposition in addressing the issue of the unavailability of drugs in the public pharmacies.

2.2 Purpose of Literature Review

The purpose of the proposed research was to analyse the drug supply chain management in the outpatient sections in public hospitals and compare the findings with the industry best practice in supply chain management. The literature review provides the backdrop to the research, determines the research problem, identifies the research gap, and informs the research strategy and the structure of the proposed interview guide. The purpose of this chapter is to explore the body of literature available on drug supply chain management in the public and private sectors, including the fast moving consumer goods and the manufacturers in the retail sector.

2.3 Source of Literature

The sources of the literature included online academic journals, public sector reports, conference papers, newspaper articles and books formed the basis of the literature review. The literature search started with the key words directly related to the problem of drug supply; distribution, demand, supply, management, supply chain management, pharmaceutical supply chain management, supply management practice, logistics, healthcare, drugs, purchasing, public hospital, public pharmacy and the discipline of monitoring and evaluation.

The review of the literature accessed directed the search to include governance, health governance, accountability, and the search subsequently

snowballed to include, public value, performance management, corruption, results based management and monitoring and evaluation. The review comprised literature primarily from the last ten years with focus on the last five years, and included earlier literature that provided the theory and development history of supply chain management.

This study explores the drug supply chain and excludes the supply chain management streams in other sections of the public hospital. The geographical limitation of the study was considered adequate as the public hospital and the private sector are well represented in the selected province.

2.4 Drug Availability-A Developing World Phenomenon

Internationally, governments are faced with the challenge of providing adequate public healthcare to its people, especially in an environment of rampant, entrenched inequality and rising costs of healthcare (Bennett & Muraleedharan, 1997). Instilling good governance and managing and monitoring corruption in healthcare are global challenges (Huss et al., 2011).

The developed world is grappling with an ageing population, chronic disease and increasing healthcare costs (Ballantine, Brignall, & Modell, 1998; Levesque, Haddad, Nayarana, & Fournier, 2006), while the developing world including South Africa is grappling with the additional obligation of providing drugs to the increasing numbers of patients accessing healthcare at public health facilities (Jager, du Plooy, & Ayadi, 2010; Levesque et al., 2006; Kachwee and Hartmann, 2013; Rachmania & Basri, 2013; Ribeiro et al., 2013; Saouadogo & Compaore, 2010; Tetteh, 2009; Van Der Geest, 1982).

The persistence of the drug supply problem is reflected in the volume of media and online releases that providing an update on the unavailability of drugs nationally. (Gonzalez, 2013; Health-e, 2013; Health-e; Health-e, 2014; Health-e, 2013; Musetha, 2013; Mahlangu, 2013; Mahlangu, 2013; Health-e, 2010; Thom, 2013; Tuwani, 2013).

2.5 Governance, the Root Cause

The literature review locates the problem of drugs unavailability in the public pharmacies to the philosophical underpinning of governance as a measure in a developmental state. Governance is defined as “a set of processes (customs, policies or laws) that are formally or informally applied to distribute responsibility or accountability among actors” (Barbazza & Tello, 2014:3).

For the purposes of this study, the literature indicates that the unavailability of drugs in the public pharmacies is due to the lack of governance, and poor governance leads to the lack of the accountability, which in turn results in poor management (Lewis, 2006).

The structures of government either enable or complicate the delivery of drugs (Brinkerhoff, 2004b) and it can be concluded that the three spheres of government structures (Figure 2) present a challenge in applying the concept of accountability in the South African health system (*Act 108 of 1996*). Accountability and transparency are important dimensions of governance (Barbazza & Tello, 2014:3). For the purposes of this study a more detailed explanation is required to contextualise the complexity and the importance of the operationalisation of accountability in drug SCM in public healthcare. Ultimately the government is held accountable to provide access and drugs to the public (Speer, 2012; Ackerman, 2004).

2.5.1 The Domino Effect of Governance

The body of literature indicates that the unavailability of drugs in the public pharmacies is due to the domino effect of the lack of governance. The lack of governance leads to lack of the accountability through lack of performance management which leads to the practice of mismanagement expressed through presence of inefficiency and corruption which leads to stock loss. Ultimately stock loss leads to unavailability of drugs and the resultant non-delivery of public value (Penney, 2003; Brinkerhoff, 2004a; Shah, 2004; Lewis, 2006; Cohen, Mrazek, & Hawkins, 2007; Tetteh, 2009; O'Hagan & Persaud, 2009; Macha, Mushi, & Borghi, 2011; Fatemi & Behmanesh, 2012;

Cepiku, 2013; Rachmania & Basri, 2013; Ackerman, 2004 Barbazza & Tello, 2014).

2.6 Accountability and Transparency

The challenge of operationalising accountability has its origins in the concept of the developmental state. Moore explores the concept to include legitimacy of support, operational capability and public value (Moore, 1994). Fukuyama enhances the concept and proposes three pillars; the state, rule of law and accountable government as representative of the developmental state (Fukuyama, 2012). Both authors view the prosperity of a developmental state and the well-being of its citizens as contingent on the performance and efficiency of government. In the context of this study, the patient measure of public service of the government healthcare is measured by the availability of drugs in the public health system.

2.6.1 The Obligation of Accountability

Accountability is defined by the manner in which authority dispenses its powers, duties and responsibilities (Jones & Stewart, 2008). This definition derives from the two components of accountability, namely, answerability and enforcement (Stapenhurst & O'Brien, 2008). Within the public sector, answerability requires the obligation of government to provide oversight of their agencies, and of the public officials to inform and justify their actions to the public. Enforcement requires government to sanction the public official in the event of the dereliction of their duty to deliver the mandated public value (Brinkerhoff, 2003; Stapenhurst & O'Brien, 2008).

To give context to the role of accountability it is important to consider the different but complementary views on the composition of accountability. The complexity arises due to the interdependent dimensions associated with the definition. The three broad components of the accountability triangle are the political, financial and performance (Brinkerhoff, 2004b). Efficiency and effectiveness have been added to further clarify the role of the financial and accounting process (Penney, 2003). In the South African governmental

structures, accountability comprises vertical, horizontal, and diagonal accountability in a matrix management approach (Ackerman, 2003).

2.6.2 Dimensions of Accountability and its Relevance to South Africa

Horizontal accountability is defined as the capacity of the state to monitor and safeguard abuse by government and its agencies and to report such transgressions “sideways” (Stapenhurst & O’Brien, 2008:1). Agencies created by the State to ensure the ‘sideways’ accountability include the Ombudsman, human rights and anti-corruption bodies.

Vertical accountability or hierarchical accountability is best represented by the top-down approach (Stapenhurst & O’Brien, 2008). In a hierarchical relationship the public officials do not have the administrative accountability to force public officials to comply with the requirements of the agreed objectives (Stapenhurst & O’Brien, 2008). Social accountability is often referred to as a “socially driven horizontal accountability” by the citizens through the civil society engagement, and is driven from the bottom up. (Stapenhurst & O’Brien, 2008:3).

Diagonal accountability refers to the quasi-legal forums namely independent auditors and the ombudsman have administrative and financial oversight and can recommend sanctions the offending public official (Deininger & Mpuga, 2004; Stapenhurst & O’Brien, 2008). Many countries have adopted the principle of creating oversight agencies to address government indiscretion and abuse of power.

In the preceding paragraph the discussion on the differentiation of accountability as horizontal, vertical and diagonal has relevance to the South African political landscape. The decentralised structures of National, provincial and local government and the independent entities of the ombudsman, auditor general, national prosecution authority and Section 27 provide the recommended structures as proposed by the academic literature (Ackerman, 2004).

2.7 The Structure of Government and its Implications on Healthcare

The sentiment of access to the large rural and peri-urban population is critical in equalising the provision of health care to the majority of the population. The unintended consequence of the approach is the 'diffused' accountability within the national, provincial and district level segmentation of the healthcare landscape (Figure 2). The (*South Africa; National Health Act 61 of 2003*, 2003) provides for Health Councils at district level and municipal levels, which leads to the duplication as the municipalities are located in the district segment of the health system (*South Africa; National Health Act 61 of 2003*, 2003).

The Constitution of South Africa (South Africa, 1996) sets out the structure of government as comprising three interdependent, interrelated but distinct spheres of government, namely national, provincial and local government (*Act 108 of 1996*). The decentralisation of government to include the three spheres of government was intended to deepen democracy and provide basic services especially to the previously neglected citizens (Young, 1999). The provincial sphere comprises nine structures and the local sphere comprises forty six districts and sub-districts, two hundred and forty eight municipalities comprising metropolitan, local and district municipalities (Figure 2).

The complex governmental structure (Figure 2) attests to the issue of a lack of a clearly defined authorising environment due to the duplication of structures at each sphere of government. The complexity is further accentuated by the Constitution assigning each sphere of government certain functions that could be distinct to each sphere of government or concurrent. Concurrent functions are shared responsibilities by both the national and sub-national governments (*Act 108 of 1996*). The contents of Figure 2 outline the structures that comprise the health system with the drug delivery component of healthcare located in the lowest tier of the structure with concurrent accountability shared with the highest office (*National Health*

Act 61 of 2003). The structures, while politically sound, presents an operational issue in terms of allocating accountability.

The decentralisation of accountability does not automatically improve the accountability of government (Speer, 2012a). Speer proposes that national control, supervision and coordination are essential in creating effective and efficient decentralised structures (Speer, 2012a). The introduction of the National Healthcare Act 61 of 2003 added further complexity by replicating health structures in line with the three spheres of government (Figure 2). The three spheres of government add to the complexity of the health budget allocation that comprises block grants, conditional and non-conditional grants across the provincial and local government structures (*Act 108 of 1996*). The differentiated budget allocation results in the complexity of applying accountability and collaboration in the delivery of the national priorities versus local imperatives generally and specifically in the healthcare.

The unintended consequences of such a structural composition leads to:

1. The duplication of structures and the blurring of accountability (Figure2).
2. The budget allocation by the national and provincial structures of government, and the classification of 'block, conditional and unconditional funding' as prescribed by the National Treasury (*Act 108 of 1996*) makes it impossible to manage the scheduled budget versus actual expenditure.
3. The complex budget allocation system discussed above is applicable to the healthcare budget. It results in the complexity of applying accountability and collaboration in the delivery of the national health priorities versus local health imperatives (*South Africa; National Health Act 61 of 2003, 2003*).
4. The hybrid healthcare operating model that comprises vertical, horizontal and diagonal accountability within the structures in the health system (Figure 2) presents a challenge to institutionalise accountability in general, and in the drug delivery system in particular (*South Africa, National Health Act 61 of 2003*). The blurring of lines of accountability is a function of the lack of a clearly articulated definition of accountability and the lack of the operationalisation of the accountability process for

implementation across the healthcare system (Stapenhurst & O'Brien, 2008; Vian, 2008). This creates confusion in the operationalisation of accountability within the health structures.

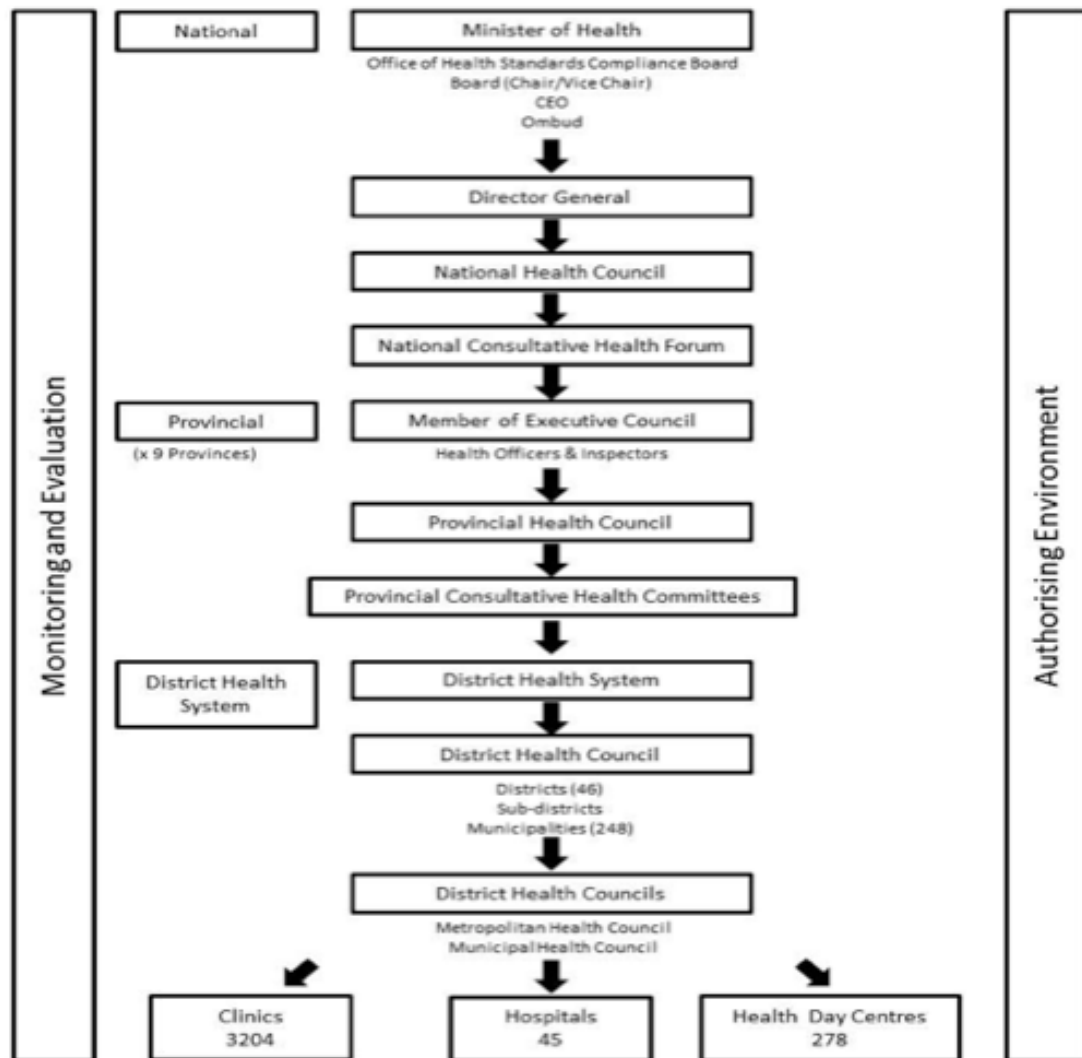


Figure 2: Source. (Compiled from National Health Care Act 61 of 2003; Health Systems Trust Baseline Audit 2012; Statistics SA 2013). Summary of Health Systems structures.

The universal challenge facing the government and the public sector is the lack of accountability as a prerequisite to delivering public value (Penney, 2003). This is evident in the results of the National Health Care Audit Facilities Baseline Audit conducted at a national level (Health Systems Trust, 2012). The key findings of the audit reveal that drug unavailability remains a major issue in the public hospitals. This does not augur well for 41 million

citizens who are dependent on the state for providing for their healthcare needs (Health Systems Trust, 2012).

The institutionalisation of accountability provides the 'checks and balances' in the functioning of national, decentralised, local, and community health structures (Brinkerhoff, 2004b). The absence of accountability fuels the breeding ground for entrenched corruption throughout the healthcare system.

2.7.1 Corruption Governance and Accountability

The focus of the research was to determine whether the adoption of the private sector approach to supply chain management (SCM) improves the availability of medicine to outpatients at the public hospital. Corruption in drug purchasing and distribution contribute to the unavailability of drugs. (Van Der Geest, 1982). Corruption is a consequence of the lack of good governance and accountability. At a general level corruption and bribery are defined as the abuse of public office for personal gain (Brinkerhoff, 2004b; Lewis, 2006; Vian, 2008).

Corruption breaks down ethical norms, and has an adverse effect on social cohesion, often referred to as social capital (Huss et al., 2011). It is a function of the lack of boundaries on the differentiation between personal and public goods by public servants. The interest of family members and other personal and community relationships of the public official trumps the interests of the state and its citizens (Van Der Geest, 1982).

The terms corruption and bribery are often used interchangeably and for clarity the act of bribery is defined as “ act of promising, giving, receiving or agreeing to receive money or some item of value with the corrupt aim of influencing a public official in the discharge of his official duties.” (Bayar, 2005:4). Corruption is defined as the “deliberate betrayal of public trust” (Vian, 2007:83). Corruption includes cronyism, nepotism; extortion and embezzlement, bribery is described as kickbacks, gratuities and pay offs (Lagunes, 2012). The definition of abuse of power includes the concepts of

the lack of governance, accountability, management and finance management entrusted to the actors.

The government as the principal, operating off a legal and judicial framework can implement effective sanctions against perpetrators of corruption in the healthcare system (Ruff, Mzimba, & Hendrie, 2011). The major factor that enables corruption is the lack of the separation and management of the demand and supply requirements of healthcare (Ruff, Mzimba, Bloomberg & Hendrie, 2011).

2.8 Supply Chain Management

The management of supply and demand is the cornerstone of delivering the profits required to sustain a business into the future (Shah, 2004). The literature review clearly articulates the importance of accountability in improving the availability of drugs in the public hospitals. The literature also indicated that accountability only works when it is measurable. The SCM concept is not relevant only to the private sector; it remains core to any business entity that requires forecasting demand, planning the supply and providing a product to the end customer. It is an enterprise-wide initiative (Lumus & Vokurka, 1999) and thus it is entrenched in the organisational DNA and philosophy. Efficient and effective supply chain management in the retail sector is considered a competitive advantage to the delivery of customer service (Blanchard et al., 2008).

Despite the high cost of drugs, little attention is paid to supply chain management in healthcare (Kelle, Woosley, & Schneider, 2012). Inventory management decisions are made throughout the system and decision making is most effective when it is iterative in a 'top-down and bottom-up approach' (Kelle et al., 2012). There are numerous definitions of SCM (Nurfitria, 2013; Razi, 2013; Hult, Ketchen, Ernest and Nicholas, 2003; Shah, 2004; Beamon, 1998). A more holistic definition of SCM presents its role as an enterprise-wide single-chain performance system that provides the link with strategy identifies the supply chain and appropriate process to achieve

the objectives, develop information systems that provide 'real-time data', understands and meets demand, manages suppliers and other partners, creates appropriate relationships, and entrenches cross-functional supply chain capability companywide (Quinn, 1997; Lummus and Vokurka, 1999).

The review of literature on SCM provides significant evidence of the benefits of adopting the SCM practices in the pharmaceutical sector (Alsultan, Khurshid, Mayet, & Al-Jedai, 2012; Bennett & Muraleedharan, 1997; Canadian Healthcare Association, 2004; Conry & Summers, 1998; Danese, Romano, & Vinelli, 2004; Kachwee & Dieter, 2013; Rajabzadeh Ghatari, Mehralian, Zarenezhad, & Rasekh, 2013).

2.8.1 Pharmaceutical Supply Chain Management

The pharmaceutical supply chain management (PSCM) continuum is a collaborative, interdependent and iterative process inside the entity and with the external partners and suppliers (Bigdell, Maryam, Jacobs, Bart, Tomson, Goran, Laing, Richard, Ghaffar, Abdul, Dujardin, Bruno, Damme, 2013; Hult, Ketchen, & Arrfelt, 2007; Tan, 2001).

The scope of PSCM is aptly expressed in the quote "the right drugs, to the right people, in the right dose, at the right time, in the right condition" (Hult, Ketchen, Ernest, Nicholas, 2003:52). PSCM has been adapted from SCM to take into consideration the complexity of medicine purchasing and supply, the stringent Medicine Control Council storing requirements in the distribution entities, pharmacies, high care, emergency room, operating theatres and administration in the health system (Ribeiro et al., 2013; Razi & Han, 2013; Yu, Li, Shi, & Yu, 2010).

The authors (Jung, Frank Chen, & Jeong, 2008; Jaberidoost, Nikfar, Abdollahiasl, & Dinarvand, 2013; Lumus and Vokurka, 1999; Rajabzadeh Ghatari, Mehralian, Zarenezhad, & Rasekh, 2013; Razi & Han, 2013; Ribeiro et al., 2013; Susarla & Karimi I, 2012; Sousa, Liu, Papageorgiou, & Shah, 2011; Sousa, Liu, Papa-Georgiou, & Shar, 2011; Stevens, 2007; Uthayakumar & Priyan, 2013) are unanimous in their the view that the

multifaceted activities of pharmaceutical supply chain management (PSCM) require an 'enterprise-wide, integrated real-time, information system' to monitor the status and flow of each drug line item in the public health system with its the distribution partners.

The health system has the onerous task of distributing drugs across all nine provinces across the large geographic landscape. It is estimated that logistics account for between 30% and 40% of hospital expenses (Rachmania & Basri, 2013). PSCM is considered effective in providing drugs to multiple locations over a large geographical region. The operational capability, due to the challenges of geographical spread of the health facilities to make drugs available, requires a robust supply chain system that is rich in institutional knowledge to make informed forecasting decisions to improve internal and external PSCM (Hult, Ketchen, Cavusgil, & Calantone, 2006; Hult et al., 2003).

