Developing a management framework for internal logistics in the Department of Education in Gauteng

by

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EXECUTIVE SUMMARY

The objective of the study was to develop a management framework for internal logistics in the Department of Education in Gauteng. For the purpose of this study internal logistics was defined as the complete process of obtaining goods and services from the compiling and processing of requisitions to the payment of invoices and the record keeping of all transactions to achieve organisational objectives. Internal logistics entails purchase planning, specification development, supplier research, contract administration and quotations, ordering and inventory control.

The management of internal logistics can enhance productivity and performance within the value chain, improving service delivery, the outcome of the audited financial statement and ultimately the optimal spending of the allocated budget per financial year. For three consecutive financial years (2006/2007, 2007/2008, 2008/2009) GDE received a qualified audited financial statement. For financial years 2009/2010 and 2010/2011 GDE succeeded to receive an unqualified audited financial statement. To maintain this achievement and ultimately receive a clean audit financial statement, it is necessary to evaluate all the business processes, specifically within supply chain management, contributing to the audit findings.

Supply Chain Management (SCM) is in some way the completion of the circle of financial management. It is important for GDE to develop a uniform internal logistics framework that would enable them to also gain the maximum from its annual allocated budget. It is also critical that the internal logistics are attended to as soon as possible to have a positive input towards the audited financial statement.

A literature study was done on the concepts of the value chain, supply chain management and the management of knowledge. A questionnaire was designed, based on the findings in the literature, and used to measure the efficiency of the internal logistics in the District offices. The state of the internal logistics at the District offices was assessed through survey questionnaires to extract the data. It became evident that certain gaps and problems exist in relation to internal logistics at the District offices and that knowledge management is related to these gaps and problems.

Internal logistics has a link with the elements of supply chain management as investigated in the literature study. The elements of supply chain management can to be broken down into clear activities for the management of internal logistics.

The key area of concern is that the internal logistics within SCM are not acknowledged and therefore not properly managed in the District offices. The result of this is that the allocated budget is not optimally utilised and also receives qualifications from the audited financial statement.

A practical framework to manage internal logistics is proposed for the Department of Education to assist with the problems, and to bridge the gaps found after analysing the questionnaires. The findings of the empirical study were used as the basis of the framework. Finally, conclusions and recommendations are

drawn and rendered in order to improve the logistics management of the Department of Education in Gauteng.

Key words:

Supply chain, supply chain management, procurement, knowledge management, internal logistics.

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SOLI DEO GLORIA!

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LIST OF ABBREVIATIONS

AFS : Audited Financial Statement

BAS : Basic accounting system

GDE : Gauteng Department of Education

GDF : Gauteng Department of Finance

GRV : Goods receipt voucher

PFMA : Public Finance Management Act

PO : Purchase order.

RLS 01: Requisition line structure

SRM : Supplier Relation Management

CHAPTER 1

NATURE AND SCOPE OF THE STUDY

1.1. INTRODUCTION

The skills in the Public service and the service delivery of Government Departments are under investigation. The value chain with all its logistical processes forms a crucial part of service delivery. The logistics of the value chain is either strengthened or weakened by the skills and competency level of each individual performing the specific tasks. Since 2007, one of the major challenges faced by the Public service was the retaining of skills (Modimoeng, 2010:12). Modimoeng (2010:12) reported on a three-day summit that was held in Durban from 11-13 March 2010 with the theme "Positioning the Public service towards a developmental state through effective service delivery". Discussions were around the "building of frontline offices for the Departments of Education, Health and Justice". At a media conference Randall Howard, special advisor to Richard Baloyi, Minister of Public Service and Administration, made the following statement: "The time for the creation of a new breed of Public servants, committed to service and the implementation of the objectives of a developmental state has arrived. We want public servants with new attributes who will eradicate corruption because the public service is not the same as any other job, it is about service" (Modimoeng, 2010:12).

Modimoeng (2010:12) continues and states that the aggressive implementation of affirmative action in the public sector and the influence of political drivers are the major contributors to the loss of skills in the public sector. Job specific skills, knowledge and experience are some of the ways to improve service delivery. At the moment there are too many managers without the necessary skills managing their specific scope of responsibility. In the private sector skills and knowledge are the most important job related competencies.

One of the aspects of service delivery involves the internal logistics within the value chain operating in that specific environment. Operating an integrated value chain

requires the up and down flow of information and material in the chain (Hugo, Badenhorst-Weiss & van Biljon, 2004:5). The focus of this study will be on the management of the internal logistics in the Gauteng Department of Education (GDE). GDE every year receives millions to provide quality education as a basic right to all children from the age of six in Grade R until age eighteen in Grade 12. The vision and mission statements of GDE also focus on teachers in classrooms, equipped with all the necessary skills, learning material, resources and furniture to provide quality education to all learners.

1.2 IMPORTANCE OF THIS STUDY

The value chain and logistical processes play a major role to achieve the goal of providing quality education within the allocated budget. Currently there are fifteen District Offices with the same post establishment but the internal logistics within the value chain differs from office to office, making it impossible to find consistency in the performance, competency levels and the measurement of the quality of any output. This study aimed to establish a management framework for internal logistics to enhance productivity and performance within the value chain, improving service delivery, the outcome of the audited financial statement (AFS) and ultimately the optimal spending of the allocated budget per financial year.

1.3 BACKGROUND OF THE STUDY

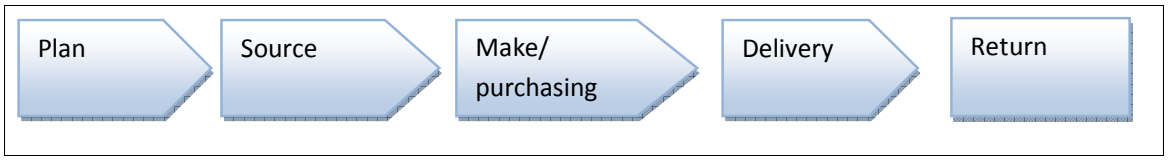
The value chain leads the way to success or failure in any organisation irrespective whether an organisation is in the manufacturing business or purely into service. The value chain can be described as "…a series of processes each of which adds value to the product or service for each customer" (Baltzan, Phillips & Haag, 2009:133). Porter uses the term value chain instead of supply chain to emphasize that each activity in the supply chain can be seen as adding value and incurring costs (Saunders, 1997:44). The grand finale to the value chain is accounts paid within 30 days of the invoice date and within the specific accounting period. From time to time it is necessary for organisations to evaluate the workflow processes in their value chain to adapt to changes and streamline their output for optimal use of resources and service delivery.

In the private sector this can be measured in terms of lead times and profit; however, in the public sector profit is replaced with the level and quality of service delivery. The success of the value chain depends on timely purchasing and delivery of goods as well as the payment of all invoices within 30 days of the invoice date.

In the public sector of Gauteng, the value chain is shared between two stakeholders. Although the paper allocated budget is with the different Departments, the procurement of goods and services are interlinked with the Gauteng Department of Finance (GDF). In other words some of the activities are performed within the Departments and some activities are performed by GDF. Nevertheless, a value chain can still be observed within the Departments. The focus of this study is specifically on the value chain with its internal logistics in the District Offices of GDE.

GDE is divided into 15 Districts Offices and a Head Office. The value chain within the District Offices is driven by the Sub-directorate Finance and Administration and can be explained according to the following five components namely plan, source, make, deliver and return of the supply chain (Baltzan *et al.,* 2009:135). For the purpose of this study and to fit this supply chain model to a service delivery organisation (GDE), the component "make" is replaced with "purchasing".

Figure 1.1: Supply chain model



(Source: Baltzan, 2009:135)

- **Plan:** Plan to manage resources towards meeting organisational objectives and end user demands for goods and services.
- **Source:** Reliable suppliers to provide value for money and deliver goods and services as required by the end user.
- **Make/purchasing:** Manufacturing of products applied to the supportive supply chain of GDE, this entails the securing of purchase orders from GDF in line with the specifications as per captured RLS 01 on SRM.

- **Deliver:** This step is commonly referred to as Logistics in a manufacturing company, which plans and controls the efficient and effective transportation of products to customers. In a supportive supply chain this refers to the management of deliveries according to purchase orders and the distribution thereof to the end users.
- **Return:** In a manufacturing company this is the receiving of defective and excess products as well as support to customers who experience problems with delivered goods.

The activities and the responsibility of these activities in the value chain as described above can be split into input and output and evaluated according to Porter (Saunders, 1997:44) in terms of adding value and incurring cost or transformation:

Table 1.1: Internal logistics in the Departmental value chain

VALUE CHAIN	INPUT	OUTPUT	RESPONSIBILITY	TRANSFORMATION
Plan	1.Paper allocated budget	1. Receive allocated budget. 2. Analyse needs and commitments and alignment with operational objectives to forecast expenditure.	End user	Compliance to PFMA, Treasury regulations, Supply chain management policies and any other applicable legislative framework.
	2. Projected costing of operational objectives	Identify budget short falls and redistribution of available funds as needed.	End user	Optimal spending of the budget in realizing objectives aligned with the vision and mission of GDE the vision.
	3. Identified demands	Compile an annual costed and projected procurement plan.	End user	Acquisition management to ensure adherence to specific time frames within the specific financial year.

	4. Expenditure control	Monitor expenditure within allocated budget according to the procurement plan.	End user	Monthly expenditure reporting to ensure no over / under expenditure as per allocated budget.
Source	1. Construction of specifications for needs and identification of possible suppliers.	1. Compile and update a Vendor database 2. Receive a request for quotation from end user. 2. Distinguish between contract and quotation purchasing 3. Identify applicable term contract. 4. Secure quotations	End user compiles specifications Procurement responsible for output 1 – 4	Identification of reliable suppliers who can ensure value for money according to the requirements of the end users. Quotations are also a budgeting tool to determine estimate cost per requisition.
	2. Requisitions (RLS 01's) from end users.	1. Receive and check RLS 01‘s and material numbers per item from material master on SRM for correctness.	End user fills in the RLS 01. Procurement: Purchasing - output 1 and 2	Paper trail of procurement activities and expenditure for audit purposes. Classification of items and uniform item description according to material master. Minimize incorrect purchasing and delivery in relation to end user expectations.
	3. Shopping cart on SRM	1. Capture/ transfer RLS 01 to a shopping cart on SRM.	Procurement: Purchasing	Computerized systemic purchasing. Step 2 does not add value to the value chain, but serves as a guide to the Buyer at GDF with regard to pricing of item.

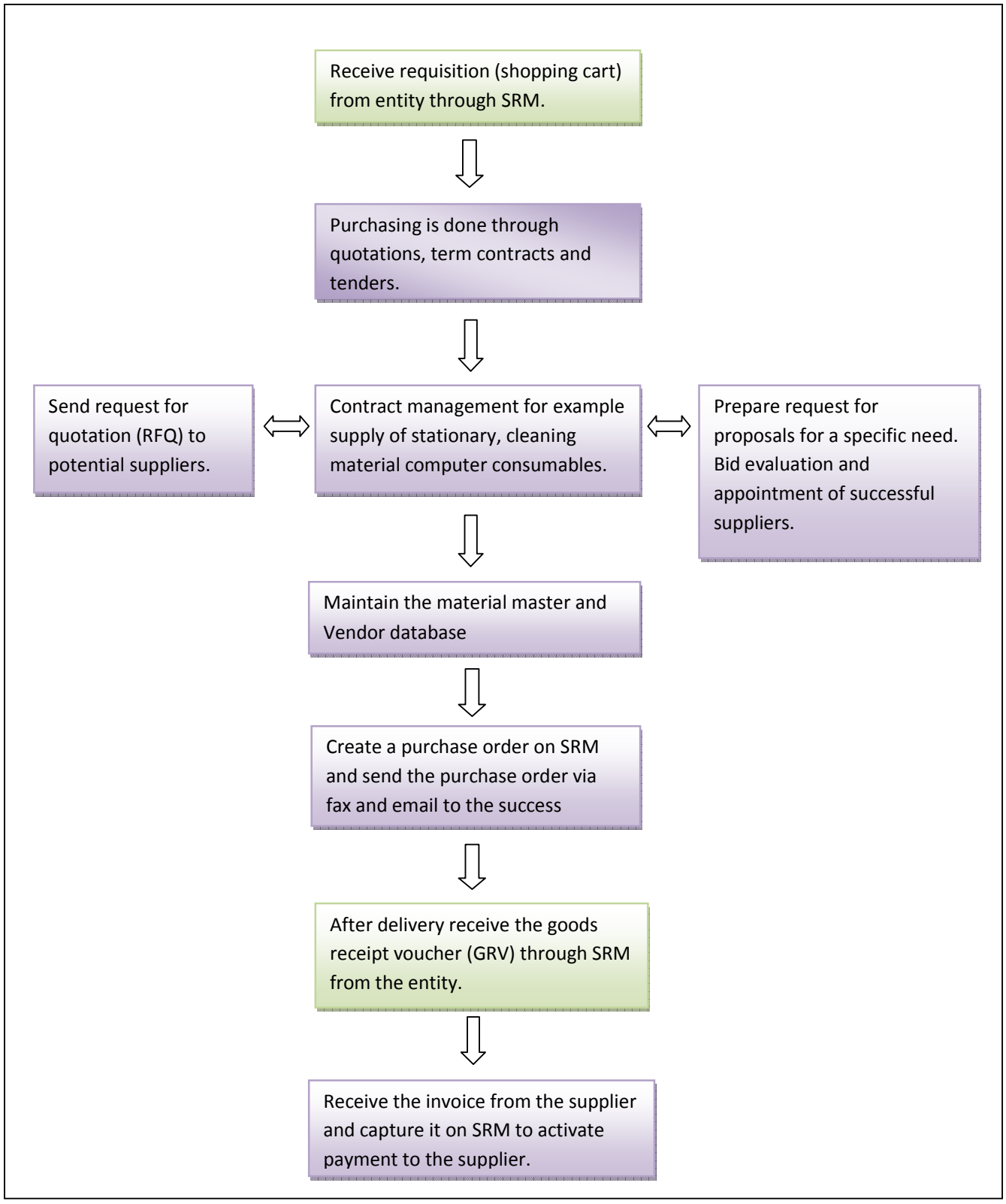
Make	Purchase orders	1. Print PO from SRM. 2. Contact supplier to ensure receipt of PO from GDF and confirm delivery date.	Procurement: Purchasing	A hard copy of the PO to fax to suppliers when they did not receive the PO from GDF or misplaced the PO. Also serves as reference document when receiving deliveries at the Store.
Deliver	GRV	1. Follow up of deliveries from suppliers. 2. Receive and quality check deliveries. 3. Complete GRV and distribute deliveries to end users. 4. Capture GRV on SRM if the end user is satisfied with the goods delivered.	Procurement: Receipts	Ensure commitment from suppliers to deliver within the stipulated timeframes Ensure deliveries are in line with the expected quality. Forms part of the 3-way match to initiate payment to the supplier.
	Delivery note and invoice.	1. Send invoice via courier to GDF 2.Monitor capturing of invoice by GDF on SRM. 3. Monitor payment to suppliers on BAS.	Procurement: Receipts	Most companies deliver with an invoice instead of a delivery note and as part of the 3-way match for payment the invoice must be captured on SRM. Ensure that the 3-way did take place and payment was done to the supplier. Any mismatch is detected timeously on the web cycle to ensure payment within 30 days after receipt of the invoice as stipulated in the PFMA.

Return	Return of goods voucher/ Credit note.	1. Inform supplier 2. Communicate with GDF and end user. 3. Return goods to supplier 4. Negotiate replacement with supplier/ cancel PO 5. Secure alternative PO from GDF if the supplier cannot deliver a better quality.		This component has a minimal impact on the value chain since processes are in place limiting the return of goods as a separate process. It is practice not to accept any delivery which does not comply to the standard as set out with the specifications of the end user, however it cannot be excluded from the value chain since there is always a possibility of incorrect deliveries or poor quality.

This chain involves the up and down flow of information and documentation and is informed by the allocated budget for a specific financial year. The role players in this chain are the end users who directly serve the schools within the parameters of the province, the Sub-directorate Finance and Administration who is responsible for the timely procurement of goods and services to end users to perform their duties as per operational plan and lastly, GDF who performs the procures to pay function.

For a better comprehension of the value chain in the Public Sector of Gauteng, the actual role and function of GDF needs to be outlined and can be seen as follow:

Figure 1.2: Value chain in Gauteng Public Sector



Payment to vendors can only be initiated if there is a 3-way match on SRM between the purchase order of the GRV and the invoice. The actual payment of suppliers is done on BAS which interfaces with SRM and SAP.

1.4 CONCEPTIONAL DEFINITIONS

1.4.1 **Logistics:** "... the process of planning, implementing and controlling the efficient cost-effective flow and storage of raw materials, in process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conformity to customer requirements" (Hugo, Van Rooyen & Badenhorst, 1999:52).

1.4.2 **Supply Chain:** "… encompasses every effort involved in producing and delivering a final product from the suppliers' supplier to the customers' customer. Four basic processes – plan, source, make, deliver – broadly define these efforts which include managing supply and demand, sourcing raw material and parts, manufacturing and assembling, warehousing and inventory tracking, order entry and order management and distribution across all channels and delivery to customers" (Hugo *et al.,* 2004:5). The supply chain consists of all the parties contributing to the procurement of goods and services (Baltzan *et al,* 2009:133). Porter uses the term 'value chain' instead of supply chain to emphasise that each activity in the supply chain can be seen as adding value and incurring costs (Saunders, 1997:44).

1.4.3 **Value chain:** "…a series of processes each of which adds value to the product or service for each customer" (Baltzan *et al.,* 2009:133).

1.4.4 **Business process:** "… is a standardized set of activities that accomplish a specific task such as processing a customer's order" (Baltzan *et al.,* 2009:133).

1.4.5 **Procurement:** "Purchasing and procurement are often regarded as synonymous terms. Procurement is strictly a wider term than purchasing which implies the acquisition of goods and services in return for a monetary or equivalent payment. Purchasing is the function responsible for obtaining by purchase, lease or other legal means, equipment materials, components

suppliers and services required by an undertaking for use…" (Lysons, 2000:1).

1.4.6 **Information:** "…data converted into a meaningful and useful context". Data are "raw facts that describe the characteristics of an event" (Baltzan *et al.,* 2009:133). Lysons (2000:98) also describes data as "figures and predictions from which information is drawn". For the purpose of this study data consists of an allocated budget, requisitions, purchase orders, deliveries, asset registers and payment to suppliers. The flow of these data through the processes of the supply chain as aligned with the legislative framework of GDE, produces information.

1.4.7 **Supply chain management:** "… is a management philosophy aimed at integrating a network (or a web) of upstream linkages (sources of supply), internal linkages inside the organisation and downstream linkages (distribution and ultimate customers) in performing specific processes and activities that will ultimately create and optimise value for the customer in the form of products and services which are specifically aimed at customer demands" (Hugo *et al.,* 2004:5).

1.4.8 **Internal logistics:** for the purpose of this study internal logistics is defined as the complete process of obtaining goods and services from compiling and the processing of requisitions to the payment of invoices and the record keeping of all transactions to achieve organisational objectives. Internal logistics entails purchase planning, specification development, supplier research, contract administration and quotations, ordering and inventory control.

1.5 PROBLEM STATEMENT

For three consecutive financial years (2006/2007, 2007/2008, 2008/2009) GDE received a qualified audited financial statement. For financial years 2009/2010 and 2010/2011 GDE succeeded to receive an unqualified audited report. To maintain this achievement and ultimately receive a clean audit report, it is necessary to evaluate all the business processes, specifically within supply chain management, contributing to the audit findings. GDE is divided in 15 District offices and a Head

Office. Supply chain management is decentralized at the different offices. The management of expenditure is done in accordance to the PFMA, Treasury Regulations and Operational plans as constructed by each District Office (SA, 2001).