The adoption of PSCM is dependent on the entrenchment of a performance management approach that is guided by clearly defined and measurable roles and responsibilities of the actors involved in the execution of their activities so as to deliver public value to the patients (Hult, Ketchen, & Nichols, 2003; Otto and Kotzab, 2003). PSCM is a team-based organisational learning initiative and improves knowledge and behaviour in the delivery of customer value (Hult, Ketchen, Cavusgil, & Calantone, 2006; Hult et al., 2003).

The authors listed below are unanimous in their conclusions on the benefits of implementing the PSCM in contributing to efficiency, access, affordability, performance management, integration, collaboration, operational best practice and improved patient service delivery (Susarla & Karima, 2012; Yu, Li, Yu, 2010; Uthayakumar & Priyan, 2013; Rachmania & Basri, 2013). Due to the diverse skills required in the management of robust and efficient supply management, large companies have opted to engage the service of specialist outsourced SCM.

2.8.2 Pharmaceutical Supply Chain Management – an Outsourced Resource

PSCM provides an effective and efficient health drug distribution system based on the alignment and mapping of the principal-agent relationship (Stevens, 2007). The third party logistics (3PL) entity is contracted as an external source to integrate the logistics services including the buyer, principal and seller relationships, transportation, warehousing, inventory management and logistics information systems to facilitate collaboration through the supply chain process (Marasco, 2008).

2.8.3 Third Party Logistics Option

3PL is used extensively in the private sector, which implements a holistic chain SCM based on the principles of cooperation, collaboration and coordination for improved performance, delivery of superior customer service, cost savings, distribution planning and fulfilment through transportation and delivery (Ribeiro et al., 2013). The importance of adopting 3PL ensures access to a knowledge based measurement system, stock keeping unit (SKU) level management, organisational memory, real time data generation for information and informed decision making, rapid response time, patient focus and flexibility, contracted with clearly articulated key performance indicators as the measurement tool between the principal and the agent (Choy et al., 2008; Day & Lichtenstein, 2006).

Contract management and service level agreements require careful drafting and managing to ensure the contractual obligations are met by the 3PL entity. 3PL reduces corruption and stock loss at the distribution centre and through the supply chain (Ombaka, 2009). It can be contested that the use of a 3PL entity will not be able to prevent the stock loss at the public hospitals, but it could quantify the stock loss through electronic information systems that are integrated seamlessly with the health facility information system to continuously measure the availability of drugs in the public hospital.

2.9 The Private Sector Narrative

To build the required capacity so as to implement effective SCM will span decades, requiring increased headcount, specialised skills and significant investment in technology (Colla & Dupuis, 2002). The fluidity with which entities successfully implement SCM was not an overnight success, Walmart, Toyota, Zara, Hewlett-Packard and Unilever are examples of sustained efforts at continuously adapting SCM to the changing business environment and the customer needs ((Blanchard et al., 2008). The common enabling feature of SCM is the 'real time' integrated technology system (Otto, Kotzab, 2003; Sousa, Liu, Papa-Georgiou; Ombaka, 2009; Susarla, Karima, 2012).

The companies who have successfully practiced SCM often utilise the services of 3PL companies to implement SCM: these include Procter & Gamble, Coca-Cola, Nike, and Dell (Cigolini et al., 2004). Walmart has an in-house distribution strategy because supply chain management is considered to be a competitive advantage (Walton, 2004; Blanchard et al., 2008). There are divergent views on the applicability of supply chain management of the Walmart supply chain best practice to the drug distribution in the public sector. Academic literature acknowledges Walmart's current expertise in supply chain management, and takes cognisance of the fact that SCM has evolved over time (Blanchard et al., 2008). The continuous striving for improvement and innovation has made the Walmart supply chain the juggernaut it is today (Blanchard et al., 2008). It is considered acceptable to learn from those companies that are considered global leaders in the field (Blanchard et al., 2008) to better understand and help configure its relevance to the public sector.

In order to overcome the possible reluctance to adopt the private sector approach to supply chain management in drug distribution in the public sector, a side-by-side study of the Walmart dimensions of supply chain management dimensions is compared with the applicability to the distribution as required by the South African health facilities (Figure 2). The key dimensions of SCM principles are defined in the Walmart success story

(Blanchard et al., 2008; Walton, 2004), and it is evident that there are more commonalities between the FMCG and public sector SCM. For ease of understanding each core competency identified as best practice in the private sector is compared for relevance in the public sector (Figure 2). Without a doubt the best practice dimensions in Walmart SCM are applicable to the public sector best practice measures.

DIMENSIONS OF MEASUREMENT	WALMART Best Practice Measures	DRUG DISTRIBUTION Best Practice Measures
Strategic Alignment		
Customer satisfaction/public value	✓	✓
Manage costs	✓	✓
Reduce costs	✓	✓
Increase volume throughput by reducing inventory	✓	✓
Customer/Patient at heart of SCM	✓	✓
Demand based supply chain flow	✓	✓
Short-term focus possible just in time principle of stock management	✓	✓
Increase collaboration between principal and supplier	✓	✓
Plan for stock availability on known value items (KVI)	✓	✓
Financial		
Swift payment of suppliers	✓	✓
Technology-enabled reconciliation of orders, invoicing and payments	✓	✓
Improved control of budget versus actual expenses	✓	✓
Track and quantify stock loss/theft	✓	✓
Logistics and distribution	✓	✓
Critical to effectiveness and efficiency of providing customer service and patient public value	✓	✓
Distribution Centre location around stores/health facilities	✓	✓
Direct distribution to centralised stores	✓	✓
Specialised warehousing facilities, cold storage, security, stringent expiry dates	✓	✓
Information Systems		

Track information throughout supply chain	✓	✓
Real time data	✓	✓
Increased accuracy, transparency & visibility of stock movement	✓	✓
Link to financial management	✓	✓
Use of internet through specialist software to improve collaboration between parties	✓	✓
Stock keeping unit information	✓	✓
Provide information at a glance to make informed management decisions	✓	✓
Reduce stock loss	✓	✓
Reduce expired stock loss, delivery picking based on expiry date. First to expire, first out (FEFO)	✓	✓
Track stock movement throughout the supply chain	✓	✓
Reduce errors due to manual entries	✓	✓
Other Benefits		
Fosters entity-wide cross functional learning, interdependencies, and collaboration	✓	✓
Collates information to promote benchmarking	✓	✓
Real time information allows effective management of tenders	✓	✓
Records electronic supplier information	✓	✓
Facilitates performance management practice	✓	✓

Figure 3: Source. (Blanchard et al., 2008; Walton, 2004). Adapted from Commonalities of the Private and Public Health Sector approach to Supply Chain Management.

As can be seen from Figure 3, the availability of stock is addressed in the adoption of an integrated, efficient and effective IT management system embedded in the private sector SCM system. The side-by-side comparison is measured along four major dimensions of strategic alignment, financial, information systems and other benefits (Figure 3). Academic literature acknowledges Walmart's current expertise in supply chain management, and takes cognisance of the fact that the SCM has evolved over time into the juggernaut it is today (Blanchard et al., 2008; Walton, 2004).

Successful supply chain practitioners replicate their success at a global level indicating that it is applicable to both developed and developing world. The Walmart geographic footprint spans United States, India, Mexico, Argentina,

Brazil and Canada, to cite a few examples of its adaptability to the developed and the developing world. Regardless of the country, Walmart prides itself in implementing the supply chain approach to delivering everyday low prices to its customers effectively and efficiently (Blanchard et al., 2008).

2.10 Monitoring for performance management and the theory of change

Performance management, the theory of change, monitoring and evaluation (M&E) and results based management (RBM) are interrelated, interdependent and will not be treated as stand-alone concepts for the purposes of this study. The donor fraternity introduced the M&E concept to measure donor-sponsored projects; to ensure that the funds and time-based desired results were achieved. The measures are identified at each milestone and referred to as indicators by the M&E practitioners. In SCM ongoing measurement is the hallmark of the discipline. It begins with the approach 'what do we measure'. This decision is exemplified by the substantiation of relevant and timeous availability of data.

The lack of demand and supply information adversely impacts on the implementation and effectiveness of M&E. The fundamental principles of SCM is based on the identification and allocation of individual and collective accountability as a requirement of M&E of SCM (Figure 4). Monitoring the agreed measures allows for the tracking of the organisational performance on a daily basis (Jaszczolt, Potkanski, & Alwasiak, 2008). Both concepts, M&E and RBM are dependent on identification of key performance indicators to measure each implementation stage in the results chain as evidenced in (Figure 4). This research study is the diagnostic stage of RBM and seeks to determine the measurable indicators to measure and track stock availability in the drug supply chain in public hospitals and to hold key personnel accountable.

Monitoring for measurement is a fundamental requirement for tracking the key performance indicators of individual performance at all levels within the supply chain system (Hubley, 2008).

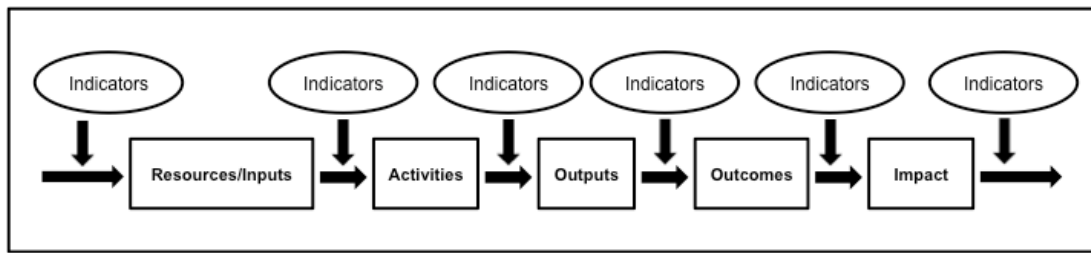


Figure 4: Source. Adapted from (W.H Kellogg Foundation 2004).

Ongoing monitoring provides the 'real time' information to determine individual and collective performance in the delivery of SCM objectives. In the private sector these concepts are considered integral to the management of structures, people, processes and in the employment of resources to deliver the business objectives (Hubley, 2008).

The private sector has a developed supply chain management system with ongoing improvements, innovation and controls to manage stock loss and improve efficiency and effectiveness to deliver their products to their customers.

In summary, the study of literature on SCM reflected the following key themes:

- Accountability and quantification of stock loss in the drug supply chain in the public hospitals is vague within the entity and supply partners. Identification of stock loss in the drug supply chain presents a problem throughout the supply chain, and thereby contributes to the unavailability of drugs in public hospitals.
- The lack of implementation guidelines, and change management interventions specific to building capability and capacity for the implementation of drug supply chain management.
- Lack of guidelines for human capacity building initiatives presents a major challenge to deliver the drug supply chain implementation capability.
- The critical contribution of an integrated real-time technology generated information in drug supply chain adversely impacts on projecting demand and the timeous management stock availability in public hospitals.

- Absence of measurable key performance indicators to effectively manage staff competency in the drug supply chain.

In conclusion, the literature review points to the multidimensional construct of the drug availability problem in the public pharmacies. The literature review clarifies the context of the lack of accountability in the drug supply problem. At a macro level, the problem could be attributed to the complexity of the reforms, including in the legislative, policy and operational interface. Further interrogation of the literature indicated that the problem is rooted in the lack of accountability within the health system that contributes to the drug unavailability in the public pharmacies. The initial step in understanding the location of the problem in the distribution continuum substantiates a need for a diagnostic assessment to probe the 'disconnect' in the distribution chain that contributes to the unavailability of drugs in the public pharmacy. The literature review provided the background to developing the conceptual framework developed in Chapter 3 (Figure 5) to serve as a guide to determine the research methodology and the design of this research questionnaire.

2.10.1 The Conceptual Framework

The overall focus of a conceptual framework is to determine the main research question that can be converted into a meaningful, important, relevant and ethical research study (Hulley, Cummings, Browner, Grady, & Newman, 2006). The purpose of the research was to compare the SCM practices and processes with acceptable industry SCM best practice. The literature review helps identify the conceptual framework for the research study. Figure 5 below represents a summary of the key learning from the literature review that academic authors as causes of the unavailability of products in a SCM system. Out of the assumption proposed by the academic journals that were consulted, the research gap was identified, leading to the development of the conceptual framework. The questions derived from the conceptual framework are presented in greater detail in the questionnaire guidelines.

As discussed in Chapter 1, the purpose of this research is to compare the SCM procedures and processes in public hospital outpatients departments with acceptable industry SCM best practice. The inclusion of the pharmaceutical and FMCG sectors in the literature review provides significant evidence of the complexity and the benefits experienced by the practitioners of SCM best practice.

The conceptual design (Figure 5) determined the design of the open-ended questionnaire guidelines to track the flow of stocks and documentation through the supply chain process, from the supplier to the end user.

The conceptual framework identifies multiple activities and paperwork requirements that are undertaken by the pharmacy section of the public hospital. The multiple touchpoints in the handling of the drugs increase the propensity for possible stock loss throughout the supply chain process.

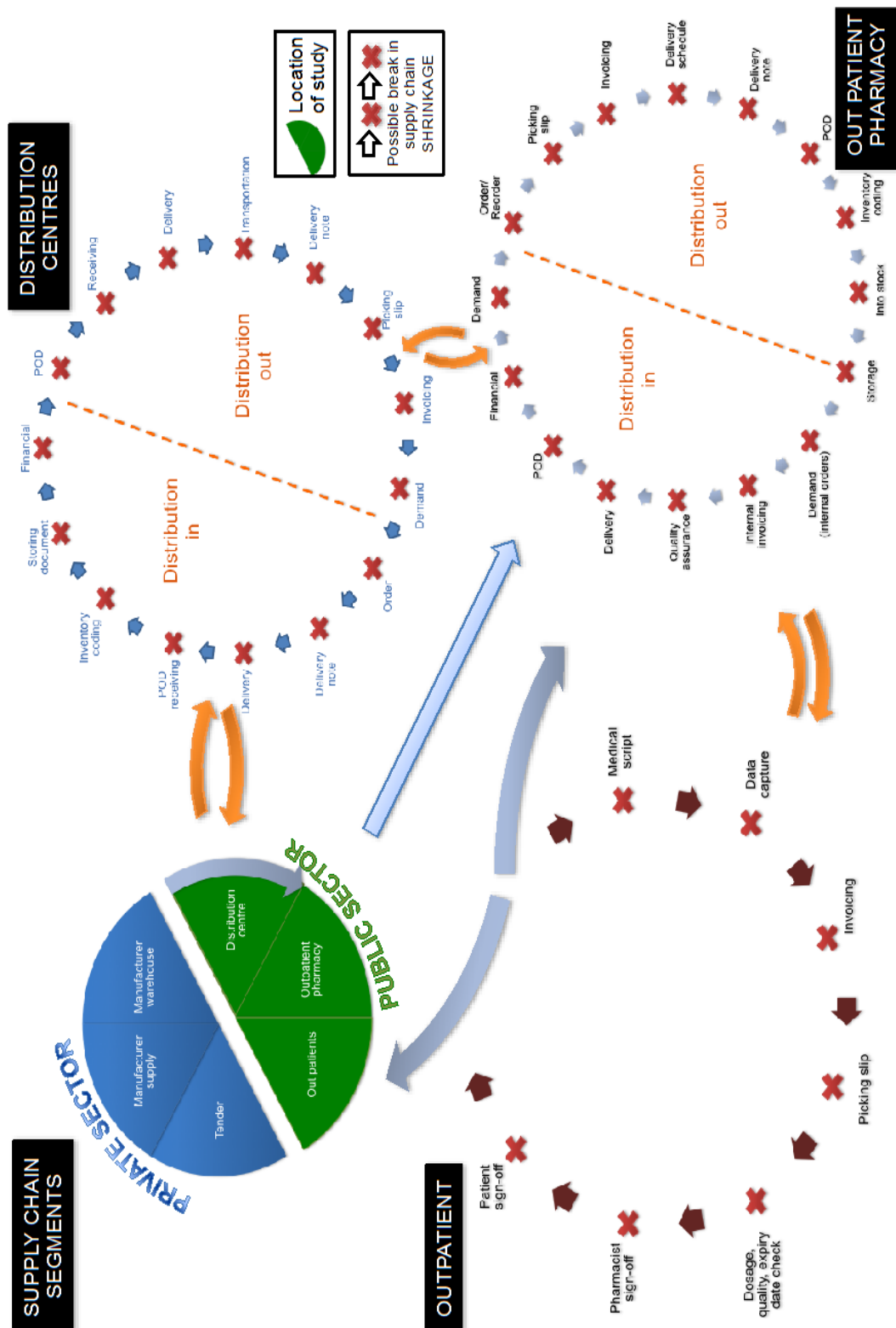


Figure 5: Source. Author's Analysis. Conceptual Framework for Research Proposal.

3 Methodology

The research design is a scholarly process whereby a research idea is developed into a research strategy. This section of the study presents an overview of the research methodologies and the rationale for the selection of the proposed methodology. The choice of the methodology, validity, reliability and ethical considerations are also included in this section. Finally the limitation of this research proposal will complete this section of the proposal.

3.1 The Philosophical Orientation of the Research

The purpose of this research was to compare the SCM procedures and processes in public hospital outpatients departments with acceptable industry SCM best practice. The research strategy was guided by the research questions formulated to answer an operational and/or implementation problem in terms of the unavailability of drugs in public pharmacies.

The option to acquire the research information was informed by two key considerations; the ontological and epistemological orientation of the concepts.

- a) Ontological consideration concerns itself with the nature of reality and its independence of the influence of the social actors (Bryman, 2012). The nature of the reality comprises two philosophical positions: objectivism implies that the study must be subjected to rigorous testing, and constructivism, which postulates that social actors create social reality, and therefore it is continuously changing (Bryman, 2012).
- b) Epistemological considerations are concerned with the theory of knowledge, which is underpinned by two philosophical positions: positivism, which maintains that the social world should be studied with the rigour of the natural sciences, and interpretivism, which views social sciences as different to the natural sciences (Bryman, 2012).

This research was based on the epistemological philosophy underpinned by interpretivism that views social sciences as different from the natural sciences (Bryman, 2012)

3.1.1 The Research Platforms

The three basic types of research are quantitative, qualitative and mixed methods. The research purpose, the research gap, and the research question determined the research strategy, which directed the selection of the research method. Quantitative and qualitative research differ in terms of the research question, analytical objectives, data and data collection instruments, the type of data generated and the flexibility of the iterative design. Qualitative research generates theory, is flexible, is iterative, and is more appropriate to make sense of complex social phenomena. It generates theory utilising unstructured or semi-structured methods such as in-depth interviews to describe individual and group experiences (Bryman, 2012).

Quantitative research tests predetermined theory, and is measurement oriented, applying highly structured close-ended questions that limit the researcher in probing for further responses. The criticism of quantitative research in social sciences is that it does not “distinguish between people and social institutions” (Bryman, 2012, p 178) and that it views social life as external to people’s lives (Bryman, 2012). For the purpose of this research the qualitative research method was selected as the best option, as it explored the perspective of the actors in the drug distribution and supply chain environment in terms of their social reality.

The steps taken in this qualitative research were both iterative and linear as there is a logical flow to the components of the study, yet the process was flexible enough to probe for the possibility of the emergence of new information. The literature review informed the development of the research question, conceptual framework, design, location, sample, data collection and analysis (Bryman, 2012).

Based on the research question, the qualitative research methodology provided the rich descriptors required for understanding of the social reality of the unavailability of drugs in the public pharmacies. Because data analyses occurred concurrently with data collection, further probing was done

to add to the data that was already collected as evidenced by the inclusion of donors, private hospitals and the independent pharmacies in the research sample. The research question was tested against the conceptual framework and the data collection during the initial research, and was refined for use in subsequent interactions with the respondents.

3.1.2 Research Design

A research design provides the basis for the collection and analysis of data. For this research, a cross sectional design was considered most suitable to provide the data and the analysis of the research question. Other research designs were considered less suited to the research due to the specific characteristics of the designs as discussed below. Both the experimental and evaluation designs required the use of control groups as a structural requirement, and are therefore deemed unsuitable for this research study (Bryman, 2012). The longitudinal design was considered unsuitable, as it required the same research to be conducted on the same sample, periodically over a protracted period of time, which was beyond the scope of this research.

The option of group discussions with an open ended questionnaire was rejected as it would not have allowed for the in depth probing of the relevant questions that were required to provide an understanding of the subset-specific data (Bryman, 2012)

The case design is an “intensive analysis of a single case” (Bryman, 2012:66) and it is more concerned with the detailed design of the research setting, e.g. a single school or single family which was considered unsuitable to the research problem and research question identified for this study. The comparative design was considered unsuitable because it assumed that social phenomena were better understood when two or more cases using identical methods were compared (Bryman, 2012).

The research focus was to compare the SCM procedures and processes in public hospital outpatients departments with acceptable industry SCM best

practice. The study was undertaken to understand the factors that contribute to stock unavailability in the drug supply chain that ultimately impact on the unavailability of drugs in the public hospital. The purpose of this research was to understand the knowledge gap, hence the cross sectional design is most appropriate. Cross sectional research design refers to the collection of data on multiple cases at a point in time and could comprise structured or semi structured interviews (Bryman, 2012; Neuman, 2012).