Poor performance of the business units results in over or under expenditure, accruals and commitments impacting on the allocated budget for the next financial year. Although the post establishment of the District offices is exactly the same, there is no uniformity in the implementation of supply chain processes. The lack of basic knowledge, skills and experience can justify poor performance but the operations within the business units are also a contributing factor. An integrated supply chain requires the continuous flow of information and with no uniformity regarding work flow processes between the District offices or the sharing of best practices amongst themselves, the audited financial statement can again reveal poor performance within the Department. To maintain the successes with the audit reports, the internal business processes need to be measured against the framework of SCM.

1.6. OBJECTIVES OF THE STUDY

1.6.1 Primary objective

The primary objective is to develop a **management framework for internal logistics** for GDE.

1.6.2 Secondary objectives

The secondary objectives indicated below were also used as a basis to compile the questionnaire used later in the study:

I. Investigate the **different aspects of SCM.**
II. Determine the **quality of services**.
III. Measure the **successes of the implemented supply chain processes** within the District offices.
IV. Determine the **paper trail of each requisition**.
V. **Identify gaps** in current processes and activities which hamper performance and service delivery.

VI. Establish **best practices** for the optimal utilisation of the allocated budget within the specific financial year for goods and services.

VII. Process flow and **information management** within the business units.

VIII. Competency levels and the **transfer of knowledge** within GDE.

Logistical processes within the value chain of GDE are implemented for the optimal utilization of the budget, which are aligned with the realisation of the vision and mission of the Department.

1.7 SCOPE, DEMARCATION AND LIMITATIONS OF THE STUDY

1.7.1 Scope

The empirical study focused on measuring the successes within the 15 District offices against the framework that was set up from the literature study. The target population for this study was the Sub-directorate Finance and Administration within the 15 District offices of the Gauteng Department of Education. This Sub-directorate is headed by a Deputy Director with four Assistant directors managing the different units: Budget management, Finance and Procurement, Office service pool and Provisioning for Institutions. Supply chain management is practiced in the Provisioning for Institutions unit to service the schools and then to service the office it is either in the unit's Office Service Pool or Finance and Procurement. In some District offices the processes are shared between both the units.

1.7.2 Demarcation

Procurement of goods and services are mainly based on the capturing of requisitions (RLS 01) on the SRM system, receipt of deliveries at the storeroom and the capturing of a goods receipt voucher (GRV) on SRM to activate the payment process. The actual request for quotations, bid evaluation, the creating of purchase orders and the payment of invoices are centralized at the GDF. Payment of invoices can only be processed if there is a 3-way match on SRM between the purchase orders, GRV and invoice. GDE is one of the largest entities currently linked to the GDF.

1.7.3 Limitations to the study

The study is confined to GDE, specifically the Sub-directorate Finance and Administration within the District Offices. Therefore, results reported in this study were done with caution. The literature review is limited to sources on the internet and publications in the libraries in South Africa.

1.8 RESEARCH METHODOLOGY

Information was gathered through primary and secondary sources:

1.8.1 Primary sources

An empirical study was undertaken to gather primary information. This was done through the design of a questionnaire, distributed to all employees working with the supply chain in the Sub-directorate: Finance and Administration of all 15 District Offices. The data gathered from the questionnaire was analysed to form an objective opinion about the internal logistics within the District Offices. The data collected from the questionnaires was summarised and the statistics analysed by North West University.

1.8.2 Secondary sources

Secondary sources were used to study the supply chain and the principles of SCM. Research also focused on quality of services and knowledge management for the application thereof to internal logistics.

1.9 LAYOUT OF STUDY

The study was divided according to four different areas of focus and consists of four chapters. A summary of the content intended for each chapter follows:

Chapter one

This is the introduction to the study and includes the back ground, causal factors, the problem statement and the objectives which form the basis for conducting the study. The chapter concludes with the research methodology, target population and chapter summary.

Chapter two

This chapter consisted of a literature study on the supply chain, SCM, quality of services and knowledge management, all related to the internal logistics and service delivery of GDE.

Chapter three

This chapter explains the methodology used during the empirical study. The design of the questionnaire, the sample design, data collection and results are discussed in this chapter. With reference to the literature study, the results received from the survey are evaluated and analysed to form an objective opinion to address the primary objective.

Chapter four

The results from the survey are summarised in this chapter. A management framework for internal logistics was developed and proposed. Recommendations are made and opportunities for future research highlighted.

1.10 CONCLUSION

A supply chain can be primary, which "relates to those concerned with suppliers to be used for manufacture or re-sale to external customers" or supportive which is "concerned with the support of internal customers (Lysons, 2000:68). The GDE has a supportive supply chain. The supply chain practitioners purchase goods and services for internal customers also called end-users (for example: educators or education specialists) to enable them to provide quality education to the learners in the classroom.

There is a need to establish uniform supply chain business processes in the fifteen District Offices of GDE for the optimal utilization of the budget objectives, which are aligned with the realization of the vision and mission of the Department. An effective supply chain will provide the necessary resources to educators to give quality education and prepare learners for their future.

1.11 CHAPTER SUMMARY

In this chapter the foundation for the study was laid. From the definitions given in 1.4 for the different aspects, it can be concluded that it is necessary for GDE to focus on the operations of the supply chain and the internal logistics to achieve optimal service delivery through the procurement of goods and services. Supply chains can be primary, which "relates to those concerned with suppliers to be used for manufacture or re-sale to external customers" or supportive which is "concerned with the support of internal customers (Lysons, 2000:68). The supply chain in GDE is a supportive supply chain. The supply chain practitioners purchase goods and services for internal customers" (for example: educators or education specialists) to provide quality education in the classroom.

CHAPTER 2

LITERATURE STUDY

2.1 INTRODUCTION

"Logistics and supply chain management refer to the same function and the terms can be used interchangeably" (Monczka**,** Handfield, Giunipero, Patterson & Waters, 2010:9).

For the purpose of this study, internal logistics is defined as the complete process of obtaining goods and services from compiling and processing requisitions to the payment of invoices and the record keeping of all transactions to achieve organisational objectives. Internal logistics entails purchase planning, specification development, supplier research, contract administration and quotations, ordering, payment and inventory control within a specific timeframe or financial year.

The literature study aims to research the following aspects in order to address the primary and secondary objectives as listed in 1.5.2.:

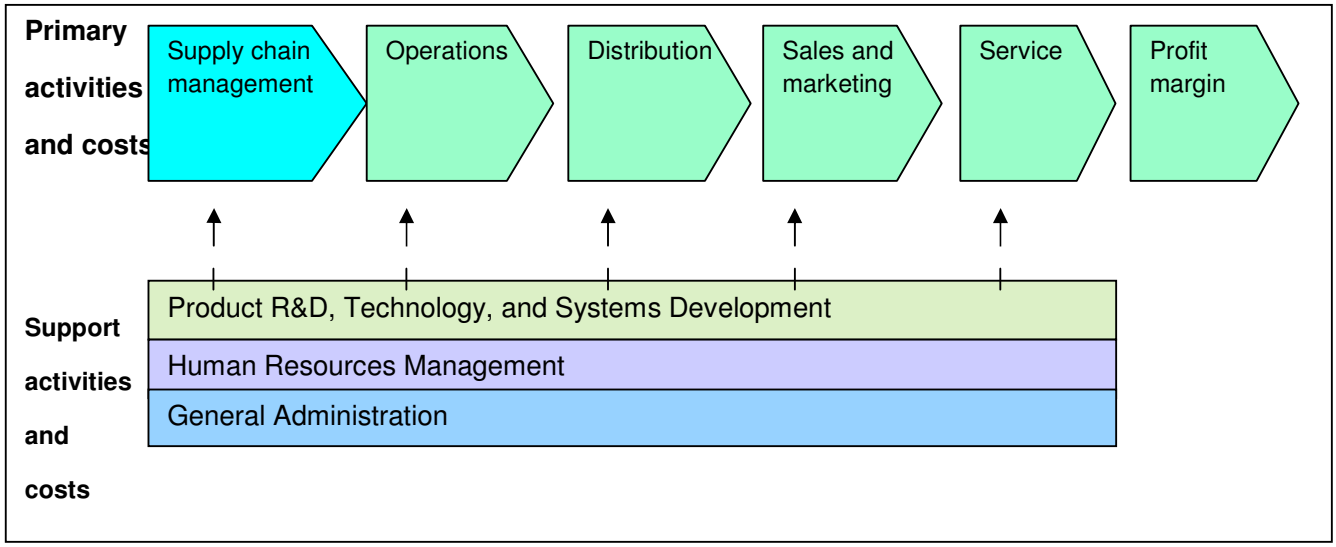
- A typical value chain to illustrated how and where SCM fits in,
- Knowledge management and supply chain management in the Public sector,
- Supply chain performance and service quality in the Public sector.

The GDE is not a manufacturing entity. The core function is service delivery with mostly a supportive supply chain. For this study the focus is on the business processes in the supply chain, with specific focus on the logistics involved within the supply chain. SCM is an integral part of financial management and addresses procurement related matters that are of strategic importance. The internal logistics involved in each supply chain can achieve better performance but it can also lead to underperformance and create total havoc if not administered efficiently. Linked to internal logistics are time management, knowledge management and quality service delivery, all within the value chain but specifically related to the SCM component as shown in figure 2.1.

2.2 THE VALUE CHAIN

The value chain has also been called the service chain and the supply chain, depending on the "fad of the moment" (Rockfordconsulting, 2011). The value chain indicates the primary activities which create customer value as well as all the support related activities of a company. The value chain of each company mirrors their business operations, its strategy and approaches to execute the strategies, as well as the technology and the operating practices it employs. Since these factors differ from company to company, value chains also differ. The operations component will also differ from manufacturing to service companies (Thompson, Strickland & Gamble, 2010:117-118). However, a generic company value chain can be constructed and is illustrated in figure 2.1 below:

Figure 2.1: A generic company value chain



(Source: Thompson *et al.*, 2010:118)

The different components entail the following:

i. **Primary activities:**

- **SCM –** activities associated with purchasing, receiving, inspection, storing and inventory management.
- **Operations –** activities associated with production, packaging, equipment maintenance, quality assurance and facilities.
- **Distribution –** costs and activities associated with physical distribution and maintaining dealers and distributors.
- **Sales and marketing –** costs and activities related to advertising, market research, planning and dealer/distributor support.
- **Service –** costs and activities associated with assistance to buyers, complaints, inquiries, maintenance and repairs.

ii. **Support activities:**

- **Product R&D –** costs and activities dealing with process and product R&D, process design, and development of computerised support systems and more.
- **Human resources management** – costs and activities associated with recruitment, training/ development, compensation, labour relations and the development of knowledge based skills and core competencies.
- **General administration –** costs and activities associated with finance management, accounting, safety /security, management of information and general office management.

The component SCM is the focus of this study, specifically the internal logistics which links all the activities.

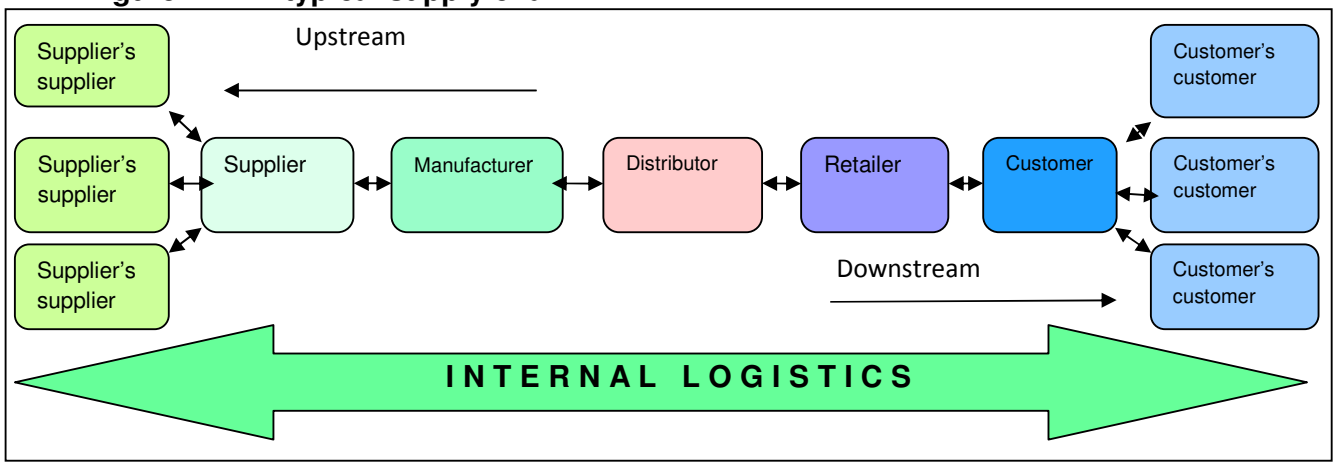
2.2.1 A typical supply chain

Internal logistics plays a prominent role in the supply chain. Logistics is that part of the supply chain that plans, implements and controls the effective flow and storage

of goods, services and information between the point of origin and the point of consumption in order to meet the requirements of the end user. The supply chain is a web of business partners who is primarily linked through contractual relationships and information networks (Monczha *et al.*, 2010:5).

Although not illustrated in the original graph of the supply chain**, logistics can also be seen as the glue that links all the activities together**, instituting the efficiency and effectiveness of the supply chain or the failure thereof.

Figure 2.2: A typical supply chain



(Source: Adapted from Baltzan *et al.*, 2009:134)

A typical supply chain has three main links:

- The flow of material between suppliers and their upsteam suppliers.
- The transformation of material into the production processes.
- The distribution of products to customers and their downstream customers (Baltzan *et al.*, 2009:135).

Activities in the supply chain are difficult to coordinate due to the complexity induced by the large number of related and interdependent activities. Some of the actions are separated from their cause, both in time and place and performed by different functional units of responsibility (Holmberg, 2000:847). Understanding the interdependency and the complex relationships is crucial to successfully manage these activities, also called internal logistics.

Business units within a supply chain are interdependent but traditionally they do not co-operate very closely. The actual processes in the supply chain are tasks that link and manage the activities (Bolseth, Sletten & Solem, 2011:2-3).

The characteristics of a supply chain include the following:

- It is a complete process to provide goods and services.
- It includes procurement, production and distribution.
- Membership includes all stakeholders, thus logistic operations from suppliers to end users.
- A common accessible information system makes co-ordination possible between all components.
- Organisational objectives are achieved through the performance of the supply chain.

It is notable that both the definition and the characteristics of a supply chain, put great emphasise on the integration of the different business units within the supply chain. The goal is to put all supply chain members on the same footing of internal logistics and information management for greater transparency. Integration focuses on the co-ordination of a network of operations to achieve organisational objectives. Information sharing and planning are the foundation of an integrated supply chain (Bolseth *et al.*, 2011:3-4).

It is also important to identify the members of the supply chain which include all companies or organisations with whom the focal company interacts directly or indirectly through its supply or customers, from point-of-origin to point-of-consumption. There are primary and supporting members:

- Primary members - all those strategic business units who actually perform operational and / or managerial activities in the business processes designed to produce a specific output for a particular customer.
- Supporting members - companies that simply provide resources, knowledge, utilities, or assets to the primary members of the supply chain, for example: agent that leases photocopy machines or building. Supporting members

contribute to a company and supply chain, but do not directly participate in or perform activities in the value-adding processes (Lepele, 2010:13).

2.3 SUPPLY CHAIN MANAGEMENT

SCM aims at "integrating a network (or a web) of upstream linkages (sources of supply), internal linkages inside the organisation and downstream linkages (distribution and ultimate customers) in performing specific processes and activities that will ultimately create and optimise value for the customer in the form of products and services which are specifically aimed at customer demands" (Hugo, Badenhorst-Weiss & Van Rooyen, 2002: 29). It can be concluded that SCM focuses on the improvements in performance, resulting is better management of key relationships.

Logistics is that part of SCM that plans, implements and controls the effective flow and storage of goods, services and information between the point of origin and the point of consumption in order to meet the requirements of the end user (Monczha *et al.*, 2010:5).

The benefits of SCM materialise over time and this is most often overlooked. It is crucial for the different stages in the chain to be integrated. Each stage is an independent entity with its own operations, controlling its own resources and setting its own objectives. These stages can each be seen as a supply chain on its own, thereby showing that an organisation may have several supply chains within the main supply chain. Typical hindrances for effective supply chains can be described as follow (SCM guide, 2005):

- Too many small transactions in the supply chain.
- Different interests among the actors in the supply chain.
- Overlapping roles and activities in the supply chain.

There are also typical reasons for these difficulties which include:

- A different price policy and discount systems according to transactions.
- Lack of incentives for rational behaviour in the supply chain
- Autonomous actors with separate targets for performance.

- Actors in the supply chain wish to control their environment; information sharing (knowledge management) is also often neglected.

With timely information sharing, the inefficiencies in supply chain performance can be eliminated, thus functional silos in the organisational structure cause the lack of common goals. This leads to a short-term focus not acknowledging the full potential of internal logistics and the management thereof (Bolseth *et al.*, 2011:6-7).

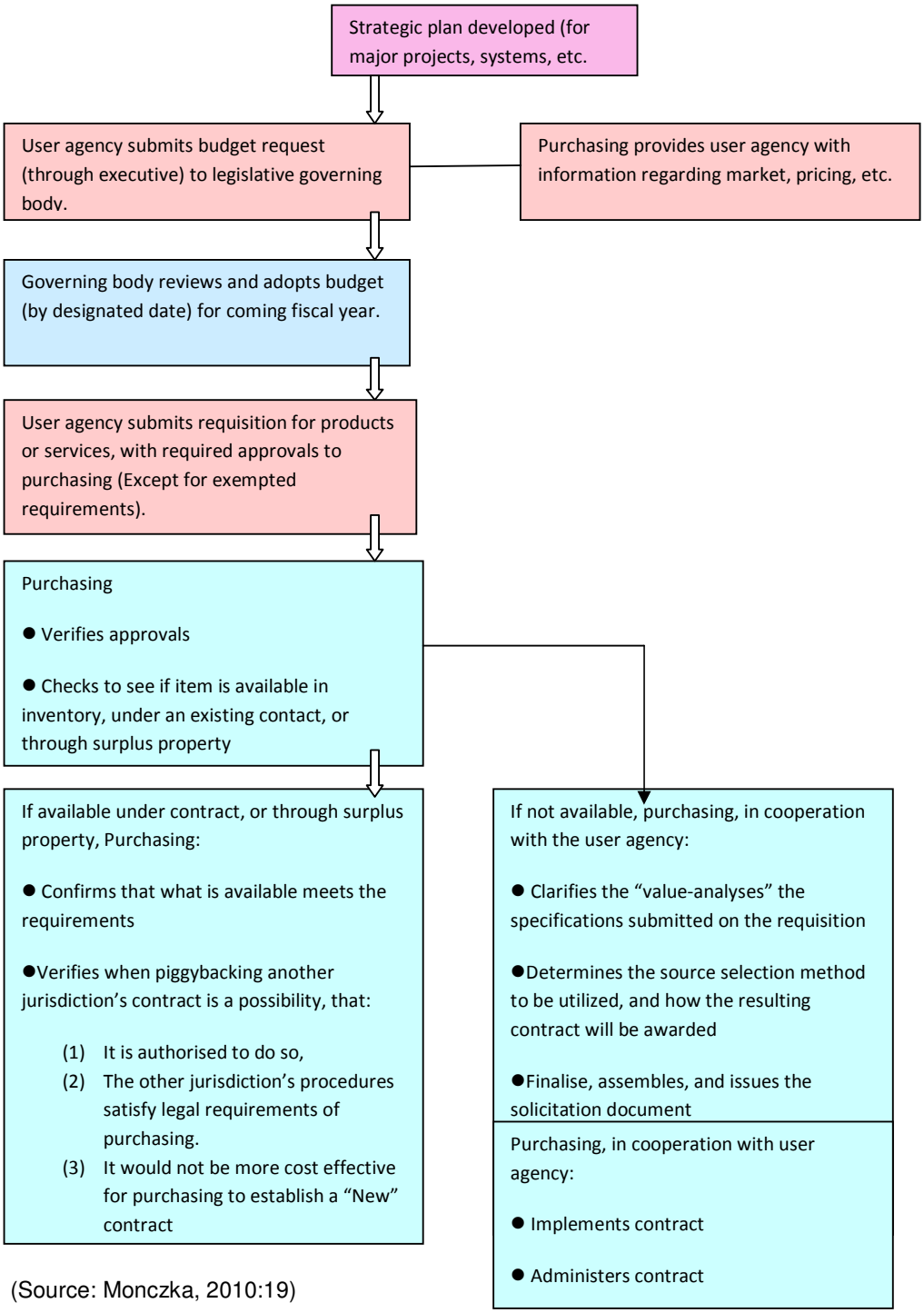
Any movement through a supply chain is initiated by a purchase requisition. Purchasing is not only an administrative task but also has a strategic impact. Therefore the term "purchasing" is inadequate and is replaced with the term supply management. Supply management is defined as "the identification, acquisition, access, positioning and management of resources and related capabilities an organisation needs or potentially needs in the attainment of its strategic objectives" (Monczka *et al.*, 2010:11-12).