The open-ended questionnaire design was the preferred technique for this research study, as it comprised six subsets of samples: the public and private hospital, pharmaceutical suppliers and distributors, FMCG manufacturers, distributors and retailers. Within each sector, the interviewees were selected based on their role in SCM at a management and operational. The purpose of including sample subsets were twofold: 1) to understand the applicability of SCM practices and processes in the public hospital, and 2) obtain an understanding of the commonalities and differences of the research findings in the various sectors that practice SCM. The research design strategy allowed for the in-depth analysis of a specific topic or theme (Bryman, 2012).

The rationale for selecting in-depth open-ended questions was considered the most appropriate means to carry out in-depth and detailed data collection, collation and analysis. The research questionnaire guideline was created to ensure that it supported the conceptual framework (Figure 6).

How does the public hospital approach to SCM differ from accepted industry best practice?

What SCM approaches are used in the public and private hospital, and how do they compare to those used in comparative industrial settings?

Listed below is the conceptual framework grid that included the scope of the research study that aided the formulation of the research questions.

Themes	Authors	What am I measuring	Questions I will ask	How does it support the purpose
1. Supply Chain Management	Bigdell et al., 2013; Chen & Paulraj, 2004; Otto & Kotzab, 2003; Hult et al., 2003; Bigdell et al., 2013; Tan, 2001; Hult et al., 2003; Blanchard et al., 2008; Walton, 2004	- Level of understanding of SCM - Determine the benefits derived in the implementation of SCM Supplier management	- Understanding of the SCM concept - What support do you have in implementing SCM and at what levels - How do you integrate the SC process in practice? - Why do you think so? -What facilitates the effective functioning of SCM? Describe the processes of supplier management	Provides the “as is” in the understanding and the respondent views on SCM Determine the process and identify stock leakages if any and at what stage of the SCM process
2. Governance and Accountability	Barbazza & Tello, 2014; Hayry, 2005; Fukuyama, 2012; Penney, 2003; Huss et al., 2011; Macha, Mushi, & Borghi, 2011; Cepiku, 2013;	- Level of decision making, if any Understand the scope of the respondents awareness and contribution to the process of SCM	-Describe your role in the SC process Is a there s signed off protocol to your work, if so who signs off? - Are you aware of the stock level objectives for your department/section? - Do you have the authority to make decisions about orders? -Describe the process for tender orders and other order or reorder	-Does the respondent believe he/she is accountable in her position Is there a sense of empowerment if so at what level

3.3 Inventory tracking	Abdallah, 2014; Blanchard et al., 2008; Rachmani a & Basri, 2013;	The role of informed decision making	corruption, and incorrect delivery. How do you prevent stock loss? How do you track your deliveries?	Identification of leakages in the supply chain Determine the process of stock replenishment and how often
4.Reports generated	Paulraj & Chen, 2007;		How do you reconcile your orders with the delivery of stocks? Do you generate an overall stock report and how often is it done?	Ascertain the paper/technology trail to manage stocks
5 Capacity Development 5.1 Training and development 5.2 Staffing 5.3 Feedback	Brignall & Modell, 2000; Manuj & Sahin, 2011; Mount, Roberts, Mott, Demuth, & Nehls, 2012; Pinheiro et al., 2013;	To explore the role of human capital in the implementation of effective and efficient SCM To determine the level of operationalization of SCM by the Health authorities	Determine length of service, staff complement Have you undergone any training for the implementation of SCM? Do you have SCM guidelines specific to drug SCM?	Determine the impact of human resources and training on the operationalization of SCM
6 Performance indicators 7 Real Time Technology	Gorgens & Kusek, 2011; Ombaka, 2009; Sousa et al., 2011; Susarla & Karimi, 2012;	Assess the readiness to implement M&E based on measureable indicators To understand the current technology challenges in implementing integrated real time technology.	Do you have performance objectives and are they linked with stock availability/ out of stocks and stock loss management? Do you have real time technology or is it a combination of manual records and technology?	Determine the role of performance indicators and its link to performance management Determine the understanding of the implications of the current technology system.

Figure 6: Source. Author's Analysis. Research Questionnaire Guidelines.

3.1.3 Sampling

The sampling frame refers to the list of “all units in the population from which the sample will be selected” (Bryman, 2012:187). In this study the purposive sampling technique was deemed central to the research question and was ideally suited for this qualitative research. Purposive sampling comprises the views and judgement of specialists or experts with prior knowledge relevant to the study (Neuman, 2012). This was a strategic decision as only those participants “relevant to the research questions that are being posed” was included in the sample (Bryman, 2012:418). In this research the sampling population comprised the public and private hospital, private sector pharmaceutical manufacturer and distributor, the FMCG manufacturer, distributor and retail store.

Coco-Cola was included to provide the manufacturer perspective on the role of the principal’s contribution to ensure the availability of the right products, in the right quantities, in the right size are available in the right location at all times. The research interviews were conducted between January and March 2015.

3.1.4 Data Collection

The researcher was the moderator and the data collection instrument during the interview discussions. Permission was sought from the interviewees for the research interview and the recording of the conversation. The researcher presented the interviewee with a written reassurance for their confidentiality and anonymity in the research documentation and presentation of the findings. The data was collected in the subsets listed in Table 1 to allow for comparison of the research findings across the selected sample. The data collection method was clearly documented in a step-by-step format before the start of the research process. This had relevance to the reliability of the data, in that the study was consistent with the data collected. A manual transcript of the recording was undertaken which allowed for the recording of non-verbal communication during the interview. The researcher compared

notes with the transcript of the recording and clarified the understanding of the interviewee response. Any variances that emerged between the interviewer interpretation and the raw data recorded was interrogated to remove any researcher bias.

3.1.5 Analysis of Data

For ease of reference, during the analysis of the research results each subset of the interview sample was referred to as a cluster. This process allowed for the clustering of key groupings comprising the public and private hospital, pharmaceutical suppliers and distributors, FMCG manufacturers, distributors and retailers. The key themes that were identified in each cluster were colour coded to facilitate ease of reference during the analysis process. Important quotes were recorded with reference to the line number for inclusion in the research report. This process was repeated for each interview within each cluster. Once the key words and themes were documented, the next level comprised the identification of themes that were common across the clusters. The final stage comprised the key findings and has been presented in a narrative format including the data presentation, discussion of the research results and the concluding chapter.

3.1.6 Reliability and Validity

The major criticism of qualitative research is based on the concepts of reliability and validity of the research. The overriding concern of the qualitative researcher is with the consistency of the results when compared to the research question and data that was collected. Internal reliability can be improved by including a peer review to ensure that the results are consistent with data collected. Providing a “step-by-step detailed audit trail of data collection and the decision making process makes it possible for other researchers to repeat a similar study” (Bryman, 2012:392). The reliability of the research study will be strengthened by including the statement of the researcher’s personal experiences, orientation and bias, to create context to how the data might be presented (Bryman, 2012). In the Lincoln and Guba study (as cited in Bryman, 2012) thick descriptors were included so that the

readers can identify with the research situation and transfer the findings to other studies

3.1.7 Ethics

Social researchers “ often must balance two values: the pursuit of knowledge and the rights of the research participants or of others in society” (Neuman, 2012:53). In social research, ethics are the yardstick by which to measure the professional obligations of the researcher.

The role of ethics directs the actions of the researcher in terms of actions that are considered “moral, right or proper and what is not” (Neuman, 2012: 53), In the Dienar and Grandall study (cited in Bryman, 2012:135) the authors define the lack of ethics as “harm to participants, lack of informed consent, invasion of privacy and deception”. Ethical code violations include the unauthorised release of specific interviewee information collected for the purposes of this study or suppressing findings at the behest of political actors for personal or political gain (Bryman, 2012).

This study is a non-medical research but it included research within a health facility, as such the Department of Health required approval for the proposed research from the Wits Human Research Ethics Committee (HREC Non-Medical), followed by the approval of the Gauteng Department of Health Pharmacy division and the public health facility where the research was to be conducted. Approval to conduct research in the public hospital was granted on 6 January 2015.

The research requirements of the private hospital follow a similar approvals process as the public hospital. In the instance of the private hospitals, a centralised research unit provides the initial approval followed by the health facility approval process. The study is bound by a code of ethics from a research perspective that ensures that quest for knowledge will not impinge on the rights of the interviewee in terms of invasion of confidentiality and privacy. Personal details of the interviewees will not be included in the report, thereby maintaining confidentiality and anonymity.

3.1.8 Conclusion

There exists a body of literature on SCM and PSCM. There is a paucity of information as regards the SCM practices and processes in the public hospital and its contribution to the unavailability of drugs in the public hospital. The significance of the study was twofold: 1) it provided insights into the current SCM practices and processes as a contributor to unavailability of drugs in the public hospital, and 2) it provided insights into the impact of the current initiatives to operationalise SCM in the delivery of drugs in the public hospitals. The problem statement, knowledge gap, and the research question presented in this research proposal provided the best option to determine the processes and practices of supply chain management in a public hospital in Gauteng.

3.2 Qualification of Results

The title of the study is 'Supply chain management in a public hospital in Gauteng'. The planned study comprised 15 interviews that included the selected public hospital, retail distribution centres and stores, pharmaceutical and FMCG suppliers. Three interviews were planned in the public hospital, however, due to the multiple dispensing units in the hospital, the interviews were increased to six to ensure the study captured the nuances that could lead to a deeper understanding of the unavailability of drugs in the hospital.

During the research interviews in the public hospital it became apparent that the donor funders played a major role in the current SCM initiatives in the public hospital. The donors were included in the study to fully understand their role in SCM in the public hospital. The inclusion of the private hospitals and the independent pharmacies increased the overall number of interviews to 25.

The groups of interviews conducted were relevant to the study to provide data at various levels of SCM in the organisations. The FMCG SCM was a dedicated focus area because it has had over 60 years of experience in the SCM discipline. The sector provides valuable learning, and in the words of

the interviewee representing SCM of the largest retail chain “we don’t reinvent the wheel, we learn from other industries and adopt” (Respondent 11, 06.12.2014).

The research approval processes in the public and private hospital were onerous as presented earlier in this section, and required longer lead times than anticipated by the researcher to conduct the interviews. Once the approval process was completed the public hospital interviewees were accommodating, and the interviews were completed within a week of obtaining approval. The interview with the public hospital administrator to acquire background information on the selected public hospital proved to be challenge. Despite six personal visits at prior agreed times and numerous emails and SMSs to obtain the information, the researcher was unsuccessful in acquiring the relevant information.

Numerous calls and emails to the Gauteng Department of Health and Medical Supply Depot (MSD) went unanswered and were therefore not included in the study. The private sector was very helpful, except the largest retail chain; they consider SCM a strategic advantage and were initially unwilling to grant the interviews. They later agreed to a conference call from Cape Town, while the FMCG manufacturer requested the meeting in Port Elizabeth, where their SCM department is located. The remaining interviews were conducted in Gauteng.

The researcher could not secure an interview with the Gauteng Province Head of Pharmacy (five emails and ten calls). All the calls went unanswered. The researcher made contact with three persons at Medical Supplies Depot (MSD), but despite 13 emails to three persons at MSD, the researcher could not secure an appointment. This is a limitation to the study as the SCM programme is a Gauteng Province programme, with the implementation of SCM shared with the public hospitals.

The private hospital granted the interview with their Supply Chain Manager located at the corporate office in Cape Town.

To maintain the confidentiality and anonymity of the respondents the following respondent identification table was created.

Table 2 : List of Research Interviewees

Respondent and Title		Location/Sector	Date of Interview
1	Pharmacist	Public Hospital	16.01.15
2	Pharmacist	Public Hospital	16.01.15
3	Pharmacist	Public Hospital	16.01.15
4	Procurement Controller	Public Hospital	16.01.15
5	Pharmacist	Public Hospital	30.01.15
6	Data Controller	Public Hospital	03.02.15
7	Warehouse Supervisor	Retailer	18.02.15
8	National Warehouse Manager	Retailer	18.02.15
9	Tender manager	Pharmaceutical Manufacturer	13.10.14
10	Retail Store Manager	Retailer	13.02.15
11	SCM Food Division	Retailer	06.12.14
12	Logistics Manager	FMCG Manufacturer	02.12.14
13	Planning Manager	FMCG Manufacturer	02.12.14
14	GM Network Capacity Planning	FMCG Manufacturer	02.12.14
15	Supply Chain Manager	Private Hospital	25.05.15
16	Pharmacist	Private Hospital	07.07.15
17	Supply Chain Manager	Pharmaceutical Distributor	15.07.14
18	International Donor	Implementation Supervisor	02.02.15
19	International Donor	Country Director	12.02.15
20	Supply Chain Manager	Pharmaceutical Supplier	29.10.14
21	Demand Controller	Pharmaceutical Supplier	04.11.14
22	Logistics Manager	Pharmaceutical Supplier	29.10.14
23	Supply Chain Manager	Retailer food	06.10.14
24	Pharmacist	Independent Pharmacy	14.07.15
25	Pharmacist	Independent Pharmacy	15.07.15

The rationale for including the FMCG and pharmaceutical manufacturer, distributors and the retail stores in the sample covers the supply chain process from ascertaining demand, production, and distribution of the product to the availability to the customer. During the analysis stage two private hospitals were included to provide comparative data on the SCM practices in the private health sector.

3.3 Contribution by the Interviewees

It is important to remind the reader that the findings in this research study represent the views of interviewees and not the views of the researcher.

It became evident during the research that the employees of the public hospital were reluctant to make negative comments about the SCM system or acknowledge the issue of stock loss. However, when the researcher reframed the same question as a more general question, their input was less guarded. An example of the question was:

You are requested to address the executives of a public drug distribution section of a public hospital strategic session, to provide advice on stock loss. Your advice must include how to identify points of stock loss and on how to reduce stock loss.

The research in the public sector was conducted in the work environment and the absence of critical enablers of structure, people processes and technology was evident. Despite the barriers for effective implementation of SCM there are a few committed and dedicated members in the public hospital drug distribution team who work against all odds to manage the distribution function to ensure the availability of drugs to their patients.

3.4 Limitations to the Study

The purpose of this research is to determine the SCM procedures and processes at the public hospital outpatients departments with acceptable industry SCM best practice.

The Medical Supply Depot and the Gauteng Province Department of Health SCM division did not acknowledge the numerous requests to participate in the research study and are therefore excluded from the study. The study has not included the procedures and practices in other sections of the hospital, or the general procurement processes at the public hospital. However, the responses of the interviewees who considered the procurement or tender

process as a major contributor to the unavailability of drugs in the public pharmacies, were included in the study.

This study excluded corruption in the medicine registration, medical research or political corruption to influence policy formulation. Tender rigging and procurement corruption is considered grand corruption (Global Corruption Watch, 2013) and can influence unavailability of drugs in the public pharmacies (Leahy, 2013; Lewis, 2006), but it is not the core focus of this study.

4 Chapter 4: Data presentation

4.1 Introduction

The title and introduction to the research study 'Supply Chain Management in a Public Hospital in Gauteng' was introduced in Chapter 1. The background and rationale for the choice of the location of the study was included in Chapter 1. Chapter 2 provided the assimilation and synthesis of available academic literature and reports that are related to the research problem. The research gap was identified and provided the context for the conceptual framework in Chapter 3.

This chapter presents the contribution of interviewees to the research study. The research study involved interviewees from the public hospital, pharmaceutical manufacturers, independent pharmacists, fast moving consumer goods (FMCG) manufacturers and suppliers, the retail trade and the donor communities that participate in the pharmaceutical supply chain at the public hospital. Both the pharmaceutical and FMCG sectors were included to strengthen the understanding of SCM across the industries recognised as practitioners of SCM internationally and locally.

The FMCG industry was the early adopter of SCM and the pharmaceutical suppliers followed. The Pharmacy Amendment Act of 2000 allowed ownership of pharmacies by non-pharmacists, resulting in the inclusion of pharmacies into the FMCG wholesale and retail sectors. Most of the pharmaceutical suppliers are dual suppliers to the public and private sectors; they provide valuable information in terms of their interaction with the public hospital.

4.2 The Public Hospital - Data Presentation

The research was conducted in the main and satellite pharmacies of the public hospital as well as the specialist (HIV) clinic.

4.2.1 The Public Pharmacy Operating Model

The public hospital included in this study has multiple dispensing units in multiple locations within the hospital. In the public hospital there are numerous sections including wards and specialist units. The main pharmacy serves as the 'exit point' for drugs to the hospital in-patient wards and the outpatient's section, and thus shoulders the ultimate responsibility and accountability of ensuring the availability of drugs in the hospital.

The hospital-operating model comprises 21 exit points for drugs ordering, inventory holding and dispensing nodes.

Table 3: Authors Analysis. Drugs distribution exit points

Pharmacy Locations in the Public Hospital	Pharmacy Source of Drug Supply
1 Main Pharmacy	Receives drugs from suppliers & distributors
3 Outpatient Pharmacies and 2 donor drug dispensing units	Receives drugs from main pharmacy and suppliers
1 Inpatient Pharmacy	Receives specialist drugs from main pharmacy
4 Inpatient general wards	Receives drugs from inpatient pharmacy
9 specialist wards	Receives drugs direct from suppliers and main pharmacy
1 Private Hospital (provides additional beds for patients)	Receives drugs from Main Pharmacy

The pharmacy operation model comprises a multi-inventory holding and complex dispensing format.

We have receiving and facilities for prepacking, manufacturing (e.g. dilution of intravenous sachets), and facilities for outpatient issuing stock, renal clinic. The internal wards are from the main pharmacy. Dangerous or expensive drugs for wards are treated as non-ward stocks – treated as special items. Ward stock do the rest. Ward stock will keep Augmentin. If someone needs Poligon, it costs R3000 per dose then our inpatient department will deliver. We have to sign and they have to sign. Oncology drugs go through inpatients departments which are supplied by the inpatient pharmacy department. From the stores to ward stock to the patient (Respondent 3, Public Hospital, 16.01.15).

The complexity of drug supply in the public hospital arises when certain drugs are delivered by the manufacturer directly to a pharmacy while others are supplied by the Medical Supply Depot or through the main pharmacy. All the dispensing units except the ward dispensing units have the flexibility to order and receive drugs directly from the supplier or via the medicine depots. A private clinic that treats the 'overflow of patients' from the public hospital, receives the medicine requirements from the main pharmacy of the public hospital (Respondent 2, Public Hospital, 16.01.15).

The interviewee indicated that there were no controls to verify that the drugs dispensed and consumed by the patient in the wards or that the fundamentals of stock management including stock rotation was practiced in the wards. The ward was described as the "black hole" where the stock disappears without the necessary controls in place.

However the black hole is the stocks ordered and stored at ward level. We have no way of monitoring the stock holding levels or where the stock went. We cannot track.
(Respondent 2, Public Hospital, 16.01.2015).

The documents from the wards are manually recorded by the ward staff. Projection of demand from the multiple locations presented a challenge to the implementation of SCM as each dispensing pharmacy operates off a different software programme that makes it difficult to obtain the "one view" of the drug demand requirements of the hospital. It was ascertained that one dispensing pharmacy within the public hospital operates on three software programmes that are 'stand-alone' programmes that do not integrate to provide the one view of the pharmacy demand and supply requirements.

4.2.2 The Staffing conundrum of the Pharmacists versus SCM Specialists

The public sector is a late entrant into the practice of the SCM discipline and as such the interviewees demonstrated an understanding of SCM relevant to their current role. Four of the five interviewees in the drug distribution section are pharmacists, with no formal training in logistics or SCM. SCM training is largely 'on the job' with the generic supply chain guidelines, SOP manual,

and computerised software training provided by the donor sponsoring the software. The understanding of SCM by the hospital pharmacy supply chain unit included the following:

SCM is SOP, it is tenders, technology people; comprises the time of orders to the patient receiving the drugs, and made up of rules processes and procedures (Respondent 1, Public Hospital, 16.01.2015).

One of the four pharmacists interviewed in the public hospital articulated the adequate criteria for effective SCM as expressed by organisations considered as best practice practitioners of SCM as follows:

Effective functioning of SCM is about efficiency, proactive thinking, inventory, includes everyone from different departments, stakeholders, involve all associated with distribution and include people from the ground level, bottom-up approach, they can provide the demand figures, they know what is going on. (Respondent 5, Public Hospital, 31.01.2015)

The interviewees manage the issue around stock unavailability in the public hospital with manual entries and spreadsheets to determine the demand levels. They are unanimous in their view that it is not ideal as they cannot determine ward stock stockholding or consumption of medicines, nor the volume and value of stock lost or expired.

The interviewees believe that the National Department of Health (NDoH) and Gauteng Department of Health (GPDoH) have not adequately supported the implementation of SCM.

The NDoH is not doing enough to set national guidelines. Each health facility is left to implement policies at their own pace, so there is no urgency or national development (Respondent 1, Public Hospital, 16.01.2015).

4.2.3 The GPDoH at the Centre of the Provincial Drugs unavailability Predicament

In the main, GPDoH holds the responsibility for ensuring the effective functioning and financial management of the health facilities in the province. The province manages the finances of the health facility including the payment to the suppliers of drugs (*South Africa; National Health Act 61 of 2003, 2003*).

The management of the financial budget is done by the province, and the province measures the finances on the overall provincial spend and not specifically that of the health facility or the drug availability segment, the main concern was the overspend of the health budget at a provincial level (Respondent 2, 16.01.2015).