Procurement and purchasing is often regarded as synonymous terms. However, procurement implies the acquisition of goods and services in return for a monetary or equivalent payment where as purchasing is responsible for obtaining equipment, materials and services required by an undertaking through purchase, lease or other legal means (Lysons, 2000:1). For the purpose of this study the term "procurement" applies.

2.3.1 The generic procurement cycle

The three phases of the cycle are planning and scheduling, supplier selection and contract administration. The cycle includes a number of steps and starts when a particular need for goods or services is identified. For services the cycle normally ends when the invoice was received and the payment has been made. For goods the cycle ends when the end user has consumed or disposed of the item. The procurement cycle is shown below in figure 2.3.

Figure 2.3: The generic procurement cycle



(Source: Monczka, 2010:19)

(Source: Lysons, 2000:13)

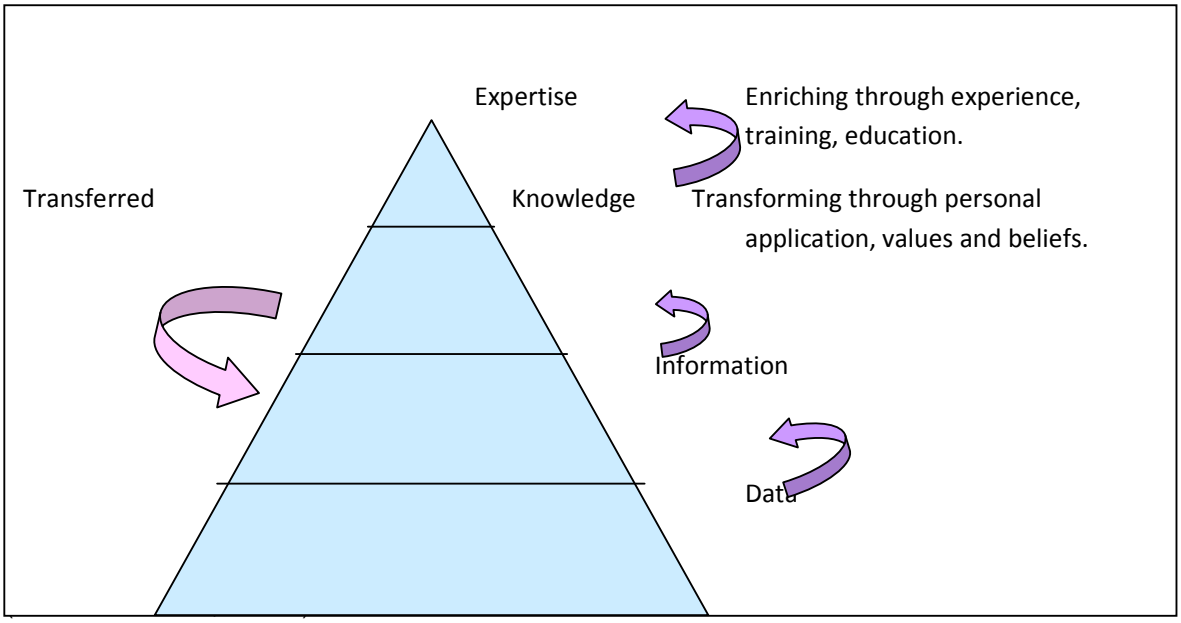
The golden thread through the procurement cycle is what the author defined as internal logistics. Although the internal logistics are not prominently illustrated in figure 2.3, it plays a vital role and is the driving force behind an integrated and successfully executed procurement cycle. To achieve procurement excellence it is necessary to follow, monitor and manage the golden thread of internal logistics.

2.4 MANAGEMENT OF INFORMATION RESOURCES

The management of information resources can also be translated into knowledge management. Knowledge management consists of the classifying, evaluating, retrieving and capturing of information in a way that provides context for effective actions and decisions. In the broadest context, knowledge management can be described as the process through which value is generated from intellectual and knowledge-based assets (Baltzan *et al.,* 2009:202). Knowledge is in the minds of people and not in technology and is acquired through experience, for the purpose of this study, experience from working in the supply chain environment in GDE.

Different aspects contribute to knowledge as can be seen in the hierarchy of knowledge in figure 2.4 below.

Figure 2.4: Knowledge hierarchy

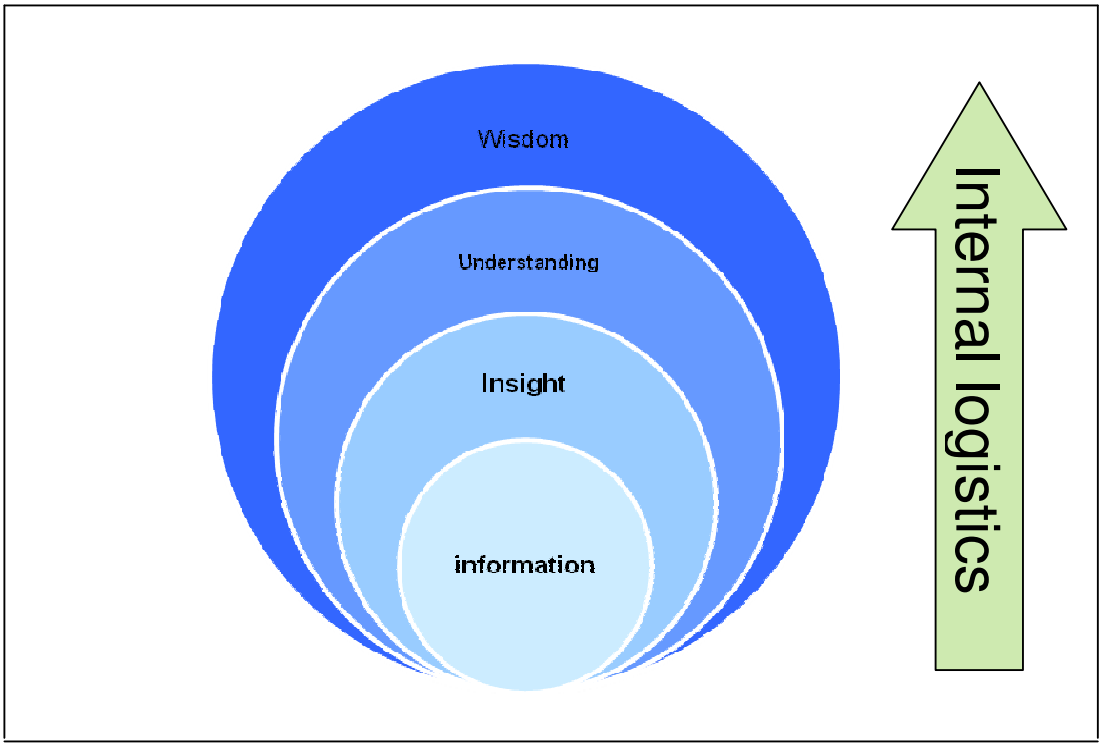


(Source: Van Beek, 2008:8)

Data within a given context becomes information. Information is transformed through opinion, skills and experience to become knowledge. Through the process of enrichment which involves applying knowledge practically, knowledge becomes expertise (Chaffey & Wood, 2005: 223). Knowledge is divided in tacit (subjective) and explicit (objective) knowledge. Tacit knowledge is the "know how" and explicit knowledge is the "know what". Tacit knowledge is personal, hard to formulate and found in the heads of employees (Jashapara, 2004:11). Explicit knowledge is found in the form of operational procedures, policies and manuals (Chaffey & Wood, 2005: 11). Converting tacit knowledge into explicit knowledge can be seen as a real challenge when managing knowledge.

It is important to understand how knowledge is generated before it can be managed. This is illustrated in Figure 2.5:

Figure 2.5: Levels of Knowledge



(Source: Adapted from Lepele, 2010:5)

Internal logistics is the complete process of obtaining goods and services from compiling and processing of requisitions to the payment of invoices and includes the record keeping of all transactions to achieve organisational objectives. Thus, the management of information resources contributes to the efficiency of the internal logistics within each phase of the supply chain.

2.5 SUPPLY CHAIN AND SUPPLY CHAIN MANAGEMENT IN THE PUBLIC SECTOR.

Although the complexity may vary, supply chains exist in both the private and public sectors. Public sector purchasing is specialized and specified and open bidding or negotiated contracts characterise most of the buying. Government buyers operate under the watchful eye of Treasury and many private watchdog groups. Government purchasing requires more forms and signatures and also responds slower and

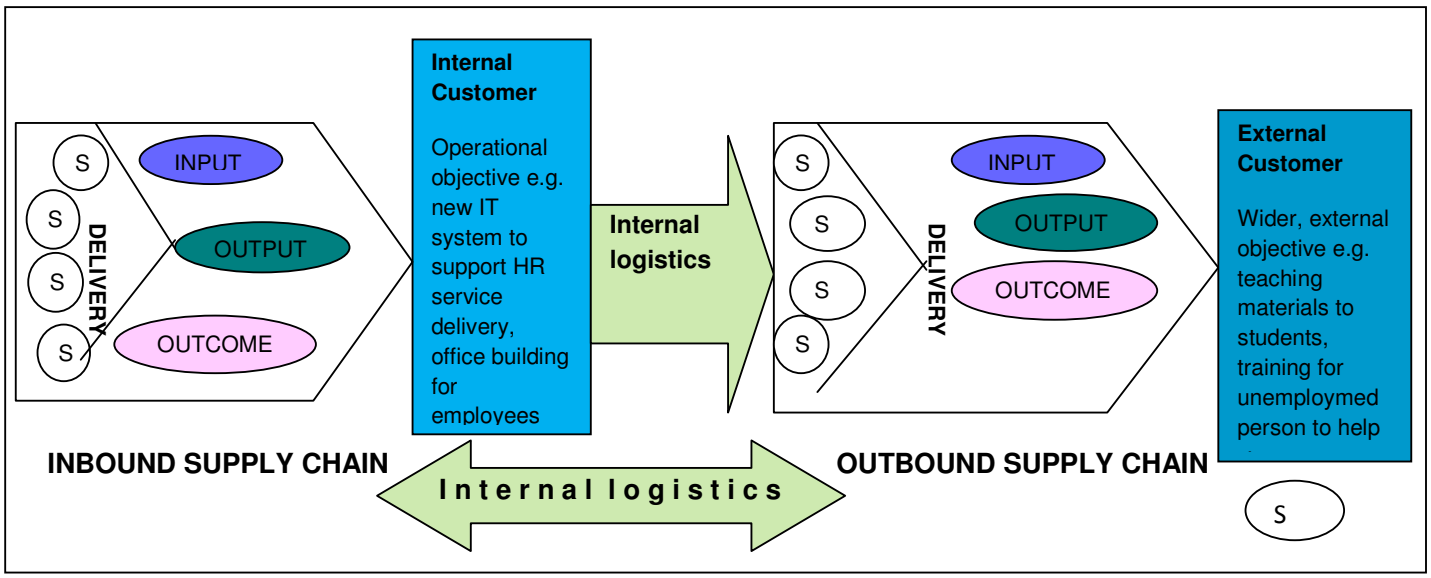
deliberately when placing orders. This is ultimately caused by the red tape within Government as well as the long line of authorization as per delegated powers (Kotler & Armstrong, 2010: 209).

SCM is also described as an interrelated process of buying, storing, utilising and disposal. The whole cycle of procurement comprises demand management, acquisition management, logistics management, disposal management and risk management and regular performance assessment. Government primarily focuses on the procuring of goods and services in the acquisition phase, neglecting the demand, disposal risk and assessment aspects of the supply chain (Mkhize, 2004:5).

A high-level definition that sets the concept of SCM in the specific context of public sector procurement is as follows: “The supply chain is the combination of all parties both inside and outside the organisation, involved in delivering the inputs, outputs or outcomes that will meet a specified public sector requirement. SCM is the coordination of all these parties” (SCM guide 2005:5).

The supply chain may be inbound into the public sector; in other words, an operational requirement for internal customers or outbound from the public sector thus in place to deliver wider organisational objectives to provide services for delivery to citizens, or a combination of both (SCM guide 2005:5). The inbound and outbound supply chain of the public sector is illustrated as follows in figure 2.6.

Figure 2.6: Governmental inbound and outbound supply chain



(Source: Adapted from SCM guide, 2005:5)

Logistics can also be seen as the glue that links all the activities together, instituting the efficiency and effectiveness of the supply chain or the failure thereof.

2.5.1 Characteristics of supply chains and supply chain management in the public sector

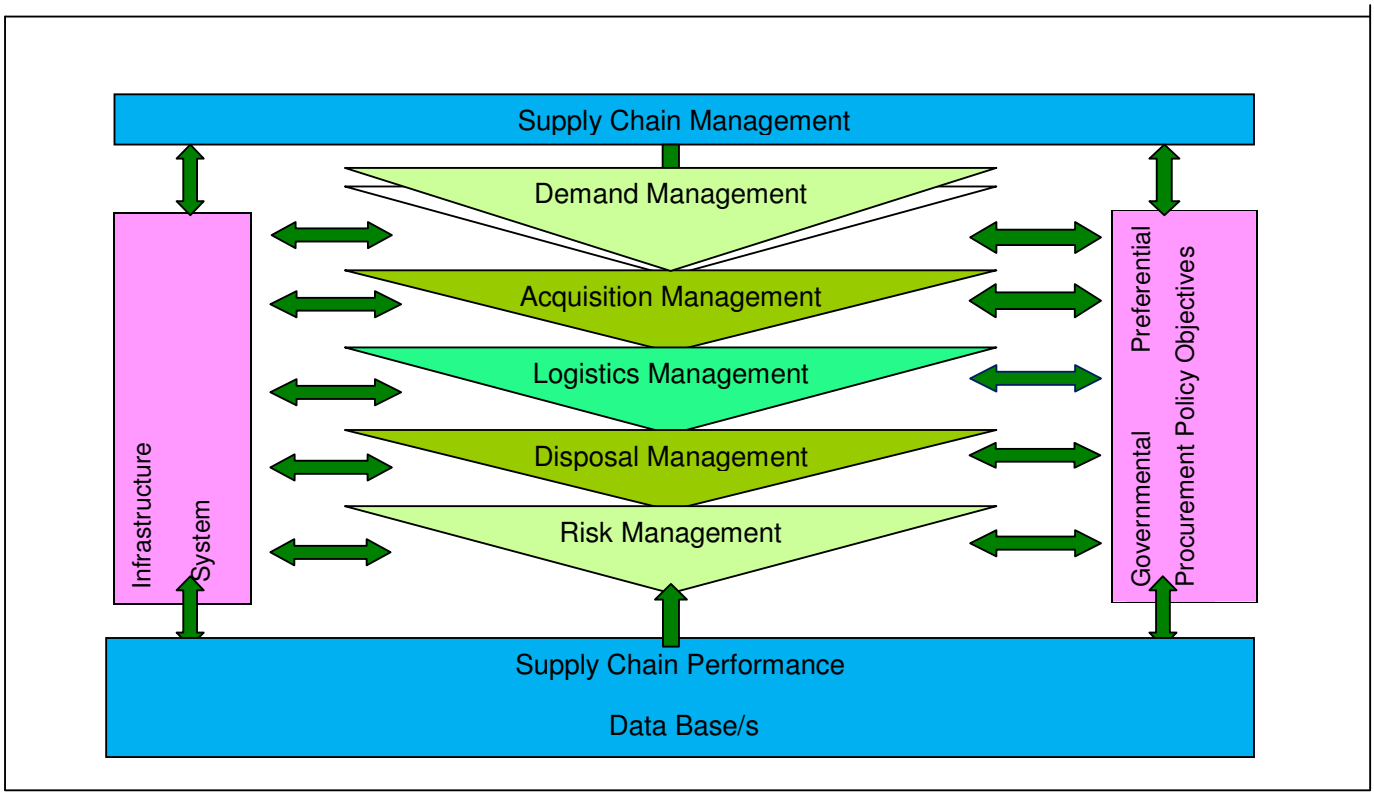
- Supply chains can be inbound to the public sector.
- Supply chains can be outbound from the public sector.
- Supply chains can be fully integrated - networks of interconnected companies with common performance and relationship management processes. Each link within the chain can differ in the nature of the interdependencies and the way in which the relationship needs to be managed.
- Supply chains can be long-term strategic sets of relationships between multiple diverse organisations which are carried from project to project or be ad-hoc structures established post-contract award to deliver a discrete once off objective.
- The focus of SCM can differ from government sector-to-sector, for instance in the health sector the focus may be more on the effective movement of goods

and services in and out of hospitals whereas SCM in the education sector focuses on the chain through which teaching materials are delivered to the learners.

- The focus of SCM can differ from industry sector-to-sector, for instance in construction the focus is on early establishment of a fully integrated client-supplier project team whereas in IT projects the focus may be on building scope for innovation and flexibility into the supply chain to cater for the changing requirements and rapidly evolving information and communications technology (SCM guide, 2005:6).

A framework in which the supply chain SCM operates is illustrated in figure 2.7. However, the importance and the efficient and effective executing logistics, is disregarded in Government and is only seen as a loose-standing compartment as seen below in figure 2.7.

Figure 2.7: Framework of supply chain management in Government



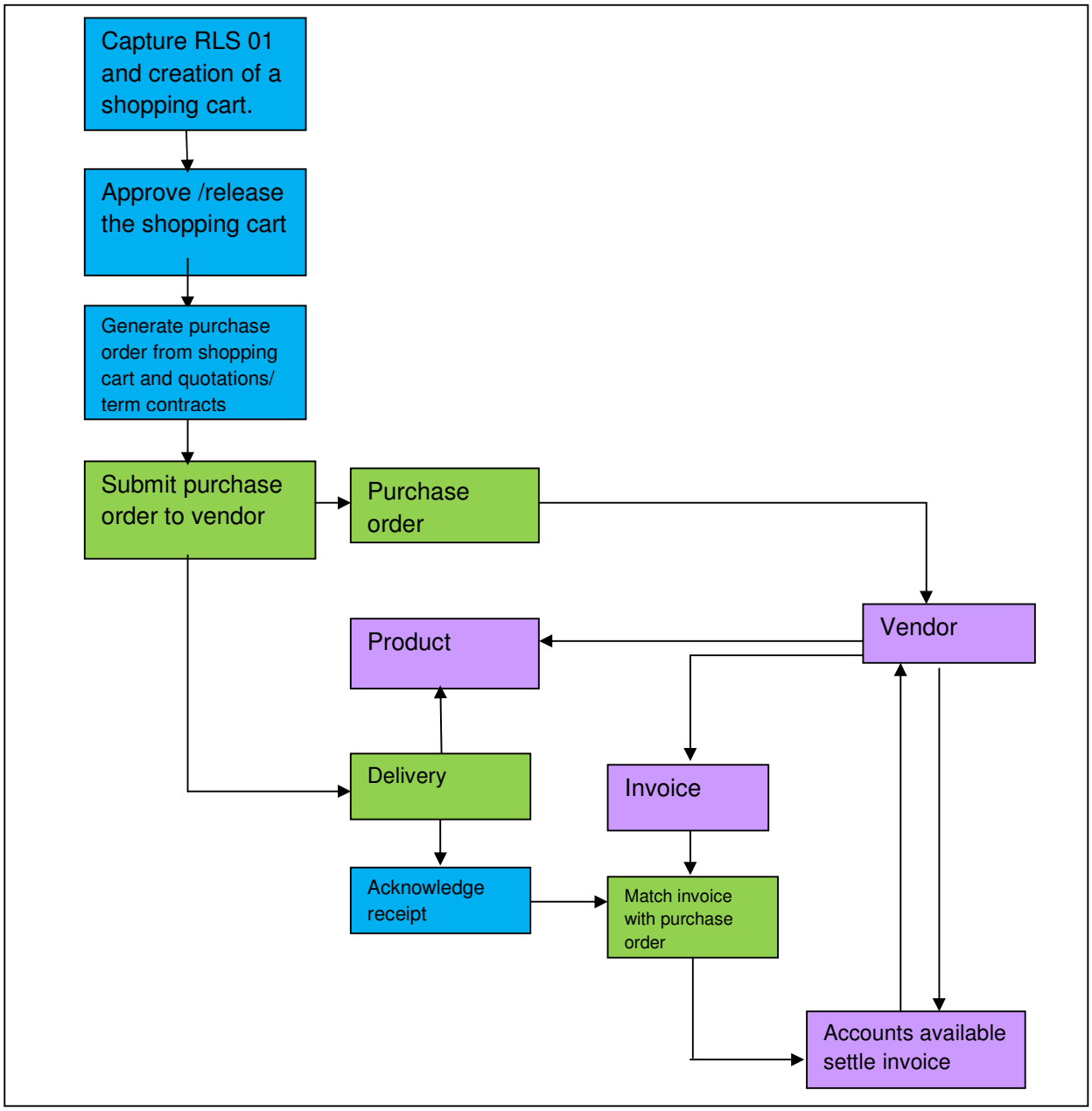
(Source: SCM Manual, 2004:28)

To understand the internal logistics within the supply chain of the Public service, it is necessary to look at procurement and the procurement process.

2.5.2 The procurement process

The procurement process includes all activities thus internal logistics that a buyer performs to acquire a specific product or service, from identifying the specific need of the end user through to the payment of the delivered product or service (Monczka et al., 2010:33). Since the requisition is the point of origin, the flow of a requisition is vital for the management of internal logistics and is illustrated in figure 2.8 below. This also illustrates the flow of the internal logistics within the purchasing process and the supply chain.

Figure 2.8: Purchase requisition flow



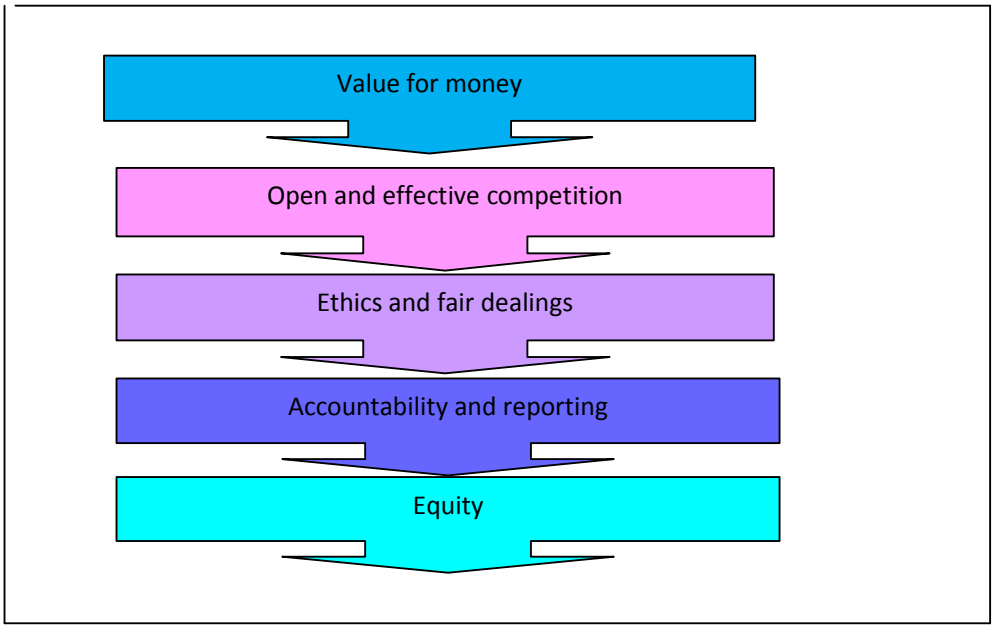
(Source: Adapted from Monczka *et al.*, 2010:33)

Purchase requisitions as received from the end-user are transmitted through an online requisition system (SRM), converting it into a purchase order and ultimately preparing it for delivery and payment. Internal logistics can also be seen as safeguarding the requisition flow for ultimate efficiency and quality service delivery. Procurement in Government is based on the five pillars of SCM as discussed below.

2.5.3. The five pillars of Supply Chain Management in the public sector

Proper SCM in the government rests upon the five pillars of procurement as illustrated in figure 2.9:

Figure 2.9: An illustration of the five pillars of supply chain management



(Source: SCM manual, 2004:17)

The pillars of SCM are discussed below:

i. Value for money

This is an essential test to justify a procurement outcome. Value for money means the best available outcome when all relevant costs and benefits over the procurement cycle are considered. Value for money is most often the accepting of the lowest price offer that meets the end user's requirements and specifications but price alone is often not a reliable indicator for value for money. Internal logistics with regard to procurement should be driven by cost effectiveness, which also includes avoiding any unnecessary costs and delays for themselves, end users and suppliers. Continuous improvement of internal processes and systems are a contributing factor to create value for money.

ii. Open and effective competition

Open and effective competition refers to the following:

- Framework of procurement laws, policies, practices and procedures that are transparent and readily accessible to all parties.
- Transparency in the procurement process.
- Encouragement of effective competition through procurement methods suited to market circumstances.
- Observance of the provisions of the Preferential Procurement Policy Framework Act No. 5 of 2000.

Government departments should do market research to get the best possible outcome from the market by ensuring that:

- All potential suppliers have reasonable access to procurement opportunities.
- Where market circumstances limit competition procurement methods should take that into account.
- Information is provided to suppliers to enable them to bid.
- Bias and favouritism are excluded from the procurement process.

This also assists BEE companies to be included in the vendor data base.

iii. Ethics and fair dealing.

In procurement, ethical standards create the platform to:

- Deal with each other on a basis of mutual trust and respect.
- Conduct business in a fair and reasonable manner with integrity.

Government officials dealing directly with suppliers or potential suppliers are required to:

- Recognise and deal with conflict of interest or the potential thereof.
- Deal with suppliers equitably.
- Ensure not to compromise ethics through the acceptance of gifts or hospitality.

- Be scrupulous in their use of public property.
- Provide all assistance in the elimination of fraud and corruption.

This also acts as a code of conduct for all supply chain practitioners in the public service.

iv. Accountability and reporting.

Within the procurement framework of the public service, reporting and accountability are broken down as follow:

- The various Directors are accountable to the accounting officer for the overall management of procurement activities.
- Heads of procurement at the various offices are accountable to Head office for various high-level management and co-ordination activities.
- Procurement officials are accountable to heads of procurement and the end users for the services they provide.

This pillar ensures Departments are answerable for their plans, actions and outcomes. Openness and transparency in administration is created through public reporting and is an essential element of accountability.

v. Equity

In this context equity means the application and observing of policies. This pillar is vital to the any organisation. It ensures commitment to economic growth by implementing measures to support the community at large, especially to advance the development of the society and historically disadvantaged individuals (HDIs). In accordance with the Reconstruction and Development Programme, SMMEs and HDIs need to play a bigger role in the economy. Greater participation in the economy and more diversified representation of blacks and gender role are essential. The Government has implemented the Preferential Procurement Policy Framework Act (PPPFA) no. 5 of 2000 as the foundation on which all procurement activities is based with the aim on advancing the development of SMMEs and HDIs, promote people with disabilities, create new jobs, promote local enterprises in a

particular region, in rural areas and support the local product (SCM Manual, 2004:22-23).

2.5.4 Elements of the Governmental Supply Chain Management

All procurement processes have to be within the framework published by National Treasury. The elements of SCM are as follow:

i. **Demand management;**
ii. **Acquisition management;**
iii. **Logistics management;**
iv. **Disposal management;**
v. **Risk management; and**
vi. **Performance management**

The elements are discussed below:

i. Demand management

Demand management is the first phase of SCM. The objective is to ensure that the goods and services required fulfil the needs identified by the end user, are delivered at the correct time, price and place and that the quantity and quality will satisfy those needs. A total needs assessment needs to be done to identify all needs as per operational plan. This will ensure that the goods and services required are linked to the budget and estimated costing was done according to predetermined specifications. Demand management leads to better communication and a closer working relationship between the supply chain practitioner and the end user (SCM manual, 2004:43-44).

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ii. Acquisition Management

Acquisition management is the management of procurement whereby it is decided on how and which market will be approached. This process entails the following.

- **Assessment of the market**

The purpose of assessment of the market is to establish a balanced approach when considering compliance to modern technology and development, enabling newcomers or HDIs to supply the goods/services and promoting black economic empowerment (BEE).

The following elements should be considered:

- Benchmarking.
- Total cost of ownership (cost drivers).
- Industry analysis.
- Market characteristics.

According to the National Treasury (2005: 14), acquisition management should involve a good sourcing strategy for obtaining goods and or services.

- **Sourcing strategy**

An optimum sourcing strategy takes cognisance of the nature of the goods or services required, the conditions of delivery, timely delivery, prospective suppliers and the goals to be promoted as contemplated in the PPPFA. Sourcing strategies include the utilising of transversal term contract, local versus provincial sourcing, obtaining quotations, inviting competitive bids, pre-qualification of bidders and negotiations. Uniformity in these documents will promote and ease the entry of new emerging enterprises to the public sector procurement, cost effectiveness both in financial and resources terms, improved understanding and easier interpretation by new emerging contractors and simplification of the documentation process.

Uniformity in contract documentation will result in:

- Bidders being able to more easily determine the scope and extent of risk.
- Easier management of contracts between potential contracting parties and the streamlining of administrative procedures.
- Savings in cost and improvement in quality.
- Greater transparency in terms of cost premiums paid in pursuit of government's preferential procurement objectives.

It is imperative to use standardised bid documents for all standard procurement of goods and services.

- **Establishment of a database of suppliers when obtaining quotations**

Quotations and bids for the required goods and services should be obtained from all potential suppliers in the specific category on a rotation basis from various suppliers. It also suggests that the list should be updated on a regular basis to allow for all potential suppliers to register. Splitting requirements to avoid the invitation of formal competitive bids is not allowed. To avoid favouritism, it is suggested that a minimum of three quotations are obtained. Where this is not possible, each case should be dealt with on its own merits. The reasons for not obtaining at least three quotations should be recorded and approved by the accounting officer or his/her assistant (SCM manual, 2004:68-79).

iii. Logistics management

Logistics is the process of strategically managing the acquisition, movement or storage of materials, parts and finished inventory, and the related information flows through the organisation and its marketing channel, in such a way that current and future profitability is maximised through the cost-effective fulfilment of orders (Stock & Lambert, 2001:57). Logistics management is the setting of an inventory level, receiving and distribution of material, stores, warehouses and transport management; and the review of vendor performance. It is that part of the supply chain that implements and controls the efficient and effective flow and storage of goods, services and related information from the point of origin to the point of consumption, in order to meet the consumer's requirements.

The essence of logistics management can be seen in the procurement of goods and services, satisfied end-users and reasonable costs. The most important task of logistics management is to constantly facilitate the correct level of consumer service and simultaneously maintain the balance in terms of total logistical costs (Hugo *et al.*, 2004: 39).

Logistics management goes hand in hand with the internal logistics which is the focus of this study and entails the following:

- **Inventory management**

Effective inventory management enables the purchasing department to meet or exceed the expectations of the end user related to product availability. To keep specific items in stock the following should be considered in order to automate the ordering process:

- Determining items and quantities necessary to be kept in stock.
- Minimum and maximum levels to be kept in stock based on consumption figures or inputs from users and allowing for a safety margin (± 20%) to be added to the minimum level to cover unforeseen circumstances.

In SCM and specifically inventory management the concept of just-in–time (JIT) has the following advantages:

- It lowers inventory levels allowing the stores to hold just what is needed implying cost saving in not keeping excessive inventory that might end up being obsolete.
- Smaller buffer stocks for items that may experience stock problems where there is a demand for short and reliable lead times.
- Quality improvement.
- Short and reliable lead times improve the adaptability of the production schedules.

Inventory management includes the following processes:

- **Stock taking**

One of the most crucial functions of stores is stock taking. Stock taking is part of inventory management, which is an important aspect for effective and efficient SCM processes. Stock taking of all inventory and capital assets should be conducted at least once a year. This procedure entails the comparison of assets counted with official records. Any deficiencies should then be accounted for.

- **Vendor performance**

The reliability of a supplier should be monitored in terms of delivery periods, quantity and quality. Any problems encountered should be followed up with the vendor and if it is a contract item, it should be reported to the body that arranges the contract.

- **Processing of invoices**

All invoices for goods and services received have to be paid within 30 days of the invoice date to avoid accrual payments (SCM manual, 2004:44).

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iv. Transport management

Inbound transportation is the transportation of goods between a supplier and the Department. Outbound transportation is a link between the Department, its stakeholders and the community. The Transport unit within each Department controls the internal and outbound movement while the supplier arranges inbound movement of goods (SCM manual, 2004:45).

v. Disposal management

Disposal management is the disposing of an asset that is no longer needed, including unserviceable, redundant or obsolete assets. When the disposal of any asset is approved the following will take place:

- Transfer to entity at market related value or if appropriate free of charge.
- Selling per price quotation, competitive bid or auction whichever is most effective to the Department.
- Destroying such assets

A specific committee is appointed to make recommendations with regard to the disposal of any asset and to deal with disposals. Responsibilities of such a committee include obsolescence planning, maintaining a database of redundant

material, inspecting materials for potential re-use, determining a disposal strategy and executing the physical disposal process (SCM manual, 2004:46).

vi. Risk management

A risk refers to any unintended or unexpected outcome of a decision or action. Risk management is the identification, analysis and economic control of those risks threatening the SCM system. This entails the following:

- Identification of risks on a case-by-case basis.
- The allocation of risks to the person/ department best suited to manage such risks.
- Acceptance of the cost of the risk where the cost of transferring the risk is greater than that of retaining it.

The management of risk in a pro-active manner and the provision of adequate cover for residual risk as well as the assignment of relative risks to the contracting parties through clear and unambiguous contract document. Therefore, it forms part of the business plan for the acquisition of all goods and services (SCM manual, 2004:47).

Vii. Supply chain performance

Supply chain performance is a monitoring process, undertaking a retrospective analysis to determine whether the proper processes were followed and whether the desired objectives were achieved. This also includes evaluating whether procurement was done in an economical, effective, efficient and accountable manner by means of checking compliance to policies and legislation. Performance is also measured by checking whether supply chain practices are consistent with government's broader policy focus and whether there are ways to improve the system (SCM manual, 2004:48). The following are included:

- **Performance measurement**

The performance of government is measured in terms of goals and economy efficiency and effectiveness. These goals also include qualitative standards such as public confidence in procedures, fair and equitable dealing, broad-based competition and the quality and integrity of the procurement system. Performance can also be measured according to the strength and effectiveness of relationships between the end user, the supply chain officials and the vendors. Performance can also be benchmarked.

Benchmarking can indicate which entity is best at performing particular activities, using their business processes or best practices to improve own internal activities and to streamline output (Thomson et al., 2010:122). For the purpose of this study a good indicator of the performance of the 15 District offices are their financial year closure results in terms of budget management; in other words, the accruals and commitments that are carried through to the next financial year.

- **Quality of services**

Currently there is great concern about the falling standards of service quality in the public sector. The gradual erosion of service quality is the result of imbalances between service capacity and management decisions. The main causes can be:

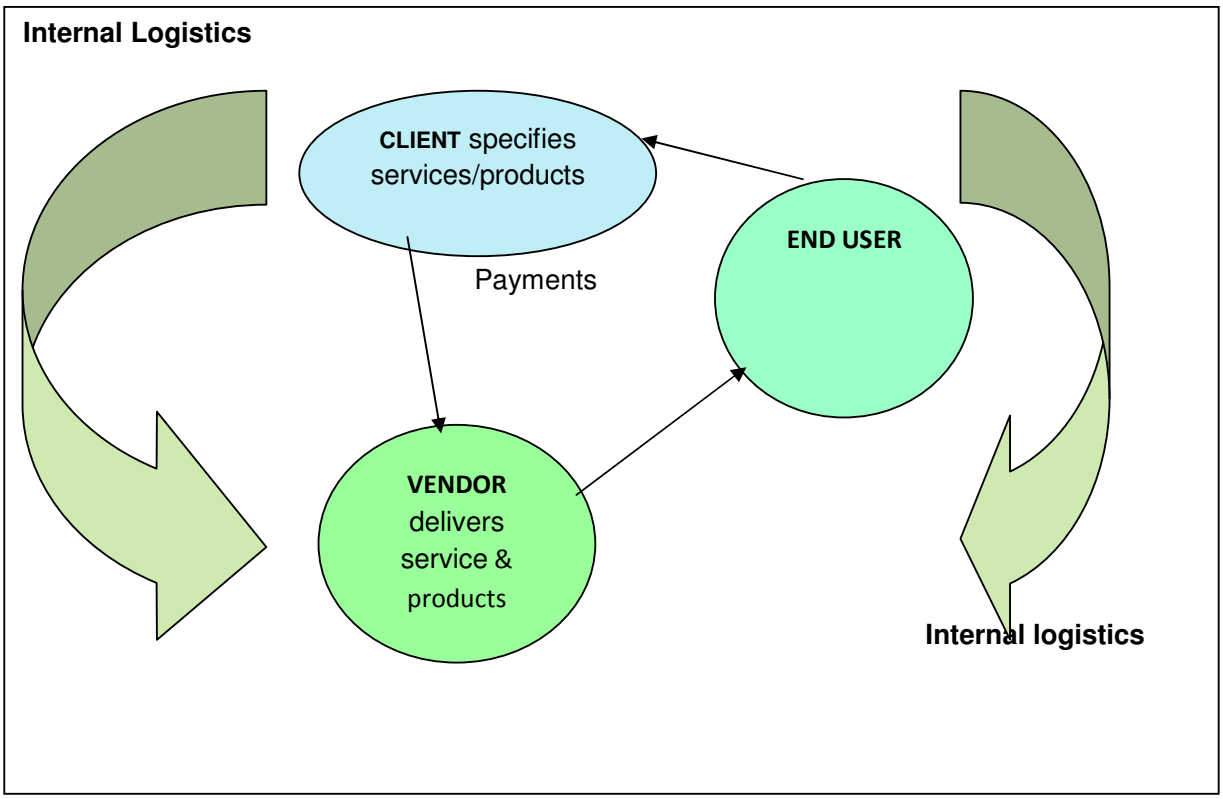
- A lack of objective quality measurements, leading to misinterpretation of an increased work load as a gain in productivity.
- Delays in realizing the ill-effect thereof and employees getting used to the lowered standards.
- An increase in customer expectations, arising from exposure to better quality in other industries (Niranjan & Metri, 2008: 125).

To evaluate services, one has to focus on quality. The measure often used for quality is customer satisfaction. One should differentiate between short-term and long-term quality where long-term quality is perceived as service quality and an attitudinal evaluation. Short-term quality is transaction specific and a good measure of customer satisfaction. Customer satisfaction is an emotional response resulting from the cognitive education process of the service against the costs of obtaining the service (Niranjan & Metri, 2008:125).