The province is responsible for the overall budget management and in the event of an overspend of the provincial budget, the province implements an indiscriminate freeze on blanket spending across all the health facilities in the province, including the purchase of drugs. The Province takes no cognisance of the individual health facility 'budget versus expenditure' management. Prudent spending by the facility was not rewarded due to the blanket approach of managing the provincial health budget.

We might manage our budgets, but if the province has overspent due to mismanagement of budgets by other facilities, then province stops orders, and if we are managing our stocks with stock levels cautions then we are most affected. Breeds the stockpiling mindset (Respondent 5, Public Hospital, 30.01.2015)

It was not clear in this research whether the budget projections were inadequate at the planning stage as the interviewees could not verify whether a zero based budgeting initiative was undertaken to test the veracity of the budgets during the planning stages.

The high degree of autonomy granted to the provinces for the creation of the structures to address the unavailability of drugs in the public hospital is creating further segmentation (*South Africa; National Health Act 61 of 2003, 2003*). The Gauteng Department of Health (GPDoH) in its effort to improve the availability of drugs has created the Provincial Medicine Procurement Unit (PMPU) to centralise the ordering and financial management of drugs in the health facilities (Respondent 2, Public Hospital, and 16.01.2015).

Early indications are that the involvement of the PMPU has not alleviated the problems associated with the availability of medicines. The study clearly showed the complex processes implemented by the PMPU as seen below have created operational issues in managing the availability of drugs in the hospital.

The orders are placed by the hospital with PMPU, PMPU then places the orders with the suppliers, the suppliers deliver the drugs to the hospital. The hospital submits paper work to the PMPU and the PMPU pays the supplier.

In an environment where demand projections are a problem, speed in correcting the out of stock drug situation is of paramount importance. In the current process the health facility cannot follow up with the supplier of short delivery of critical drugs because only the PMPU is allowed interaction with the supplier. Further payment to the supplier is made by the PMPU while the supporting documents are supplied by the hospital.

The PMPU creates the order number before it is allocated to national. The order number comes back to us with details of the invoice then the stock is delivered. Once we receive the stock and proof of delivery, we send that through to the PMPU and they release for payment. With Medicine Supply Depot we place direct as they hold stock. When we do not receive the stock we have to call PMPU to find out why it is not delivered. We cannot call directly. Suppliers get paid but dependent on whether the documents are done properly, if done then OK. (Respondent 5, Public Hospital, 30.01.2015).

Any incorrect documentation stalls the payment process and the supplier withholds delivery of the drugs. "We sometimes have to wait over a year to be paid" (Respondent 9, Pharmaceutical Manufacturer, 13.10.14). The hospital pharmacy drug section is often unaware of the missing document or whether or not the supplier has been paid. Issues related to non-payment of suppliers is not transparent (Respondent 2, Public Hospital, 16.01.15).

Four out of six interviewees in the public hospital doubted the transparency of the stock unavailability issue, as they believed that the main cause of non-delivery by suppliers was the PMPU non-payment and other operational

factors including timeous completion of the reconciliation of the documents to effect payment to suppliers.

We place the order with PMPU, we sign off the stock received and submit to PMPU, the rest we don't know about. Central procures, as province managers we order, it can lead to time delays or document issues. Numerous role players, central procures, province orders, the health facility receives orders, administration and finance manage the payment (Respondent 5, Public Hospital, 30.01.2015).

The PMPU initiated process is an attempt to centrally manage the availability of drugs in the provincial public health system and thereby reduce stock loss, corruption, manage the finances and improve the availability of drugs in the provincial health facilities (Respondent 2, Public Hospital, 16.01.15).

The drug suppliers are critical of the provincial financial management and payment of accounts. The pharmaceutical suppliers claim that they have to submit the orders, invoices, receiving documents and POD's for payment multiple times. They have now resorted to scanning all documentation so that they can attach them to the invoices for payment for repeat submissions.

We now have to compile payment packs, copies of orders, delivery notes and PODs. Sometimes we have to resend multiple times (Respondent 9, Pharmaceutical Supplier, 13.10.2014)

4.2.4 The Impact of the Tender Process is our big problem

The pharmacists in the public hospital and the drug suppliers from the pharmaceutical sector regard the lack of tender volume projections to the supplier as the single biggest contributor to the unavailability of drugs.

The tender contracts are awarded by the NDoH to multiple suppliers, the contracts are managed and the order and payment to suppliers are executed at a provincial level. The tender contract document to the supplier reflects the total annual volume requirement, which makes it difficult for the supplier to schedule the monthly production, or purchase the active ingredient, and this

could have a two year lead time. The inability by the tender authorities to determine drug demand results in the inability of the supplier to provide the stocks to the health facility.

The interviewee explained that the hospital stocked 616 products on the Essential Drug List (EDL) and 194 non EDL drugs. The high number of items on the EDL increased the propensity for the drugs on tender 'to be in an out of stock items' regularly and for long periods of time. Due to the lack of monitoring capabilities, the out-of-stocks of the products on tender were not measured, so that corrective action could not be taken to improve the tender projections in subsequent tenders.

A problem that was experienced two years ago appears again, means we did not learn anything from it and did not solve the problem, so it keeps happening or we experienced a particular situation in December, two years in a row but we don't do anything to avoid it in the third year.... We do not identify patterns (Respondent 2, Public Hospital, 30.01.15).

4.2.5 Stock Loss dilemma in the Public Hospital

The interviewees were reluctant to admit to the loss of stock as a contributor to the out-of-stock experienced in their facility or in their area of responsibility. They are unanimous in their view that they cannot quantify stock loss, nor can they identify the location or the reasons for the loss. They attribute the stock loss to factors such as expired stock, lack of stock rotation, ward stock loss or 'squirreling of stock' referred to as stockpiling or hoarding of stock (Respondent 2, Public Hospital, 16.01.15). This measure is undertaken to limit the impact of stock unavailability in the event of a moratorium by the GPDoH on purchasing due to budget constraints.

Other reasons for stock loss proposed by the interviewees were, incorrect documentation, damaged stock, erratic ordering and the inability to project demand. The lack of an integrated technology system, inadequate network capacity and standalone computers that are not linked were cited as the major causes for the inability to implement electronic monitoring that which could have enabled a more accurate demand projection.

Provides good information and better service, provides better forecasting, and that affects the entire supply chain. The lack of integration of the technology systems, inadequate network capacity and that our systems are not linked is a major problem (Respondent 6, Public Hospital, 16.01.15).

Theft was acknowledged as a contributor to the unavailability of drugs in the public hospital. Three of the hospital interviewees responded with “it does happen but not in this section of the hospital” (Respondent 3, Public Hospital 16.01.15). There was no additional information volunteered despite the researcher request of “Why do you say that?”. One of the pharmacists acknowledged “theft is an issue, but the bigger issue is that we cannot tell you how much is stolen and where it is stolen (Respondent 2, Public Hospital, 16.01.15). The interviewee added that the problem could only be solved with technology that allows for electronic ordering, warehousing and dispensing on one system.

The interviewee remarked that stock security was a problem “Where there is money to be made, our products have money value, there will always be the issue of theft” (Respondent 1, Public Hospital, 16.01.15). One of the interviewees said that incomplete documentation, non-adherence to process and lack of sanctions to those employees who did not do their jobs allowed stock security to remain a problem. “In my time I have never seen anyone fired for not doing their job” (Respondent 3, Public Hospital 16.01.14).

4.2.6 We cannot Project Demand

Four of the six interviewees locate the heart of the SCM problem in the inability of the public pharmacy supply chain role players to project demand.

Our greatest stock outs occur because we cannot project demand (Respondent 2, Public Hospital, 16.01.15)

The major factor in the inability to project demand to be a function of the multiple drug ordering, storing and dispensing touch points in the public hospital. The multiple dispensing locations without integrated technology capability was identified as the biggest contributor to the inability to calculate stock levels and stock loss in the public hospital.

Our problem is that we have stock at so many points at the hospital that unless we are fully technology assisted it is impossible to manage. Our wards carry stock so we cannot tell you how much is used by the patients or nursing staff (Respondent 1, Public Hospital, 10.01.15)

Another factor contributing to the inability to project demand by the public hospital are that the stock is recorded by products and supplier as opposed to stock keeping unit (SKU). The researcher probed the rationale for the listing of product by the suppliers as opposed to SKU's, the interviewee could not offer an explanation, stating "it is the way they record the products" (Respondent 2, Public Hospital 16.01.15).

4.2.7 The Technology patchwork blanket and the Donor effect

The rallying cry among the public sector interviewees was the inability to monitor the stocks and determine demand. They pinpoint the problem to the inadequate network capacity, hardware and fragmented software programs that made electronic monitoring and reporting impossible.

Respondent 2 explained that the multiple donor programmes running concurrently within one section of the drug dispensing division in the hospital, created a 'legacy based' technology capability. The researcher was not able to determine the existence of an IT strategy, IT architecture, software or a network capability audit. The pharmacist indicated that the software programs do not 'talk to each other' making it impossible to have one view of the demand requirement.

The outpatient pharmacy section has launched the donor drug dispensing software that is managed by a non-profit organisation (NPO) that implements the program on behalf of USAID WHO, World Bank and UNICEF. The software solution is a standalone stock management system and does not include the facility for integrated supply chain management including the demand and supply component. Measurement of the out-of-stock situation and stock loss cannot be quantified or coded on this system to locate and ascertain the value of the stock loss.

In the pharmacy dispensing the drugs for dread diseases, four independent software programs were in operation to dispense drugs:

Two software systems funded by USAID and managed by a managing donor (NPO), a prepacked dispensing system, and two electronic script writing software programmes for HIV and TB (Respondent 5, Public Hospital, 30.01.15).

These software programmes do not “talk to each other” (Respondent 5, Public Hospital, 30.01.15). The complexity arises when the HIV/Aids patient is also a tuberculosis (TB) patient. The pharmacist added that an interface is in the process of being written to connect the dispensing and the script writing software programs. All three programmes are funded by USAID and other donor partners. The stock management software launched in the outpatient section is also a USAID initiative, but there was no collaboration on the initiatives by the managing donor organisation responsible for the implementation of the programmes.

The introduction of the donor software has been in implementation phase through various health facilities and according to the interviewee has achieved a mix of successes and failures. The donor was unable to provide information on the sustainable success of the programme at health facilities since its introduction. The donor places blame for the mixed success rate of the software programme on the unwillingness of the public hospital staff to implement the changes.

When probed for any change management initiatives that were implemented pre-, during or post-implementation stage, the donor response was that the hospital was responsible for the implementation of the change management programme, and not the donor. The donor considers the change management process located outside the agreement with the hospital. It was believed that the inclusion of people-related issues could jeopardise the acceptance of the donor programme.

4.2.8 Pilot Programme Fatigue

Over and above technology overload, four major projects are managed by the team comprising two pharmacists and 13 interns and pharmacy assistants. The pilot projects are: GP Down Referral Group, Adherence Groups and Direct Meds which is a national project; and the Central Procurement Unit initiative that has been implemented in the “20 busiest sites” which is a national. The interviewees blame the multiple concurrent pilot projects for creating “pilot fatigue syndrome,” a term used by the interviewee to describe the experience endured by the pharmacy team (Respondent 5, Public Hospital, 30.01.15).

The following quotes summed up the sentiments expressed by the interviewee:

Too many donor-funded projects in the system make the problem bigger because it usually looks at one aspect of the system. I rely on physical stock count as we have too many projects at the same time, some new, others in stages of implementation.e.g the pre-packed dispensing system is being replaced by a new system, an ATM type of system of dispensing drugs (Respondent 5, Public Hospital, 30.01.2015).

The interviewees indicated that there was no collaboration amongst the various role players in the adoption of the software programmes. In the interview with the donors, it was clear that there was no collaboration or integration with the existing software programs. The donors do not share any learning with the key role players in the SCM in the hospital including those members responsible for the implementation. It is important to differentiate between training to use the software (keyboard clicks) and training in SCM. It could not be ascertained whether the level of collaboration exists with the donor at the provincial level.

The international donor is currently rolling out a stock management system in the outpatient pharmacy. This system does not include the electronic script writing or dispensing software. The donor acknowledged that there was no due diligence conducted in the health facility before the pilot study or the implementation of the initiative (Respondent 18, Donor, 02.02.15). The

Country Director however stated that they do conduct a due diligence (Respondent, Donor, 12.02.15). The researcher was not provided with any documentation to support the claim of the Donor Country Director.

The donor implementation unit has been implementing the software program since 1997 in the Eastern Cape health facilities, and has achieved mixed success. Since then it has been rolled out in the Free State and currently is being introduced in Gauteng and KwaZuluNatal. The donor conceded that there was no collaboration between the two donor entities currently implementing the software in the public hospital. In fact there is lack of knowledge between the two donors (Respondent 19, Donor, 02.02.15) about the projects being planned or being implemented at the public hospital.

When probed about the mixed results on the initiatives, the interviewee responded that while the software program works, “it falls flat once we leave” the facility (Respondent 18, Donor, 02.02.15). Probing the reasons for the mixed results and failures in others, the interviewee stated that people issues are the biggest problem, “competent, willing people, people who want to be accountable, and who take pride in their work” (Respondent 18, Donor, 02.02.15). When probed for the people capacity and capability assessment required for the successful implementation of the software, the Country Director responded:

We do not advise on people requirement, it could jeopardise the acceptance of the project if there are people implications in terms of the new programs (Respondent 19, Donor, 02.02.15).

The response to the researcher probing with the question, “If there was one thing you could change tomorrow to contribute to the improvement of stock availability, what it would be and why?”. The people factor emerged as one of the critical success factors for the implementation of supply chain management.

Competent people, people willing to work, wanting to be held accountable. Networking at the facility, doesn't seem to exist

anymore. I feel the nurses are not committed, they just see it as a job (Respondent 18, Donor, 02.02.15),

4.2.9 Staffing, Performance Management and the Unions

One of the biggest barriers for the effective implementation of SCM is people and their capacity and capability to function within the SC continuum, whether at provincial or facility level. SCM is a specialised field and requires specialised skills. Four of the five interviewees in the outpatient pharmacy supply chain section are pharmacists. Neither the pharmacist nor the pharmacy technicians have been trained in SCM, nor are there any NDoH or GPDoH initiatives in place to upskill the health facility staff on SCM or logistics specific to drug SCM. The training that is implemented by the donor fraternity is specific to the use of the computer software and not in SCM. The statement was verified by the researcher having sight of the software training manual, comprising mainly of the 'keyboard clicks' routine.

We always focused on IT stuff, but we know it is more than that, more to do with HR, no one likes change, it's the attitude, we have that issue on every site (Respondent 18, Donor, 02.02.15)

HR department does not have guidelines for sponsorship to move people internally. We need to develop it (Respondent 1, Public Hospital, 16.01.15)

There is no capacity and capability planning, with very little human capital development. On the flip side the interviewees maintain that people are unwilling to learn and there is nothing that can be done as the employees are highly unionised (Respondent 5, Public Hospital, 30.01.15) and they are protected so "they don't do what they don't want to do, the people are so protected there is nothing you can do" (Respondent 2 Public Hospital, 16.01.15). This, despite the fact that pharmacy staff are performance measured by KPI's four times a year (Respondent 1, Public Hospital, 16.01.15). The researcher was refused access to a performance evaluation template, with the respondents citing confidentiality or unavailability of the document as it was being updated.

The interviewees believe that salary increases are the major motivator for performance. In this instance the union negotiated the salary increases and only the bonus is motivated by performance (Respondent 2, Public Hospital, 16.01.15). The 'one size fits all' union negotiated salary increases were considered to be demotivating to those who made the effort to perform at a consistently high standard (Respondent 2, Public Hospital, 16.01.15). The interviewee commented that they viewed performance management measurement as including the obligation of holding employees responsible for poor performance. The sentiment of the interviewee in the drug distribution unit was summed up with the statement "I have never seen anyone fired or reprimanded for not doing their job (Respondent 3, Public Hospital, 16.01.15).

The researcher probed for the possibility of employing suitably trained SCM staff and was informed that reassigning an employee to a post out of the current role requires relinquishing the post with the employee to the new position. The interviewee added that the lack of posts for the drug distribution section of the hospital was a problem. The interviewee added:

It was better to have a body working at 50 per cent capacity than none at all, you are stuck with what you are stuck with (Respondent 2, Public Hospital, 16.01.15).

4.2.10 We Work in the Dark

Communication in the public hospital has been identified as a major problem by the interviewees from the public hospital.

Often the doctors are unaware of the changes to the EDL and prescribe the deleted drug. The dispensing department will reflect an out of stock and the patient will not receive the drug (Respondent 2, Public Hospital, 16.01.15).

The interviewees consider that the lack of communication and feedback on the numerous pilot projects at the specialist pharmacy contributes to the abdication of the day-to-day responsibilities in managing the progress of the projects. There was a lack of communication on SCM at all levels in the facility (Respondent 5, Public Hospital, 30.01.15).

The interviewee qualified the comment with the view that the SCM results could be presented by the GPPTC to senior management, but were not shared with people intimately involved with the implementation of the programme. SCM staff considers communications an important means to provide feedback on performance (Respondent 2, Public Hospital, 16.01.15). One of the interviewees considered communication to be very important to reaffirm objectives and allow for 'bottom up' integration because "the people on the ground know more about it" (Respondent 5, Public Hospital, 30.01.15). While drug SCM is a national initiative, its implementation programme is dependent on the provincial and health facility buy-in and management commitment. One of the interviewees added that the M&E (if it was done) were not shared with the SCM implementing staff of the health facility, as a result they are not privy to the information (Respondent 2, Public Hospital, 16.01.15).

4.2.11 "Our Problem lies in the Monitoring"

The interviewees in the pharmacy section of the hospital are unaware of the functioning of the M&E department. "It has not yet been established to work the way it should function" (Respondent 2, Public Hospital, 16.01.15). The Government-wide Monitoring and Evaluation System (GWM&ES) are viewed as standalone department in the public hospital and are considered the solution to implementing the measurement of SCM.

Our biggest problem is that we don't have a system to monitor our stocks (Respondent 2, Public Hospital, 16.01.15).

The SCM best practice requires the identification and measurement of performance indicators for all activities throughout the supply chain. Any attempts by the researcher to obtain sight of the agreed performance indicators from the interviewees were rejected, citing confidentiality as a reason. Additional probing on the role of SCM did not yield additional information on M&E.

4.2.12 Non-verbal Observations by the Researcher

The research interviews were conducted in the pharmacy environment that comprised a receiving, warehousing, repacking, general and dispensing environment. Limited security controls were identified in the literature review as a contributory factor to stock loss and the unavailability of stocks in the public hospital. The researcher observed that there was no physical search of employees or visitors entering or leaving the pharmacy area. In the main pharmacy, there was a security checkpoint located at the entrance of the section, ensuring that the visitors sign in. The in-patient dispensing pharmacy was located to the left of the checkpoint.

The drugs were dispensed to the wards through individuals who announced themselves as 'pick up medicines'. The security person nodded approval, and there was no effort to record the name of the person collecting the medicines. The courier left with the medicine; there were no security measures in place to determine that the courier left with only the drugs listed on the documentation. The researcher undertook multiple visits and on each visit the security modus operandus remained the same. The outpatient pharmacy dispensing staff did not undergo any form of security checks. The researcher did not undergo any security checks and at no stage was there a request made by security about a laptop or other instruments the researcher could have on her person.

The drug dispensing staff interacting with the patients do not wear a uniform, distinguishing garment or a name tag that differentiated the pharmacy staff, the pharmacists, trainees and pharmacy assistants. The location of the outpatient drug dispensing pharmacy was very crowded and it was difficult to differentiate the hospital pharmacy staff from the outpatients.

There were no information boards, workflow charts or standard operating procedure (SOP) signs visible in any work area. The researcher ascertained that the SOP is filed away. Information posters on vision, mission and values of the facility were not visible to the researcher. Posters reminding the staff of

performance levels required or consequences of theft in the facility were not visible.

4.2.13 Concluding Remarks on the Public Sector Interviews.

The unavailability of drugs in the public hospitals is not due exclusively to theft or corruption but rather a function of a number of factors among them the lack of understanding and practice of the supply chain principles throughout the supply chain continuum.

There was no reference to theft or corruption as issues relating the unavailability of drugs, however mismanagement, maladministration, incompetent and uncommitted employees, the lack of technology, inventory management tools, processes and procedures were considered the major contributor to the unavailability of accurate data. The interviewee considered the unavailability of technology as critical and defended her position on the people issue by stating there is inadequate SCM training especially in the drug SCM (Respondent 6, Public Hospital, 18.02.15).

4.3 The Private Sector – Data Presentation

4.3.1 Introduction

For clarity this section of the study comprises the findings in the private hospitals, independent pharmacies, pharmaceutical and FMCG manufacturers, distributors and the retailers. The responses by interviewees in the private sector sample demonstrated similar responses to the questionnaire guidelines. For the purposes of presenting the research findings were the responses from the various private sector sample sets were aggregated as a component of the private sector. Any differences were recorded as such and the comments have been attributed to interviewee views from the specific sample set.