- **Client-Vendor-End User relationship**

The service relationship within GDE has three players namely the buyer, the end user, the customer and the vendor. This relationship is illustrated in figure 2.10:

Figure 2.10: Relationships within the supply chain



(Source: Adapted from Niranjan & Metri, 2008:126)

The buyer sets the specifications and pays for the goods or service, hoping to satisfy the end user/consumer. The vendor simultaneously has to satisfy both the client and the end user (Niranjan & Metri, 2008:126).

2.5.5 Benefits of supply chain management

The benefits of SCM include the following:

- Better risk allocation. In an increasingly complex delivery landscape, effective risk allocation is a critical consideration in SCM.
- SCM creates greater opportunities for innovation. Supplier innovation in the supply chain can contribute to better quality, faster delivery and reduced costs. An effective SCM offers strong potential for innovation to be released through the supply chain. Better-defined requirements through early supply

chain involvement in the shaping of the business need and this is where market research and innovation comes into play.

- End user involvement in the supply chain at an early stage is vital in establishing the correct requirements and specifications in order to establish a common understanding between the purchasing department and the end user of the identified need.
- SCM improves the ability to identify bottlenecks in contract delivery. Quality solutions offered by suppliers as opportunities can be more easily identified in their supply chains to improve quality, increase delivery times and reduce costs.

The benefits of SCM lead to increased value for money and better efficiency in service delivery. SCM can also contribute to improved long-term sustainability and better capacity management of the market through the availability of a more competitive and diverse supplier base (SCM guide, 2005:9).

2.6 CONCLUSION

The literature reviewed pertained to the supply chain and the logistics involved during each phase of the chain. From there the literature study and discussion continued with what procurement and SCM in the public sector entail. It was concluded that logistics is a golden thread weaving one phase to another.

However, it is now also very clear that the logistics involved in the supply chain can either achieve better overall performance or lead to underperformance and create total havoc if not administered efficiently. Currently the logistics within the supply chain of the GDE and with the focus on the District offices in particular, differ from office to office. This results in a situation where performance measurement and quality of service delivery are not on the same footing for all the offices, making the purpose of this study even more viable, as this study aims to develop a management framework for internal logistics which will enhance productivity and performance within the supply chain, improving service delivery and ultimately the optimal spending of the allocated budget of the GDE within the specific financial year.

An effective supply chain is based on quality input and output (internal logistics), which will provide the necessary resources to educators to give quality education and prepare learners for their future. SCM is about meeting customer demands with high precision and as cost effectively as possible. Simplicity comes from clear principles of operation and well defined processes with organisational focus. Excellence in procurement comes from a well defined strategy which aligns with operational objectives and is well executed to deliver the required needs through internal logistics.

Logistical processes within the supply chain of GDE are implemented for the optimal utilization of the budget, and aligned with the realization of the vision and mission of the Department. However, the processes are currently not efficient and result in dissatisfied end-users, poor service delivery, audit queries, poor management and reporting of the expenditure.

Closing the gap between the expectations of the end-user and performance of the supply chain is also vital in measuring the quality of service delivery.

2.7 CHAPTER SUMMARY

In chapter 2 various concepts relating to the logistics within the supply chain were investigated. The chapter is divided into two main topics namely supply chains in general and supply chains in the public sector. The value chain and a generic supply chain were discussed where it was indicated that a supply chain has primary activities and support activities. The supply chain is one of the primary activities and also the focus of this study, specifically the internal logistics within which it carries and links all the activities. This is followed by SCM with its pillars, elements, difficulties and benefits as well as supply management, the procurement cycle and the management of information resources.

The chapter concluded with the measurement of the supply chain performance which includes evaluating whether procurement was done in an economical, effective, efficient and accountable manner by means of checking compliance to policies and legislation. Furthermore, performance is also measured by checking

whether supply chain practices are consistent with government's broader policy focus and whether there are ways to improve the system.

Moving forward, chapter three explains the methodology used during the empirical study. The design of the questionnaire, the sample design, data collection and results are discussed in this chapter. With reference to the literature study, the results received from the survey with the questionnaires are evaluated and Analysed and an objective opinion formed in relation to the primary and secondary objectives.

CHAPTER 3

RESEARCH METHODOLOGY AND FINDINGS

3.1 INTRODUCTION

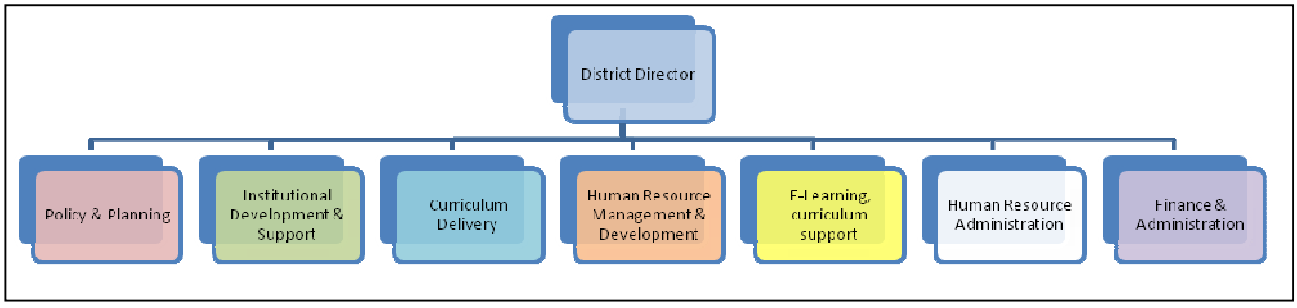
The literature study done in chapter 2 focused on the concepts of internal logistics within supply chain management. Chapter 3 focuses on the research methodology used in the study in order to meet the research objectives explained in chapter 1. The findings from the survey are also presented.

3.2 RESEARCH PROCESS AND DESIGN

3.2.1 The sample group

The study focused on the Sub-directorate Finance & Administration within the 15 Districts offices of GDE. The reasoning behind this sample was that this Sub-directorate is responsible for SCM in accordance with the PFMA, Treasury Regulations and Operational plans in the District offices. As illustrated below in figure 3.1, a District office consists of seven Sub-directorates, where SCM is practiced by the Sub-directorate Finance and Administration.

Figure 3.1: District organisation



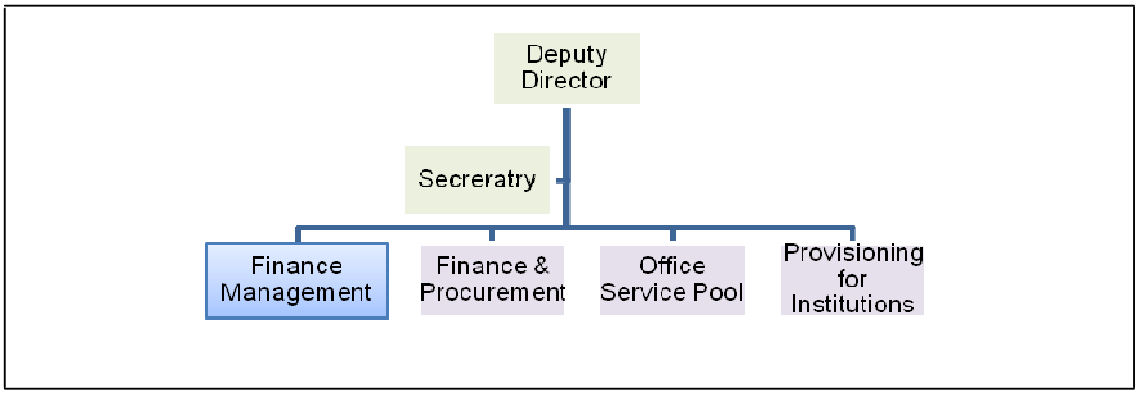
(Source: self-derived)

The Sub-directorate Finance and Administration is divided into four units, namely: Finance Management, Finance and Procurement, Office Service Pool and

Provisioning for Institutions. The Sub-directorate is headed by a Deputy Director with four Assistant Directors managing the different units.

Illustrated in figure 3.2, SCM is practiced in the three purple units; in other words, in the Provisioning for Institutions unit to service the schools and to service the office either in the units Office Service Pool or Finance and Procurement. In some District offices the processes to procure for the District office are shared between the latter units.

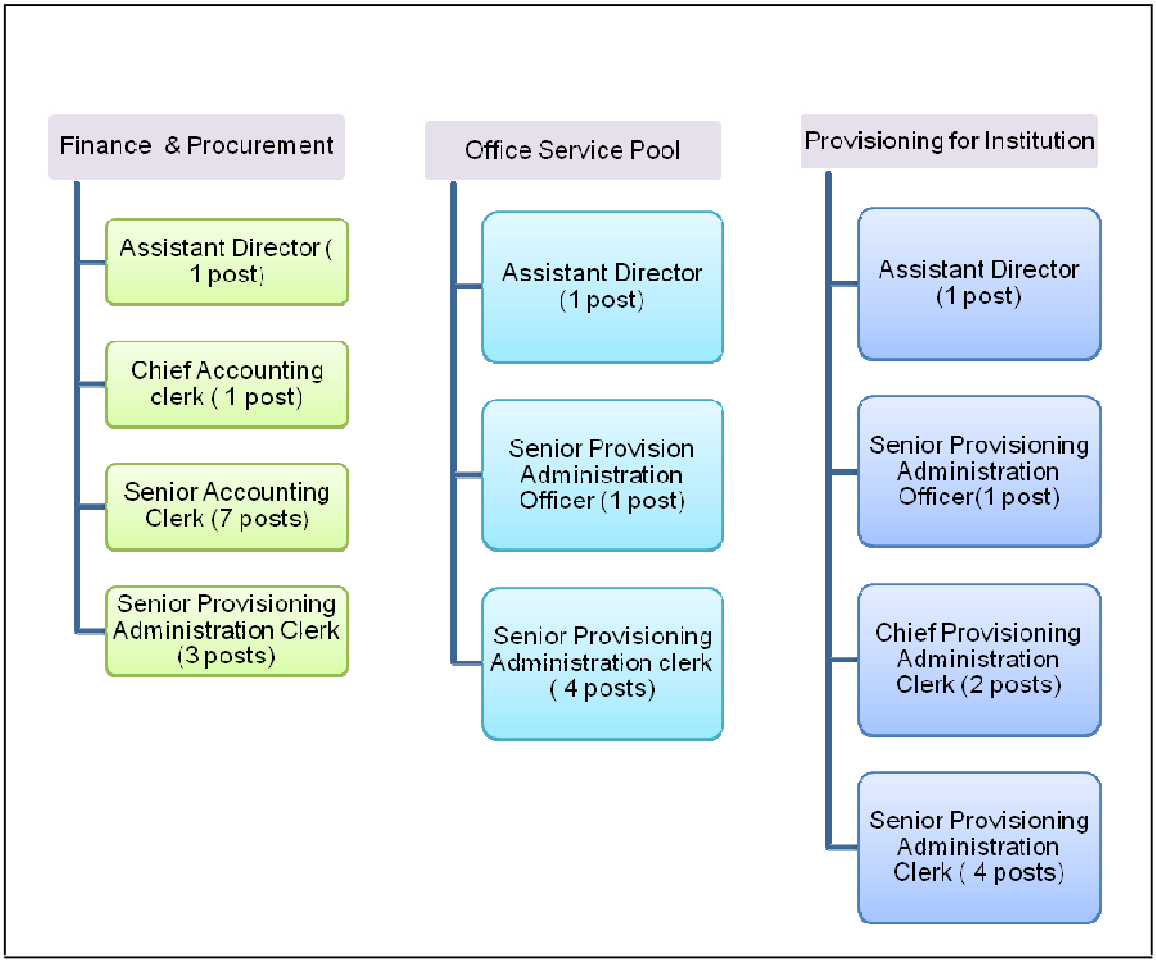
Figure 3.2: Sub-directorate: Finance and Administration



(Source: self-derived)

The current post establishment provides for SCM as a job description of Provisioning administration with different levels of delegation and authority. These posts are allocated in the purple units as indicated below in figure 3.3, and in total there are 26 posts per District office. However, these are not the only posts in these three units but are combined with other posts such as Senior Accounting Clerks, Senior Administration Clerks, and Chief Accounting Clerks. Each District office uses the filled posts and officials as best to maximise the output and service delivery of the Sub-directorate. A full breakdown of the post establishment is illustrated in Figure 3.3.

Figure 3.3: Post establishments with regard to SCM in the different unit



(Source: self-derived)

Table 3.1 below gives a full breakdown of the number of employees according to their ranks and post description (coloured in blue) working with SCM.

Table 3.2: A summarised breakdown of the sample according to the post establishment

Section	Positional Level	Number (N)
Finance and Procurement	Assistant Director	1
	Chief Accounting clerk	1
	Senior Accounting clerk	7
	Senior Provisioning admin. Clerk	3
Total		**4**
Office service pool	Assistant director	1
	Senior Provisioning Admin Officer	1
	Senior Provisioning Admin clerk	4
Total		**6**
Provisioning for Institutions	Assistant Director	1
	Senior Provisioning Admin officer	1
	Chief provisioning Admin. Clerk	2
	Senior Provisioning Admin. Clerk	4
Total		**8**
Finance Management	Assistant Director	1
	State Accountant	1
	Senior Accounting clerks	3
Total	**Assistant Director**	**3**
	Senior Provisioning Officer	**2**
	Chief Provisioning Clerks	**2**
	Senior Provisioning Admin Clerk	**11**
Total per District office		**18**
Total of population(15 District offices)		**270**

The population consisted of the total number of employees who are involved with SCM, which amounts to 18 officials per District Office thus for the 15 District offices the total population consisted of 270 respondents.

3.2.2 The Sample size

As illustrated above in table 3.1 the population group was 270 employees concerned with SCM in the 15 District offices. If a random sample is used the calculation of the sample size is an important variable to ensure that results are scientific and statistically significant during the research process. The equation for the calculation of the sample size of a random sample is as follows:

Equation 3.1: Sample size

$$n = \frac{Z^2 \pi(1-\pi)}{e^2}$$

Where:

n = sample size required for given parameters.

Z = number of standard deviations for given accuracy.

π = proportion of sample of interest (a value of 0.5 maximises the sample size, thus minimising the error.

e = error allowable, in this case 10 %

(Source: Levin, Stephan, Krehbiel & Berenson, 2008:303)

The number of employees in the population is 270 as seen in table 3.1. For these set values it was calculated that a random sample of 56 questionnaires would be required to assume the survey results are representative of the opinion of the population. In total, 126 responses were received and would it have been a random sample, it would have been representative for the population.

However, in this study the author made use of an availability sample and not a random sample. In particular, questionnaires were handed out to the entire population and those who responded formed the sample. The method of distribution was by hand by the author herself to the Deputy Directors of the 15 District offices during a weekly management meeting. The questionnaire was active for three weeks with reminders sent weekly to the Deputy Directors via email. The completed questionnaires were returned to the author at the weekly management meeting in

unmarked and sealed envelopes. The response rate was 47%. A total of 270 questionnaires were sent out and 126 were received back. The response rate of only 47% can among other aspects be attributed to the fact that the population was calculated according to the current post establishment which indicated a total number of 270 posts in SCM. However, the author did not take the possibility of vacant posts into consideration which impacted on the target population making it smaller than anticipated.

The sample used in this study (an availability sample) should be considered as a subpopulation from the population, rather than a random sample from which conclusions about the population can be drawn. Statistical inference based on p-values is not applicable to an availability sample. Therefore, conclusions should be based on the effect sizes to determine the practical significance of the relationships that are investigated (Ellis & Steyn, 2003).

3.2.3 Survey instrument

There are various instruments that can be used by researchers for collecting the information needed. The schools of thoughts can be grouped into two, namely qualitative and quantitative approaches. Qualitative research is a subjective approach. In this approach the interpretation of events is important such as the observation during an in-depth interview. Qualitative research involves analysis of data such as words (as from interviews), pictures (such as video), or objects (such as an artefact). Quantitative research is an objective approach. This method seeks precise measurement and analysis of target concepts. Researchers use tools such as surveys and questionnaires for gathering the data needed. The quantitative research approach is less time-consuming and the data are in the form of numbers and statistics. From this kind of data, relationships can be established, hypotheses can be tested and models can be derived (Neill, 2007). The author chose a quantitative approach in order to objectively meet the research objectives. The design decided upon for the study was a non-random availability sampling approach. The intent was to obtain the maximum number of responses possible within the timeframe available.

The survey instrument used in this study was a questionnaire. The advantages and disadvantages of using a questionnaire were considered and it justified the use in this study. The questionnaire was developed to improve user-friendliness and to ensure a high response rate. The questionnaire consisted of 4 sections according to the following themes: Demographics, Supply chain practices, Supply chain performance and Supply chain processes. There are 13 main questions with a number of selection type questions with answering mainly in the form of a 5-point or 4-point Likert scale. There were 5 different scales used depending on the type of questions. The first scale used for questions 6 and 9 was from 1 (strongly disagree) to 5 (strongly agree). The second scale applied to question 8 from 1 (not at all) to 4 (mostly) with a 5th option where the respondent can indicate that he or she does not know the answer to the question (do not know). The third scale was in relation to questions 10 from 1 (always) to 4 (rarely). The fourth scale was applied to question 11 from 1(excellent) to 4 (poor). One question (question 7) had only the choice of Yes (1) or No (2). The last two questions related to internal processes and the same scale was used where the respondent had to indicate a specific unit Finance and Procurement (2), Office service pool (3), Provisioning for Institutions (5) or not at all (1). Provision was also made for a selection of "do not know" when the respondent did not know the answer to the question. The questionnaire is included as Annexure 1.

3.2.4 Ethical aspects

The questionnaire included an informed consent in the form of a paragraph stipulating the objective of the questionnaire. The questionnaire was also discussed with the Deputy Directors during an information session at the weekly management meeting. Anonymity of the questionnaires was ensured through returning the questionnaires in sealed unmarked envelopes. The author also tried to do the analyses of the results as objectively as possible. The Statistical Consultation Services of the NWU assisted with the statistical analyses. Analyses were done using SPSS (2009) and STATISTICA (2011).

3.3 FREQUENCY ANALYSIS AND DESCRIPTIVE STATISTICS

3.3.1 Assessment of margin of error

The margin of error was calculated at a 95% confidence level. Equation 3.2 was used to calculate the margin of error on the questions.

Equation 3.2: Calculation for margin of error

$$L = 2\sqrt{\frac{p\,(100-p)}{n}}$$

Where:

L = the margin of error

p = the percentage of answers received back per question

n = the number of questionnaires received back.

For the number of questionnaires received back, each question received 100% response.

3.3.2 Section A: Demographical data

Question 1 determined the current position of the respondent according to the posts as indicated in figure 3.1. Procurement activities are mostly performed by the senior clerks and it can be assumed that they are best capable to give an opinion relating to practical applications.

Table 3.2: Current position of respondent

Current position	Percentage
Deputy director	1.6
Assistant Director	12.7
Senior officer	15.9
Chief clerk	15.1
Senior clerk	54.8

It is clear that most respondents were senior clerks at 54.8%; they are the employees actually performing the tasks related to the supply chain processes.

Question 2 and 3 focused on the number of years working in the Department and the Sub directorate Finance and Administration. The number of years working in the GDE and in the Sub-directorate give an indication of work experience gained in SCM in the public sector.

Table 3.3: Number of years respondents are working

Current position	Percentage: years respondents are working in the Department	Percentage: years respondents are working in Finance and Administration
Less than 1 year	4.0	3.2
More than 1 year but less than 5 years	15.1	22.2
More than 5 years but less than 10 years	2.4	13.5
More than 10 years	78.6	61.1

Working more than 10 years in both the Department and in the Sub-directorate Finance and Administration, received a significantly higher response rate at 78.6% and 61.1% than the other possibilities to have chosen from.

Question 4 gave an indication in which units the respondents are currently working.

Table 3.4: Unit respondent is currently working in

Unit	Percentage
Finance and Procurement	28.6
Finance Management	9.5
Office service pool	29.4
Provisioning for Institutions	32.5

It is concluded that the most respondents (32.5%) are working in the unit Provisioning for Institutions which also relates to figure 3.1 and also confirms that the unit Provisioning for Institutions has the most posts with regard to supply chain management.

Question 4.1 is an indication of how long the respondents have been working in the unit as indicated in Question 4.

Table 3.5: Period working in specific unit

Current position	Percentage: years respondents have been working in the unit
Less than 1 year	4.0
More than 1 year but less than 5 years	29.4
More than 5 years but less than 10 years	13.5
More than 10 years	53.2

It was determined that 53.2% respondents have more than 10 years of service working in their current unit, therefore should have significant knowledge and experience in their field of operation and, therefore, it can be concluded they were able to answer the questions in the questionnaire.

Question 5 determined the highest qualification of the respondents.

Table 3.6: Highest Qualification of respondents

Qualification	Percentage
Grade 12	24.6
Certificate	10.3
Diploma	40.5
Degree	19.8
Post degree	4.8

This table shows most of the respondents obtained at least a diploma qualification and therefore are used to an academic environment, with a reasonable level of comprehension to understand what is expected from them at their workplace.

3.3.3 Section B: Supply chain practices

Section B aimed to evaluate the implementation and adherence to the five pillars as well as the elements of SCM; in other words the different aspects of SCM and the quality of the logistics in the supply chain.

Question 6

In this table the responses to Question 6 is presented. In the third column the % of respondents who indicated that they don't know is given. The fourth to the seventh column shows the percentages of Strongly disagree (1), Disagree (2), Agree (3) and Strongly agree (4) respectively. In the last two columns the mean and standard deviation of the responses are given. Please note the "don't know" option was

indicated by a score of 5 in the questionnaire but these responses were removed for the calculation of the mean and standard deviation.

Table 3.7: Adherence to the pillars of SCM

	Question 6	% Don't know	% Strongly Disagree(1)	% Disagree (2)	% Agree (3)	% Strongly agree (4)	Mean Score	Standard deviation
6.1	My office operates according to the 5 pillars of SCM.	**4.8**	0.8	4.8	**55.6**	**34.1**	3.29	0.6
6.2	My office procures at the lowest price which best fits the requirements of the end-user.	1.6	0	19.0	58.7	20.6	3.02	0.637
6.3	My office links demand plans and procurement processes.	**4.8**	0.8	15.1	51.6	27.8	3.12	0.688
6.4	The procurement processes are transparent.	2.4	0.8	17.5	41.3	38.1	3.20	0.754
6.5	Potential suppliers have equal access opportunities to quote.	3.2	0.8	18.3	54.0	23.8	3.04	0.685
6.6	Favouritism plays a role in supplier selection.	6.3	34.1	52.4	3.2	4.0	1.75	0.715
6.7	Procurement is done with integrity.	0.8	0.8	15.1	**65.1**	**18.3**	3.02	0.609
6.8	Gifts are accepted from suppliers.	**9.5**	47.6	37.3	3.2	2.4	1.56	0.692
6.9	The current Procurement processes provide a quality service to end-users.	0.8	0	15.9	**73.0**	10.3	2.94	0.513
6.10	Procurement processes are co-ordinated activities for quality service delivery.	0	0.8	15.1	**73.0**	**11.1**	2.94	0.541
6.11	All procurement policies are currently applied.	**6.3**	0	7.9	**70.6**	15.1	3.08	0.492

Although the percentage of 4.8% (Question 6.1) is not high for respondents not knowing whether their office operates according to the pillars of SCM or whether

their office links demand plans (Question 6.3) and procurement processes, it definitely raises a question to the knowledge and skills of the respondents. Linked together with the 6.3% (Question 6.11) respondents not knowing whether their office applies all current SCM policies and the 9.5% (Question 6.8) respondents not knowing whether gifts are accepted from suppliers, it surely poses a risk to the internal logistics and a threat to integrity. A possible reason for these percentages can be the respondents working in the Sub-directorate less than 1 year.

Question 6.10 shows a total of 84.1% respondents agreed that their current procurement processes are co-ordinated activities and provide a quality service to end-users.

According to Question 6.7, for the agree and strongly agree responses, 83.4% of the respondents are of the opinion that procurement is done with integrity which is also supported by the fact that in Question 6.11 (combination of the agree and strongly agree responses), 85.7% of the respondents agreed that all policies are applied and 89.7% respondents agreed that their office operates according to the five pillars of SCM (Question 6.1, combination of agree strongly agree).

Question 7

Question 7 measured the basic compliance to supply chain elements. Vendor performance has a direct impact on quality and timely service delivery as well as value for money and therefore impacts on internal logistics.

Table 3.8: Management of vendor performance

	Question	**% Yes(1)**	**% No(2)**
7.1	My office has a supplier data base.	**73.8**	26.2
7.2	My office has a standard price quotation form (RFQ).	47.6	**52.4**
7.3	My office has records on vendor performance.	35.7	**64.3**

It is apparent that although 73.8% of the offices have a vendor data base, the basic principle of acquisition management, is not adhere to with 52.4% of the offices not using a standard price quotation form and 64.3% offices do not have records on vendor performance. This can indicate a large number of offices do not acknowledge vendor performance as a crucial part of SCM. A standard price quotation ensures open and effective competition for all potential vendors and provides transparency, ethics and fair dealing when comparing the proposals and quotations from vendors for the requested goods or services, therefore it is suggested that a standard price quotation is used.

Question 8

This question also measures the extent to which supply chain practices are adhered to. This is valuable for the assessment of the health and performance of the supply chain. The "Don't know" options were not included in the calculation of the mean and the standard deviation.

Table 3.9: Adherence to supply chain practices

	Question	% Do not know	% Not at all (1)	% To a small extend (2)	% To a consider-able extent (3)	% Mostly (4)	Mean	Standard deviation
8.1	Certification of deliveries by end-users before payments is made.	4.8	**18.3**	**18.3**	**22.2**	**36.5**	2.81	1.147
8.2	Regular checking and verification of assets.	2.4	0	7.1	44.4	46.0	3.40	0.624
8.3	Monitoring and review of vendor performance.	11.1	**31.7**	15.9	28.6	12.7	2.25	1.095
8.4	Disposal of assets.	15.1	22.2	16.7	34.1	11.9	2.42	1.028
8.5	Monitor consumable inventory.	6.3	7.1	28.6	42.9	15.1	2.70	0.830

The response to question 8 was hoped to be "To a considerable extent". All practices listed in this question are supposed to be adhered to. Therefore, responses such as "Not at all" and "To a small extent" indicate that it can be problematic and threatens service delivery and the outcomes of the AFS.

The combination of the responses "Mostly" and "To a considerable extend" in Question 8.1 received a percentage of 58.7 however, it poses a high risk since 36.6% of the respondents indicated "Not at all" or "To a small extend". This shows 36.6% respondents indicated that the consent by the end-user is problematic.

The offices mostly check and verify assets (Question 8.2) with only 7.1% of the respondents in the sample indicated that it is done "To a small extent" in their offices". Although this percentage is low, not checking and verifying assets can lead to a qualification on the AFS and therefore indicates a problem area which needs to be addressed.

Question 8.3, vendor performance monitoring, has the highest percentage for "Not at all" (31.7%). This is also a problem area which can threaten value for money and quality of service delivery.

The fact that 15.1% respondents (Question 8.4) indicated they "Do not know" if assets are disposed can indicate poor management of assets and it is not in line with the elements of SCM. The high response "not at all" (22.2%) and "to a small extent" (16.7) are also affecting the AFS.

3.3.4 Section C: Supply chain performance

This section aimed to determine how the supply chain is performing according to the respondents as well as the successes of the implemented supply chain processes, competency level and the transfer of knowledge in GDE.

Question 9

This question focused on the quality of service delivery as perceived by the respondents. It is adding value to this survey by ensuring an opinion on the output of the current procurement activities, can be expressed. The option "Don't know" was excluded from the calculations of the mean and the standard deviation.

Table 3.10: Quality of service delivery

		Do not know	% Strongly Disagree (1)	% Disagree (2)	% Agree (3)	% Strongly agree (4)	Mean	Standard deviation
9.1	Procurement processes are supported by management.	0.8	1.6	1.6	67.5	28.6	3.24	0.559
9.2	Procurement processes are clear within the office.	0	0.8	4.8	70.6	23.8	3.17	0.538
9.3	Procurement processes are clearly broken down into specific tasks.	2.4	0	24.6	59.5	13.5	2.89	0.617
9.4	End-users are all trained in procurement processes	4.0	2.4	15.9	60.30	17.5	2.97	0.670
9.5	End-users trust the procurement processes to be best practices.	10.3	1.6	9.5	69.8	8.7	2.96	0.524
9.6	End-users are satisfied with the procured goods and services.	2.4	0.8	18.3	71.4	7.1	2.87	0.527
9.7	RLS 01's are completed correctly.	0	0	25.4	52.4	22.2	2.97	0.692

On average the respondents agreed with the statements. However, there are 24% (Question 9.3) of the respondents in the sample that disagreed that the processes are broken down into specific tasks. This has a major implication for the internal logistics and not only indicates there are respondents without a clear understanding of their role and activities but is also a threat to the quality of service delivery to end-users.

In Question 9.4, the combined responses to “strongly disagree” and disagree shows 18.3% respondents indicate that end-users are not trained in procurement processes. Although it is not expected of end-users to have an in-depth knowledge of SCM, they have certain responsibilities with regard to expenditure and requisitioning thus a basic understanding is needed.

It raises a concern that 10.3% (Question 9.5) of the respondents indicated they do not know if end-users trust the procurement processes to be best practices. This implies that there is poor communication between the end-users and the supply chain practitioners and therefore impacts on the perceived end-user satisfaction as seems to be, on average, high but also qualifies the 19.1% (Question 9.6) respondents who indicated they disagree or strongly disagree with the statement that end-users are satisfied with procured goods and services.

It is very important that the RLS 01 (requisition) is correctly completed since this is the source document for procurement. An average of 25.4% (Question 9.7) of respondents disagreed that the RLS01 is completed correctly. This definitely has an impact on time management as well as on quality and correctness of the transactions.

Question 10

This question focused on specific activities within the procurement process and gives an indication of how the respondents rated the performance of their office concerning these activities. Time management also plays a major role.

Table 3.11: Performance of office in relation to procurement activities

	Question	% Always (1)	% Most of the time (2)	% Some-times (3)	% Rarely (4)	Mean	Standard deviation
10.1	PO’s are delivered according to delivery dates.	4.8	29.4	52.4	13.5	2.75	0.748
10.2	RLS01’s are captured the same day they were	13.5	29.4	37.3	19.8	2.63	0.952

	received.						
10.3	Shopping carts are released the same day they were captured.	10.3	50.0	29.4	10.3	2.4	0.811
10.4	PO's are created within 5 days after the shopping cart was released.	9.5	50.0	19.0	21.4	2.52	0.936
10.5	Deliveries are issued to end-users on the day they were received.	10.3	58.7	21.4	9.5	2.30	0.783
10.6	GRV's are captured the same day as the delivery.	7.9	55.6	25.4	11.1	2.40	0.791
10.7	Web cycles are cleared daily.	17.5	31.7	38.9	11.9	2.45	0.917
10.8	Payment of invoices is within 30 days.	17.5	34.1	37.3	11.1	2.42	0.906
10.9	At the end of the financial year accruals amounts to more than 10% of the total allocated budget.	17.5	36.5	20.6	25.4	2.54	1.056
10.10	At the end of the financial year commitments amount to more than 10% of the total allocated budget.	8.7	43.7	24.6	23.0	2.62	0.937

All the activities listed in question 10 are supposed to be performed on a daily basis therefore the responses to these statements should have been "Always". Therefore responses of "Sometimes" or "Rarely" are definitely problematic. If the percentages for these two responses are combined it actually paints a picture of internal logistics not being acknowledged and managed. This will definitely defeat the goal to obtain a clean AFS. From these combined responses of the respondents in the sample the following are concluded:

- 65.9% of respondents are of the opinion that purchase orders are sometimes/ rarely delivered according to delivery dates (Question 10.1). This compromises service delivery to end-users, impacting on their operations and can cause commitments at the end of the financial year. This also indicates that vendor performance is not monitored and is substantiated by the responses to Question 7.3 where 64.3% of respondents indicated that their office does not have records on vendor performance.
- 57.1% of respondents are of the opinion that RLS01's are sometimes/rarely captured the same day they were received (Question 10.2). A purchase order flows from the shopping cart as the captured RLS 01 on SRM, thus causing a delay in the delivery of goods and services and impacts on service delivery to end-users, compromising their operations.
- 39.7% of respondents are of the opinion that shopping carts are sometimes/rarely released the same day they were captured (Question10.3). Shopping carts not released block the next systemic phase, being the creation of the purchase order, thus causing a delay in the delivery of goods and services and impacts on the service delivery to end-users, compromising their operations.
- 40.4% of respondents are of the opinion that PO's are sometimes/rarely created within 5 days after the shopping cart was released (Question 10.4), thus causing a delay in the delivery of goods and services and service delivery to end-users, compromising their operations.
- 30.9% of respondents are of the opinion that deliveries are sometimes/rarely issued to end-users on the day they were received (Question 10.5). This not only causes a delay in service delivery to end-users, compromising their operations.
- 36.5% of respondents are of the opinion that GRV's are sometimes/rarely captured the same day as the delivery (Question 10.6). This delays the payment of invoices within 30 days, compromising trust and relationships with suppliers.
- 50.8% of respondents are of the opinion that Web cycles are sometimes/rarely cleared daily (Question 10.7). Web cycles are the result of incorrect invoices or an electronic mismatch either between the purchase order, GRV and invoice or between the GRV and invoice. This needs to be monitored daily and dealt with immediately to ensure payment of invoices within 30 days.
- 48.4% of respondents are of the opinion that payment of invoices is sometimes/rarely within 30 days (Question 10.8). This is a huge problem

especially for small companies with an insufficient cash flow and can cause accruals at the end of the financial year.

For a better comprehension of the last two conclusions (Question 10.9 and 10.10) the terms accrual and commitment need to be clarified. An accrual results from a purchase order delivered within the financial year but not paid before the end of the financial year and is carried forward to the next financial year for payment. A commitment results from a purchase order not delivered before the end of the financial year which could not be cancelled since the end-user still needs the ordered goods or service and is carried forward to the next financial year for delivery and payment.

- 46.0% of respondents are of the opinion that at the end of the financial year the accruals carried forward to the next financial year by their office, amount to more than 10% of the total allocated budget of that financial year (Question 10.9). These accruals are not only paid from the allocated budget of the next financial year, resulting in lesser funds available for the new financial year but can also result in the delay of payments to suppliers.
- 47.6% of respondents are of the opinion that at the end of the financial year commitments carried forward to the next financial year by their office, amount to more than 10% of the total allocated budget (Question 10.10). These commitments are not only paid from the allocated budget of the next financial year, resulting in lesser funds available for the new financial year but also compromise service delivery to end-users and end-users to schools.

Question 11

Question 11 determined how the respondents rated the officials in their respective offices responsible for the procurement of goods and services. The responses gave an indication of the level of competencies and skills as perceived by the respondents and have an impact on the ability to perform the procurement activities efficiently.

Table 3.12: Level of competencies and skills

	Question	% Excellent (1)	% Good (2)	% Reasonable (3)	% Poor (4)	Mean	Standard deviation
11.1	Level of skills.	18.3	71.4	10.3	0	1.92	0.531

11.2	Level of commitment.	29.4	55.6	15.1	0	1.86	0.654
11.3	Level of motivation.	19.0	65.9	15.1	0	1.96	0.585
11.4	Level of experience.	29.4	57.1	13.5	0	1.84	0.638
11.5	Level of accuracy	5.6	76.2	18.3	0	2.13	0.473
11.6	Level of time management	19.0	56.3	23.0	1.6	2.07	0.695
11.7	Level of end-user satisfaction	18.3	38.9	42.1	0.8	2.25	0.758
11.8	Level of compliance to policies	5.6	81.0	13.5	0	2.08	0.431
11.9	Level of knowledge	24.6	63.5	11.9	0	1.87	0.593
11.10	Level of interdependency between units within Finance & Admin.	5.6	75.4	18.3	0.8	2.14	0.501
11.11	Level of cooperation between units within Finance & Admin.	4.0	64.3	30.2	1.6	2.29	0.567
11.12	Level of communication between units within Finance & Admin.	5.6	64.3	29.4	0.8	2.25	0.565

For the interpretation of Question 11 a mean below 2 is seen as being low and problematic. The following questions scored a mean below 2:

Question 11.4 (level of experience) scored the lowest mean of 1.84. This indicates that respondents are of the opinion that the level of experience of the officials responsible for procurement is problematic.

Question 11.2 (level of commitment) scored a low mean of 1.86 which is, according to the responses of the respondents, also problematic.

Question 11.9 (level of knowledge) scored a mean of 1.87 which is also low and therefore also problematic.

Question 11.1 (level of skills) scored a mean of 1.92, indicating that respondents are of the opinion that the level of skills of the officials responsible for procurement is problematic.

Question 11.3 (level of motivation) scored a mean of 1.96 and is also problematic.

From the above it is concluded that the respondents in the sample are of the opinion that officials responsible for procurement are lacking in experience, skills, knowledge, commitment and motivation.

3.3.5 Section D: Supply chain processes

This section focused on the paper trail of each requisition or process flow of procurement, thus the internal logistics within the supply chain, also indicating in which unit these activities are performed.

Question 12 and 13

As said previously, each District office uses the filled posts and officials as best to maximise the output and service delivery of the Sub-directorate. With question 12 and 13 the intention was to determine in which unit specific procurement activities are performed for the District office as well as for the non-section 21 schools. Question 12 determined the District office procurement activities and Question 13 the non-section 21 school procurement activities. In the table below the results are combined with the scores given for the office in black and for the non-section 21 schools in red.

Table 3.13: Unit in which procurement activities are performed

	Question	% Not at all (1)	% Finance and Procure-ment (2)	% Office service pool (3)	% Provisioning for Institutions (4)	% Finance Management (5)
12.1	Secure quotations.	31.7	22.2	32.5	12.7	0.8
13.1		19.8	0.8	3.2	75.4	0.8
12.2	Create and update a vendor database.	40.5	21.4	27.0	10.3	0.8
13.2		31.7	3.2	3.2	61.9	0
12.3	Capture RLS 01.	0	70.6	27.0	1.6	0.8

13.3		0	23.8	2.4	73.0	0.8
12.4 13.4	Release RLS 01.	0 0	62.7 16.7	23.0 3.2	0 69.0	14.3 11.1
12.5 13.5	Ensure a PO is created correctly.	2.4 1.6	56.3 22.2	40.5 2.4	0 73.0	0.8 0.8
12.6 13.6	Follow up of deliveries.	0 0	33.3 0.8	54.0 7.1	12.7 92.1	0 0
12.7 13.7	Monitor vendor performance and compile a monthly report.	31.7 26.2	24.6 4.0	33.3 0.8	6.3 64.3	4.0 4.8
12.8 13.8	Receive, check and distribute deliveries.	0 0.8	23.8 0.8	61.1 18.3	15.1 80.2	0 0
12.9 13.9	Check invoice and send to GDF.	0 0	65.1 16.7	20.6 0.8	5.6 74.6	8.7 7.9
12.10 13.10	Capture GRV.	0 0.8	78.6 19.8	0 0	11.9 72.2	9.5 7.1
12.11 13.11	Follow up payment of invoices.	0 0	85.7 24.6	1.6 0.8	2.4 65.1	10.3 9.5
12.12 13.12	Aging of supplier payments.	8.7 9.5	73.8 20.6	2.4 0.8	2.4 61.9	12.7 7.1
12.13 13.13	Filing of RLS 01 and quotations.	0 0	59.5 14.3	30.2 1.6	1.6 80.2	8.7 4.0
12.14 13.14	Filing of GRV and delivery note/ copy of invoice.	0 0	64.3 15.1	22.2 2.4	5.6 77.0	7.9 5.6
12.15 13.15	Asset register and asset control within office.	0 4.8	20.6 13.5	61.9 11.1	16.7 70.6	0.8 0
12.16 13.16	Maintain the record of labour saving devices (monthly payments, lease expiry date etc).	0.8 7.1	42.9 1.6	38.9 9.5	13.5 81.0	4.0 0.8
12.17	Management of Consumable inventory.	3.2	23.0	56.3	12.7	4.8

13.17		15.9	15.9	9.5	57.9	0.8
12.18 13.18	Compiling of accruals and commitments for audit reporting.	0 0.8	60.3 7.9	9.5 1.6	2.4 73.0	27.8 16.7
12.19 13.19	Petty cash administration	0 0	89.7 0	0.8 0	0.8 0	8.7 0

The scores recorded in black for the District office show that the procurement activities are performed mainly in two units namely Finance and Procurement and Office service pool.