The private sector views SCM as the means to ensure that the “the right product, in the right place, in the right size, at the right price, is available at the right time, all the time” (Respondent 13, FMCG Supplier 02.12.14). This is critical to delivering on the company objectives, as unavailability of stock

impacted directly on the levels of customer satisfaction and profitability. The pharmaceutical supplier has adopted SCM to improve efficiencies and has been compelled to subscribe to the requirements of their dual private and public sector client base (Respondent 20, Pharmaceutical Supplier, 29.10.14).

The lines between the pharmacy and the FMCG retail stores have become blurred; as pharmacies are now located within most retail chain stores. The retail stores have adopted the SCM in the retail pharmacies from their FMCG experiences with relative ease while maintaining the pharmaceutical protocols (Respondent 7, Retail, 18.02.15).

4.3.2 Supply Chain Management is embedded in the business

The definition of SCM provided by a South African pharmaceutical manufacturer captures the basic understanding of SCM as follows:

Supply chain management does not just happen, nor is it only about technology. It is about planning, forecasting demand, inventory management and distribution. Overselling and under selling the estimated volumes can create problems. Planning and forecasting is the key action, from which flows our accountability to ensure we provide the customer with the right product, at the right place, in the right size at the right time at the right price, all the time (Respondent 20, Pharmaceutical Manufacturer, 29.10.14).

Large companies that manage and distribute multiple products to the multi-location markets concurred that the key output of SCM is the collection, collation and interpretation of data to make informed decisions about the financial and non-financial strategic objectives.

Research was conducted in two private hospitals that showed the similar SCM understanding, process and practices as adopted in the FMCG and pharmaceutical sectors. The private hospital represented by Respondent 15, has a centrally structured SCM oversight unit, located in the corporate office, with the responsibility to design the technology architecture, house the analytics team and manage the overall hospital SCM communication at a group level (Respondent 15, Private Hospital, 25.05.15). Each private

hospital in the hospital chain retains accountability to manage their SCM requirements supported by technology. The analytics team derive an activity-based template from the patient data that determines the size of the SCM team required to adequately support the Drug supply management process. It is not based on the number of beds. This approach has been adopted to improve efficiency, effectiveness and cost containment without adversely affecting patient care (Respondent 15, Private Hospital, 25.05.15).

The private hospital represented by Respondent 16 has centralised technology system but a decentralised SCM management role without the hands-on oversight approach to the day-to-day SCM. The individual hospital determines the stock levels and manages the stock holding with order cards that have a minimum and maximum stock level (Respondent 16, Private Hospital, 07.07.15); they do not have a central analytics team that provides the guidance and assistance. The decentralised SCM practice results in high levels of 'dead stocks' due to the private doctors who are located in the facility prescribe specialist drugs and on a subsequent visit by the patient could prescribe another drug.

I wish I can better manage the private doctor prescription usage and prescription pattern, it's a big headache for me
(Respondent 16, Private Hospital, 07.07.15)

This difference lends credence to the best practice finding in the Literature Review (Chapter 2) that identifies that a centralised SCM unit with centrally managed technology architecture and with the oversight on SCM functioning throughout the organisation helps foster SCM best practice in an organisation.

The private independent pharmacy views SCM as "the proper record keeping and the method in which we manage stocks to supply our customers, and remain in business. Manage your stocks, you cannot be successful without it" (Respondent 25, Independent Pharmacy, 15.07.15). The independent pharmacies manage their stocks on two dimensions - customer service and financials.

4.3.3 The Enabling Environment - structure follows strategy

The interviewees listed internal environmental factors as the precursor to practicing effective and efficient SCM. The following key concepts were collated from the responses and are considered critical to effective SCM: participatory environment, accountability, leadership, management approach, collaboration, iterative process, coordination, integration, people, commitment, dedication, willingness, performance measurement and communication, as critical for the effective functioning of SCM.

The Group Supply Chain Manager of an FMCG manufacturer stated that SCM is based on the company strategy (Respondent 13, 02.12.14). The interviewee from the retail sector added that seniority of the supply chain executives within the management hierarchy demonstrates the importance of the SCM role within the organisation (Respondent 10, 13.12.14). The position of the supply chain manager on the organogram signals to the organisation and the people within the SCM continuum the seriousness attached to the SCM portfolio. The pharmaceutical supplier qualified the SCM approach as follows:

The enterprise strategy determines the appropriate processes that design the structure and the structure in turn determines the people composition to effectively manage the SCM (Respondent 14, FMCG Manufacturer, 02.12.14).

The largest retailer in South Africa with over 350,000 stock keeping units (SKUs) considers efficient SCM as a competitive advantage to deliver on the business strategy (Respondent 11, FMCG Retailer, 6.12.14). The two South African retailers with an international footprint that were included in this study were one of the early entrants to adopt SCM as a critical component to ensure the availability of their stocks throughout the urban and rural footprint. The retailers could not provide dates of the initial SCM implementation but place the commencement of technology-driven SCM in the late 1960's or early 1970s.

The enterprise strategic decision to focus on SCM became a necessity with the adoption of the central distribution centres

(CDC) model of managing their stocks throughout the stores. The adoption of the distribution centres (DC) distribution model created three supply chains; one from the supplier to the DC, and from the DC to the retail stores, and finally from the stores to the end customer (Respondent 23, FMCG Retailer, 06.12.14).

The retailer manages the complex supply chain through technology. Master data is created to record the supplier information, which is stored through the management of individual SKU.

The movement of the 350,000 line items on the master list is managed by technology and analytics to determine the demand and supply of the line items per store. The capacity and capability in managing the magnitude of stock items provides the backdrop to effective and efficient implementation of SCM.

We have to have an effective and efficient SCM because we have local, transnational and international distribution, we export, import so we have to have a state of the art SCM (Respondent 11, FMCG Retailer, 06.12.2014).

The FMCG retailer explained at length that technology alone could not deliver effective SCM - the clarity of roles, responsibility and accountability are key to the effective functioning of SCM throughout the organisation.

Technology alone won't do that, it requires the correct data capture and means that all staff need to do their jobs assigned to them (Respondent 8, FMCG Retailer, 18.02.15).

4.3.4 Governance and Accountability in action

Governance and accountability are key to effective and efficient SCM.

It's the whole process, applying proper process, proper governance, managing the financial side, logistics is just a component of it, comes down to taking accountability for your expertise (Respondent 15, Private Hospital, 25.05.15)

Governance and accountability do matter according to the SCM executives and staff interviewed from the private sector.

We have clear accountability, each staff, logistics team, expeditors, and warehouse managers, have KPIs so they know what is expected of them. (Respondent 13, FMCG Manufacturer, 02.12.14).

The respondent maintains that it sets the framework for the effective functioning of SCM and the employee performance measurement as identified in Chapter 2. The private sector views governance and accountability as a shared company responsibility, both individually and collectively.

In order for all these (SCM) components to work well, a very deep sense of corporate governance and ethics need to be in place. The management of SCM is complex and it needs to work at all levels (Respondent 17, Pharmaceutical Distributor, 15.07.14).

Performance measurement at all levels is an integral component of a well-functioning supply chain. In the words of the supply chain manager in the pharmaceutical sector, KPIs instil accountability at every level so there is no confusion as to what is expected of each of us individually and collectively” (Respondent 13, FMCG Manufacturer, 02.12.14). The organisation identifies that the key performance measures cascade from the CEO to all levels within the company (Respondent 13, FMCG Manufacturer, 02.12.14). The all-encompassing companywide performance measurement builds SCM consciousness throughout the company (Respondent 12, FMCG Manufacturer, 02.12.14).

Respondent 12 explained that the group-wide KPIs were derived from the data that was available, and through data modelling it was possible to set KPIs that were meaningful and measurable. The interviewee explained that accountability was not seen as just a company buzzword, it was translated into actionable measures relevant to all levels of the company.

The KPI measures were possible due to the availability of data that electronically collated and aggregated from all sections of the business in real time, thereby “simplifying the business and making life easier”

(Respondent 12, FMCG Manufacturer, 02.12.14). This concept was further expanded on to demonstrate the level of commitment to SCM:

We have well defined KPIs using real time metrics; stand-alone systems are now integrated. The KP's flow automatically from the EXCO KPIs (Respondent 12, FMCG Manufacturer, 02.12.14).

4.3.5 Accountability, measuring Stock Availability Focus, reduces Stock Outs

This section contains a detailed FMCG approach to ensuring stock availability to provide context to the private sector approach to stock management. The FMCG sector tracks the products by SKU, to ensure that “the right product, in the right size, at the right price, in the right place is available at the right time, all the time” (Respondent 14, FMCG Manufacturer, 02.12.14). Three interviewees from three different companies (Respondent 12, 23, and 24) repeated this statement during the course of the interviews. The statement on the “right product at right time...right condition” is quoted by academic authors consulted for the literature review, (Chapter 2), demonstrates that the respondents are well versed in the academic publications on SCM.

The data, planning, forecasting, production planning, warehousing stock management and logistics are measured by SKU. Planning and forecasting is measured by SKU to make the decisions on the location of the customer to ensure effective and efficient SCM. Accountability for stock availability is therefore measured at an SKU level, preventing a distorted view on stock availability based on the overall brand, as explained by the pharmacist in the public sector, “For example Panado tablets are not listed by pack size and strength, but just as Panado tablets” (Respondent 2, Public Hospital, 16.01.15).

Planning and forecasting is the key action, from which flows our accountability to distribute on time and for us to capture and manage the products (Respondent 8, Retailer, 18.02.15).

Managing by SKU ensures efficient deployment of resources and is essential in extracting efficiencies throughout the supply chain, “We produce stock based on as accurate demand projection as possible” (Respondent 21, Pharmaceutical Supplier, 04.11.14). The interviewee (Respondent 12, FMCG Manufacturer, 02.12.14) clarified the importance of managing stock availability by the segmentation of SKU’s by allocating stock line items into A, B, and C levels, with A representing the highest rate of sale measured against 98% accuracy and B and C with a lower rate of sale measured at 97% accuracy. The information provided by the stock segmentation approach of managing by SKUs provides invaluable information for the effective implementation of SCM (Respondent 13, FMCG Manufacturer, 02.12.14).

The independent pharmacies manage SCM processes as a means to sustain their business. Stock management including managing theft is the critical requirement to ensure profitability.

Theft both internal and external is a major problem, if we don’t manage it we have to close our doors (Respondent 25, Independent Pharmacy, 15.07.15).

In addition the FMCG sector utilises company own codes to manage stock internally, while the private hospital utilises their company own codes for internal product management, and bar codes for external purposes. In the private hospital, company own codes and the NAPPI (National Pharmaceutical Product Interface) code is utilised. In the private hospital company own codes and the NAPPI codes are used manage for all other stock related activity. The NAPPI code is a global coding system owned by MediKredit for improving data quality, accuracy, integrity and completeness for all health related consumables. Both of these codes are electronically compatible on the one integrated technology system (Respondent 15, Private Hospital, 25.05.15).

The coding, collation and monitoring of the drugs throughout the supply chain makes it easier to identify stock leakages and thereby reduce stock loss.

4.3.6 Managing for Stock Loss

The hallmark of effective SCM is the consistent monitoring, measurement and evaluation at all stages of the product life stages: production, storage, internal and external distribution, and customer purchase, and customer location.

All measurement is against the budgeted levels. Included in the budget is the provision for stock loss that is closely measured by location, volume and value. The measure of stock loss is directly attributed to the accountability role within the supply chain (Respondent 17, Pharmaceutical Distributor, 15.07.14).

The private sector sees theft as an expense item on the profit and loss statement “We budget for stock loss and theft, but we have very strict control over stock loss” (Respondent 7, Warehouse Manager, Distribution Centre).

The strict controls include security guards, electronic surveillance, physical searches, and restricted access, stock holding measures, movement and quantification of stock and stock variance reports. All the interviewees in the private sector including the highest volume producer of FMCG products listed theft and pilferage as the single biggest challenge (Respondent 12, FMCG Manufacturer, 02.12.14).

The private sector viewed stock as cash, therefore stock loss is considered to be a reality of business, “Theft is the biggest challenge (Respondent 13, FMCG Manufacturer, 02.12.14). Pinpointing the location and quantifying the value of stock loss provided the means to manage and minimise stock loss (Respondent 17, Pharmaceutical Distributor, 15.07.14). The reasons propagated for stock loss include expired and damaged stocks, incorrect documentation, theft and corrupt practices. Stock loss is considered a business process and management issue (Respondent 22, Pharmaceutical Supplier, 29.10.14). Technology enabled daily stock reconciliation and stock variance reporting to quantify the stock loss and thereby helped retain management focus on the problem.

It is part of their financial KPI, we give them reports, we have lots of reports to manage it, and they have to manage the stock through the system (Respondent15, Private Clinic, Private Hospital, 25.05.15).

Stock production, storage and movement are monitored at every step with both human intervention and electronic tools. The initiatives undertaken by the private sector to reduce theft are considered a deterrent. The interviewee acknowledged that theft cannot be eradicated, but it can be reduced to manageable levels (Respondent 11, Retailer, 06.12.14).

The zero tolerance approach to theft, results in staff loss. Staff churn necessitates increased cost and time to train new staff due to the specialist nature of SCM (Respondent 11, FMCG Retailer, 06.12.14). The continuous security upgrades and innovative approaches adopted to minimise stock loss contributed significant costs to the business, a cost the private sector believes should be minimised but is necessary in conducting their business (Respondent 13, FMCG Manufacturer, 02.12.14).

4.3.7 Technology makes Supply Chain Management easier

The interviewees were at great pains to differentiate between technology and SCM. At a composite level technology can be defined as the machines and tools that extract and apply scientific knowledge to make informed decisions for operational application. The understanding of the role of technology and its importance to SCM is aptly described:

You can't computerise chaos with due respect, it (SCM) is basic principles whether you have a computer system or not, if you apply the basic principles, you can exercise a lot of control with a manual system. Technology makes it easier to manage (Respondent 15, Private Clinic, 25.05.15)

The above definition lends credence to the views expressed by interviewees in the private sector that technology makes life easier, provides accurate information available on ones finger tips for viewing 24/7, helps manage stocks, measure individual and collective accountability and provides one view of the business, highlights inefficiencies and helps in achieving profitability. The role of technology in SCM is viewed as follows:

"Technology is a tool, it is not SCM, the principles of SCM must be in place; technology cannot do that. Technology is based on the SCM principles, sound processes and

accountability to make SCM work. (Respondent 13, FMCG Manufacturer, 02.12.14).

The private sector views technology as an enabler to manage the whole business, and the availability of stock is vital to achieving the company objectives, thereby ensuring the sustainability of the business (Respondent 7, Retailer, 18.02.15). The integration of the various components of the business by means of the integration of technology provides the “one view of the business, including the one view of the customer” (Respondent 17, Pharmaceutical Distributor, 15.07.14). The role of technology cannot be underestimated as a tool to ensure the availability of stocks to the customers; however technology adds significant cost to the business (Respondent 14, FMCG Manufacturer, 02.12.14).

Technology is expensive but it is vital in effectively managing the business through supply chain management, understanding the demand levels and managing stockholding must underscore the customer service and the overall financial well-being of the organisation (Respondent 11, Retailer, 06.12.14).

In summary, technology is viewed in the private sector as a given in managing the availability of stock, but it is also about monitoring the total business financial health. One of the key outputs of supply chain management is the ability to project as accurately as possible the demand and supply requirement of the product.

4.3.8 Data and Demand Planning

The interviewees in the private sector are unanimous in the view that data is the starting point in the planning and forecasting process critical to ensuring the availability of stock. The importance of this comment is echoed by the private sector:

For me it always starts with planning, accurate inventory demand planning and forecasting, it is not an exact science, but we understand standard deviation errors etc. to help us narrow the gap and get as close to demand as possible, planning properly is golden, everything else is wishful thinking (Respondent 13, FMCG Manufacturer, 02.12.14).

It is considered impossible to look at data and demand planning exclusively as two stand-alone concepts because elements are interdependent on the other, without the other, neither is of value to the SCM process. The supply chain management process started with the collection of data. Good data is not only based on technological measures alone, it was also dependent on the human factor providing information critical to the decision making within the forecasting and planning function, by integrating the stock and demand levels (Respondent 15, Private Hospital, 25.05.15).

The interviewees in the private sector maintain that cross-functional teams are better equipped to forecast demand, make informed decisions as regards stock availability. People skilled in sophisticated predictive modelling tools drive the demand management metrics in the private sector. (Respondent 12, FMCG Manufacturer, 02.12.14).

We have a cross functional team with matrix management but with dedicated accountability. We collect vast amounts of data, we need to aggregate and interpret the data to convert it to information that can be used to guide the decision making. It is an iterative process (Respondent 20, Pharmaceutical Supplier, 29.10.14).

4.3.9 Infrastructure, People and Process

In the private sector, SCM supports overall business strategy through the logistics strategy (Respondent 23, Retailer, 06.12.14). SCM principles are process driven, which ensured that relevant data was collected at the appropriate time and measured with the precise tools. (Respondent 13, Group SCM FMCG Supplier, 02.12.14).

Each stage of the supply chain was monitored, evaluated and reported on (Respondent 21, Pharmaceutical Supplier, 04.11.2014). In the FMCG category, the KPIs includes individual and collective performance scores to ensure collaboration throughout the supply chain (Respondent 14, FMCG Manufacturer, 02.02.14). Effective SCM is about on-going measurement and comprises a series of questions that require answers:

Measure what, measure how, benchmark to what, where are we, where do we want to be, where is the cost going, where is the market going, what went wrong and what should we do? (Respondent 14, FMCG Manufacturer, 02.12.14).

In the private sector, an FMCG supplier creates the group-wide KPIs metrics derived from existing data.

It started at CEO level and drilled-down and socialised throughout the organisation. The performance metrics is visible to all employees electronically and on measure boards in the various sections of the business. The KPIs are integrated into the business performance and referred to as the 3L: Language (common understanding), Linkage (KPI individual and cross functional measures) and Leverage, (the logistics capability) is embedded throughout the business (Respondent 12, FMCG Manufacturer, 02.12.14).

The development of KPI measures requires communication throughout the organisation both on a formal and an informal basis in order to create a consciousness of performance and measurement (Respondent 7, Retailer, 18.02.15).

SCM is an integral component of the organisation; it cannot exist in a vacuum as a stand-alone initiative. It takes its cue from 'what else' is happening in the organisation.

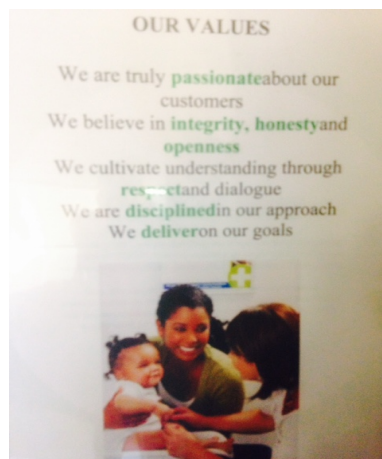


Figure 7: Source. Pharmaceutical Retail Organisational values on display

The interviewees in the private sector list the three important dimensions of SCM as infrastructure, people and process as core to the effective

implementation of SCM (Respondent 9, Pharmaceutical Manufacturer, 13.10.14).

The organisational culture (Figure 7) based on personal and collective accountability, performance, and customer satisfaction will predispose the organisation to the successful functioning of SCM (Respondent 15, Private Hospital, 25.05.15). The interviewees in the private sector list three important dimensions of SCM, infrastructure, people and processes, core to the effective implementation of SCM (Respondent 9, Pharmaceutical Manufacturer, 13.10.14)

The use of a clear and common understanding of supply chain terminology as discussed in Chapter 4.3.5 heightened awareness of SCM throughout the organisation (Respondent 13, FMCG Manufacturer, 02.12.14). The private sector interviewee identified the system wide hardware, software and human capability as the cornerstone to effective supply chain management (Respondent 12, FMCG Manufacturer, 02.12.14).

In the private sector, the SCM team members have clearly defined roles and responsibilities, documented in the detailed SOP manual with workflow charts identifying the incumbent's role within the supply chain process (Respondent 7, Retailer, 18.02.15). The KPIs included individual and collective performance measures to break down silos in the workplace (Respondent 8, Retailer, 18.02.15). It is obvious from the responses of the private sector interviewees that cross company collaboration is one of the cornerstones of effective SCM.

4.3.10 Communicating for Success

"Daily morning meetings start our day in our warehouse" (Respondent 7, Retailer, 18.02.15). The interviewee listed communication (vertical and horizontal communication) as a key factor in ensuring the supply chain team are appraised of the overall group performance at the more senior and middle manager level. Managers share the responsibility of communicating the relevant information to their teams.

Feedback upwards and downwards creates an environment of collaborative thinking and creates a feeling of inclusiveness in the supply chain continuum (Respondent 7, Retailer, and 18.02.15). The organisation clearly articulates that the values of the organisation drive the behaviour of the employees in achieving the performance objectives. These values are socialised, visible throughout the organisation and serve as a guide to employee behaviour.