The unit Office service pool shows the highest percentage of all units responsible for the following activities:

- Secure quotations
- Create and update a vendor database
- Monitor vendor performance
- Monitor deliveries
- Receive check and distribute deliveries
- Asset management
- Consumable inventory management

Finance and Procurement shows the highest percentage of all units for the following procurement activities:

- Capture RLS 01's to create a shopping cart on SRM
- Ensure correct creation of purchase orders
- Check invoice and send to GDF
- Capture GRV
- Monitor payments
- Aging of supplier payments
- Filing of source documents
- Maintain the record for labour saving devices
- Compiling of accruals and commitments
- Petty cash administration

With these activities divided between the two units, interdependency between these two units is a priority, preventing operational silos. However, the workload is not shared equally, placing more responsibility and accountability on Finance and Procurement as the current structure only provides for 5 posts including the managerial level being the Assistant director where Office service pool has 6 posts including the managerial level of Assistant director. The chief clerk in Finance and Procurement is a lower post level than the senior officer in Office service pool. The chief clerk also has to supervise two different disciplines being SCM on the one side and salary administration on the other side, whereas the senior officer is only responsible for SCM. The risk of taking short cuts, compromising internal logistics and neglecting best practices within Finance and Procurement is higher than in Office service pool. There is also movement of source documents between the two units, which poses a risk of lost or misplaced documents.

From the table above it is also clear that the average percentages as captured in red for the non-section 21 schools, show most of the SCM activities are bound to one unit only namely Provisioning for Institutions. With all procurement processes located in one unit, internal logistics can be better managed, reporting is easier and accountability ensured. Unfortunately the author did not also differentiate in the other questions of the questionnaire between the District office and the non-section 21 school. Thus the performance and the service delivery of the two scenarios (Procurement activities divided between two units vs. Procurement activities mostly in one unit) cannot be compared and statements not formulated accordingly.

3.4 INTERNAL CONSISTENCY OF THE SURVEY

Internal consistency is measured using the Cronbach alpha value. The Cronbach alpha coefficient estimates the reliability of this type of scale by determining the internal consistency of the average correlation of items within the test (Field, 2009:675). The equation used to calculate the Cronbach alpha is given below:

Equation 3.3: Cronbach alpha coefficient

$$a = \frac{k}{k-1}\left[1 - \frac{\sum_{1}^{k} s_i^2}{s_T^2}\right]$$

Where:

α = Cronbach alpha coefficient

k = number of items in the analyses

Si = item standard deviation

St = total standard deviation of all items in the construct

If alpha is greater than 0.7, there is a sufficient reliability in the construct. "Although the generally accepted value of 0.8 is appropriate for cognitive tests such as intelligence tests, for ability tests the cut-off point of 0.7 is more suitable (Field, 2009:675). This same idea applies to the Likert-scale type of items in question 6, 8, 9, 10 and 11.

Note that some items were reversely phrased. These items, scores were reversed for the calculation of Cronbach alpha and the aggregated section scores. The reversed phrased questions were question 6.6, 6.8, 10.9 and 10.10.

The following Cronbach alpha coefficients were obtained:

Table 3.14: Cronbach alpha coefficient

Question	Construct measured	Cronbach alpha coefficient
Question 6 (all items)	Pillars of SCM	0.902
Question 8 (all items)	Elements of SCM	0.672
Question 8 (item 8.1 removed)	Elements of SCM	0.818
Question 9	Quality of service delivery	0.826
Question 10 (all	Time management	0.651

items)		
Question 10 (item 10.9 and 10.10 removed)	Time management	0.804
Question 11	Knowledge management	0.911

After removal of items that did not correlate highly with the other items in the question the alpha value of the constructs varies between 0.804 and 0.911. These values are greater than the value of 0.7 which indicates a high degree of internal consistency.

For Question 8, the removal of 8.1 significantly improved the value of Cronbach alpha. Therefore it is concluded that 8.1 was badly phrased and therefore difficult to understand. For question 8, items 8.2 to 8.5 were aggregated.

For Question 10, the removal of 10.9 and 10.10 significantly improved the value of Cronbach alpha. These items were reversely phrased which could have affected the way the respondents answered it. Indicating "always "or "most of the time" is actually bad. For question 10, items 10.1 to 10.8 were aggregated.

3.5 DESCRIPTIVE STATISTICS OF THE AGGREGATED CONSTRUCTS

A summary of the descriptive statistics for the aggregated scores on Questions 6, 8,9,10 and 11 (after removal of items that did not correlate highly with the other items) are as follow:

Table 3.15: Aggregated scores for Question 6, 8, 9, 10 and 11

Question	Construct measured	Mean	Standard deviation
Question 6	Pillars of SCM	3.11	0.44

Question 8	Elements of SCM	2.76	0.74
Question 9	Quality of service delivery	3.02	0.40
Question 10 (item10.9 and 10.10 removed)	Time management	2.48	0.55
Question 11	Knowledge management	2.06	0.42

The **pillars of SCM** (question 6) can also be seen as the guardian of procurement in the public service and have a mean of 3.11. In Question 6.1, 89.7% respondents agreed that their office operates according to the pillars of SCM.

The **elements of SCM** (question 8) entail all processes within the supply chain in the public sector. The elements have a mean of 2.76. The scale of measurement was as follows: scale 1"not at all" scale 2 " to a small extent" scale 3 was "to a considerable extent" scale 4 "mostly" and scale 5 was "do not know". The respondents indicated that the elements are mostly adhered to.

The **quality of service delivery** (question 9) has a mean of 3.02. The scale of measurement was as follow: "strongly disagree", scale 2 "disagree," scale 3 "agree," scale 4 "strongly agree" and scale 5 "do not know". In (question 9.6) 78% of the opinion of 73.0% respondents the respondents agreed or strongly agreed that the end-users are satisfied with the service delivery.

Time management (question 10) has a mean of 2.48. The measurement of scale was as follows: scale 1was "always", scale 2 "most of the time", scale 3 "sometimes" and scale 4 was "rarely". With skills, knowledge and experience problematic, time management is also negatively affected. When knowledge, skills and experience are not applied appropriately, activities take longer to perform, internal logistics are neglected and therefore cripple the supply chain.

This table shows that **knowledge management** (question 11) has a mean of 2.06 where scale 1 indicated "excellent" scale 2 "good", scale 3 "reasonable" scale 4 "

poor". It is concluded that the "know how" related to procurement activities is efficiently transferred. However, if this is problematic it poses a high risk to the internal logistics and best practices are compromised in the daily routine.

3.6 CORRELATIONS BETWEEN CONSTRUCTS

Pearson's correlation coefficient (r) was used to determine the linear relationship between the aggregated constructs. For the correlation coefficient the following two aspects are important for interpretation:

- The sign:

  + indicates a positive linear relationship and the – sign indicates a negative relationship.

- The size:

  r = ± 0.1 thus a small correlation and therefore no practical significance correlation.

  r = ± 0.3 thus a medium correlation and therefore a practical visible correlation

  r = ± 0.5 thus a large correlation and therefore a practical significance correlation.

The following correlation coefficient scores were obtained:

Table 3.16: **Correlation coefficient scores**

	Question 8 **Elements of SCM**	**Question 9** **Quality of service delivery**	**Question 10 (item 10.9 and 10.10 removed)** **Time management**	**Question 11** **Knowledge management**
Question 6 **Pillars of SCM**	0.379	**0.671**	**0.092**	**-0.290**

Question 8 **Elements of SCM**		0.236	-0.371	-0.94
Question 9 **Quality of service delivery**			-0.070	-0.502
Question 10 (item 10.9 and 10.10 removed) **Time management**				0.338

Question 6 (pillars of SCM) and 8 (elements of SCM) have a medium positive correlation of r = 0.379 thus the pillars of SCM and the elements of SCM are practically visible correlated. The "pillars" construct entails how much guidelines of procurement such as value for money is adhered to and the "elements" construct represent how much the procurement processes are followed. Thus there should be a correlation between how procurement should be done and the processes involved with procurement which is confirmed by the medium positive correlation.

Question 6 (pillars of SCM) and 9 (quality of service delivery) have a large positive correlation of r = 0.671 and therefore the adherence to the pillars of SCM and the quality of service delivery have a practically significant positive correlation. The pillars are the guidelines for the processes to ensure that quality services are delivered and therefore the positive correlation between these constructs could be expected.

Question 6 (pillars of SCM) and 10 (time management) show a small positive correlation of r = 0.092 and therefore adherence to the pillars of SCM have no practical significance correlation with time management. The pillars are guidelines for the processes and are not time bounded which explains the low correlation.

Question 6 (pillars of SCM) and 11 (knowledge management) has medium negative correlation of r = -0.290, thus adherence to the pillars of SCM and knowledge management have a practical visible negative correlation. Note that according to the scale of measurement for the "pillars of SCM" construct, higher

scores represent better adherence to the pillars. On the other hand for the "knowledge "construct lower scores represent better knowledge. Therefore the negative correlation actually implies that more knowledge is associated with more adherences to the pillars of SCM. This is expected since knowledge of the pillars is very important to be able to perform procurement activities in the public sector.

Question 8 (elements of SCM) and 9 (quality of service delivery) show a small to medium positive correlation with r =0.236, therefore the elements of SCM and the quality of service delivery have a slightly visible positive correlation. The elements entail what have to be done in SCM and quality of service indicates a level of performance. In this study these constructs are slightly correlated.

Question 8 (elements of SCM) and 10 (time management) have a medium negative correlation of r = -0.371, thus the negative correlation between the elements of SCM and time management is practically visible. Note that according to the scale of measurement for the "elements of SCM" construct higher scores represent better adherence to the elements. On the other hand for the "time management" construct lower scores represent better time management. Therefore the negative correlation actually implies that better time management is associated with more adherences to the elements of SCM. This is as expected since the elements entail what have to be done in SCM and time management contributes to how many can be done within a specific timeframe.

Question 8 (elements of SCM) and 11 (knowledge management) show a large negative correlation of r = -0.94 and thus the elements of SCM and knowledge management has a practical significant negative correlation. This negative relationship can be expected since the scale of measurement in question 11 was reversed when compared to the scale of measurement in question 8. This high negative correlation shows that the extent to which the elements of SCM are in place and the level of knowledge management are strongly related where higher scores on SCM being in place are associated with better knowledge by the officials.

Question 9 (quality of service delivery) and 10 (time management) show a small negative linear correlation of r = 0.07, thus the correlation between quality of service delivery and time management has no practical significance. According to this study

time management do not have a significant impact on the quality of services which are delivered.

Question 9 (quality of service delivery) and 11 (knowledge management) have a large negative correlation of r = -0.502 and thus the negative correlation between quality of service delivery and knowledge management is practical significant. Keeping in mind the reversed order of the knowledge management scale as discussed above, one conclude that better knowledge is managed the more likely it will be that quality services are delivered.

Question 10 (time management) and 11 (knowledge management) have a medium positive correlation of r = 0.338 and therefore time management and knowledge management is practical significant. If employees are appropriately skilled the time consumed with performing the procurement activities will be reduced resulting in a streamlined supply chain.

3.9 CONCLUSION

It was concluded that a good fit was found between the literature and the results obtained from the analysis of the questionnaire.

From the discussion about the demarcation, it was concluded that the respondents are working more than 10 years in both the Department and in the Sub-directorate Finance and Administration and 53.2% respondents have more than 10 years of service working in their current unit. However, the respondents in the sample are of the opinion that officials responsible for procurement are not only lacking commitment and motivation but also experience, skills, knowledge.

From the results of the survey, gaps were found within internal logistics and are threatening the performance of supply chain, quality service delivery and the outcome of the AFS. Internal logistics is the complete process of obtaining goods and services from compiling and processing of requisitions to the payment of invoices and includes the record keeping of all transactions to achieve organisational objectives chain. With timely information sharing and knowledge management, the inefficiencies of the internal logistics can be eliminated.

Another factor hindering the efficiency of internal logistics is overlapping roles/ tasks/activities in the supply chain. It was clearly seen from the survey that procurement activities for the office are divided between two units and for the non-section 21 schools are mostly bound to one unit. The performance and the service delivery of the two scenarios (Procurement activities divided between two units vs. Procurement activities mostly in one unit) was not be compared but it could be concluded that the functional silos are not acknowledging the full potential of internal logistics and the management thereof.

3.10 CHAPTER SUMMARY

In chapter 3, the empirical study was done. A quantitative research study was chosen to enable the author to meet the aims that were set out in chapter 1. The focus of the sample chosen was on the supply chain component within the District offices of GDE. The internal consistency of some of the questions in the questionnaire was tested and a high level of consistency was found for all questions after the removal of items in some questions. The analysis of the questionnaires revealed a number of insights regarding to the internal logistics. A comparison between what was found in the literature and findings in the analysis of the questionnaire were made. No formally formulated internal logistics framework is currently present but there were, elements of internal logistics found.

In chapter 4, conclusions will be drawn based on the analysis that was done in chapter 3. Recommendations will be made and, as stated in chapter 1, a management framework for internal logistics in GDE will be proposed.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

The primary objective of this study (section 1.6.1) was to develop a management framework for internal logistics in GDE. SCM is in a way the completion of the circle of financial management. It is important for GDE to develop an internal logistics framework that would enable them to gain the maximum from its annual allocated budget. It is also critical that the internal logistics are attended to as soon as possible to have a positive input towards the ASF of GDE. In chapter 3, it became evident that certain gaps and problems exist in relation to internal logistics at the District offices of GDE. However it became evident that knowledge management is related to these gaps and problems. In order to address these problems, recommendations are put forward to GDE. A framework to manage internal logistics is proposed. The findings of the empirical study were used as the basis of the framework. A summary of the conclusions that were drawn in chapter 3 follows below.

4.2 INTERNAL LOGISTICS IN THE DISTRICT OFFICES IN GDE

From the literature study critical aspects of SCM were identified which need to be implemented, to pave the way for internal logistics. These aspects were tested at the District office with a questionnaire and the results were analysed in chapter 3. From this analysis, a number of conclusions were drawn regarding the state of the internal logistics:

- Internal logistics is not formally linked to the procurement processes. Respondents in the sample disagreed that the processes are broken down into specific tasks, thus indicating that there are respondents without a clear understanding of their role and activities within the supply chain in GDE. The result of this misalignment will inevitably be that the budget is not optimally utilised and not relayed to the specific objectives as identified in the annual operational plans.

- Respondents were also of the opinion that officials responsible for procurement are lacking in experience, skills, knowledge, commitment and motivation.
- No gap assessment is done between the current output and the results achieved at the end of each financial year, thus opportunities for growth are not utilised.
- Best practises are not identified or shared and much time is spent on reinventing the wheel, thus effectiveness and efficiency are compromised.
- There is no formal internal logistics management system.
- GDE has also not yet identified the knowledge currently available in SCM and that knowledge management is also critical to internal logistics and to the performance of SCM.
- The efficiency of internal logistics and the management thereof in GDE can be greatly improved.

From the above, it is clear that there is a significant opportunity for the identification of best practices, linking it with internal logistics within SCM in GDE. The key area of concern is that the internal logistics within SCM are not acknowledged and, therefore, not properly managed in GDE. The result of this is that the allocated budget is not optimally utilised and have qualifications from the AFS.

In section 4.5, recommendations are made to correct the status quo in order to improve some of the aspects mentioned above. In the next section, a gap analysis is done to strengthen the need for a framework for the management of internal logistics as proposed in section 4.4.

4.3 A GAP ANALYSIS FOR THE INTERNAL LOGISTICS OF SCM IN GDE

The primary objective of this study was the development of a framework for the management of internal logistics in GDE. However, one of the secondary objectives was to also propose a framework to improve workflow processes and performance within the supply chain. During the literature study, the six elements of SCM (Demand-, Acquisition-, Logistics-, Disposal-, Risk-, and Performance management) were discussed. It is the opinion of the author that these elements have to be

broken down into clear activities for the management of internal logistics and can be used to manage internal logistics in SCM.

In question 12 and 13 of the Questionnaire a list of the current activities in the procurement processes were identified. However, these tasks are specifically linked to the three units dealing with procurement processes and therefore the part of budget control and Demand management were not included in the Questionnaire. However, the framework for internal logistic demand management will be included. In order to do a gap analyses in the procurement processes (Table 4.1) these activities are linked to the elements of SCM to construct a framework for workflow processes to improve performance.

Table 4.1 Gap analyses to link the current activities to the elements of SCM

Activities	**Element of SCM**
Secure quotations.	Acquisition management
Create and update a vendor database.	Acquisition management
Capture RLS 01.	Acquisition management
Release RLS 01.	Acquisition management
Ensure a PO is created correctly.	Logistics management
Follow up of deliveries.	Logistics management
Monitor vendor performance and compile a monthly report.	Acquisition management
Receive, check and distribute deliveries.	Logistics management
Check invoice and send to GDF.	Logistics management
Capture GRV.	Logistics management
Follow up payment of invoices.	Logistics management
Aging of supplier payments.	Logistics management

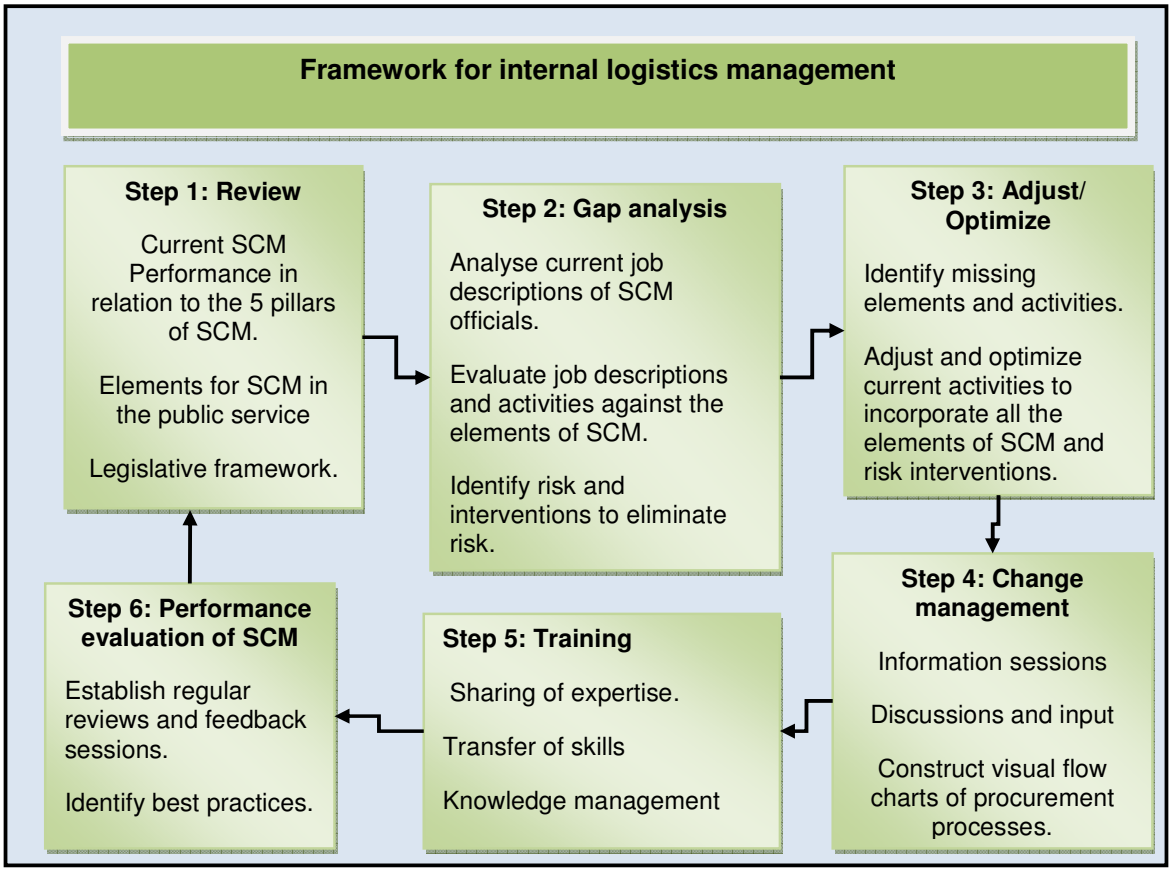
Filing of RLS 01 and quotations.	Logistics management
Filing of GRV and delivery note/ copy of invoice.	Logistics management
Asset register and asset control within office.	Disposal management
Maintain the record of labour saving devices (monthly payments, lease expiry date etc).	Logistics management
Management of Consumable inventory.	Logistics management
Compiling of accruals and commitments for audit reporting.	Logistics management
Petty cash administration	Logistics management

There are two crucial golden threads lacking from the listed activities, namely risk management and performance management. Both these elements contribute to the generation of best practices to eliminate risk and to improve performance which is part of the sharing of information and the management of information resources (knowledge management). This was also clear from the results of the questionnaire, since respondents were of the opinion that officials responsible for procurement are lacking in experience, skills, knowledge, commitment and motivation.

4.4 MANAGEMENT FRAMEWORK FOR INTERNAL LOGISTICS IN GDE

The summary of the conclusions in section 4.2, gave some insight in the gaps in internal logistics in SCM in GDE. These findings, together with the information from the literature study, gave suggestions into the formulating of a framework for the management of internal logistics in SCM in GDE. This framework was not tested in any organisation before and, therefore, is to be used only as a guide to assist with the management of internal logistics.

Figure 4.1: Management framework for internal logistics



Step 1 – Review

The first step to manage internal logistics is to review the SCM performance of the last few years to establish the quality of the supply chain output and service delivery. The current SCM Manual for the Public Service in conjunction with the applicable legislative framework needs to be consulted to be familiarised with the elements and pillars of SCM to be able to identify the misalignment of the internal logistics.

The implementation of the management framework is fixed to the duration of one financial year in which the micro or macro environment of GDE can change but it will not affect the structure of SCM. However, the internal logistics may have to be adjusted to streamline the supply chain processes even more for a framework best fit for GDE. After the performance evaluation of SCM was done in step 6 at the end of the financial year, it might be found that the output of the internal logistics is not yet optimum, and needs to be improve and therefore some changes need to be done.

This management framework can be applied recurrently at the end of each financial year.

Step 2 – Gap analysis

A gap analysis is based on the analysing of the current job descriptions of SCM officials, evaluating job descriptions and activities and identifying risks in the supply chain, with interventions to eliminate these risks. Gaps in the internal logistics will become evident when the job descriptions and activities are compared with what the elements of SCM entail.

Step 3 – Adjust and optimise

During step 3 missing elements and activities are identified. Plans are also set up to bridge the gaps that were found in the internal logistics in order to adjust and optimise current activities to incorporate all the elements of SCM and risk interventions. It is suggested that the timeline for bridging the gaps must be aligned with the review that was compiled in step 1. These bridging plans can also be part of step 5 in the form of coaching and mentoring and compiling quick-reference guidelines.

Step 4 – Change management

It was found that respondents did not think procurement processes are clearly broken down into activities. It is often found that more is learnt from colleagues than from books. The power base of employees is their experience and their knowledge. For this reason it is important to have information sessions which will open the channels for discussion and input from the riches of experience, expertise and skills of the officials responsible for procurement. Furthermore it will prepare the climate for change and confront issues born from a lack of commitment and motivation. Constructing visual flow charts of the newly aligned procurement processes and activities will assist with the process of change.

The success of the supply chain not only depends on the regulatory, administrative and structural aspects but also on a mind-set change of the public servants tasked with the management of the supply chain (Mkhize, 2004: 8-9).

Step 5 – Training

The training of the employees is imperative. The success of the internal logistics depends on the training of the responsible officials. During training the SCM business process gets presented so that the employees buy-in to the new internal logistics initiative. The employees have to understand their involvement in the whole process of sharing of expertise and the transfer of skills. During this stage, the employees get familiar with internal logistics as concept, how to put theory into practice, breaking down procurement processes into activities and how to identify practical solutions for identified risk areas.

The success of this stage unlocks uniformity in the way internal logistics is practiced and managed in GDE. This will not only ensure quality service delivery and but also sound financial management which filters into the AFS, resulting in the transition from an unqualified AFS to a clean AFS.

Step 6 – Performance evaluation of SCM

The importance of a review phase was stated earlier. In table 4.1 it was established that apart from risk management performance evaluation appears also a gap in the current processes. Performance evaluation is a test to measure the input and output of the supply chain. It further analyses the whole procurement process and internal logistics to ascertain if the management framework is on track and adding value to SCM to meet the required aims of optimal utilisation of the allocated budget and realising the vision and mission during each financial year. It is the opinion of the author that the internal logistics needs to be evaluated on a quarterly basis in terms of the management framework, to track the progress and performance of the supply chain. Regular feedback sessions with the responsible officials are non-negotiable.

As indicated in figure 4.1, the framework is a closed circle. Effective internal logistics are not a once-off exercise, because the macro and micro environment of GDE are dynamic and will change. Continuous improvement, system upgrading and the generating of good practices will bring changes to the internal logistics. In step 6, the whole management framework for internal logistics will be assessed, resulting in

changes to be made to the framework and thus starting a new cycle in the framework.

It is the opinion of the author that the efficiency of the internal logistics will be improved if the management framework is implemented. In the next section, recommendations will be made.

4.5 RECOMMENDATIONS

In section 4.2, a number of statements were made about the state of the internal logistics in GDE. These statements were combined and the outcome is the framework that is proposed in section 4.4. From these two sections, it can be concluded that GDE can do a great deal to improve the internal logistics in SCM by implementing the management framework that was proposed. This will help GDE to increase not only the efficiency of the supply chain but also the quality of service delivery to end-users. The focus points that are recommended are the following:

- An internal logistics framework needs to be established. Internal logistics are to be linked to the procurement processes and clearly broken down into specific tasks. Respondents were also of the opinion that officials responsible for procurement are lacking in experience, skills, knowledge, commitment and motivation.
- A gap assessment needs to be done. This will, firstly, give a clear understanding of the gaps in the current work flow processes and secondly, get uniformity about the processes and activities.
- Best practices are to be identified and shared.
- Knowledge critical to internal logistics and to the success of SCM, and currently available needs to be identified and managed.
- In chapter 1 section 1.5, the problem statement stated that GDE received an unqualified AFS for two consecutive years (2009/2010 and 2010/2011). To maintain this achievement and to progress to a clean AFS it is necessary to look at all the business processes contributing to the audit statement findings. There is a correlation between the operational performance of SCM and the management of internal logistics. Internal logistics is the glue that links all the

activities together, instituting the efficiency and effectiveness of the supply chain or the failure thereof.

Internal logistics connect supply chain activities into a circle which can become doom or gloom, depending on the management or lack of management thereof. A circle of life will be ensured if the proposed management framework for internal logistics is adopted and set in to motion in GDE.

4.6 RECOMMENDED FURTHER STUDIES

- The level of motivation and commitment within GDE.

  From the results of the questionnaire it was concluded that the level of motivation and commitment of the officials dealing with procurement are very low. The following questions arise:

  i. What are the contributing factors to these low levels of motivation and commitment?
  ii. How extensive is the problem in GDE?
  iii. How can motivation and commitment be revived in these officials?

- The impact of E-government on the service delivery of GDE.

  The aim is to establish to:

  i. What extent is the service delivery of GDE affected by poor server connectivity and of system down time?
  ii. What is the impact of E-government on internal logistics?

- Procurement activities divided between two units vs. procurement activities mostly in one unit.

  From the results of the survey it was not possible to compare these two scenarios but it is concluded that functional silos are not acknowledging the full potential of internal logistic. It is proposed to:

  i. Investigate and compare these two scenarios.

ii. Determine a post establishment that will be the best fit for the operational needs in SCM and objectives of GDE.

- The management of knowledge in GDE.

  The survey revealed that knowledge management is an area of concern in GDE. The question arises whether there is a relationship between SCM performance and good knowledge management.

4.7 CONCLUSION

The primary aim of the study was to develop a management framework for internal logistics in GDE to increase the efficiency of SCM. The aim was to base this on a quantitative study within the 15 District offices of GDE. A literature study was done and used as the basis for the questionnaire in the empirical study. During the literature study a typical supply chain in the public sector as well as SCM was analysed which explained the pillars and elements of SCM. A questionnaire was distributed to the units responsible for procurement at the District offices in GDE.

The analysis of the questionnaires revealed areas of good compliances and areas for improvement. It also revealed some gaps and areas of concern within the procurement processes and internal logistics. A practical framework to manage the internal logistics was constructed, based on the findings of the analysis of the data from the questionnaires.

It can finally be concluded that the adoption and implementation of this framework will:

i. Assist with the management of internal logistics.
ii. Increase the success of the supply chain processes.
iii. Manage information and the paper trail of each requisition.
iv. Identify gaps to improve work flow processes and SCM performance.
v. Generate best practices.
vi. Ensure the optimal utilisation of the allocated budget within the financial year.

Through the study other research opportunities were also identified and mentioned in section 4.6 of this chapter.

4.8 CHAPTER SUMMARY

In chapter 4, a number of conclusions and recommendations were made in an attempt to assist the procurement processes and activities and to management of internal logistics. At the start of this chapter the conclusions from chapter 3 were summarised. It was concluded that it is critical to develop a management framework for internal logistics. This will formalise uniformity in the procurement processes in GDE. It was further concluded that a gap analyses is the first building block of the management framework, giving it clear direction. A framework based on the conclusions was constructed and consists of six steps. The goal of step 1 is to review SCM performance of the last few years to establish the quality of the supply chain output and service delivery. The second step is to do a gap analyses. This analysis will also form the basis of determining the success of the framework during phase 6. It was found that risk management and performance management were neglected in the current procurement processes and activities, therefore it was concluded that some changes are needed and that it will be done in Step 3. Step 4 is change management and the constructing of visual flow charts of the newly aligned procurement process and activities which will assist with the process of change and implementation of the aligned activities. This will also increase support for the implementation of the framework to manage internal logistics. Step 5 involves the training of employees. During training the SCM business process gets presented so that the employees buy-in to the new internal logistics initiative. The last step is to evaluate the performance of SCM. It is important to determine during this step if the framework could manage the internal logistics as it was supposed to do. Misalignment and challenges need to be corrected during the next cycle of the framework.

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APPENDIX A: SUPPLY CHAIN QUESTIONAIRE

The aim of this questionnaire is to establish to what extent GDE is practising the elements of supply chain management and linking supply chain management to uniform processes. The study is for academic purposes and will take you as respondent ten (10) minutes to complete. Respondents will remain anonymous in the analysis of the data, presentation of the results, and discussion of the outcomes. Please answer each question honest and from your perspective in your current working environment. Please mark your answer clearly with a **X**.

Section A: Demographics

1. Current position/rank

Deputy director	Assistant director	Senior officer	Chief clerk	Senior clerk
1	2	3	4	5

2. Years of service in the Department of Education

Less than 1	More than 1 but less than 5	More than 5 but less than 10	More than 10 years
1	2	*3*	4

3. Years of service in Finance and Administration

Less than 1	More than 1 but less than 5	More than 5 but less than 10	More than 10 years
1	2	*3*	4

4. Unit working in currently

Finance & Procurement	Finance management	Office service pool	Provisioning for Institutions
1	2	3	4

4.1. Years working in the Unit indicated i

Less than 1	More than 1 but less than 5	More than 5 but less than 10	More than 10 years
1	2	3	4

5. Highest qualification.

Grade 12	Certificate	Diploma	Degree	Post graduate
1	2	3	4	5

Section B: Supply Chain Management (SCM) Practices

6. To what extent do you agree with the following statements?

		Strongly Disagree	Disagree	Agree	Strongly Agree	Do not know
6.1	My office operates according to the 5 pillars of SCM.	1	2	3	4	5
6.2	My office procures at the lowest price which best fits the requirements of the end-user.	1	2	3	4	5
6.3	My office links demand plans and procurement processes.	1	2	3	4	5
6.4	The procurement processes are transparent.	1	2	3	4	5
6.5	Potential suppliers have equal access opportunities to quote.	1	2	3	4	5
6.6	Favouritism plays a role in supplier selection.	1	2	3	4	5
6.7	Procurement is done with integrity.	1	2	3	4	5
6.8	Gifts are accepted from suppliers.	1	2	3	4	5
6.9	The current Procurement processes provide a quality	1	2	3	4	5

	service to end-users.					
6.10	Procurement processes are co-ordinated activities for quality service delivery.	1	2	3	4	5
6.11	All procurement policies are currently applied.	1	2	3	4	5

7. Do you agree with the following statements?

		Yes	**No**
7.1	My office has a supplier data base.	1	2
7.2	My office has a standard price quotation form (RFQ).	1	2
7.3	My office has records on vendor performance.	1	2

8. To what extent are the following applied in your office?

		Not at all	**To a small extent**	**To a considerable extent**	**Mostly**	**Do not know**
8.1	Certification of deliveries by end-users before payments is made.	1	2	3	4	5
8.2	Regular checking and verification of assets.	1	2	3	4	5
8.3	Monitoring and review of vendor performance	1	2	3	4	5
8.4	Disposal of assets.	1	2	3	4	5
8.5	Monitor consumable inventory.	1	2	3	4	5

SECTION C: SUPPLY CHAIN PERFORMANCE

9. To what extent do you agree with the following statements?

		Strongly			**Strongly**	**Do not**

		Disagree	Disagree	Agree	Agree	know
9.1	Procurement processes are supported by management.	1	2	3	4	5
9.2	Procurement processes are clear within the office.	1	2	3	4	5
9.3	Procurement processes are clearly broken down into specific tasks.	1	2	3	4	5
9.4	End-users are all trained in procurement processes	1	2	3	4	5
9.5	End-users trust the procurement processes to be best practices.	1	2	3	4	5
9.6	End-users are satisfied with the procured goods and services.	1	2	3	4	5
9.7	RLS 01's are completed correctly.	1	2	3	4	5

10. How would you rate the performance of your office against the following?

		Always	Most of the time	Sometimes	Rarely
10.1	PO's are delivered according to delivery dates.	1	2	3	4
10.2	RLS01's are captured the same day they were received.	1	2	3	4
10.3	Shopping carts are released the same day they were captured.	1	2	3	4
10.4	PO's are created within 5 days after the shopping cart was released.	1	2	3	4
10.5	Deliveries are issued to end-users on the day they were received.	1	2	3	4
10.6	GRV's are captured the same day as the delivery.	1	2	3	4
10.7	Web cycles are cleared daily.				

10.8	Payment of invoices is within 30 days.	1	2	3	4
10.9	At the end of the financial year accruals amounts to more than 10% of the total allocated budget.	1	2	3	4
10.10	At the end of the financial year commitments amounts to more than 10% of the total allocated budget.	1	2	3	4

11. How would you rate the officials in your office responsible for the procurement of goods and services?

		Excellent	**Good**	**Reasonable**	**Poor**
11.1	Level of skills.	1	2	3	4
11.2	Level of commitment.	1	2	3	4
11.3	Level of motivation.	1	2	3	4
11.4	Level of experience.	1	2	3	4
11.5	Level of accuracy	1	2	3	4
11.6	Level of time management	1	2	3	4
11.7	Level of end-user satisfaction	1	2	3	4
11.8	Level of compliance to policies	1	2	3	4
11.9	Level of knowledge	1	2	3	4
11.10	Level of interdependency between units within Finance & Admin.	1	2	3	4
11.11	Level of cooperation between units within Finance & Admin.	1	2	3	4
11.12	Level of communication between units within Finance & Admin.	1	2	3	4

SECTION D: Supply chain processes

12. In which unit are the following tasks performed to procure for the **District office**?

		Not at all	Finance and Procurement	Office service pool	Provisioning for Institutions.	Finance management
12.1	Secure quotations.	1	2	3	4	5
12.2	Create and update a vendor database.	1	2	3	4	5
12.3	Capture RLS 01.	1	2	3	4	5
12.4	Release RLS 01.	1	2	3	4	5
12.5	Ensure a PO is created correctly.	1	2	3	4	5
12.6	Follow up of deliveries.	1	2	3	4	5
12.7	Monitor vendor performance and compile a monthly report.	1	2	3	4	5
12.8	Receive, check and distribute deliveries.	1	2	3	4	5
12.9	Check invoice and send to GDF.	1	2	3	4	5
12.10	Capture GRV.	1	2	3	4	5
12.11	Follow up payment of invoices.	1	2	3	4	5
12.12	Aging of supplier payments.	1	2	3	4	5
12.13	Filing of RLS 01 and quotations.	1	2	3	4	5
12.14	Filing of GRV and delivery note/ copy of invoice.	1	2	3	4	5
12.15	Asset register and asset control within office.	1	2	3	4	5
12.16	Maintain the record of labour saving devices (monthly payments, lease expiry date etc).	1	2	3	4	5
12.17	Management of Consumable inventory.	1	2	3	4	5
12.18	Compiling of accruals and commitments for audit reporting.	1	2	3	4	5
12.19	Petty cash administration	1	2	3	4	5

13. In which unit are the following tasks performed to procure for the **Non section 21 schools**?

		Not at all	Finance and Procurement	Office service pool	Provisioning for Institutions.	Finance management
13.1	Secure quotations.	1	2	3	4	5
13.2	Create and update a vendor database.	1	2	3	4	5
13.3	Capture RLS 01.	1	2	3	4	5
13.4	Release RLS 01.	1	2	3	4	5
13.5	Ensure a PO is created correctly.	1	2	3	4	5
13.6	Follow up of deliveries.	1	2	3	4	5
13.7	Monitor vendor performance and compile a monthly report.	1	2	3	4	5
13.8	Receive, check and distribute deliveries.	1	2	3	4	5
13.9	Check invoice and send to GDF.	1	2	3	4	5
13.10	Capture GRV.	1	2	3	4	5
13.11	Follow up payment of invoices.	1	2	3	4	5
13.12	Aging of supplier payments.	1	2	3	4	5
13.13	Filing of RLS 01 and quotations.	1	2	3	4	5
13.14	Filing of GRV and delivery note/ copy of invoice.	1	2	3	4	5
13.15	Asset register and asset control within office.	1	2	3	4	5
13.16	Maintain the record of labour saving devices (monthly payments, lease expiry date etc).	1	2	3	4	5
13.17	Management of Consumable inventory.	1	2	3	4	5
13.18	Compiling of accruals and commitments for audit reporting.	1	2	3	4	5

Thank you for your time and honesty.
It is appreciated.

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November 11, 2011

TO WHOM IT MAY CONCERN

Re: Letter of confirmation of language editing

The MBA mini-dissertation "**Developing a management framework for internal logistics in public schools" b**y **Marinda Viljoen** was language, technically and typographically edited. The sources and referencing technique applied was checked to comply with the specific Harvard technique as per North-West University prescriptions.

Antoinette Bisschoff

Officially approved language editor of the NWU