The SCM performance is based on the overall metrics, which gets broken down to the department levels, team level and then to an individual level (Respondent 20, Pharmaceutical Supplier, 29.10.14). In the private sector distribution teams have early morning meetings to address the performance levels daily (Respondent 7, Retailer, 18.02.15). At the meeting, the operational staff provides feedback on issues they have experienced so that they could be resolved before it becomes a company-wide issue and adversely affect the company performance. This format of communication creates the bottom-up approach to problem solving.

4.3.11 Demystifying Monitoring and Evaluation

In the private sector, monitoring is embedded in the organisation; it happens as an integral component at all levels of the business, including SCM. Monitoring is often described as tracking by the interviewees in the private sector.

When we receive an order, it is fed into the computer and it generates a picking slip, identifying the batch number we need to pick from, it is scanned onto the truck, an invoice is generated, when the stock is delivered, the receiving signs off on the picking slip, it then updates our stock holding figures and alerts our production planning division on status of our stock holding. During distribution we track the movement of the product through the truck tracking system (Respondent 22, Pharmaceutical Supplier, 29.10.14)

Without monitoring, evaluating performance measures would not be possible. The IT structure is a fundamental requirement for the seamless integration of monitoring as the natural course of managing the organisation activities (Respondent 12, FMCG Manufacturer, 02.12.14).

The more complex analysis, predictive modelling and metric measurement are produced by the integrated IT system and analysed by specialists (Respondent 22, Pharmaceutical Supplier, 29.10.14). This approach to monitoring and evaluation is made possible by the prior identification of the key performance indicators that require tracking, and the IT system is engineered to provide the required information. The interviewees in the private sector consider monitoring to be a fundamental requirement for effective SCM.

We see one truth of everything all based on mathematical toolsets, including the service providers, we see one truth of everything (Respondent 23, FMCG Retailer, 06.12.14)

4.3.12 Non-verbal Observations by the Researcher- Private Sector

The interviews scheduled at the head offices of the organisations took place in a typical boardroom environment. The reception areas included visuals of the vision mission and values of the organisation. The researcher was accompanied to the boardroom and back to reception with access card control. There were very high security measures with customised card access throughout the facility. The Interviews that were conducted in the warehouse or distribution centres were conducted following very stringent security measures

All visitors to the warehouse facility including the researcher were provided with a luminous red protective vest so that the visitor status is visible at all times (Figure 8). All people movement in the facility is controlled by access card, with clearly defined access to specific sections of the facility. Some products are considered high risk to stock loss; those areas include card and manual sign-in.



Figure 8: Source. Pharmaceutical Retail Security measures, visitor Identification apparel.

In the retail warehouse environment, the researcher underwent three sign-ins and security searches prior to the meeting and three security searches on the way back to the reception.



Figure 9: Source. Pharmaceutical Retail. Theft deterrent poster.

It is important to note staff and visitors were subjected to the same security protocols. Throughout the facility there were posters informing and reminding the staff of the organisation's core values and informing them of the consequences of theft (Figure 9)

4.3.13 Concluding Remarks on the Private Sector interviews.

The private sector makes a conscious effort to instil accountability throughout the organisation - each employee is provided with a process map and individual SOP document that clearly identifies the step-by-step action

required to perform the expected contribution to achieve the personal and collective objectives of the organisation. Collaboration and integration is key to SCM effectiveness. The private sector believes in integrated supply chain system that makes it possible to have one sales target, one production target, one planning process, one finance number, one language, one understanding of key supply chain concepts, so that all talk with one voice (Respondent 13, FMCG manufacturer, 02.12.14).

5 Chapter 5: Discussion on the Research Results

5.1 Introduction

The aim of this chapter is to present the discussion of the findings of the research study titled 'Supply chain management in a public hospital in Gauteng'. The previous chapter comprised the results of the research interviews in the public and private hospitals, the independent pharmacies, the donor fraternity and the private sector. This chapter presents the discussion around those findings, the prevailing practices in SCM, and the commentary on extracting the core themes evident in the research study.

It is evident from the Literature Review in Chapter 2 and interviews that were conducted in the private sector, that the unavailability of drugs in the public hospital is a function of lack of governance and accountability. Stock loss in the public hospital through theft and pilferage is a factor, but does not contribute exclusively to the unavailability of drugs in the public hospital.

It became obvious from the research results that the private and public sectors are at different stages in the adoption of SCM principles, its philosophy, terminology, understanding and implementation. The academic literature, reports and publications as discussed in Chapter 2 of this study makes no differentiation based on the level of SCM practiced in the organisation under review.

5.2 Convergence of Disciplines

The literature review in Chapter 2 and the results of the research study in chapter 4 allude to the convergence of the four disciplines that comprise supply chain management, namely, SCM, project management, financial and performance management disciplines. Therefore it can be deduced that the generalist in SCM ideally is knowledgeable in the four disciplines for the effective and efficient implementation and performance of SCM.

5.3 SCM is not a One Size Fits All approach

SCM is a set of principles and processes that move products internally and externally and it varies in approach based on the organisation's SCM life stage and the complexity of the organisation. This became apparent in the interrogation of the research results from the public hospital, the pharmaceutical, FMCG and the retail sector. For clarity of reference, the life stage of SCM determines the approach required for successful implementation. SCM in the companies can be differentiated as developmental, mature and advanced stages:

Developmental stage:	Preparing the structure, process and people to implement the enabling factors of SCM (in this research, the public hospital exemplifies this assumption)
Mature stage:	SCM as a discipline is embedded in the organisation with focus on improving the effectiveness and efficiencies (Pharmaceutical suppliers are examples of this stage)
Advanced stage:	Innovative approach to redefine SCM, and rewriting the best practice guidelines (FMCG manufacturers and suppliers are examples of this level)

Determining the SCM stage upfront assists in the design, plan and implementation of the interventions. The responses of the public and private sectors vary considerably in the depth of understanding of SCM. The private sector has developed common language, words and understanding of the concepts in SCM (the supply chain, data versus good data, SKU, product line item segmentation, data management versus supplier data management, demand planning, accurate inventory management, and efficiencies both financial and non-financial, KPI and performance measurement, iterative processes and organisation-wide collaboration).

Creation of one understanding of the supply chain concepts and terminology was a conscious decision and required allocation of significant resources and commitment to ensure that the management and operational staff 'talked'

with one voice, one understanding and one set of terminology (Respondent 13, FMCG manufacturer, 02.12.14). The organisations with global and local best practice capability considered it paramount to embed the concepts of SCM throughout the organisation.

Effective and efficient SCM is about strategic leadership and requires on-going investment and recognition of SCM as a strategic tool (Respondent 13, FMCG Manufacturer, 02.12.14).

In contrast, the public sector interviewees described SCM with varied terminology, usually in the context of their role within the health facility, whether is placing orders, receiving or dispensing drugs. The private sector interviewees expressed SCM as “planning, forecasting, accurate demand, data, technology, logistics, information flow, process driven, efficiencies, system, infrastructure, budget, stock management, and people management.

SCM does not exist in a vacuum, it is dependent on the overall company approach to SCM prevailing in the organisation. The understanding of SCM by the respondents in the public hospital is indicative of the partial understanding of the supply chain management process. Therefore identifying the level of the entity in terms of SCM proficiency will determine the approach that needs to be adopted in the implementation process.

5.4 Supply Chain Management – Discussion Matrix

As reflected in the literature review in Chapter 2, the unavailability of drugs in a public hospital is not a linear or one-dimensional issue associated with the delivery of stock (Kelle et al., 2012b). It is a complex proposition that requires an enterprise-wide combination of collaboration, interdependencies and interrelationships, both internal and external to the organisation (Bigdell, Maryam, Otto & Kotzab, 2003; Hult, Ketchen, & Arrfelt, 2007; Jacobs, Bart, Tomson, Goran, Laing, Richard, Ghaffar, Abdul, Dujardin, Bruno, & Damme, 2013; Tan, 2001). The interrelated and collaborative principles of SCM presented a problem in presenting a logical discussion on the research results in a linear format.

For the purposes of providing a structured approach to the inter-related discussion on SCM in the public hospital the following process was followed to create a visual representation of the overall findings (Figure 10):

- 1) The research results were coded and core themes identified by sectors on one spreadsheet so that a side by side assessment could be made
- 2) The core activities were identified then grouped into logical sub groups
- 3) The sub groups were then organised under the relevant themes
- 4) The enabling factors for the SCM disciplines were listed horizontally below the five themes
- 5) Change management was identified as an overarching factor across the SCM matrix alongside the vertical dimensions of the illustration
- 6) Human capital identifies the processes that determines the technology requirements and is ultimately responsible for success of SCM. It is represented vertically as it permeates the SCM landscape.
- 7) Horizontal and vertical accountability were placed at the top of the illustration to demonstrate its all-pervasive presence in the SCM.

This section of the discussion will be based on the enablers of effective SCM as mentioned in Chapter 2 and Chapter 4. Considering that the enablers impact on the whole supply chain system, it will include the activities listed in the illustration (Figure 10).

5.4.1 Unpacking the enablers

Underscoring the specialist operational skill set are the enabling factors for effective SCM. The fundamental philosophy of governance and accountability influences the supply chain landscape for the effective management of five core components supported by the enablers as illustrated (Figure 10) comprising governance and accountability; integrated IT systems; streamlined processes; measures and analytics; human capital and communications.

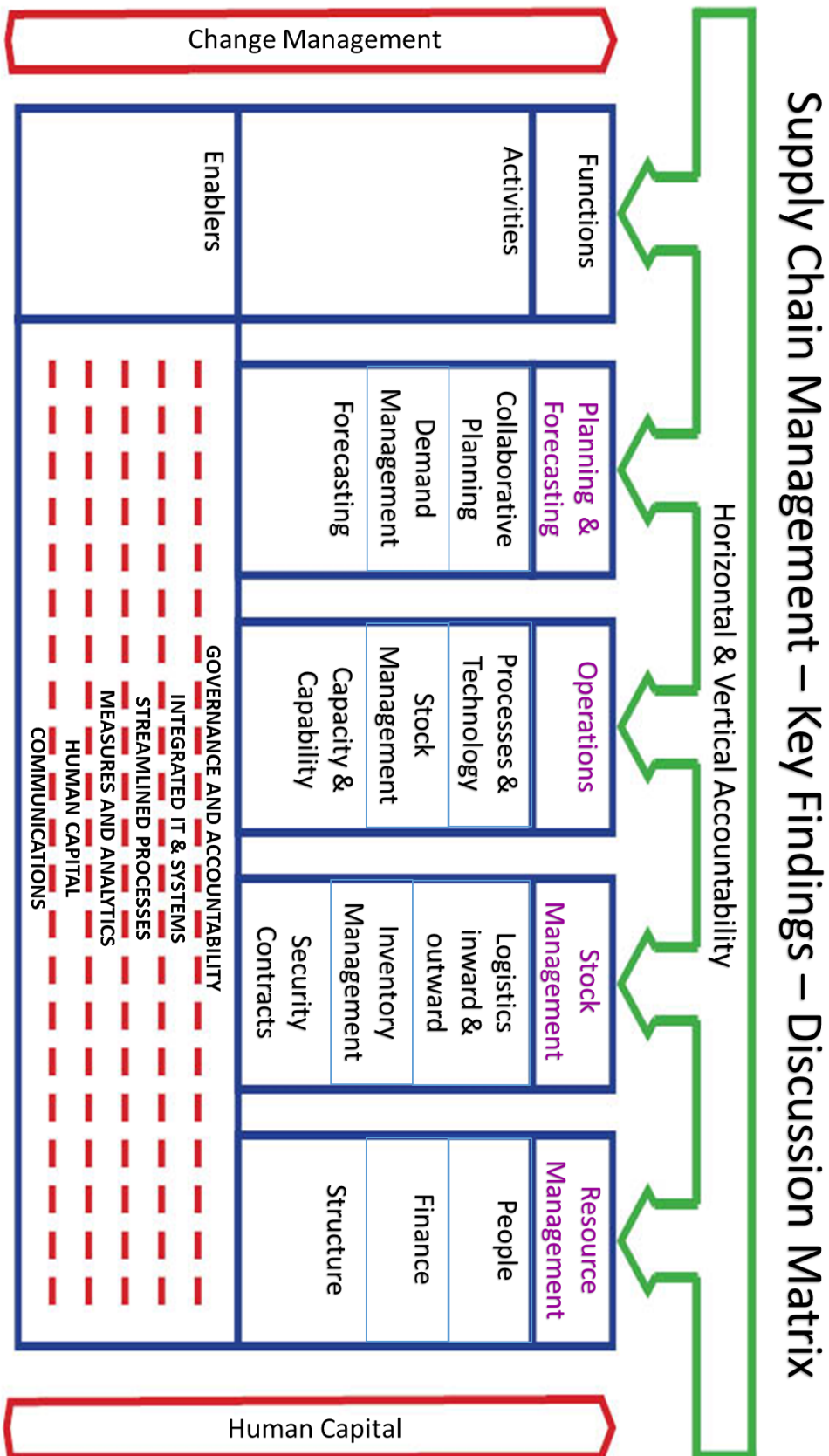


Figure 10: Source Author's Analysis. Supply Chain management, key findings – Discussion Matrix

Effective SCM is the collaboration and integration of the enablers listed in the diagram (Figure 10) on the preceding page.

The principles of SCM must be in place, technology can't do that as technology must be based on the principles, needs sound processes and accountability to make SCM work in (Respondent 11, Retailer, 06.12.14).

5.4.2 Governance and Accountability

For ease of readability the enablers as presented in Figure 10 is repeated in the discussion on each of the enablers to provide context in terms of the overall discussion matrix.

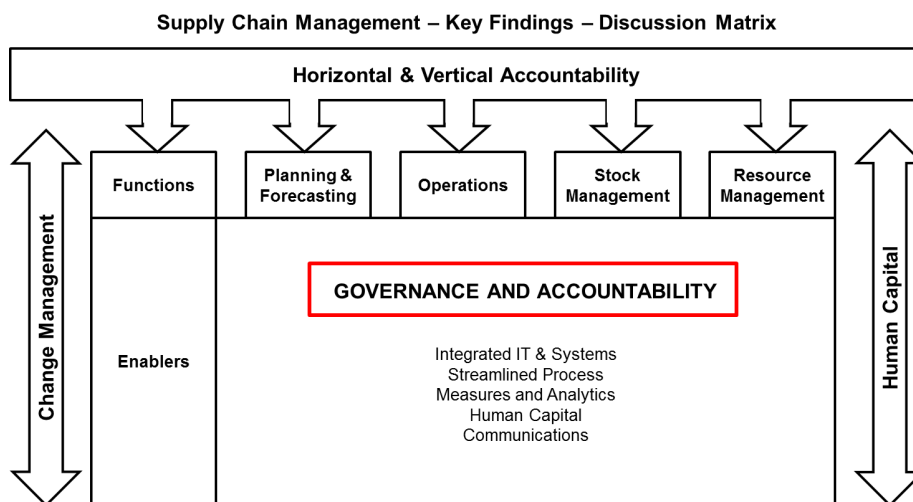


Figure11: Source. Author's Analysis. Supply Chain Management Enabler, Governance and Accountability.

Governance is defined as “a set of processes (customs, policies or laws) that are formally or informally applied to distribute responsibility or accountability” (Barbazza & Tello, 2014, 3).

Good governance enables effective use of medicines, human resources and finances to deliver health service performances for improved health outcomes (Respondent 18, Donor, 02.02.15).

The findings of this research study concurred with this view. In the South African instance, the added complexity of the three tiers of government, the national, provincial, district and health facility dilutes the governance and accountability roles within the drug supply chain in the public hospital. The

province and each health facility create its own operational structures and technology requirements to manage its drug supply, making it difficult to determine demand for the national tenders contracts (Respondent 9, Pharmaceutical Supplier, 13.10.14). The complexity in the public hospital arises due to the centralised functions at the National and Provincial levels of Healthcare without the availability of centrally collated 'good data'.

Respondents in the private sector mention accountability as the fundamental requirement for the efficient functioning of SCM while the public sector respondents did not mention accountability or list it as a fundamental requirement of SCM. For the public sector, the IT systems, staffing, and processes are the fundamental requirement of SCM. The lack of mention of the role of accountability in the public sector demonstrates the lack of 'top of mind' awareness of the role of accountability in SCM.

The private sector identified governance, accountability and ethics as a prerequisite to effective SCM (Respondent 13, 15, 21, and 17), elaborated that SCM was complex and governance, accountability and ethics must work at all levels within the supply chain. An FMCG interviewee commented that accountability and responsibility are clearly explained to the staff and is understood by the employees at all levels of the organisation (Respondent 7, Retailer, 18.02.15). While the omission of reference to accountability in the public sector, it could be an oversight. The respondent in the public sector use the phrase 'do not do their jobs' presupposes only individual performance matters, while the use of the word accountable presupposes an individual and shared responsibility for the performance and contribution to the whole supply chain performance.

In the private sector each employee has clearly defined roles and responsibilities in relation to their specific job function as articulated in the standard operating procedures manual (SOP). The SOP in the public sector is based on job category and not clearly listed at the job function level. SOP's are the blueprint for the 'way things need to be done' and if it is vague or

incomplete it could lead to non-compliance of key activities in the supply chain process.

The respondents in the private sector do not focus on the IT and technology aspect as the panacea to SCM because the availability of the technology system is an accepted tool and its role in SCM is clearly understood. The private sector view processes, change management, measurement and people as critical to effective and efficient SCM.

Governance, accountability, individual and collective performance are continuously tracked and measured. In the public sector you do not have dependable IT which make it difficult to identify clearly defined and measureable KPIs, therefore making it difficult to implement governance measures to hold people accountable for their performance. While technology alone cannot provide the tools to implement accountability, technology engineered without the relevant processes and the KPI measurement metrics make it difficult to hold people accountable.

The Gauteng Province shares responsibility for the availability of drugs in the public hospital, it is the responsibility of the Province (*South Africa; National Health Act 61 of 2003*, 2003). The PMPU is a unit created by the province, and through the PMPU it manages the drugs orders and payments. The accountability for the availability of drugs therefore shifts from the health facility to the province, in this instance on the Gauteng Department of Health (GPDoH) – to ensure the drugs were available and to ensure that the suppliers were paid timeously.

The current process requires the health facility queries to be resolved by the GPDoH which creates further delays in resolving drug unavailability issues speedily (Respondent 5, Pharmacist, Public Hospital). The suppliers of drugs express concerns about the delays in processing payments and the multiple submissions of the supplier documents to the GPDoH to effect payment.

We are now having to compile 'payment packs' (copies of orders, delivery notes and POD's. Sometimes we have to resend the packs multiple times (Respondent 9, Tender Manager, Drug Supplier).

In order to effectively and efficiently manage the day-to-day operation of the drug supply in the Gauteng province it is imperative to create an adequately staffed financial unit to ensure that the financial protocols are adhered to by the health facility.

As stated previously in Chapters 1, 2 and 4, the Gauteng Department of Health has requested the drug suppliers to provide documentation detailing the orders placed, drugs delivered and the drugs that were out of stock. The reliance of the GPDoH and the PMPU on data provided by suppliers is risky as there are no checks and balances to test the veracity of the information submitted by the supplier. The health facility does not have the technology, human capacity or the data to manage the PMPU process requirement. Good data based on the hospital's demand is the hallmark of demand planning, without which the best SCM process is flawed.

The GPDoH relies on supplier data source for the information to make informed decisions on the volume requirements the drugs on tender. The National Department of Health (NDoH) volume projections are dependent on the provincial demand projection and considering that 76% of the drug requirement at the hospital is based on tenders (Respondent 2, Public Hospital 13.10.14), the need for good data is amplified to make drugs on tender available at the public hospital. The national tender division is therefore complicit and shares accountability for the unavailability of the tender stock as referenced in Chapter 4.2.4.

5.4.3 Integrated IT Strategy, Architecture and Systems

Technology facilitates the generation of one set of data, off one integrated IT system and provides relevant data to make informed decisions. Technology "helps us make the right decision, the software tools allow us to build permutations into our system to work out the best solution" (Respondent 9, Drug Supplier 13.10.14).

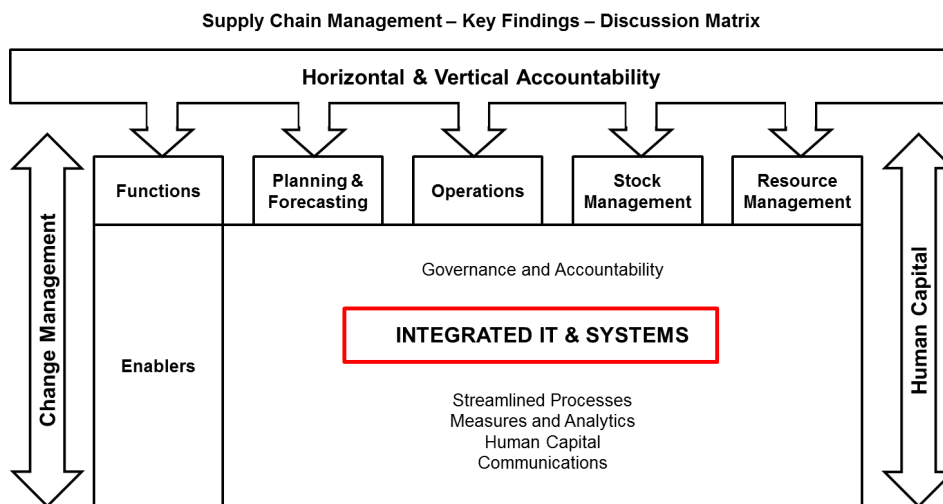


Figure 12: Source. Author's Analysis; Supply Chain Management, Enabler, Integrated IT Strategy and Systems.

As presented in Chapter 5.1.7, the Province determines the IT system including the preferred software to be adopted in the public hospitals. There is a tendency by the GPDoH to adopt multiple donors recommended software. This approach is contrary to that adopted by organisations considered leaders in SCM best practice. Chapter 4 makes reference to fragmented software systems and inadequate network capacity that adversely impact on the availability of data to make informed decisions (Respondent 5. Pharmacist, Public Health)

In order to provide the data that is required to make informed decisions, a centralised overarching IT strategy is required to direct the technology developments and guide the adoption or rejection of ad hoc IT initiatives.

IT is central, we could not manage our business without it. At any time we have a view in terms of what is going on in our business (Respondent 17, Pharmaceutical Distributor, 15.07.14).

Based on the contribution of the Respondents representing organisations that have adopted best practices, automation of technology and integration of the IT system is required to enable the organisation to seamlessly integrate governance and SCM processes. In the instance of the findings in public hospital, only one the respondent interviewed for this study, stated, “we have a system problem” (Respondent 5, Public Hospital, 16.01.15)

The private sector FMCG suppliers are significantly advanced in the optimisation of SCM. Companies considered as SCM best practice entities (Chapter 2) are categorical in their view that a single IT strategy and architecture is a basic requirement for the successful implementation of SCM (Chapter 4.3.7).

In comparison to the private sector where a single IT architecture provided accurate and up to date information; in the public health sector there were a number of different systems in each Province with multiple systems within each facility (Respondent 19, Donor, 12.02.15).

In the public hospital a number of stand-alone donor funded software programs (Chapter 4.2.7) contribute to the fragmentation of the technology system. The donor software programs were implemented and managed by multiple NPO's (donor funded agencies). Both the donor organisations interviewed for this study have not consulted each other or complemented the initiatives being undertaken by the other (Respondent 5, Public Hospital, 16.01.15). The multiple pharmacies in the hospital are not aware of the pilot programmes that were being implemented. There was no known due diligence conducted by the donors or public hospital, nor were the respondents in the public hospital provided with evaluations of the projects that were current or those that had been completed. The stand-alone dispensing system, after 3 years in operation was pending replacement with the new software, without the donor providing reasons for the change. The fundamental understanding that SCM is not only about technology, it is about understanding the processes and procedures necessary for the optimal functioning of SCM.

Technology is a tool, it is not SCM, the principles of SCM must be in place; technology cannot do that. Technology is based on the (SCM) principles, sound processes and accountability to make SCM work. (Respondent 13, FMCG Manufacturer, 02.12.14).

5.4.4 Data and Demand Management

As presented in Chapter 2.8 forecasting demand is core to the supply chain management and forecasting is dependent on the availability of relevant and timeous data. The interviewees in the public and private sectors agree that product and market segmentation is crucial to understand the nuances of demand management. The public hospital segmentation model and resultant data collection protocols are based on supplier details, e.g. the drugs could be sourced from the supplier, Medicine Supply Depot (MSD), Direct Delivery, or Buy Outs. Listing the drugs by supplier allows the hospital to “we know where it is from” (Respondent 2, Public Hospital, 16.01.02).

Province has the authority to determine the drugs list through The Gauteng Province Pharmacological and Therapeutic Committee (GPPTC). This committee comprises a multi-disciplinary team that manages the clinical and operational components of the drug availability throughout the Province (Respondent 2, Public Hospital, 16.01.15). Regardless of the seniority status of the multi-disciplinary team, without accurate demand data, the issues related to drug unavailability cannot be resolved.

In the private sector, the products are segmented by SKU based on demand history and categorised as class A, B, C, and D with A representing the high volume demand classification.

We segment the market and project demand on each segment by SKU, we don't aggregate demand because different markets impact on the logistics component of the business, and ultimately affects stockholding and the availability of stocks to our customers (Respondent 14, , FMCG Manufacturer, 02.12.14).

Any cross-functional team cannot find a solution to the forecasting demand if they do not have good data to make decisions. The demand management concept was contextualised by the logistics manager of a large retail chain:

We have a cross functional team with matrix management reporting approach but with dedicated accountability. We collect vast amounts of data, we need to aggregate and interpret the data to convert it to information that can be used

for decision making. It is an iterative process (Respondent 14, FMCG Manufacturer, 02.12.14)

Demand forecasting is a major problem in the public hospital. The interviewee listed a number of factors that adversely affect the accuracy of demand projection:

Our greatest stock outs occur because we cannot project demand. I don't believe anyone can tell you how much stock has been stolen, we cannot track theft. We depend on the ordering pattern to predict demand. We feel that is a big issue, a lot of stock loss comes in because of our erratic ordering & our 'squirrel mentality' of hoarding drugs. It is a vicious cycle, because of lead times & erratic delivery
Respondent 2, Public Hospital, 16.01.15).

The public sector demonstrates distrust for the quality of data it generates and therefore renders any attempt to adopt SCM practices difficult. An interviewee from the donor community expressed the sentiment as “garbage in garbage out” (Respondent 18, Donor, 02.02 15).

5.4.5 Streamlined Processes

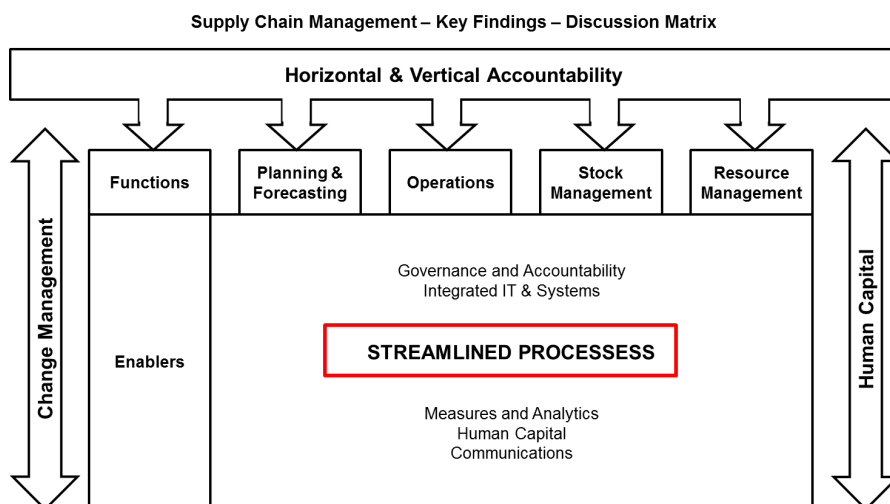


Figure 13: Source. Author's Analysis; Supply Chain Management, Enabler Streamlined Processes.

Private sector interviewees concurred that embedding the SCM principles throughout the organisation was critical to its successful implementation. Embedding SCM includes developing one language, one understanding and one voice philosophy that becomes entrenched company-wide. The interviewees viewed 'oneness' being achieved in the private sector by the on-

going measurement of performance through clearly articulated policy, detailed guidelines and an instructive SOP manual. In the private sector the SOP is created for each role within the supply chain with detailed step-by-step process detailing the accountability, obligation and responsibility of each job function, while in the public sector the SOP is created by category and more generic in nature and does not include the detailed step by step process to be followed.

In the private sector the SOP and process maps are clearly visible in the workplace in the form of charts, are prominently displayed on the walls; while the SOP guidelines in the public sector are stored on a bookshelf. The researcher found a lack of evidence of the availability of process maps or flow diagrams. A well-documented and comprehensive SOP manual, the training of the staff as per the detailed SOP, workflow mapping and empowering the staff throughout the supply chain is essential to empower the staff in the operational requirement of SCM.

Supply chain processes in the private sector have as much complexity as the healthcare environment in the form of structures, (international, national, regional and district distribution centres, retail stores, satellite warehouses, manufacturing facilities across Africa). Each retail outlet is allocated a customised stock holding list with between 35,000 to 350,000 SKUs depending on the classification of the retail store. The interviewees within the private sector indicated the SKU measure of the products information allowed for more accurate information for the planning, supply and demand projection. The SKU segmentation model is based on line items by product type, product, pack size, and variant. This process of identifying the stock facilitates the method of data collection, collation and analysis. This process could provide more accurate demand planning and allow for informed decision making as regards the stock availability within the pharmacy.

An example of the issues of non-acceptance of the line item segmentation by SKU in the public hospital is best demonstrated by the product Paracetamol. It comprises 15 SKU's as follows:

Paracetamol Syrup	3 line items (50ml, 100ml and 500ml)
Paracetamol Suppository	2 line items (125mg and 250mg)
Paracetamol Tablets	500mg x10 ; 500mg x 20; 500mg x 20; 500mg x 100; 500mg x 5000 tablets
Paracetamol Tablets (codiene)	10mg x 20; 20mg x 40; 10 x 100; 10mg x 500; 10mg x 5000 tablets.

The numerous variants requires monitoring by line item to ensure the availability of the specific Paracetamol variant. The private sector in FMCG (Respondent 8, 10, 13, 14, 17, 20, 23) and the private hospitals track the stocks by line item codes (Respondent 15, Private Clinic, 25.05.15).

5.4.6 Communication

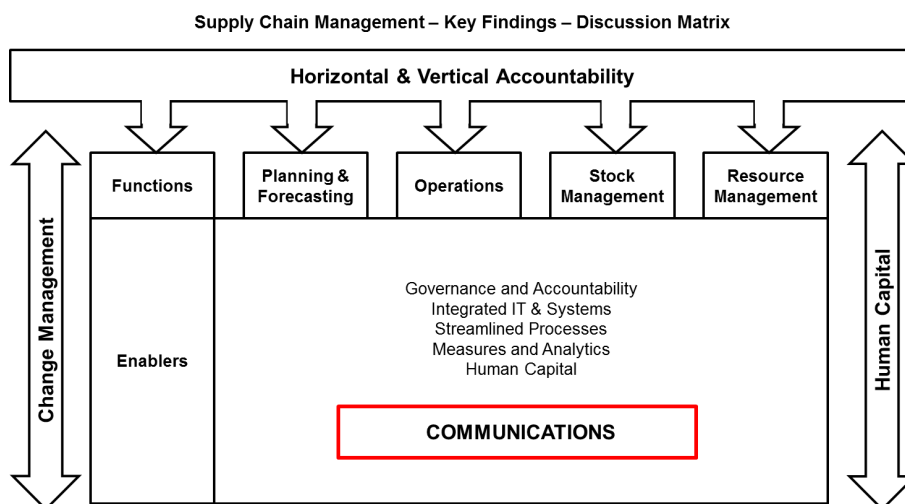


Figure 14: Source. Author's Analysis, Supply Chain Managemen, Enabler, Communication.

Any activity that needs more than one person to execute the task require communication to finish the task. The interviewees in both the public and private sectors view communication as the connective tool that informs, mobilises, motivates, changes attitude, socialises and assists in managing the process (Figure 14). The private sector, with its integrated technology system and analytic capability allows for easier, meaningful lines of

communication “a computer on every work station” (Respondent 15, Private Hospital, 25.05.15). Top down, bottom up and lateral communication, both formal and informal, keeps the whole organisation focused and committed to achieving the organisation goals.

In an organisation as complex as the public hospital, communication is mandatory to inform and motivate the collective workforce on effective and efficient SCM. The pharmaceutical suppliers experience difficulty in communicating with the public hospital, and believe that “knowing who to talk to” will be beneficial to resolving distribution related problems (Respondent 17, Pharmaceutical Distributor, 15.07.15). Communicating with the suppliers is an on-going problem, “the people we need to talk to at the public hospital do not have emails, and it is impossible to get them on the phone” (Respondent Pharmaceutical Manufacturer, 13.10.14).

All drug related queries were channelled through the province (Chapter 4.2.3). After three days the public hospital can make contact with the supplier (pending the approval by provincial representative). This process is not conducive to resolving stock issues speedily and efficiently. While the current communication arrangement by the province is an attempt to manage stocks, it does not empower the distribution staff at the hospital to resolve the unavailability of drugs speedily. Empowering the hospital staff to interact with the supplier timeously is vital to improving stock controls within the hospital and improving the staff capability.

5.4.7 Monitoring and Evaluation, Measurement and Analytics

As presented in Chapter 2.10, SCM is most effective with the measurement of key performance indicators of all the functions within the entity and with external partners. Employees in the supply chain of the retailer, the distribution centre and the stores are performance managed off the same metrics (Respondent 13, FMCG Manufacturer, 02.12.14).

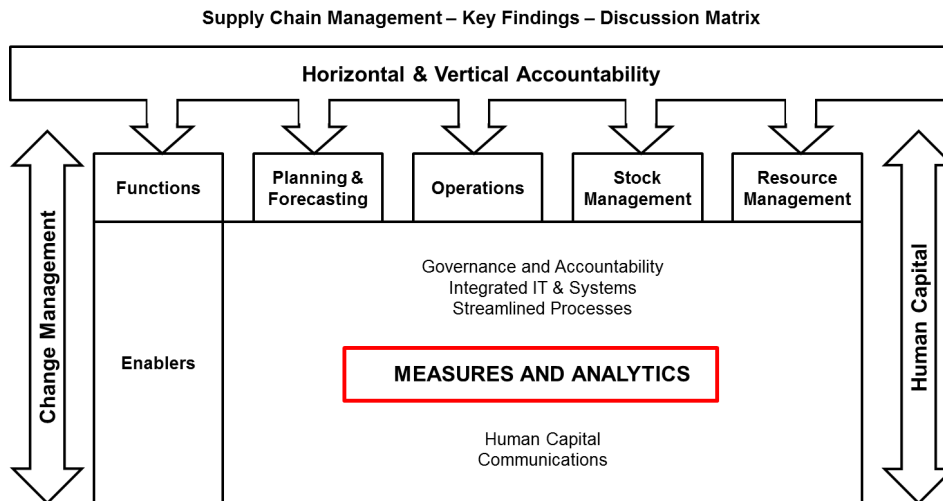


Figure 15: Source. Author's Analysis, Supply Chain Management, Enabler, Monitoring and Evaluation.

In the private sector, the data is collected, collated and analysed with the aid of technology. Skilled personnel apply the software tools to make sense of the data, referred to analytics. Analytics is the systematic quantifiable information and analysis derived by computer-generated intelligence of data or statistics. The advanced use of the analytics provides the predictive tool capability. Major companies use the predictive tool to predict demand for their products.

The inability to forecast demand is one of the reasons cited by the interviewees for the unavailability of drugs in the public hospital. The multi-location pharmacy sites, multiple independent software programs and limited staff capacity and capability, make the collection, collation and analysis of data in the public hospital unattainable. The use of analytics in the private sector provide the baseline metrics to set KPI's for an organisation, a division, a team, and as an individual employee.

Identifying the KPI's is the critical first step in results based management (RBM) and is considered the building block of performance measurement throughout the SCM process. The performance measure in SCM is not to be confused with a stand-alone GWM&ES capability that has been entrusted with the responsibility of monitoring and evaluation in the public sector. Performance measures within the supply chain process are embedded in the

SCM practice and are measured for every role and every action always in real-time, which allows for corrective action to be speedily implemented. Corrective action to resolve any issue that might arise regarding the unavailability of drugs.

The adoption of GWM&E as an activity to manage performance creates a perception that measurement belongs to a dedicated department and is not the responsibility of every team member within the supply chain. The M&E has its origins in the donor fraternity to manage the effective and efficient use of funds and to monitor progress of programmes. The approach became an acceptable approach propagated by the World Bank and the UN and other large donors. M&E has since achieved acceptance within the public sector as the preferred measurement and management technique.

In the context of private sector supply chain management, M&E is a function that is performed daily, using analysis of data to provide insights to aid in management decision-making throughout the SCM.

5.4.8 The Elephant in the Room

The unavailability of drugs in the public hospital is not due exclusively to theft or corruption. Mismanagement and non-adherence of the philosophy of governance allows theft to remain an unacknowledged, unquantifiable fixture in the unavailability of drugs in the public hospital. For all but one of the public sector respondents, theft is not an issue. “It does happen but not in this section of the hospital” (Respondent 4, Public Hospital), while the private sector interviewees acknowledged theft “is the biggest issue” (Respondent 17, Pharmaceutical Distributor) and “theft is the single biggest challenge” (Respondent 13, FMCG Manufacturer).

The private sector, “actively manages the issue of theft” (Respondent 17, Pharmaceutical Distributor, 15.07.14). Stock management with security controls like surveillance, physical searches, scanning of stocks, and restricted access serves as a deterrent rather than a means to eradicating theft.



Figure16: Source. Pharmaceutical Retail in FMCG Retailer, managing stock loss.

In the private sector, posters are prominently displayed on walls and notice boards reminding the staff of the consequences of theft. “Stealing a pencil is treated with the same gravity as stealing a truck full of stock” (Respondent 7 Retailer, 18.02.15). The staff is aware of the zero tolerance on the issue of theft, regardless of the value of the item stolen. This approach serves as deterrent, as the organisation believes that the time and cost of training a new employee is onerous and time consuming due the specialised skills required in the roles in SCM.

In contrast to the private sector approach, the public sector does not readily acknowledge that theft is a problem and there are no communication posters informing and reminding the staff of expected employee behaviour or the consequences of theft. In the public hospital theft is a problem, “our products have money value, there will always be an issue of theft” (Respondent 1, Public Hospital, 16.01.15) however the location or quantification of stock loss cannot be identified. “I don’t believe anyone can tell you how much stock has been stolen” (Respondent 2, Public Hospital 16.01,15).

5.4.9 Human Capital

People are the key to SCM implementation. They either create an enabling environment, or obstruct the successful implementation of SCM, “major challenge to system success is more behavioural than technical” (Lorenzi & Riley, 1999: 1). The successful adoption of the technology is dependent on

the organisation culture, level skills, and the capability and capacity of the people in the SCM process.

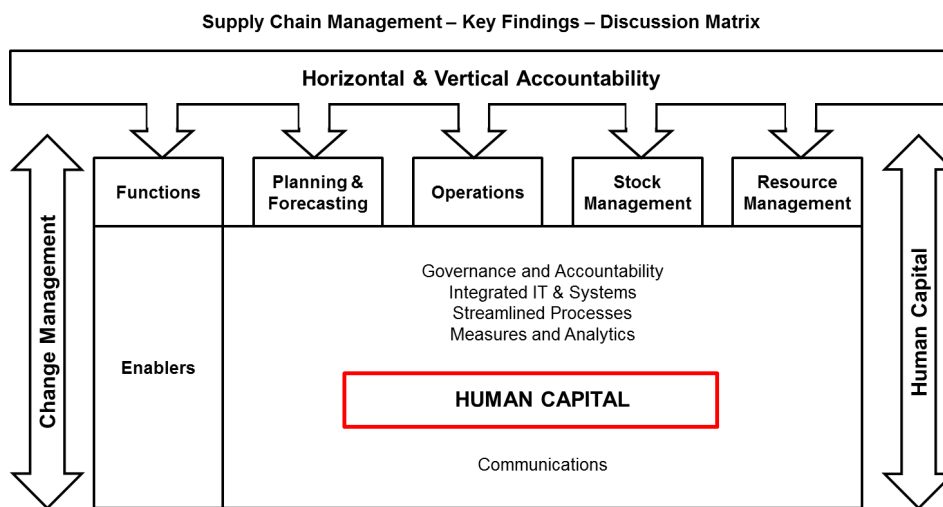


Figure 17: Source. Author's Analysis: Supply Chain Management, Enabler, Human Capital.

The organisational culture influences the adoption of SCM principles and processes “imposing change means fighting entrenched set of values and beliefs shared by organisation members”(Graetz & Smith, 2010, 145). An organisation with a culture of lifelong learning improves people capabilities and propagates collaboration within the supply chain “culture toward flexibility and agility with regard to change”(Graetz & Smith, 2010, 43). Changing the culture is dependent on proactive leadership and investment in education and training (Respondent 2, Public Hospital, 16.01.15)

The culture they are creating in the public sector and the lack of keeping people accountable and responsible, no system can work or fix it (Respondent 15, Private Hospital, 25.05.15).

In the public sector donors introduce SCM software technology in the public hospital. The donors maintain that the overall SCM education and training is not within the scope of their relationship with the hospital. As a result the training on the use of the software is limited to the ‘keyboard clicks’ training as opposed to the holistic training on supply chain management.

A public and private hospital comprises two major capabilities, the medical and operational capability. Both these capabilities comprise unique and

specialist skills. The literature review in Chapter 2 categorises SCM as a specialist operational capability. Four out of five key people interviewed in the public hospital drug distribution section were pharmacists. The pharmacists had little or no formal training in SCM, logistics or an allied discipline. This study acknowledges that the selection of drugs, its management in terms of drug efficacy and quality assurance remains a pharmacist or medical professional responsibility. On the other hand the SCM function is an operational imperative and therefore requires specialist SCM operational skills.

The public hospital in this study has not made the differentiation between the two core capabilities, and continues to fill the SCM posts with pharmacists and other health professionals without the necessary skills or training in the supply chain discipline. “Technology can only take you so far” (Respondent13, FMCG Manufacturer, 02.12.14) articulates the importance of creating an environment to facilitate the successful implementation of SCM. This leads the discussion to the most understudied concept in the academic literature on SCM in public healthcare, namely the role of change management in implementing SCM.

5.4.9.1 The Role of Change Management

Change management is the application of processes and tools to manage the people component of change process from a current state to a desired future state (Mento, Jones, & Dirndorfer, 2002). It is applied to integrate the individual and the collective outcomes to achieve organisational change.

The greatest challenge to introducing SCM is addressing the possible people resistance to the initiative. Change management prepares the organisation to embrace the ‘new way’ of undertaking their roles and responsibilities (Respondent 15, Private Hospital, 25.05.15). The organisation should function off a shared mission, vision and values (Respondent 15, Private Hospital, 25.05.15). The people must be co-opted with clear understanding of the reasons for the change, the implications on their role in the hospital (Respondent 13, FMCG Manufacturer, 02.12.14)

Every new process or system update we implement, we create a change management program with a roll out plan, with structured training and each facility is properly trained and we measure them on how they are implementing the changes. It is an on-going process (Respondent 15, Private Hospital, 25.05.15)

The interviewee responses in the public and private sector, including the private hospital in Chapter 4 of this report makes reference to the combination of technology and people as the most important component in SCM. A search through the available data on SCM or change management in drug SCM did not yield information. The information that is available on change management is located in the human resources space only. Academic research is required to understand the role of change management in the implementation of SCM in the public hospital.

In conclusion the discussion on research results of this study demonstrates that the unavailability of drugs in a public hospital is a multifaceted and complex mix of policy, processes, practices, people, structure, communication and donor funding that contributes to the problem. Resolving the drug availability issues will require the 'whole supply chain' reengineering with significant investment in skills development, time and funding.

6 Chapter 6: Summary of Key Findings

The title of this study is 'Supply chain management in a public hospital in Gauteng'. The purpose of the study was to compare the SCM procedures and processes in public hospital outpatients departments with acceptable industry SCM best practice. In Chapter 4 the research findings in the public and private sector are documented, with the discussion on the research findings presented in Chapter 5.

In summary, the findings in the private sector provided the backdrop to understand the processes and practices in the public hospital. In keeping with the view that SCM is a collaborative, interrelated, interdependent and iterative process as presented in Chapter 2, the key findings reflect similar distinguishing characteristics.

SCM comprised two distinct components in the drug SCM process; the pharmacological and operational aspects of SCM. The pharmacological aspect is a legal and regulatory requirement of Medicine Control Council (MCC) of any entity engaged in the production or distribution of drugs. The operational dimensions are the process of managing the availability of drugs for dispensing of the right drugs to the right patients at the right time in the right dose.

The supply chain process includes the manufacturers, intermediaries, the health facility and the end users while subscribing to the MCC regulatory requirements. The process adopted to effectively and efficiently deliver the drugs is dependent on the level of supply chain readiness of the organisation. The customisation of SCM is the first step in the implementation of the SCM strategy and plan.

A summary of the five key findings emerged from the analysis and synthesis of information derived from the research study. The first key finding identifies the root cause of the unavailability of drugs in the public hospital is the lack of

governance and accountability at all levels of the multiple dispensing touch points in the hospital.

Secondly the lack of a single integrated IT system compromises the SCM decision-making and implementation program. The single integrated IT system structured off the overarching IT strategy directs the IT architecture for the current and to the future planned technology developments. The absence of the IT strategy and architecture fragments the IT development initiatives.

Thirdly, the unavailability of drugs in the public hospital is not due exclusively to theft, bribery and corruption, but rather a function of mismanagement and maladministration, both internal and external to the public health entity. Theft and stock loss were barely acknowledged by the public hospital interviewees due to the inability of the drug distribution team to quantify the stock loss or qualify the location of the loss of stock in the distribution chain.

The fourth key finding clarifies that SCM is not a 'one size fits all' approach. The prevailing organisational level of development, the unique capacity and capability characteristics requires a customised approach to SCM. This aspect of SCM had not been addressed in the academic research that was consulted for this study. It is recommended that a customised SOP manual based on the segmentation model of product categories be aligned to the segmentation of the health facility.

The fifth key finding that performance measurement is key to effective SCM as discussed in Chapter 2.5. It became apparent from the private sector research findings that 'if you measure it, determine what needs to be measured' (Respondent 13, FMCG Manufacturer, 02.12.14). The advice from the private hospital is "if you don't measure, you cannot improve it (Respondent 12, FMCG Manufacturer, 02.12.14). Best practice recommends the relevance and quality of data collected, collated and analysed encourages informed decision making in the organisation.

The sixth key finding pertains to the role of GWM&E in the public sector and its limited role in management of SCM performance. Monitoring and evaluation is dependent on the timeous availability of relevant data that is converted to knowledge to more effectively manage the organisation. Monitoring and measurement of SCM requires embedding the monitoring the performance of the day-to-day management of the SCM operational activities, against measureable metrics throughout the organisation.

Every process or system change, we create a change management programme with a roll out plan, with structured training. Each facility is properly trained, and we measure how they implementing the change. It is an ongoing process (Respondent 15, Private hospital, 07.07.15).

And finally the seventh key finding is the role of change management including the human inclusivity and contribution is as important as the technology requirement in SCM. Change management is the systematic engagement orientated processes which will move the organisation towards a more efficient and higher impact performance.

People and the organisational culture is the key to successful SCM implementation. The people component of SCM is often neglected or reduced to an ancillary role. Internal collaboration in and among teams and divisions, and the external collaboration with provincial and national health structure and suppliers, is facilitated by people creating the enabling collaborative environment throughout the SCM process.

Building the capacity and capability in human capital is dependent on the allocation of resources for education, customised training and development. Leading private sector SCM practitioners universally embraced the training and development responsibility it continuously up-skill the people and thereby create a learning organisation.

6.1 Conclusion and Recommendations

The background, problem statement, purpose, literature review, discussions and key findings identify the lack of governance and accountability as the

root cause for and non-compliance of SCM. The other factors including the lack of technology, inability to project demand requirements, human capital, performance measure and development are symptoms of the lack of governance and accountability impact on the unavailability of drugs in the public hospital.

The unavailability of drugs in the public hospital cannot be viewed as a single problem of stock loss experienced in the public hospital. It is a multidimensional problem that has its roots in the lack of governance and accountability throughout the drug supply chain. The Government-wide M&E system (GWM&ES) implemented to measure the performance in the public sector is inadequate for the purposes of the ongoing measurement of the key performance indicators in the supply chain process. Measurement in SCM is effective in real time.

Measurement by key performance indicators is embedded in the supply chain processes and therefore requires robust measurement for the day-to-day management of supply chain management. The interrelated collaboration of the structure, authorising environment, people, processes and practices provides a greater impact on the availability of drugs in the public hospital than the implementation of GWM&ES as a measure to manage the availability of drugs in the public hospital.

The legislation, policy, and guidelines for drug SCM require being ring fenced as a stand-alone SCM initiative in relation to SCM in general. It is not only about the procurement process and distribution, it requires defined roles and responsibility of the actors in the drug supply chain management, at the national, provincial, local and health facility level. This study demonstrates the importance of demand management at all levels of the drug distribution system; the capacity to roll up the demand levels to a provincial and national level. This approach requires a single IT strategy and architecture network mapping for the South African healthcare environment.

The current regional approach of the nine provincial IT infrastructure and software contributes to the fragmentation of technology capability and it will not facilitate the ability to quantifying the required national drug demand for budgeting and tender volume projections. In the public hospital selected for this study 76% of drugs are acquired through the tender process, making the forecasting of demand at a national level a critical contributor to improve the availability of drugs in a public hospital in a province.

SCM starts with a due diligence to determine the gap between the 'as is' to the 'to be' in terms the role of the public pharmacy and the distribution of drugs. To assist in the assessment a checklist, is compiled (Appendix 1) to guide the process to adopt a 'top down and bottom up' approach to embed SCM.in the organisation.

6.1.1 Governance and Accountability

Clearly defined collective and individual accountability, roles and responsibility at the national, provincial, local and public hospital level is paramount to reversing the drug unavailability in the public hospital. The KPIs of the actors in the supply chain must include metrics to measure accountability from the highest office to all the role players within the supply chain ecosystem.

The National Health Act 61 of 2003 defines the structures across the three spheres of government with centralised and decentralised structures within the health functions. The Policy Strategy Guide (National Treasury, 2003) addresses the procurement guidelines, it does not deal with the guidelines to address the supply and demand requirements at a health facility or provincial level nor does it address the implementation of effective and efficient distribution of the procured goods. An urgent and dedicated approach to address the drug SCM strategy and implementation plan is required.

6.1.2 Technology

It is recommended that the NDoH develop a national overarching IT strategy and IT architecture for drug distribution in the health facilities that will direct

the public hospital IT strategy, IT architecture and IT infrastructure. The standalone donor software initiatives in the public hospital do not augur well for the development of an integrated IT infrastructure. It is recommended that any ad-hoc initiatives comply with the agreed national IT infrastructure strategy. The IT architecture will determine the technology roadmap for the effective implementation of SCM based on the vision, mission and values of the public hospital.

6.1.3 Public Hospital Management

It is recommended that SCM responsibility including the ordering and financial management of drugs be assigned to the public hospital so that the hospital is accountable for the availability of drugs in its facility. This is a contentious recommendation but necessary to inculcate accountability as an inherent requirement within the public hospital to improve the availability of drugs. This recommendation is based on the assumption that capable and committed people are employed to fulfil the roles. This recommendation is contrary to the provincial approach of redesigning the structure, process and management of the hospital procurement and financial administration to overcome the human capital capability and capacity deficiencies in the supply chain system. The provincial structure need not relinquish the oversight function to manage the performance of the drug availability in the public hospital, and must hold the public hospital to account.

6.1.4 People

It is recommended that a skills audit is undertaken across all the departments that actively manage the supply chain. This approach could highlight the training requirements of the existing personnel and or the need to employ persons with SCM skills. Skilled, capable, and motivated people in the SCM process will provide the momentum to drive the change and create the required performance based culture. The training and development focus is integral to up-skilling the current workforce. The KPI's requires updating with the link to the performance indicators to allow for effective monitoring and evaluation. The staff skills audit is urgently recommended in the SCM discipline at the public hospital to ascertain the skills gap.

6.1.5 Performance Measurement

There is a need to create a culture of performance measurement with clearly developed key performance indicators throughout the public hospital including SCM continuum. SCM cannot exist outside the entity or as an island within the organisation; the new way of working and output driven performance culture needs to be embedded throughout the entity.

The performance management culture will require the collaboration and support of the Unions. The union engagement must be supported with clear vision and values of the hospital KPIs, and remedial actions to address the performance gaps that have been identified. The management and staff are required to be fully conversant with the labour laws and the legal framework that regulates the public sector to ensure that the relevant documentation in terms of measurable KPIs and performance reviews are in place to facilitate the sanction process of the non-performing employee.

6.1.6 Product Segmentation

The hospital segmentation model (district, regional, tertiary, national central and eight specialist hospitals) require a segmented approach to the drug delivery supply chain functions in terms of SCM structure people and processes. The product segmentation template follows the hospital facility segmentation model. The appropriate product segmentation model allows for more streamlined management of reduced inventory holding based on stock line items. Customised SOP guidelines will be required as per the health facility segmentation model as job functions could be streamlined to fit the designation and capacity of the health facility.

6.1.7 Security Measures and Stock Loss

Tighter, more visible security measures and stock controls are required throughout the drug supply chain process to reduce stock loss. The technology system configuration must provide stock loss assessment through each supply chain touch point, thus ensuring that the hospital has the data to

measure and hold people accountability both individually and collectively, in real time.

6.1.8 Change management

The SCM initiative will require change management intervention to mobilise the employees to the 'new way of working'. The adoption of core values in an organisation serves as a means to influence employee behaviour. The development and agreement of the core values is a structured process that is embedded in the organisation and serves as a guide to conducting business and the acceptable behaviour that is embraced by the entire organisation. Core values are adopted by the organisation through an implementation programme based on the change management process to ensure that the initiative generates momentum amongst the employees.

Creating a culture of lifelong learning is required as SCM is not a static programme; it evolves with innovative developments and will require people who are adaptable and embrace change. This requires funding to facilitate the training and development initiatives on an on-going basis. In the private sector SCM is considered a strategic advantage, and it is about efficiency and effectiveness to deliver superior service to the end users of products and services, consistently

In conclusion, the quest for improved performance in the public or private sector necessitates change that requires the organisation to develop dedicated capabilities for managing change. No longer is change a unique extraordinary 'once in a while' occurrence; it is a permanent feature in any organisation.

The public hospital is a complex organisation and as such it requires a robust supply chain management system and robust implementation program. Forward planning and project management become key functions in the successful implementation of SCM.

Chapter 7: Conclusion

The research highlights the magnitude of the issues surrounding the unavailability of drugs in the pharmacy division in a public hospital. Initially the view that theft, corruption and bribery were the root cause of out of stocks in public pharmacies is in effect the symptoms. International and local academic research studies and reports located the problem to poor governance and accountability in public hospital. The research findings indicated the practice of poor governance and accountability results in the unavailability of drugs in the public hospital. The study further indicated that the implementation of the GWM&ES is inadequate to manage the day-to-day implementation and management of SCM.

The study provided the opportunity to explore the various dimensions of SCM in both the public and private sector in terms of the structure, authorising environment, process, practices and people. Contrasting the private sector approach to SCM highlighted the under developed SCM approach in the public hospital. It is fair to consider that the advanced SCM practice in the private sector is due to the fine-tuning of the SCM process over the last 60 years.

At the outset, the study was based on the unavailability of drugs in the public hospitals. The media and the NGO community expose the unavailability of drugs in the public hospitals on a regular basis. Citizen activism on health service delivery has been instrumental in maintaining focus on the areas of non-delivery of drugs in the public hospital. The public sector while relatively new to the SCM concept, can leapfrog the experiential learning and adopt and adapt to the innovative approach of organisations with established SCM practices. The largest retail store chain in the South African and African market has successfully adopted this approach.

Chapter 1 introduced the macro landscape and the background to the public health environment and the problem associated with the availability of drugs in the public hospital.

This chapter includes the legislative and policy contribution of the government initiatives implement SCM is recognised in this chapter, including the implementation of GWM&ES The rationale for the study, highlighting the purpose, the research question and significance of the study completes this chapter. The articulation of the research question is pivotal in the construct of the study. The background to the study in Chapter 1 includes the scope of the national and provincial scenario of drug unavailability and the motivation for the selection of the location of the study.

Chapter 2 provides a review of academic studies, reports and evaluations conducted in the field of SCM, and SCM in the health sector with a focus on the distribution of drugs both internationally and locally. This chapter included that that which is already known about SCM. The synthesis provided the contextual relevance that provided the tools for the analysis of the problem and the development of the research question to provide the answers to problem. The literature review covered the philosophical underpinnings of governance and accountability as the root cause and covered the domino effect of the lack thereof on the availability of drugs in the public hospital.

The conceptual framework is presented in Chapter 3 with the identification of the research problem and the resultant knowledge gap. This chapter determined and validated the research question and provided the rationale for the sample selection, research methodology, data collection, analysis and interpretation of the information emanating from the research study.

Chapter 4 comprised the data presentation based on the research methodology selected for this study. The findings in the public and private sectors are presented separately to clearly identify the findings in each differentiating sector. This section does not include any interpretation of the findings derived from this study.

The discussion of the research result, its significance and the insights are presented in Chapter 5. The discussion addressed the collation and

presentation of the findings into logical groups that allow for the identification of related findings.

Chapter 6 comprises the summary of key findings. The research question for this study is 'how does the public sector approach differ from the accepted industry best practice for SCM'. This chapter highlights the key findings already known about the research problem and includes new data that became available to enhance the understanding of the problem. The section highlights the importance of the human capacity and capability quotient in SCM in the public sector.

Chapter 7 presented the concluding thoughts in the context of the discussion matrix presented in Chapter five and the summary of the key findings presented in Chapter six. A checklist is provided in Appendix 1 to present the fundamental requirements to the implementation of SCM in a health facility that was identified as level 1 SCM practioners as referred to in Chapter 5.3

Chapter 8 lists the references of source material that are cited in the thesis.

In conclusion the fragmented approach to SCM adopted by the public hospital creates confusion amongst the actors in the SCM process. The current approach to SCM and its implementation in the public hospital can destroys belief in the supply chain process and could lead to either the non-acceptance or partial acceptance of SCM as a solution to reduce the unavailability of drugs in the public hospital. The findings of this study could lead to the view that SCM has not worked in the public hospital. The interviewee contribution to this study corroborates the view that the implementation of the SCM in the public pharmacy has had its challenges. It has not focussed on the operational dimension of drug SCM to deliver operational excellence necessary to provide "the right drugs to the right people in the right dose at the right time in the right condition" (Hult, Ketchen, & Nichols, 2003:52).

7 Chapter 8: References

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8 Appendices

8.1 Due diligence guideline and checklist recommended for Public hospital SCM implementation plan

SCM DIMENSIONS OF MEASUREMENT	BEST PRACTICE	PUBLIC HOSPITAL
Governance		
Authorising environment		
Accountability measures		
Transparency measures		
SCM strategy/ plan/implementation		
Information Systems		
IT Governance		
IT Audit		
IT Strategy/ IT Architecture		
Integrated Technology System/end to end capability		
Information		
Real time		
Stock control/tracking/movement of stock		
Reduce stock loss/Internal measures/		
Demand Management Projection		
Operations		
Supply Chain Flow		
Capacity Optimisation		
Stock optimisation/Tracking Internal & External		
Logistics/internal & external/Warehouse management		
Electronic FEFO/Picking slip/POD		
Security controls, measures/Theft Management		
Process alignment		
Process enablement		
Cross functional Training		
Process Flow/SOP		
Collaborative Planning		
Performance Measure (PM) /Financial & Non Financial		
Measure Efficiency & Effectiveness		
Institutionalised PM companywide integration		
PM indicators/ KPI/ Integration /benchmarking measures		
Empowerment and Accountability		

Resource allocation		
Budget Management		
Structure		
Resource Management (cont.)		
Human Resource strategy		
Capacity building/training		
Skills Audit		
Change management interventions		
Financial		
Technology Integration of Finance process across the Facility		
Technology Reconciliation/ Orders/ Invoices/Payment		
Budget tracking & control		
Track Stock loss/location/financial impact		
Manage employment of funds		
Communications		
Levels / Internal/ External/ Patient/ Provincial/ National		
Update on performance versus KPI		
Establish Core values		
Vision, mission & values of the organisation		

8.2 Participant Information Sheet for the Gauteng Department of Health

Good day,

My name is and I am currently completing my Master in Public Management at the University of the Witwatersrand, Johannesburg.

My current research is entitled “.....”. Through my research, I aim to explore

I am inviting you to be a participant in my current research study due to your experience in the field of

By being a participant in this research study I request an interview session to be conducted (where/place). With your permission, I request that this interview be recorded through the use of an audio-recorder (if applicable). This will allow for accurate results and analysis to be done. This interview session will be approximately 1 hour (for example) in length.

Your participation in this research is voluntary and I guarantee that your personal details will remain anonymous throughout this research study as well as in the final research dissertation. You, as the participant may refuse to answer any question that you feel uncomfortable with and you are free to withdraw from this study at any time. By being a participant in this research you will not receive payment of any form and the information you disclose will be used in the research report.

This research will be written into a Master of Management Dissertation and will be available through the University’s website. Should you require a summary of the research, I can make it available to you.

Should you have any further questions or queries you are welcome to contact myself or my Supervisor, at any time at contact details provided below:

Researcher

Mr/s.....

.....@.....

Tel.:

Supervisor

Professor.

.....@wits.ac.za

Tel.:

8.3 Consent form

Consent Form for

I, _____, acknowledge that I understand the research and that the research has been fully explained to me. I also understand that the information that I give to the researcher will be used in the research report.

I further acknowledge that the researcher has promised me the following:

- That my participation in this research is voluntary
- That my personal details will remain anonymous throughout the research study as well as in the research dissertation
- That I can refuse to answer any questions which I feel uncomfortable with

I hereby consent to being interviewed for the research study
“.....”

I agree / I do not agree to the interview being audio- recorded

Participant

Researcher

Date Signed

8.4 HREC (Non Medical) Approval



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Cooper

CLEARANCE CERTIFICATE

PROTOCOL NUMBER H14/11/38

PROJECT TITLE

Supply chain management in a public hospital in Gauteng

INVESTIGATOR(S)

Ms D Cooper

SCHOOL/DEPARTMENT

School of Governance

DATE CONSIDERED

21 November 2014

DECISION OF THE COMMITTEE

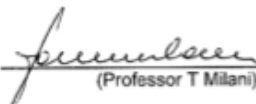
Approved Unconditionally

EXPIRY DATE

03/12/2016

DATE 08/12/2014

CHAIRPERSON


(Professor T Milani)

cc: Supervisor : Mr M Cairns

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10000, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature _____

Date / /

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES