

Activity-based performance management at Strategic Logistical Alliance

SJ Spratt Hons. B. Com.

12127841

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Supervisor: FJ Bibbey

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Psalm 37:3-4

***Trust in the LORD and do good; dwell in the land and enjoy safe pasture.
Delight yourself in the LORD and he will give you the desires of your hart.***

ABSTRACT

In the era of competitive global environment and technology-based organisations, managers are pressured to find ways to maintain their competitive advantage. Management has the responsibility to maintain their competitive advantage whilst maintaining the profitability of the organisation. This responsibility includes decisions regarding the retention of profitable customers, and the minimisation of costs to improve profitability of services. The analysis of cost and profitability of individual services and customers represents a critical issue with which Strategic Logistical Alliance (SLA) should be concerned

SLA has proved to be a market leader within the logistics services market whilst maintaining profitability in most of its core business functions, with the exception of the warehousing and distribution function. The reasons for a lack of profitability in the warehousing and distribution function are inadequate planning, controlling and decision-making within these functions. The main reasons for these problems are incorrect cost allocations, the non-reflection of the true cost of activities, unprofitable pricing and the lack of effective performance management.

The primary objective of this study is to analyse the existing cost allocation system, the cost management system and the performance management system of SLA, focusing on the warehousing and distribution functions. The study addresses the shortcomings of the existing system and recommends activity-based performance management as a possible solution. To achieve this primary objective, a number of secondary objectives were relevant.

The research was conducted at SLA in Gauteng. The research comprised a literature study and an empirical survey using structured interviews to obtain information from relevant staff and managers. The empirical study was further extended by obtaining permission from top management to gather information by observation of activities and processes carried out by staff in the warehouse and distribution function.

For management of SLA to achieve their goal of becoming a profitable leading third-party logistical service provider, a combination of tools should be used, which include activity-based costing, cost management and performance management.

Activity-based performance management will enable management to gain useful information for decision-making to achieve their goal.

OPSOMMING

In die era van die mededingende wêreldwye omgewing en tegnologiegebaseerde organisasies is bestuurders onder druk om wyses te vind waarop hulle hul mededingende voorsprong kan handhaaf. Bestuur is daarvoor verantwoordelik om hul mededingende voorsprong te behou terwyl hulle terselfdertyd ook die winsgewendheid van die organisasie handhaaf. Hierdie verantwoordelikheid behels ook besluite oor die behoud van winsgewende kliënte en die minimalisering van koste om die winsgewendheid van dienste te verbeter. Die ontleding van die koste en winsgewendheid van individuele dienste en kliënte verteenwoordig 'n kritieke kwessie waarby Strategic Logistical Alliance (SLA) betrokke behoort te wees.

SLA het hulself bewys as 'n markleier in die logistiekdienste-mark terwyl hulle terselfdertyd winsgewendheid in die meeste van hul kernbesigheidsfunksies handhaaf, met die uitsondering van hul pakhuis-en-verspreidingsfunksie. Die redes vir die gebrek aan winsgewendheid in die pakhuis-en-verspreidingsfunksie is ontoereikende beplanning, beheer en besluitneming binne hierdie funksie. Die hoofrede vir hierdie probleme is foutiewe kostetoedelings, die nie-weerspieëling van die ware koste van aktiwiteite, nie-winsgewende prysvasstelling en die gebrek aan doeltreffende prestasiebestuur.

Die primêre doelstelling van hierdie studie is om die bestaande kostetoedelingstelsel, die kostebestuurstelsel en die prestasiebestuurstelsel van SLA te ontleed, met die fokus op die pakhuis-en-verspreidingsfunksie. Die studie handel met die tekortkominge van die bestaande stelsel en beveel aktiwiteitsgebaseerde prestasiebestuur as 'n moontlike oplossing aan. Om hierdie primêre doelstelling te verwesenlik, is daar ook 'n aantal sekondêre doelstellings wat betrokke is.

Die navorsing is gedoen by SLA Gauteng. Die navorsing het bestaan uit 'n literatuurstudie en 'n empiriese opname met gebruik van gestruktureerde onderhoude om inligting van toepaslike personeel en bestuurders te verkry. Die empiriese studie is verder uitgebrei deur toestemming van die topbestuur te verkry om inligting te versamel deur waarneming van aktiwiteite en prosesse wat personeel in die pakhuis-en-verspreidingsfunksie uitvoer.

Vir die bestuur van SLA om hul doelstelling te verwesenlik om 'n winsgewende, toonaangewende derdeparty-verskaffer van logistiekdienste te word, moet 'n kombinasie van hulpmiddels aangewend word, wat aktiwiteitsgebaseerde kostebepaling, kostebestuur en prestasiebestuur insluit. Aktiwiteitsgebaseerde prestasiebestuur sal bestuur in staat stel om nuttige inligting in te win met die oog op besluitneming ten einde hul doelstelling te verwesenlik.

LIST OF ABBREVIATIONS USED

- ABC** – Activity-Based Costing
- ABM** – Activity-Based Management
- AGOA** – African Growth and Opportunity Act
- BPR** – Business process reengineering
- BSC** – Balanced Scorecard
- EBIT** – Earnings before Interest and Taxes
- EDI** – Electronic Data Integration
- EDA** – Estimated Times of Arrival
- ETD** – Estimated Times of Departures
- EVA** – Economic Value Added
- GAAP** – Generally Accepted Accounting Principles
- ISO** – International Standards Organisation
- INCO** – International Cooperation
- ITAC** – International Trade Administration Commission
- IT** – Information Technology
- JIT** – Just-in-time
- LCC** – Life cycle costing
- MCE** – Manufacturing Cycle Efficiency
- NPV** – Net Present Value
- POD** – Proof of delivery
- PMS** – Performance Measurement System
- RI** – Residual Income
- ROI** – Return on Investment
- ROS** – Return on Sales
- SARS** – South African Revenue Services
- SLA** – Strategic Logistical Alliance
- TC** – Target costing
- TQM** – Total quality management
- USA** – United States of America
- WACC** – Weighted Average Cost of Capital
- WIP** – Work in progress

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CHAPTER 1

INTRODUCTION AND OBJECTIVE OF THE STUDY

1.1 SUGGESTED TITLE

Activity-based performance management at Strategic Logistical Alliance

1.2 BACKGROUND AND INTRODUCTION

Established in August 1996, Strategic Logistical Alliance (SLA) is a South African-based third-party logistics provider operating around the globe through a network of more than 130 offices worldwide. Ownership of the business is held equally between management and listed Italian company Savino del Bene, which has held interests in SLA since April 1999.

Based on innovation and a determination to deliver, SLA's business activities are focused on providing an integrated logistics service to a range of business sectors. Information technology (IT) plays a key role in realising this ambition, enabling full control of all consignments, from collection (at the factory) to the point of delivery (SLA, 2006).

SLA's approach is one of partnership, ensuring an understanding of clients' needs and the development of customised solutions. Something that attests to their quest for quality is the fact that SLA obtained international standards organisation (ISO) 9002 listing in 1997, and they have maintained this status ever since (SLA, 2006).

SLA state that they strive to deliver the right logistics answer for every business they serve. They are not constrained by traditional methodologies and conventions. Instead, they thrive on thinking outside the box, applying the intellectual capital within the business to design and implement the best solution for every situation (SLA, 2006)

1.2.1 The business vision of SLA

SLA is committed to become and remain the number one third-party logistics service provider in the local South Africa market. To this end they offer a range of standard-setting logistics services that consistently exceed customer expectations, whether implemented independently or as part of an integrated logistics solution (SLA, 2006).

1.2.2 Services offered by SLA

- Collection

SLA controls the client's consignment through the whole of the logistics chain, from the supplier to the recipient.

- Expediting and forwarding (import/export)

SLA's advanced computer-tracking system ensures the visibility of every consignment throughout the logistics chain – a system that can be viewed on-line 24 hours a day, seven days a week. SLA also handles all the requisite documentation – including instructions to expedite orders; routing orders; packing lists/commercial invoices; EUR1/certificates of origin; African Growth and Opportunity Act (AGOA) registration in the United States of America (USA); export clearances in countries of origin; air waybills/ocean bills of lading; import clearances; and statements of landed cost per unit.

- Customs clearance

SLA has extensive clearing expertise. This, they say, together with a reputation for compliance with customs and excise rules and regulations, has earned SLA the trust and respect of customs offices across South Africa. SLA handles all customs and excise matters, including obtaining clearances and permits, applications, registrations, payments and rebates (SLA, 2006).

SLA also has experience in issues relating to the Department of Trade and Industry and the South African Revenue Service – including managing the formalities and applying for refunds and drawbacks on behalf of importers. SLA is familiar with the Motor Industry Development Programme, and has the know-how to manage the paperwork and administration for eligible exporters of motor vehicles.

- Warehouse management

SLA controls inventory in both their bonded warehouse (a warehouse at SLA's premises, but under customs control) and their non-bonded warehouse (a warehouse at SLA's premises, but not under customs control) by bar-coding and scanning all consignments received, storage bins and consignments issued. This allows for electronic management of the documentation and enables goods to be tracked and traced at any stage in the process.

- Local distribution

SLA delivers imports to their client's doors, striving to do so promptly and cost-effectively.

1.2.3 Business process

- Leg 1: Origin Pick-Up

As the pick-up and placement of cargo at the relevant airport or port is the first and vital step in the seamless flow of a shipment, SLA assumes responsibility for this leg. SLA's extensive global presence allows them to co-ordinate shipments according to each individual customer's tailor-made needs (SLA, 2006).

SLA also state (SLA, 2006) that they ensure that they understand their client's country of origin pick-up requirement. SLA's central database is kept up to date with each supplier's address details and any special requests which need to be in place to stack cargo. SLA oversees that all the necessary equipment is in place at the supplier's premises to load any abnormal cargo. SLA provides their customers with relevant information regarding ETD (estimated times of departure) for all carriers and ensure that the placement of cargo for export will meet the required service level.

- Leg 2: Origin Handling

SLA's overseas are responsible for processing overseas export formalities and shipping documentation. SLA's overseas network was founded more than 90 years ago and it has achieved a high level of acknowledgement among customs and port authorities in the relevant countries. Likewise, SLA respects their partners for their high standards and expertise, which allow SLA complete peace of mind.

- Leg 3: Carrier Air and Sea

Whether SLA's clients require shipment by air, sea or road, containerised, breakbulk (when a consolidated shipment arrives at the destination terminal, the carrier must break down the many shipments in the vehicle for dispatch to the individual consignees) or specialised, SLA advises on a continuous basis regarding the features and benefits of the different modes of transport (SLA, 2006). SLA's priority is to ensure that their clients' unique requirements are met and that they are guided with regard to costs, risks factors and the relevant shipping terms. Through the global network and secure relationships with leading carriers, SLA offers its clients the buying power to manage their total landing costs. Whilst their cargo is on the road, in the air or at sea, clients have the benefit of track and trace systems that enable access to the status of shipments (SLA, 2006).

- Leg 4: Destination Handling

SLA is accredited with the South African Revenue Services (SARS). SLA has expert knowledge of local airline procedures and South African Port Authority requirements. SLA branches are strategically placed in Elandsfontein, Durban, Cape Town and Port Elizabeth. Their operational staff specialises in and are acknowledged for their dedication and hands-on approach. All premises boast de-grouping, unpacking and bonded warehousing facilities (SLA, 2006).

- Leg 5: Customs Clearing

SLA has extensive expertise in Customs Clearance (SLA, 2006). SLA records a complete database of products and tariff codes, ensuring the accurate processing of clearance documentation. SLA is EDI-compliant (electronic data integration-compliant) which means that SLA guarantee entry release within 24 hours from submission. SLA has vast experience in managing refunds/drawbacks (like customs stop or customs examination) and other complex procedures with the International Trade Administration Commission of SA (ITAC) or SARS. SLA is proud to have been chosen by SARS to be part of the export pilot initiative regarding paperless F178 (SLA, 2006).

- Leg 6: Warehousing

SLA operates beyond traditional boundaries to customise warehousing requirements. SLA's information technology professionals design unique, integrated electronic management system to streamline ordering and distribution processes. SLA is the first logistics specialist in South Africa to obtain permission from SARS to operate their computerised record-keeping system for bonded warehouses. This system manages bonded warehouses and allows for goods to be traded out of the bonded store on demand, whilst still complying with SARS requirements (SLA, 2006).

- Leg 7: Delivery

State of the art dispatch radios, cellular communication and satellite vehicle tracking facilitate constant contact with SLA's fleet of vehicles, ensuring absolute and time-bound efficiency (SLA, 2006).

1.2.4 Leveraging technology

Advanced information technology, developed by SLA, holds the key to the efficient rendering of their services (SLA, 2006). Their extensive in-house information technology department has the proven capacity and skill to develop proprietary systems, both for SLA's purposes and to fulfil their client's specific needs.

1.2.5 SLA's client approach

SLA's approach is to understand their client's

- required service levels and cycle times,
- the volumes they move,
- suppliers and end users,
- Incoterms (developed by the Paris-based International Chamber of Commerce in 1936, Incoterms are internationally accepted rules defining trade terms (Coyle *et al.*, 2003:388)), and
- existing and potential problem areas, before devising the best solution for its clients.

Only by understanding their clients' needs (as listed above) can SLA provide a comprehensive door-to-door logistics service, complete with all the required paperwork, leaving their clients to focus on their core business (SLA, 2006).

SLA currently serves a broad cross-section of industries, including the motor industry (Nissan, Fiat, Ford, etc.), textiles, information technology, earthmoving equipment, chemicals and plastics, tyres (Michelin, Pirelli, Yokohama), food products, paper, cosmetics, catering equipment, petrochemicals, paper pulp, white goods, aviation, ammunition, gaming and forklifts.

1.3 PROBLEM STATEMENT

SLA (2006) is committed to become and remain the number one third-party logistics provider in the South African market. To this end SLA offers a range of standard-setting logistics services that consistently exceed customer expectations, whether implemented independently or as part of an integrated logistics solution. SLA is also committed to delivering imports to their client's doors promptly and cost-effectively. SLA sets high standards for itself, but these standards can only be achieved if the company is profitable and financially successful.

In the era of competitive global environment and technology-based organisations, managers are pressured to find ways to maintain their competitive advantage. Management has the responsibility to maintain their competitive advantage whilst maintaining the profitability of the organisation. This responsibility includes decisions regarding the retention of profitable customers, and the minimisation of costs to improve profitability of services. The analysis of cost and profitability of individual services and customers represents a critical issue with which SLA should be concerned

SLA has proved to be a market leader within the logistics services market whilst maintaining profitability in most of its core business functions, with the exception of the warehousing and distribution function. The reasons for a lack of profitability in the warehousing and distribution function are inadequate planning, controlling and decision-making within these functions. The main reasons for these problems are incorrect cost allocations, the non-reflection of the true cost of activities, unprofitable pricing and the lack of effective performance management.

1.4 STUDY OBJECTIVES

1.4.1 Primary objective

The primary objective of this study is to analyse the existing cost allocation system, the cost management system and the performance management system of SLA, focusing on the warehousing and distribution functions. The study will address the shortcomings of the existing system and recommend Activity-Based Performance Management as a solution.

1.4.2 Secondary objectives

Secondary objectives include the following:

1. To implement activity-based performance management systems effectively and efficiently so as to ensure business success through continuous improvement.
2. To improve existing cost management systems and measure performance in order to achieve an overall competitive advantage. (How can existing cost management systems be modified and improved to optimise their effectiveness?)
3. To implement an activity-based performance management system to assist management in decision-making, planning and controlling, by providing timely and useful information to ensure accurate cost allocation, the ability to determine the true cost of activities and facilitating performance management.

1.5 HYPOTHESIS

With the goal of becoming and remaining the number one third-party logistical services provider in South Africa, SLA should focus on two strategic means to achieve and sustain competitive advantage. The first of these is the achievement of high-quality service levels, and the second a competitive pricing structure.

For management of SLA to achieve their goal of becoming a profitable leading third-party logistical service provider, a combination of tools should be used, which include activity-based costing, cost management and performance management. Activity-based performance management will enable management to gain useful information for decision-making to achieve their goal.

1.6 METHOD OF RESEARCH

1.6.1 Literature study

The study involved in-depth literature research of activity-based and performance management systems, tools and relevant aspects by consulting books, journal articles, the internet and other relevant sources.

1.6.2 Empirical study and field of research

Relevant information was obtained from SLA by means of an empirical study. Structured interviews were used to obtain information from relevant staff and managers. Permission to gather information by observation of activities and processes carried out by staff in the warehouse was obtained from top management.

After completion of the questionnaires, information was analysed, followed by final conclusions and recommendations for SLA.

1.7 CHAPTER CLASSIFICATION

Chapter 1: Introduction and objective of study. This chapter sets the background for the study, giving a scenario for SLA. The problem statement, objective of the study, hypothesis and method of research is set out.

Chapter 2: Activity-based costing and Activity-based management. A theoretical framework of activity-based costing as a system is provided. A comparison between activity-based costing and traditional costing is made. The steps necessary to implement an activity-based costing system are explained and the advantages and disadvantages of an activity-based costing system evaluated. Lastly the activity-based costing and activity-based management model is explained.

Chapter 3: Cost Management. A theoretical consideration of cost management is provided. Different types of cost management tools are defined and evaluated.

Chapter 4: Performance measurement and performance management. A theoretical framework of Performance measurement; focussing on financial and non-financial performance measurement, is provided. A theoretical framework for performance management is discussed, focussing on the balanced scorecard in order to link financial and non-financial measures. The steps necessary to implement the balanced scorecard will be explained, key elements of the balanced scorecard will be discussed and the advantages and disadvantages of the balanced scorecard will be evaluated. The need to manage performance within SLA will be emphasised.

Chapter 5: Empirical study. The empirical study is set out. Findings are set out and analysed.

Chapter 6: Conclusions and recommendations. Conclusions and recommendations are made with regards to the activity-based performance management in SLA.

Appendix

Bibliography

CHAPTER 2

ACTIVITY-BASED COSTING AND ACTIVITY-BASED MANAGEMENT

2.1 INTRODUCTION

The analysis of cost and profitability of individual products, services, and customers represents a critical issue with which companies should be concerned and one where activity-based costing (ABC) tries to help.

The shortcomings of traditional costing systems, in terms of validity, accuracy, completeness, consistency, understanding and relevance, increased the need of companies to refine their costing system. ABC evolved from the 1960s and the 1980s and became one of the main ways in which companies around the globe refined their costing systems.

ABC focuses on what is important for the organisation, and on what information is needed to help management understand cost behaviour and absorption by product/services in order to make better decisions about pricing and to understand exactly where to take actions that will drive profits. ABC does not only focus on financial information for internal reporting but also focuses on non-financial information.

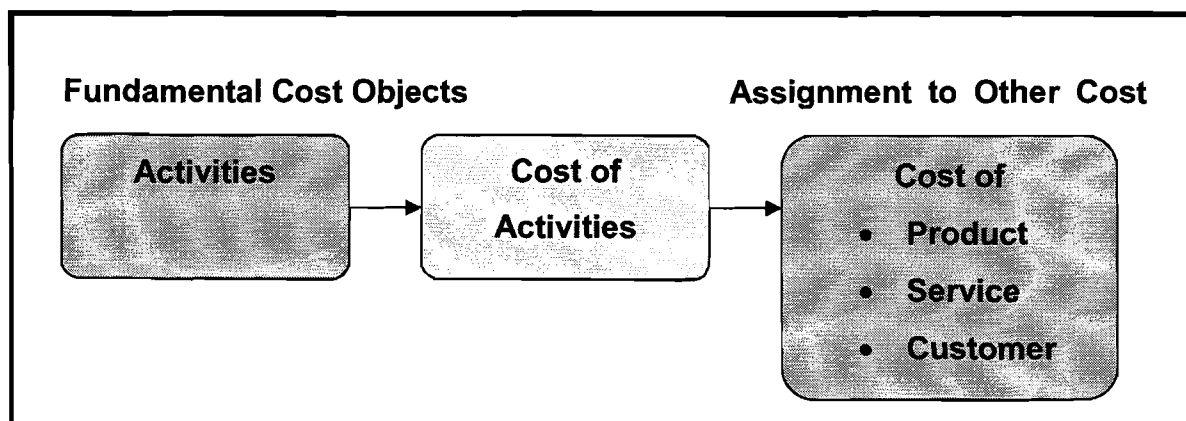
2.2 DEFINITION OF ABC

ABC is a costing method based on the principle that products and/or services require an organisation to carry out activities and that those activities require of an organisation to incur costs. In ABC, systems are designed so that any costs that cannot be directly accredited to a product or service flow into the activities that makes the cost necessary. The cost of each activity then flows to the product(s) or service(s) that make the activity necessary, based on their particular use of that activity (Hicks, 1999:6 and Griful-Miquela, 2001:135).

ABC is a method of measuring the cost and performance of activities, and cost objects. ABC assigns costs to business processes, also called activities, based on their use of resources. The costs incurred by business processes are assigned to cost objects (i.e. products, services, customers, etc.) based on their consumption of these processes (activities). ABC recognises the fundamental relationship between cost drivers and business processes (Sedgley & Jackiw, 2001:369).

According to Horngren *et al.* (2006:144-145), ABC refines a costing system by focusing on individual activities as the essential cost objects. An activity is an event, task or unit of work with a particular purpose; for example, designing products, setting up machines, operating machines, and distributing products. ABC systems calculate the costs of individual activities and assign costs by making use of cost drivers to cost objects such as product and services on the basis of the activities needed to produce each product or service:

Figure 2.1: Activity-based costing



(Source: Horngren *et al.*, 2006:145)

ABC can therefore be defined as a system that calculates the costs of individual activities and assigns costs by making use of cost drivers to cost objects such as products and services on the basis of the activities undertaken to create each product or service. ABC is designed to provide managers with cost information for strategic and other decisions.

In essence, ABC uncovers the true cost of a product or service of a business.

2.3 ABC VERSUS TRADITIONAL COSTING

Historically, companies used a traditional method of costing but during the 1980s the limitations of traditional costing caused major publicity. These systems were realistic when labour and materials were the two major costs involved in creating a narrow range of products. Overhead costs were relatively small and problems which arose from inaccurate overhead allocation were not important (Drury, 2004:374 and Beheshti, 2004:377).

Today, companies make use of modern technology and they produce many products and services, therefore direct labour and material represent only a small portion of total costs, while overhead costs became more important. The traditional method of costing became insufficient for effective decision-making, whereas an ABC system generates a more representative examination of how costs are actually consumed by a product or service within the organisation.

An overview of the major differences between traditional costing and ABC is illustrated in figure 2.2 below.

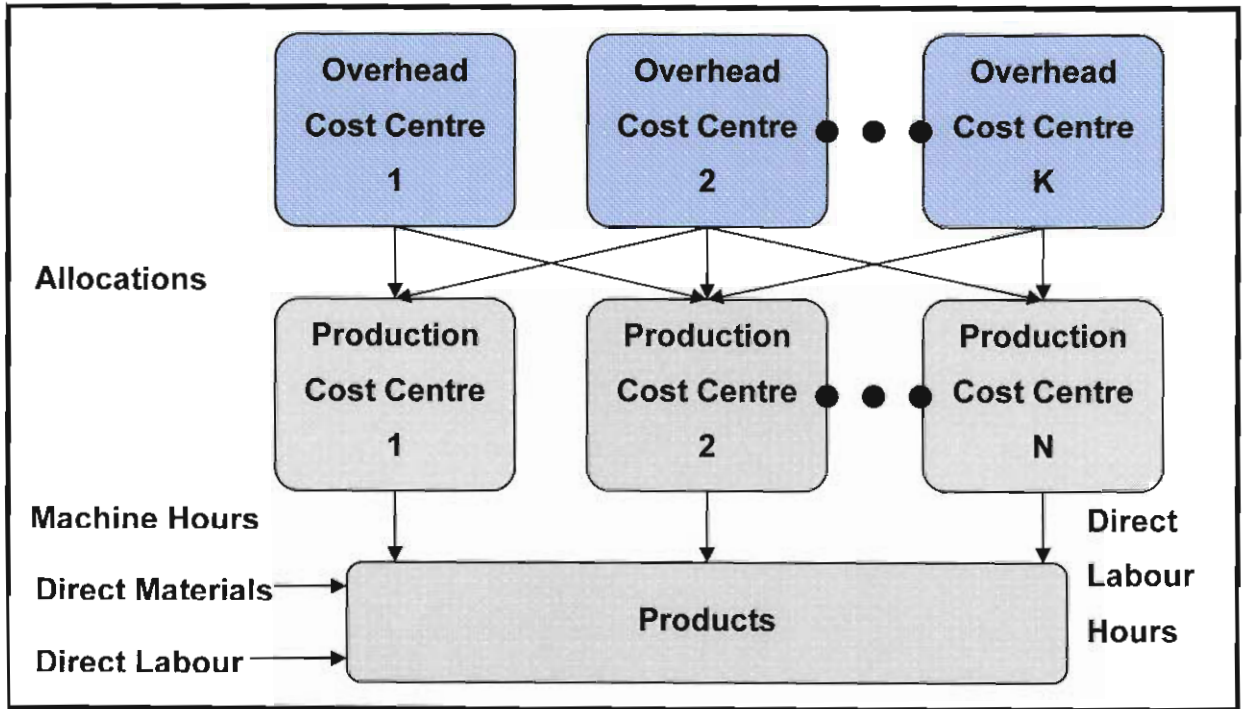
Both these systems make use of a two-stage allocation process. In traditional costing systems, overheads are first grouped into one or more cost pools by allocating the overheads to production and/or service department. In the second stage it reallocates service department costs to the production departments using an allocation base such as direct labour cost or hours, machine hours, or number of units (Drury, 2004:372 and Eldenburg & Wolcott, 2005:260).

In the first stage of an ABC system, the overhead costs of resources are assigned to activity cost pools, and then activity costs are allocated to individual products or services, using cost drivers that are chosen to reflect the use of resources (Drury, 2004:372 and Eldenburg & Wolcott, 2005:260).

The two processes are therefore very comparable, but the first stage is different as an ABC system uses activities instead of functional departments or cost centres on which to base costing.

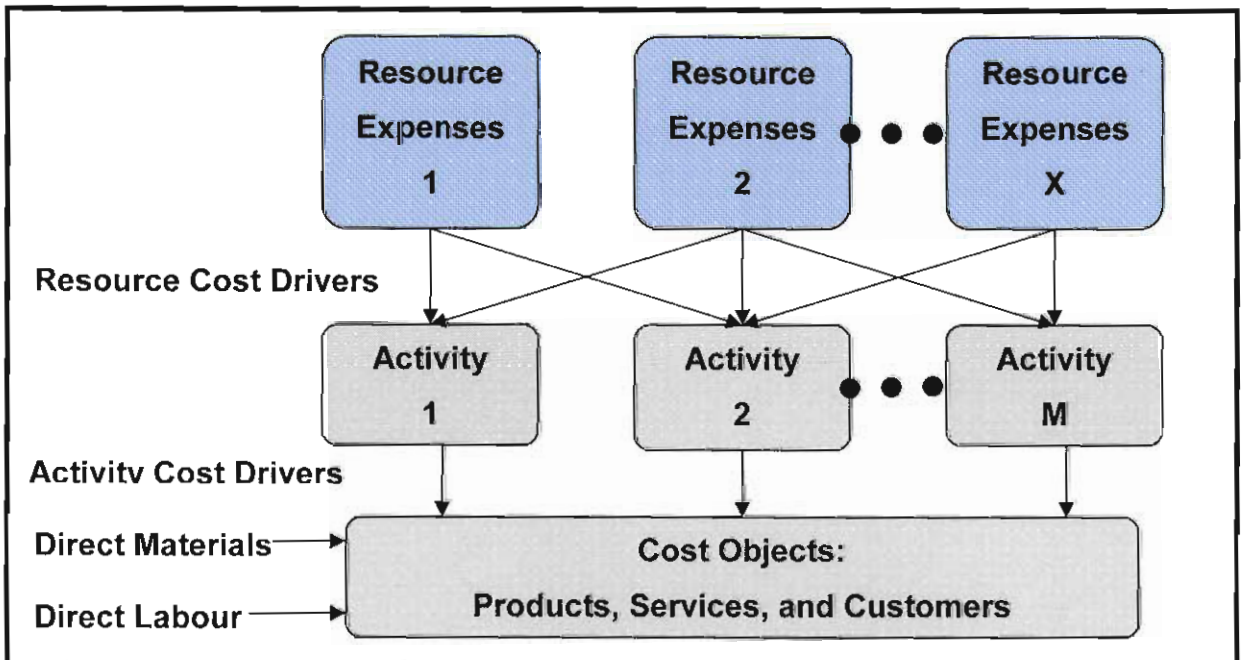
Figure 2.2: An illustration of the two-stage allocation process for traditional and activity-based costing systems

a) Traditional costing systems



(Source: Kaplan & Cooper, 1998:83 and Drury, 2004:373, adapted)

b) Activity-based costing systems



(Source: Kaplan & Cooper, 1998:83 and Drury, 2004:373, adapted)

2.3.1 Simple example to compare traditional costing with activity-based costing

The following example is a simple introduction to ABC. The number of departments and activities is coincidental and is used just for simplicity in this demonstration.

An organisation produces three products for which the standard quantities per unit are as follows:

Source: Wilks & Burke (2005:272-273) (adapted)

Products	X	Y	Z
Quantity produced	10000	20000	30000
Direct material (ZAR/unit)	60	50	40
Direct labour (ZAR/unit)	40	50	60
Labour hours (/unit)	4	5	6
Machine hours (/unit)	5	5	8
Number of purchase orders	1200	1800	2000
Number of machine set ups	250	300	350

Production overhead analysis per department:

Department 1	R 1,400,000.00
Department 2	R 1,800,000.00
	<u>R 3,200,000.00</u>

Department 1 is labour intensive and department 2 is machine intensive

Total labour hours in department 1:	175,000
Total machine hours in department 2:	450,000

Production overhead analysed by activity:

Inspection	R 1,400,000.00
Production scheduling/machine set-up	R 1,200,000.00
	<u>R 2,600,000.00</u>

Number of batches inspected	5000
Number of batches for scheduling and set-up	800

Traditional costing

Absorption rates:

$$\begin{aligned} \text{Department 1} &= \frac{\text{R1,400,000.00}}{175,000} \\ &= \text{R 8.00 per labour hour} \end{aligned}$$

$$\begin{aligned} \text{Department 2} &= \frac{\text{R1,800,000.00}}{450,000} \\ &= \text{R 4.00 per machine hour} \end{aligned}$$

Product cost statement

	X	Y	Z
	ZAR	ZAR	ZAR
Direct material	60	50	40
Direct labour	40	50	60
OVERHEAD:			
Department 1	32	40	48
Department 2	20	20	32
Total cost/unit	152	160	180

Activity-based costing

Cost driver rates:

$$\begin{aligned} \text{Inspection} &= \frac{\text{R1,600,000.00}}{5000} \\ &= \text{R 280.00 per inspection} \end{aligned}$$

$$\begin{aligned} \text{Production scheduling/} \\ \text{machine} \\ \text{set-up} &= \frac{\text{R1,500,000.00}}{800} \\ &= \text{R 1,500.00 per set-up} \end{aligned}$$

Product cost statement

	X	Y	Z
	ZAR	ZAR	ZAR
Direct material	60	50	40
Direct labour	40	50	60
OVERHEAD:			
Inspection	34	25	19
Production scheduling	38	23	18
Total cost/unit	172	148	137

Should management have applied the traditional way of costing, Product Z (R180/unit) would have appeared to be more expensive than if ABC had been used. Product X (R152/unit) would appear to be cheaper when the traditional system is used and more expensive (R172/unit) when ABC is used. The effect of making a decision not to use ABC (with the assumption that ABC is more accurate) will lead management to over-price product Z (R180/unit) and under-price product X (R152/unit). This can lead to major failure in an organisation. The selling price of product Z will not be market related and will lead to low selling volumes. Product X will be sold in high volumes, but the organisation will unknowingly be making a loss per unit of product X.

Based on the above case it is extremely important to every company to achieve and sustain a competitive advantage. The importance of ABC and the implementation of ABC will form the content of the rest of this chapter.

2.4 IMPLEMENTATION OF AN ABC MODEL

2.4.1 Identifying activities

An ABC system makes use of activities and not cost centres or departments, like in the case of traditional costing systems. **Activities** are defined as a collection of actions (or work) performed within an organisation to produce an output. Activities are described by verbs related to objects (Glad & Becker, 1994:18; Beheshti, 2004:378 and Turney, 1996:99).

A cost hierarchy is used to identify activities and to assign costs to these activities (Eldenburg & Wolcott, 2005:261; Drury, 2004:382-383; Lere, 2000:24-25 and Garrison *et al.*, 2006:321-322). The following are the various activities.

- **Unit-level activities**

Unit-level activities are the activities performed for every unit of product or service produced. The quantity of unit-level activities should be proportional to production and sales volumes, for example direct labour and direct material. Typical examples of cost drivers for unit-level activities will be labour hours and machine hours.

- **Batch-level activities**

Batch-level activities are the activities that have to be performed for a collection of products or services, regardless of how many units are in the batch. For example processing a customer order and arranging for a shipment to a client. The cost of batch-related activities varies from the number of batches, but is a fixed cost for all units within the batch. For example, the cost of processing a customer order will be the same regardless of whether the batch contains two or 50 items.

- **Product-sustaining activities or service-sustaining activities**

Product-sustaining activities are the activities performed to enable the production and sales of individual products or services. These activities are not unit- or batch-related, but are related to individual products or services. For example, inspection of individual products or services, and technical support for individual products or services.

- **Facility-sustaining or business-sustaining activities**

These activities occur regardless of how many customers are served, which products are produced, how many batches are processed or how many units are produced. Many of these costs are fixed and typically assigned to the facility or business as a whole, for example insurance, depreciation, arranging for loans and providing a computer network.

2.4.2 Assigning costs to activity cost centres

Once the activities are identified, the **cost** of resources consumed by these activities can be determined. The aim of ABC is to determine the “true cost” of the organisation's activities (Closs & Goldsby, 2000:500). The activities do not involve only production costs, but rather all costs related to the activities, for example inspection of individual products or services and development costs should be taken into consideration. This includes fixed and variable costs. By identifying activities in paragraph 2.4.1 and the cost of activities, ABC seeks a greater level of detail to understand how an organisation uses its resources.

2.4.3 Selecting appropriate cost drivers for assigning the cost of activities to cost objects

According to Stapleton *et al.* (2004:586), activities and cost objects are linked by cost drivers, therefore a cost driver is a unit of activity that causes or influences costs (Lin *et al.*, 2001:708).

According to Drury (2004:380-381) and Kaplan & Cooper (1998:95-97), activity cost drivers consist of three types:

1. Transaction drivers

Transaction drivers, such as the number of purchase orders and the number of customer orders processed, provide a count of how often an activity is performed. Transaction drivers are the least expensive cost driver and are also expected to be the least accurate cost driver because they expect that the same quantity of resources is necessary every time an activity is performed.

2. Duration drivers

Duration drivers represent the amount of time necessary to perform an activity. Duration drivers are useful when significant variation exists in the amount of activity that is required for different outputs. For example the set-up hours for a simple product will be 20–25 minutes, but complex products can require quite a few hours. Using a transaction driver like number of set-ups will cause an over-costing of simple products and an under-costing of complex products. Therefore using set-up hours as a cost driver will overcome this problem.

3. Intensity drivers

Intensity drivers directly charge for the resources used every time an activity is performed. A complex product may require skilled personnel for set-up. Duration drivers will determine an average hourly rate to calculate the cost of the activity, whereas intensity drivers would record the time required from skilled personnel and assign the specific resources directly to the product.

2.4.4 Assigning the cost of the activities to products or services

The fourth step is also known as second-stage allocation. Activity rates are used to apply costs to products and customers (Garrison *et al.*, 2006:328-330). The allocation rate is determined by dividing the total cost of the activity by the total amount of times the activity takes place (Eldenbug & Wolcott, 2005:265).

$$\text{Allocation rate} = \frac{\text{Total cost of the activity}}{\text{Total amount of times the activity takes place}}$$

In this example there are two types of tyres: Truck tyres and passenger tyres. And two activities: A and B. Truck tyres make use of activity A only once and make use of activity B three times. Passenger tyres make use of activity A four times and makes use of activity B only once. The total use of activity A is five times and activity B is four times. The allocation rate for activity A will be the total cost of activity A divided by five, and the allocation rate for activity B will be the total cost divided by four.

2.4.5 An example of implementing activity-based costing

Strategic Logistical Alliance (SLA) has decided to increase the size of the warehouse. It wants information about the profitability of each individual service line: X tyres and Tips shoes. SLA provides the following information:

	Tips shoes	X tyres	Total
Revenue	R 4 536 000	R 2 016 000	R 6 552 000
Cost of goods sold	R 3 600 000	R 1 800 000	R 5 400 000
Number of purchase orders	600	200	800
Number of pallets		600	600
Number of cartons	1200		1200
Number of high value items	1200		1200
Number of low values items		600	600
Number of small parcels	14400		14400
Number of large parcels		3600	3600
Number of deliveries	760	140	900

SLA also provides the following information:

Activities	Cost	Quantity of Cost-allocation Base
Orders received	R 80 000	800 purchase orders
Unload incoming goods	R 15 000	600 pallets
	R 48 000	1200 cartons
Palletising	R 9 000	600 pallets
	R 42 000	1200 cartons
Check incoming goods	R 6 000	1200 high value
	R 1 200	600 low value
Put away incoming goods	R 7 200	600 pallets
	R 21 600	1200 cartons
Picking	R 172 800	14400 small parcel
	R 28 800	3600 large parcel
Package and labelling	R 12 000	800 purchase orders
Load outgoing goods	R 15 000	600 pallets
	R 48 000	1200 cartons
Delivery	R 72 000	900 deliveries

An ABC system will now be used to calculate the operating income as a percentage of revenues for each service line.

Step 1 is to determine the activities in the warehouse as discussed in paragraph 2.4.1. Step 2 is to assign cost to activity centres as discussed in paragraph 2.4.2. Step 3 is selecting appropriate cost drivers for assigning the cost of activities to cost objects as discussed in paragraph 2.4.3. Step 4 is assigning the cost of the activities to products or service as discussed in paragraph 2.4.4; here SLA calculates cost-allocation rates for each activity area. The activity rates are as follows:

	Identifying activities (Step 1)	Total cost (Step 2)	Cost drivers (Step 3)	Assigning the cost of activities (Step 4)	
Cost centres	Activities	Cost	Cost Driver	Quantity of cost-allocation base	Overhead allocation rate
Receiving	Order received	R 80 000	Number of purchase orders	800 purchase orders	R100 per order
	Unload incoming goods	R 15 000	Quantity and packaging (pallets or cartons)	600 pallets	R25 per pallet
		R 48 000		1200 cartons	R40 per carton
	Palletising	R 9 000	Quantity of pallets or cartons	600 pallets	R15 per pallet
R 42 000		1200 cartons		R35 per carton	
Check incoming goods	R 6 000	Quantity and quality of supplier	1200 high value	R5 per quantity	
	R 1 200		600 low value	R2 per quantity	
Centre floor	Put away incoming goods	R 7 200	Quantity and number of returns	600 pallets	R12 per pallet
		R 21 600		1200 cartons	R18 per carton
	Picking	R 172 800	Size of parcel picked	14400 small parcel	R12 per parcel
R 28 800		3600 large parcel		R8 per parcel	
Package and labelling	R 12 000	Number of orders picked	800 purchase orders	R15 per purchase order	
Dispatch	Load outgoing goods	R 15 000	Quantity and packaging (pallets or cartons)	600 pallets	R25 per pallet
		R 48 000		1200 cartons	R40 per carton
Delivery	R 72 000	Quantity of deliveries	900 deliveries	R80 delivery	

The cost of each service line per activity is obtained by multiplying the total quantity of the cost-allocation base for each service line by the activity-cost rate. Operating income and operating income as a percentage of revenues for each product line are as follows:

		Tips shoes	X-tyres	Total
Revenue		R 4 536 000	R 2 016 000	R 6 552 000
Cost of goods sold		R 3 600 000	R 1 800 000	R 5 400 000
Order received		R 60 000	R 20 000	R 80 000
Unload incoming goods	(0;600) pallets X 25	R 0	R 15 000	R 15 000
	(1200;0) pallets X 40	R 48 000	R 0	R 48 000
Palletising	(0;600) pallets X 15	R 0	R 9 000	R 9 000
	(1200;0) cartons X 35	R 42 000	R 0	R 42 000
Check incoming goods	(1200;0) high value X 5	R 6 000	R 0	R 6 000
	(0;600) low value X 2	R 0	R 1 200	R 1 200
Put away incoming goods	(0;600) pallets X 12	R 0	R 7 200	R 7 200
	(1200;0) cartons X 18	R 21 600	R 0	R 21 600
Picking	(14400;0) small X 12	R 172 800	R 0	R 172 800
	(0;3600) large X 8	R 0	R 28 800	R 28 800
Package and labelling	(600;200) orders X 15	R 9 000	R 3 000	R 12 000
Load outgoing goods	(0;600) pallets X 25	R 0	R 15 000	R 15 000
	(1200;0) cartons X 40	R 48 000	R 0	R 48 000
Delivery	(760;140) deliveries X 80	R 60 800	R 11 200	R 72 000
Operating income		R 467 800	R 105 600	R 573 400
Operating income/revenues (ratio)		10.31%	5.24%	

ABC clearly distinguishes the different types of activities. It also tracks how the individual service lines use resources. X tyres consume fewer resources than Tips shoes. X tyres have fewer deliveries than Tips shoes and require less packaging and labelling.

SLA can use ABC information to guide their decisions, such as how to allocate a planned increase in floor space. Pricing decisions can also be made in a more informed way with activity-based information. For example, suppose a competitor announces a 2% reduction in Tips shoes warehousing prices. Given the 10.31% margin SLA currently earns on its Tips shoes service line, it has the flexibility to reduce prices and still make a profit on this line.

2.5 ADVANTAGES AND DISADVANTAGES OF THE ABC APPROACH

During the discussion of traditional costing systems versus ABC systems in paragraph 2.3, it became clear that traditional costing does not allocate cost accurately to individual products or services. It is especially so where organisations:

- Produce more than one product and service and where all products or services do not make use of all the resources in the production or service line, or
- make use of more indirect cost in the production or service line.

ABC has been developed to overcome the shortcomings of traditional costing systems. It has certain advantages, and certain disadvantages, and these are discussed below.

2.5.1 *Advantages of activity-based costing*

- ABC provides a clear picture of where **resources** are spent in an organisation. ABC reduces the unpredictability in cost measurement by closely matching cost allocations to the actual use of resources by operating activities (Stapleton *et al.*, 2004:591 and Eldenburg & Wolcott, 2005:276).
- ABC helps managers focus on activity level measurement. After identifying activities and cost drivers, managers are more aware of the **cause-and-effect** relationships. This awareness motivates managers and employees to look for ways to advance **performance** simply because they have more **information** about the cost effects of an activity (Eldenburg & Wolcott, 2005:276).

- ABC relies on a greater number of **cost drivers** to allocate overheads on a cause-and-effect basis and therefore organisations can trace cost more accurately and determine the areas and/or customers that generate the greatest profit or loss. Product and customer profitability analysis performed by the organisation using activity-based management may significantly alter management perceptions of the status of operations, as a more accurate and effective allocation of costs is obtained (Drury, 2004:372-374 and Stapleton *et al.*, 2004:591).
- ABC identifies **value-adding activities**. Value-adding activities are those activities that add value from the customer's point of view (Griful-Miquela, 2001:136).
- ABC helps managers identify **non-value-adding activities** so that they can be improved to add value from the customer's point of view or so that the activity can be eliminated (Stapleton *et al.*, 2004:591).
- ABC identifies many activity costs that are not directly linked to production at all but are traditionally allocated to products as production cost. On the other hand, it identifies many marketing, selling and administrative costs that should be included to establish better **pricing** estimates (Stapleton *et al.*, 2004:592).

2.5.2 Disadvantages of activity-based costing

- According to Horngren *et al.* (2006:157), the main costs and limiting factors of an ABC system are the measurements necessary to implement the system. Cost-allocation bases require management to estimate costs of activity pools and to identify and measure cost drivers for these pools. ABC systems require many calculations to determine costs of products and services. These measurements are **costly** and rates need to be updated regularly.
- Due to the lengthy procedures which ABC entails, it can be a very **time-consuming procedure** (Stapleton *et al.*, 2004:592).

- It is not appropriate for every organisation; firms with low overhead costs will not benefit from an ABC system (Stapleton *et al.*, 2004:592).
- ABC is a very complex system, due to the near impossibility of tracking and attaching every resource cost to a particular activity. Hundreds and possibly thousands of activities take place in organisations every day. Some activities may not be identifiable or quantifiable without a great amount of effort (Lin *et al.*, 2001:710).

Most organisations ask the following question: Are the costs of implementing an ABC system worth the benefits achieved? ABC is clearly a more complicated and expensive costing approach but the benefits of this system definitely justify these inputs.

2.6 ACTIVITY-BASED MANAGEMENT

To achieve continuous improvement, managers should remain informed. Managers need timely and accurate information about the activities (work) done and the objects of these activities (the products and the customers). This is what ABC is all about as discussed throughout chapter 2. Obtaining good quality information is only one half of the challenge. The key to success is putting ABC information to work to identify appropriate strategies, improve product design, and remove waste from operating activities (Turney, 1996:139).

Using ABC to improve an organisation is called activity-based management (ABM) and will form the content of the rest of this chapter.

2.6.1 Defining activity-based management (ABM)

According to Horngren *et al.* (2006:152-155), activity-based management (ABM) describes management decisions that use ABC information to please customers and advance profitability, and more broadly defines ABM to include decisions about:

- pricing and product mix,
- how to reduce costs,
- how to improve processes, and
- product design.

According to Eldenburg & Wolcott (2005:270), ABM makes use of ABC information to calculate the costs and benefits of production and internal activities and to identify and implement opportunities for improvement in profitability, efficiency and quality within an organisation.

ABC can be used to identify areas that would gain from process improvement, and when ABC is used in this manner it is called ABM. ABM focuses on managing activities to eliminate waste and reducing delays or defects (Garrison *et al.*, 2006:335).

ABM can be defined as a system that focuses on the management of activities. Activities consume costs, therefore by managing activities, cost will be managed, which leads to continuous improvement. ABM is very dependent on the quality of information provided by ABC. ABM adds value to activities and thus leads to an increase in the level of satisfaction of customers.

2.6.2 Principles of activity-based management

ABM is directly aimed at two goals. The first goal is to satisfy customers' needs by improving the value of the product or service received by the customer. The second goal is to improve profits by making fewer demands on organisational resources. These goals will be obtained by managing activities (Drury, 2004:951 and Turney, 1996:141).

Knowing the cost of activities highlights those activities with the highest cost so that management can prioritise the analysis of these activities so that they can be eliminated or performed more efficiently.

Turney (1996:146) recommend using a Pareto rule to identify the activities with the greatest potential for improvement. Pareto's rule or the 80/20 rule states that 20% of the activities cause 80% of the cost (Turney, 1996:146 and Wayne & Searcy, 2004:51). This will help management identify activities that need to be analysed. Another way of dealing with activities is to classify them as either value-adding or non-value-adding activities.

- **Value-adding activities**

A value-adding activity is an activity that customers recognise as adding value to the product or service they purchase. For example, on-time deliveries of the right quality and quantity will be a value-adding activity for the client. Other definitions include an activity that is performed as efficiently as possible and/or an activity that is in line with the primary objective of producing outputs (Drury, 2004:955 and Griful-Miquela, 2001:136).

- **Non-value-adding activities**

A non-value-adding activity is an activity that does not add value to a product/service and therefore is unnecessary and can be reduced or eliminated. This is an opportunity for cost reduction, without forfeiting the value or quality of the product or service to the customer (Drury, 2004:955 and Griful-Miquela, 2001:136). For example, a third hundred percent audit check (inspection) of inventory that has been previously picked and audited will be a non-value adding activity in the warehouse.

According to Drury (2004:955), a value-adding or non-value-adding activity can be classified in terms of the following five point scale.

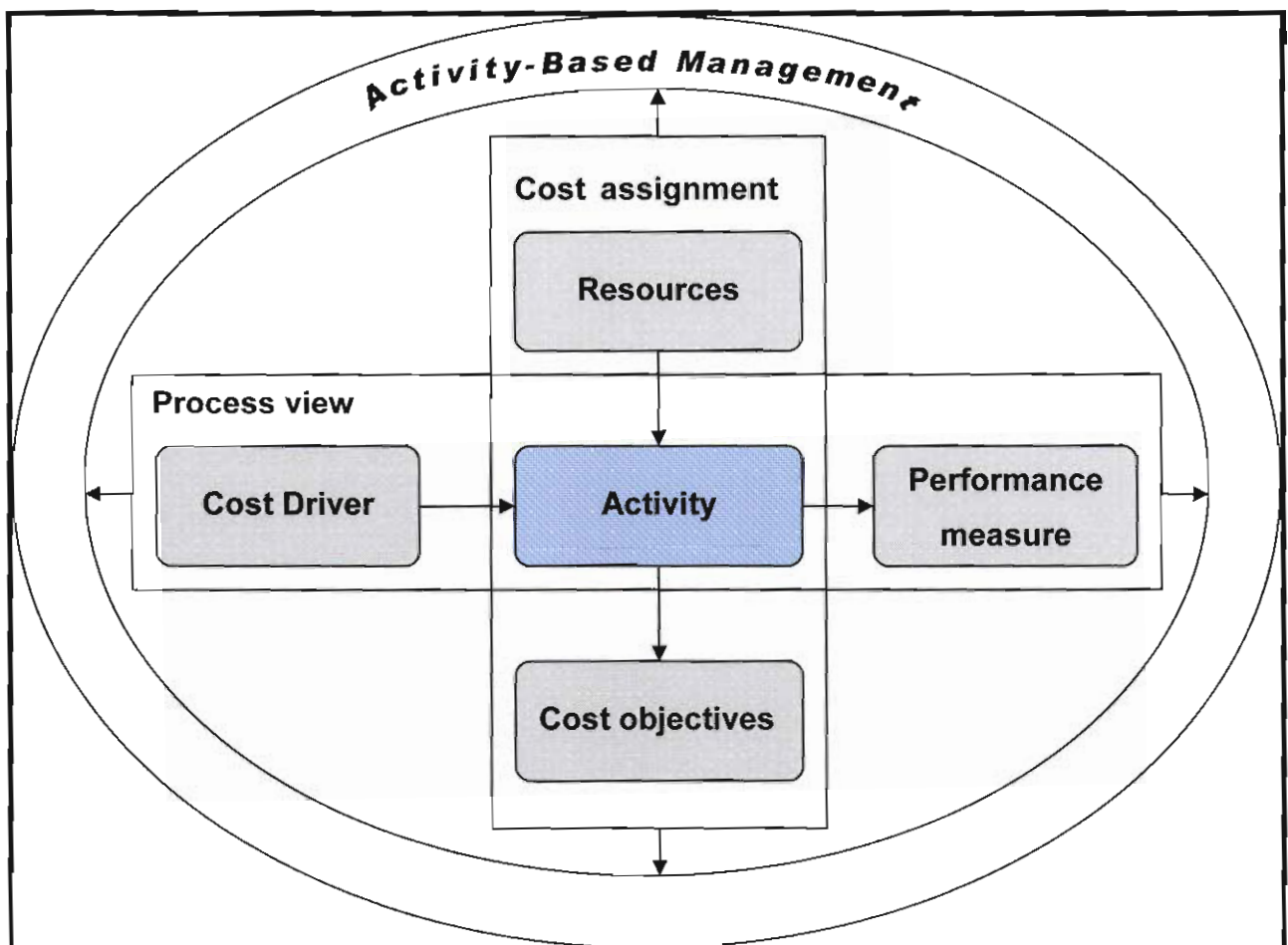
1. Highly efficient, with little opportunity for improvement
2. Moderately efficient, with a few opportunities for improvement
3. Of average efficiency, with reasonable opportunity for improvement
4. Inefficient, with plenty of opportunities for improvement
5. Highly inefficient, should maybe not be done at all, opportunity for improvement

By identifying the cost of activities that make up the organisation and classifying them into the above five categories, opportunities for cost reduction can be identified and prioritised. Cost reduction can be achieved by eliminating the activities, performing them more efficiently with fewer resources or redesigning them so that they are performed entirely differently and more efficiently, also in terms of cost.

2.7 THE ACTIVITY-BASED COSTING AND ACTIVITY-BASED MANAGEMENT MODEL

Figure 2.3 below illustrates a graphical model of activity-based performance measurement. This model is defined by Turney (1996:81) as second-generation ABC. This model has three main views:

Figure 2.3: The activity-based costing model



(Source: Turney, 1996:81 and Drury, 2004:392, adapted)

- **ABM view** (indicated by the circle) illustrates the interrelationship between ABC and ABM. ABC provides the information needed to manage activities. ABM uses the information provided by activity-based costing as the route to continuous improvement.

- **The cost assignment view** (indicated by the vertical box). The vertical box relates to product or customer costing, where costs are first assigned to activities, and then to cost objects. The resources and activity drivers within the model reflect the total time or other resources consumed in performing a specific activity (La Londe & Ginter, 1999:17). Thus the vertical box focuses on financial information. This information is important in order to analyse critical decisions. These decisions include pricing, product mix, sourcing, product-design decisions and setting priorities for improvement efforts.
- **The process view** (indicated by the horizontal box). The horizontal box reflects information about events that influence the performance of activities and activity performance. What causes work and how well it is done? Thus the horizontal box focuses on non-financial information. Organisations use this information to help improve performance and the value received by customers.

This model indicates the connection between financial and non-financial information. This connection enables performance to be translated into cost information and into how performance affects process costs or profitability. Improved performance can also be translated into a revised activity cost that requires fewer resources. The vertical box or cost view of ABC allows the activity cost to be translated into changes in necessary resources or into customer or product or service cost (La Londe & Ginter, 1999:17).

The aim of this chapter was to look at how ABC can be used to provide relevant information for decision-making by more accurately assigning costs to cost objects. ABM was also discussed to see how the information provided by ABC is used by ABM to manage activities. Cost management and performance measurement/management are considered more valuable than pure financial evaluation to evaluate overall organisational performance (Burk & Douglas, 1994:17). This statement will be explained in Chapters 3 and 4.

2.8 SUMMARY

Knowledge of product cost or service cost is critical for any organisation that hopes to maintain, or improve, its competitive advantage. This is especially true in small and mid-sized organisations that face ever-increasing pressure from their key customers continually to reduce the price of their products and services.

Traditional cost accounting methods suffer from several defects that can result in distorted cost for decision-making purposes. All manufacturing costs – even those that are not caused by any specific product – are allocated to products. Traditional methods also allocate the costs of idle capacity to products. In effect, products or services are charged for resources that they don't use. And finally, traditional methods tend to place too much reliance on unit-level allocation bases, such as direct labour and machine-hours. This results in over-costing high-volume products and under-costing low-volume products and can lead to mistakes when making decisions.

ABC estimates the costs of the resources consumed by cost objects such as products and customers. The approach taken in ABC assumes that cost objects generate activities that in turn consume costly resources. Activities form the link between costs and cost objects. ABC is concerned with overhead costs. The accounting for direct labour and direct material is usually unaffected.

To build an ABC system, managers should choose a set of activities that summarises much of the work performed in overhead departments and associate that with each activity-cost pool. The remaining overhead costs are assigned to the activity-cost pools in the first-stage allocation.

An activity rate is computed for each cost pool by dividing the costs assigned to the cost pool by the measure of activity for the cost pool. Activity rates provide useful information to managers concerning the costs of carrying out overhead activities. A particularly high cost for an activity may trigger efforts to improve the way the activity is carried out in the organisation.

In the second-stage allocation, the activity rates are used to apply costs to cost objects such as products and customers. The costs computed under ABC are often quite different from the costs generated by a company's traditional cost accounting system. While the activity-based costing system is almost certainly more accurate, managers should nevertheless exercise caution before making decisions based on activity-based costing data. A vital part of any activity-based analysis of product or customer profitability is an action analysis that identifies who is ultimately responsible for each cost and the ease with which the cost can be adjusted.

CHAPTER 3

COST MANAGEMENT

3.1 INTRODUCTION

The aim of chapter 2 was to look at how activity-based costing can be used to provide relevant information for decision-making by more accurately assigning costs to cost objects. According to Drury (2004:391), activity-based costing can be used for a range of cost management applications. The vertical box as illustrated in figure 2.3 in paragraph 2.7 relates to product or customer costing, where costs are first assigned to activities and then to cost objects. According to Drury (2004:391), the horizontal box as illustrated in figure 2.3 in paragraph 2.7 relates to cost management, where a process approach is adopted and costs are allocated to activities. This represents the basis for cost management applications.

Therefore activity-based costing should not only be used to provide relevant information for decision-making, but should also represent the basis for cost management applications. Cost management will be discussed in this chapter.

3.2 DEFINING COST MANAGEMENT

According to Horngren *et al.* (2006:2-3), cost management describes the activities of managers in the short- and long-term in which they

- (i) implement programmes to control decisions that minimise costs of products or services, and
- (ii) increase the value or quality of the products or services to ensure customer satisfaction.

Cost management forms an important part of management strategies and their implementation.

Cost management focuses on cost reduction rather than cost control. Traditional cost-control systems are applied on a continuous basis, while cost management tends to be applied on an ad hoc basis when cost reduction opportunities are identified. Cost-control systems rely heavily on accounting techniques, whereas cost management sometimes makes use of accounting information, and sometimes not. Accounting information for example is not needed for process improvements, where an opportunity is identified to perform a process more effectively and efficiently in order to reduce costs. Although cost management aims to reduce costs, it should not be at the expense of customer satisfaction (Drury, 2004:943-944).

Managers commonly use the following cost management tools to implement an organisation's strategy and to facilitate the achievement of success in respect of critical success factors: life-cycle costing (LCC), target costing (TC), kaizen costing, activity-based management (ABM), business process reengineering (BPR), costs of quality and total quality management (TQM), value chain, benchmarking and just-in-time (JIT). Everything except for the balanced scorecard (BSC) will be discussed in this chapter. The BSC will be looked at in chapter 4.

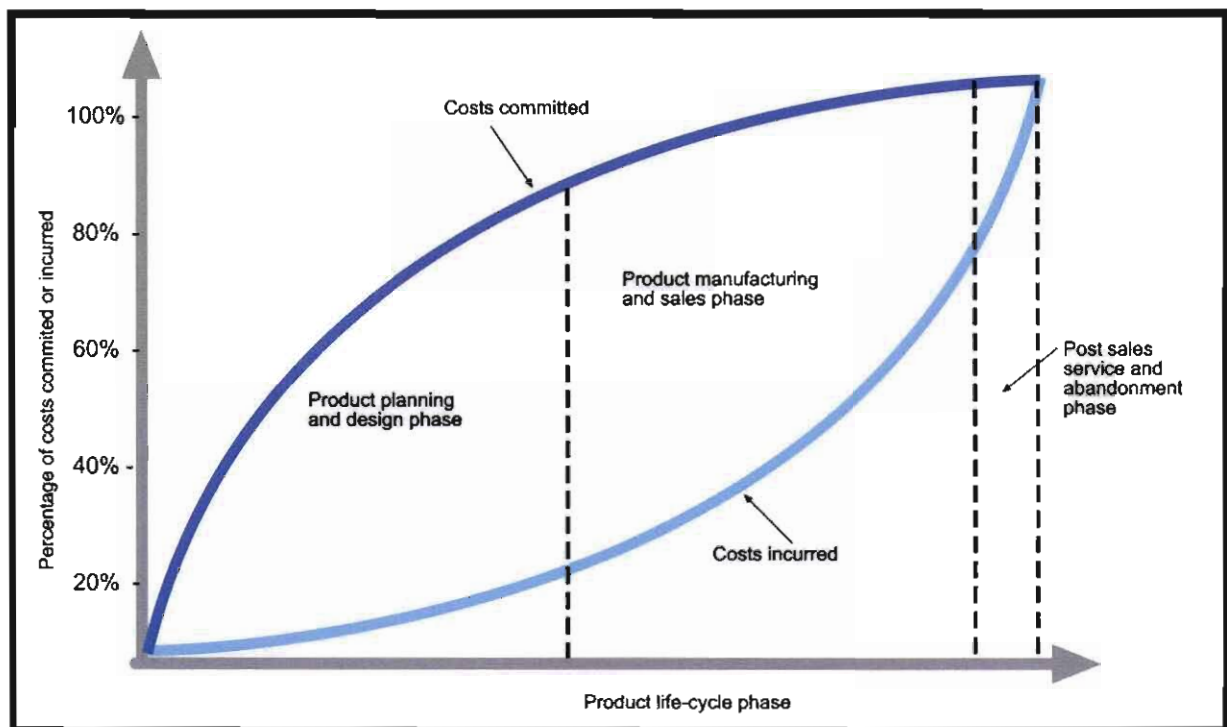
3.2.1 Life-cycle costing (LCC)

Swain *et al.* (2005:579) define life cycle costing (LCC) as the method of measuring all costs involved in creating, producing and utilising a product or service. LCC is not only the costs incurred by the organisation measuring these costs but also the costs incurred by the suppliers and the customers of the product or service.

LCC estimates and accumulates costs involved over a product's entire life cycle. The aim is to assist managers to determine if profits earned during the manufacturing phase will cover the costs incurred during the pre- and post-manufacturing phase. Identifying costs in different stages will give managers insight into understanding and managing the total costs of the product or service and will help managers identify areas in which cost reduction efforts are likely to be most effective (Drury, 2004:944).

Life-cycle costing considers the entire cost of a product or service. Therefore it provides a long-term complete perspective of product costs and product or service profitability. According to Drury (2004:944-945), LCC consists of three phases; the planning and design stage, the manufacturing stage and the service and abandonment stage. Figure 3.1 below will illustrate a typical pattern of cost commitment and cost incurrence in these three stages.

Figure 3.1: Product life-cycle phases: relationship between costs committed and costs incurred



(Source: Drury, 2004:945)

As illustrated in figure 3.1 above, more or less 80% of the costs are committed in the planning and design stage, and the majority of costs are incurred during the manufacturing stage, but it has already been locked up in the planning and design stage. Committed costs are costs that have not been incurred yet, but will be incurred in future. Costs are incurred as soon as a resource is used or sacrificed.

According to Blocher *et al.* (2005:392-394), managers should consider high investments in the planning and design stage, because it will see to the following critical success factors:

- **Reduce time to market** – the speed of product development and the speed of delivery are critical in a competitive environment and therefore the efforts to reduce time to market should receive first priority.
- **Reduce expected service costs** – the expected service costs can be greatly reduced by careful, simple design and the use of modular, interchangeable components.
- **Improved ease of manufacture** – to reduce production costs and time, the design should be easy to manufacture.
- **Process planning and design** – the manufacturing process should be flexible, allowing fast setups and product flow, using responsive manufacturing concepts, computer-integrated manufacturing, computer-assisted design and synchronised engineering.

The following is an example of different costs in the LCC of a warehouse and distribution function in all three phases as illustrated in figure 3.1 above:

- Planning
 - Planning the layout of the warehouse in order to determine the number of square meters needed for Tips shoes.
 - Security
 - Insurance
 - Racks needed to stack shoes
 - The number of employees needed for the process
 - Scanners
 - Number of vehicles needed for distribution
 - Vehicle tracking system
- Manufacturing/day to day operations
 - Receiving
 - Centre floor
 - Dispatch

- After-sales service
 - Customer complaints
 - Returns

LCC leads to target costing. Target costing is a technique that manages costs during the planning and design stage of a product or service. Target costing will be discussed in detail below.

3.2.2 Target costing (TC)

Target costing (TC) is a market-driven or customer-orientated strategy that was developed by Toyota during the 1960s, and is widely used by Japanese organisations (Drury, 2004:945-946 and Chen & Chung, 2002:1).

According to Cooper & Slagmulder (1997:72), TC is a structured process aimed at insuring that a product launched with specified functionality, quality and sales price can be produced at a life-cycle cost that generates a satisfactory level of profitability. TC is linked to the organisation's competitive strategy and provides means for achieving the organisation's goals of satisfying customer demands at an acceptable level of profitability (Hibbets *et al.*, 2003:65-67).

According to Drury (2004:945-946), TC involves the following steps:

- **Step 1:** Determine the target price which customers are willing to pay for the product or service.

The first step requires **market research** to determine a competitive price customers are willing to pay for the product or service, without forfeiting specified functionalities and quality and risking substitute products offered by competitors. Customers are either willing to pay higher prices for higher quality and functionality or they are willing to give up on certain qualities and functionalities. Management should determine this to differentiate their products and services strategically (Drury, 2004:946; Lockamy III & Smith, 2000:213 and Eldenburg & Wolcott, 2005:517).

- **Step 2:** Subtract the target profit margin from the target price to determine the target cost.

The second step is to determine the desired profit margin based on the organisation's strategy and subtract it from the target price to determine the target cost (Cooper & Slagmulder, 2005:46; Lockamy III & Smith, 2000:213; Eldenburg & Wolcott, 2005:517 and Drury, 2004:945-946). Therefore the formula can be set out as follows:

$$\text{Target cost} = \text{Competitive target price} - \text{Required profit margin}$$

- **Step 3:** Estimate the target (allowable) cost of the product or service

The product or service development team is given the responsibility of designing the product or service for no more than the target cost (Drury, 2004:945-946).

- **Step 4:** Compare the actual cost to the target cost.

The actual cost is then compared to the target cost, and the whole process ends either if the firm discovers a way to satisfy customer requirements at the target cost or if the product or service gets abandoned (Drury, 2004:945-946).

3.2.2.1 An example of target costing in the warehouse and distribution function

To provide a simple example of TC, assume the following situation: The warehouse and distribution function needs to deliver an estimate of 500 000 pairs of shoes to Tips shoes in the Gauteng area. The price per delivery of their competitors is R2.80 per pair of shoes delivered. To develop the infrastructure, the warehouse and distribution function will need an investment of R2 200 000.00. SLA requires a 15% return on investment (ROI). Given these data, the target cost to distribute one pair of shoes is R2.14, as shown below.

Projected distribution (500 000 pairs X 2.80)	R 1 400 000.00
Less desired profit (15% X R2 200 000)	R 330 000.00
Target costs	<u>R 1 070 000.00</u>
Target cost per pair	R 2.14

This target cost must be broken down into various functions, and each functional area would be responsible for keeping its actual costs within the target.

3.2.2.2 Value engineering

According to Blocher *et al.* (2005:381), value engineering is used in TC to reduce product cost. Value engineering assists organisations in managing the trade-offs between functionality and cost. The first important step in value engineering is to do a consumer analysis during the design stage. To obtain this information, organisations can make use of surveys and interviews with customers. The consumer analysis identifies customer preferences that define the desired functionality of the product for which the customer is willing to pay.

According to Cooper & Slagmulder (1997:51-52), value engineering is a efficient, interdisciplinary examination of factors that affect the cost of a product so as to develop a way of achieving the specified purpose at the required standard of quality and reliability at the target costs.

Value engineering is an engineering approach applied during the design phase by a multidisciplinary team. The team focuses on applying cost-reduction techniques during the design phase of the product (Ingram *et al.*, 2003:496 and Cooper & Slagmulder, 1997:72).

According to Horngren *et al.* (2006:426-427), managers implementing value engineering will find it useful to distinguish between value-adding cost and non-value-adding costs. **Value-adding costs** are costs that, if eliminated, will reduce the actual usefulness of the product or service to the customer. **Non-value-adding costs** are costs that, if eliminated, would not reduce the actual usefulness of the product or service to the customer. The aim of value engineering is to reduce non-value-adding costs by reducing the quantity of cost drivers of non value-adding activities. Value engineering also focuses on reducing value-adding costs by achieving greater efficiency in value-adding activities.

Drury (2004:947) states that the aim of value engineering is to achieve the assigned target costs by

- (i) reducing the product cost by identifying improved product designs without sacrificing the functionality of the product, and
- (ii) eliminating unnecessary functions that increase the product's cost, but customers are not willing to pay for.

Value engineering requires the use of **functionality analysis**, a process of examining the performance and cost of each major function of the product or service. A price, or value, for each function is determined that reflects the amount the customer is willing to pay. Benchmarking (see paragraph 3.2.8) is often used to determine which features give the organisation a competitive advantage. If the cost of the function exceeds the amount the customer is willing to pay, then the function should be eliminated, modified to reduce costs or enhanced in terms of its supposed value so that its value exceeds costs. Thus, the objective is to determine a desired balance of functionality (performance) and cost.

3.2.3 Kaizen costing

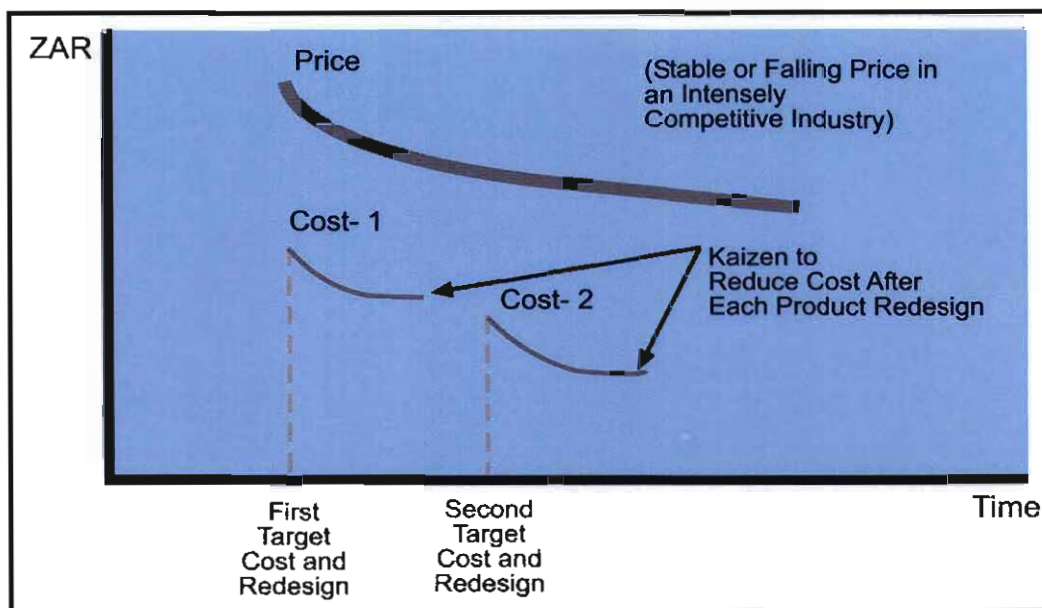
According to Blocher *et al.* (2005:384), "kaizen" can be defined as **continuous improvement**, which is the ongoing process of finding new ways to minimise and manage cost during the manufacturing process, without forfeiting the quality and functionality of the product or service.

Kaizen costing focuses on reducing the costs of a process through constant small incremental improvements, rather than through large innovations in the design and development phase of the product or service (Modarress *et al.*, 2005:1753 and Drury, 2004:950). Kaizen costing relies on employee empowerment. Therefore management should set cost-reduction goals for production processes and give workers the responsibility to find ways to achieve these goals by improving the process and reducing costs (Cooper & Slagmulder, 2005:47).

TC is applied during the design stage of the product life cycle and the objective of cost reduction is primarily achieved through improvements during the design stage of the product. Kaizen costing is applied during the manufacturing stage of the product life cycle and the objective cost reduction is primarily achieved through increasing the efficiency of the production process (Drury, 2004:950 and Cooper & Slagmulder, 1997:56).

Despite the differences between target and kaizen costing as mentioned above, there is a close relationship between target and kaizen costing, as indicated by Blocher *et al.* (2005:384) in figure 3.2 below. Price is assumed to be stable or could decrease over time. TC ensures that a product is profitable at the introduction stage, but innovations by competitors can lead to a product becoming unprofitable in the future. Innovations by competitors pressure organisations to periodically redesign their product by making use of TC to add value to the product and to reduce the product price. The time period between the first and second TC and redesign in figure 3.2 below is approximately the product's sales life cycle. Kaizen costing is used during TC redesign to decrease cost, and to increase efficiency during the manufacturing process. Target and kaizen costing are used together continuously to reduce cost and improve value.

Figure 3.2: The relationship between target and kaizen costing



(Source: Blocher *et al.*, 2005:384)

The warehouse and distribution manager should encourage employees to be innovative and to find ways of improving the process and reducing costs. Kaizen costing relies on employee empowerment, therefore the manager should always be open to suggestions from employees and implement them, if cost effective.

3.2.4 Activity-based management (ABM)

Activity-based management (ABM) can be defined as a system that focuses on the management of activities. Activities consume costs, therefore by managing activities, costs will be managed, which will lead to continuous improvement. ABM is very dependent on the quality of information provided by an activity-based costing system. ABM adds value to activities and thus leads to an increase in the level of satisfaction of customers. ABM is discussed in detail in paragraph 2.6.

3.2.5 Business process reengineering (BPR)

Business process reengineering (BPR) concerns a detailed examination of the current business processes and making radical changes to how the organisation currently operates. It involves fundamental rethinking and radical redesign in order to eliminate unnecessary steps (or activities), to reduce opportunities for error, reduce cost and improve quality, service, lead time, flexibility, innovation and customer satisfaction (Drury, 2004:956-957 and Garrison *et al.*, 2006:16).

A **business process** is a series of related activities that are followed in order to carry out a specific task in the organisation that adds value for a customer (Drury, 2004:956-957; Garrison *et al.*, 2006:16 and Gunasekaran & Kobu, 2002:2523). For example the steps followed in receiving a container at the warehouse constitute a business process.

According to Drury (2004:957), the objective of BPR is to improve the key business processes in an organisation by focusing on simplification, minimising cost, and improving quality and customer satisfaction. In order to do this all activities that do not add value to a product or service must be identified and eliminated (Drury, 2004:957 and Garrison *et al.*, 2006:16). **Non-value-adding activities** are activities that do not add value to a product or service and that customers are unwilling to pay for (see paragraph 2.6.2). The example mentioned before of a third hundred percent audit check (inspection) of inventory that has been previously picked and audited is be a non-value-adding activity in the warehouse.

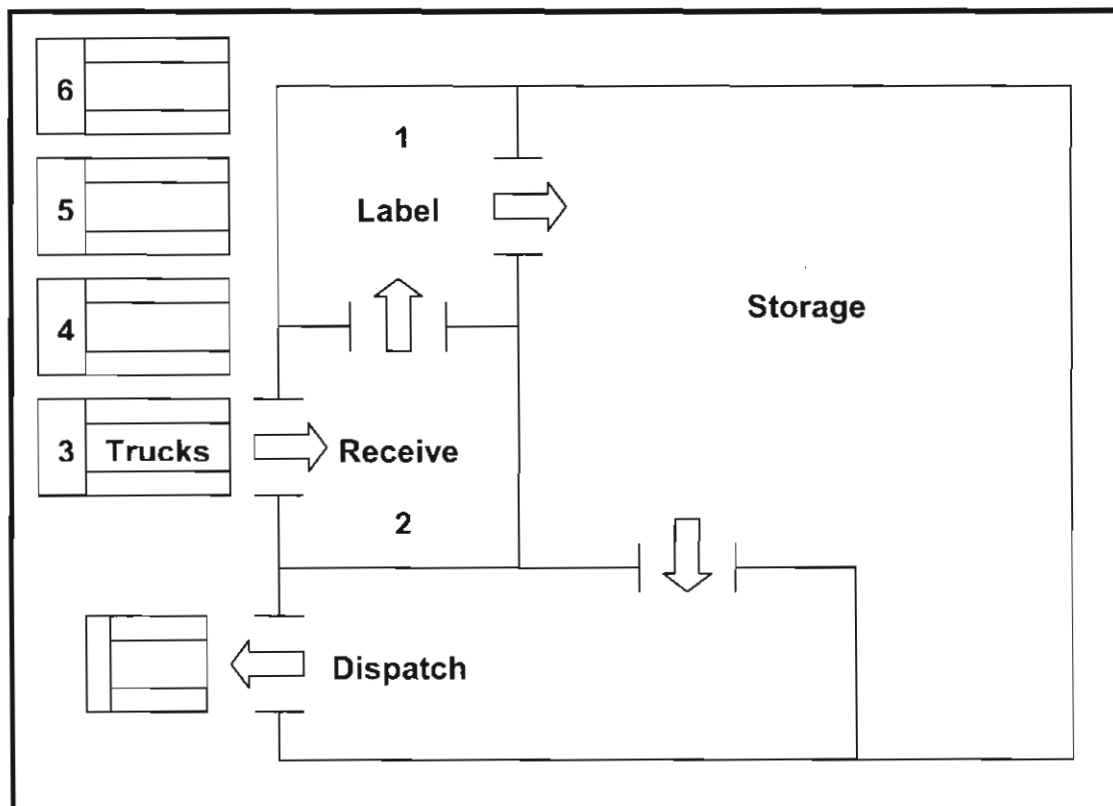
According to Blocher *et al.* (2005:634), BPR and productivity go hand in hand and will help organisations achieve higher levels of profitability and improve competitiveness. BPR are for ambitious companies that are willing to make radical changes to improve productivity and achieve significant performance improvements (Gunasekaran & Kobu, 2002:2524). Therefore BPR focuses on the whole process, identifying non-value-adding activities, and should reduce the inputs needed for the same output or should increase the level of output from the same input (Blocher *et al.*, 2005:634 and Gunasekaran & Kobu, 2002:2524).

3.2.5.1 An example of BPR in the warehouse and distribution function

To provide a simple example of BPR, assume the following situation as per figure 3.3 below. There are six trucks that arrive ten minutes after each other, standing outside the warehouse ready to be offloaded in the receiving department. Tips shoes need the high fashion shoes in container number six to be distributed as soon as possible. Due to a lack of space in the receiving division, only one container at a time can move through the receiving division before it is able to move to the storage division, and this creates a bottleneck.

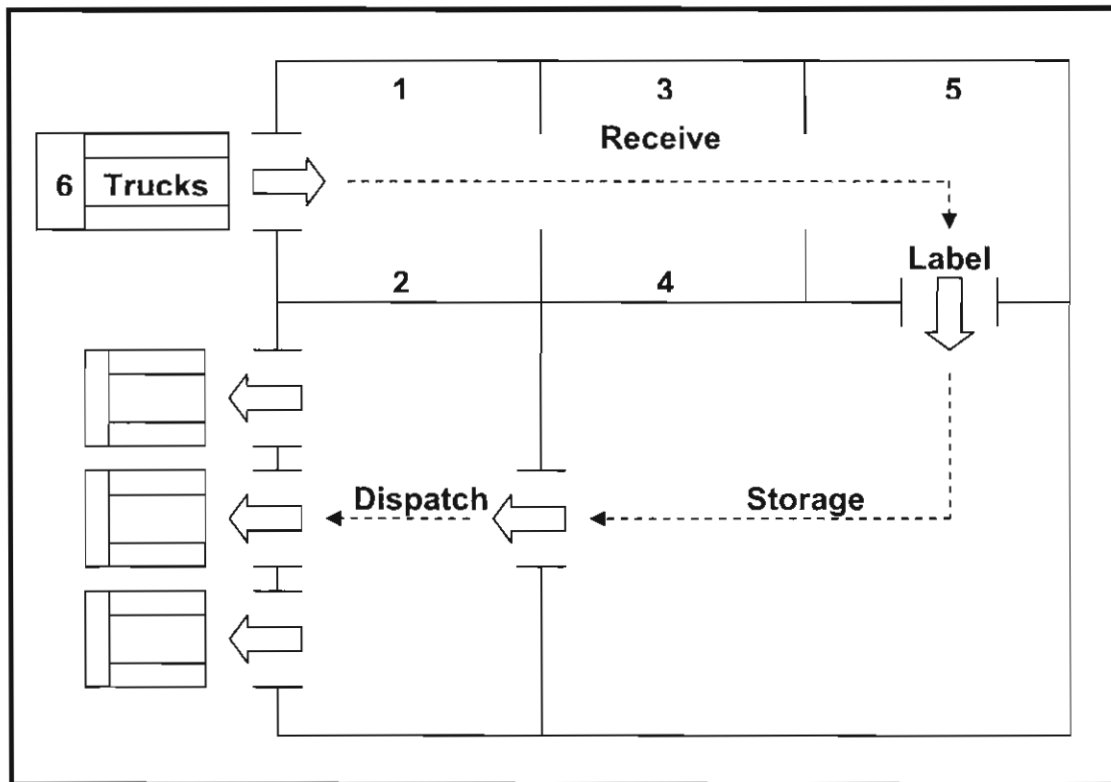
By redesigning the layout of the warehouse as shown in figure 3.4 below, the warehouse manager can ensure that the receiving department can store up to five containers, thus enabling container number six to move straight through the business process in order to obtain on-time delivery.

Figure 3.3: Warehouse layout before BPR



(Source: Own research)

Figure 3.4: Warehouse layout after BPR



(Source: Own research)

According to Garrison *et al.* (2006:16), just-in-time (JIT) involves process reengineering, as does total quality management (TQM). TQM and JIT are discussed later in paragraphs 3.2.6 and 3.2.9 of this chapter.

3.2.6 Cost of quality and Total Quality Management (TQM)

In order for companies to be successful in the global competitive environment, companies should focus on customer satisfaction. According to Drury (2004:957), customers demand improvement in services regarding cost, quality, reliability and on-time delivery. Quality has become one of the key competitive tools and therefore management accountants should focus on it.

Total quality management (TQM) is a management system that seeks continuous quality improvement by ensuring that all business functions in the organisation understand, meet and exceed the needs of customers (Ingram *et al.*, 2003:344).

According to Pheng & Teo (2004:8), higher customer satisfaction, better quality products and services and higher market share are often obtained by implementing TQM. Pheng & Teo (2004:8) are also of the opinion that TQM will improve the competitiveness, effectiveness and flexibility of the entire organisation.

The foundations of TQM are customer focus, continuous improvement and teamwork. All workers in the organisation should work together as a team to improve quality on a continuous basis using a set of tools and techniques. Offering products and services of high quality to satisfy customers should always be a top priority (Ho *et al.*, 2000:180-184).

According to Drury (2004:957-958), quality saves money, therefore it is important to produce items or services correctly the first time rather than wasting resources by making defective products that have to be detected, reworked, scrapped or returned by an dissatisfied customer. TQM emphasises that quality should be designed in and not achieved through inspection and re-work.

Most companies are not aware of how much they invest in quality and therefore a cost of quality report can be used to enable management to measure and manage their cost of quality. According to Swain *et al.* (2005:476), cost of quality can be defined as costs incurred to ensure high quality of products and services, as well as costs spent if any defects occurred. Costs of quality can be classified into four categories. These four categories are prevention costs, appraisal costs, internal costs and external costs, all of which will be discussed below (Drury, 2004:959-961; Blocher *et al.*, 2005:691-694; Swain *et al.*, 2005:477-478; Garrison *et al.*, 2006:59-63 and Eldenburg & Wolcott, 2005:273-274).

1. Prevention costs

Prevention costs are expenditure incurred to ensure that activities are performed correctly the first time and that the product or service meets customer requirements. Prevention is better than cure; it is much less costly to prevent a problem than it is to find and correct the problem after it occurred. Examples of prevention costs include quality training and planning costs, equipment maintenance costs, education of suppliers, information system costs, process or product design costs, information system costs and other quality improvement costs.

2. Appraisal costs

Appraisal costs (also known as inspection costs) are expenditures incurred on inspection, testing, sampling of purchased parts, work in progress, and finished goods or services. These costs are incurred to identify defective products prior to delivery to customers. Examples of appraisal costs include quality inspectors, costs to adjust measuring and testing equipment, quality audits and field tests.

3. Internal failure costs

Internal failure costs are expenditures incurred when a product fails to meet quality standards. These costs are incurred to identify defective products prior to deliveries to customers, are non-value-adding and are never necessary. Examples of internal costs are costs of scrap and rework, repair downtime and work stoppages caused by defects.

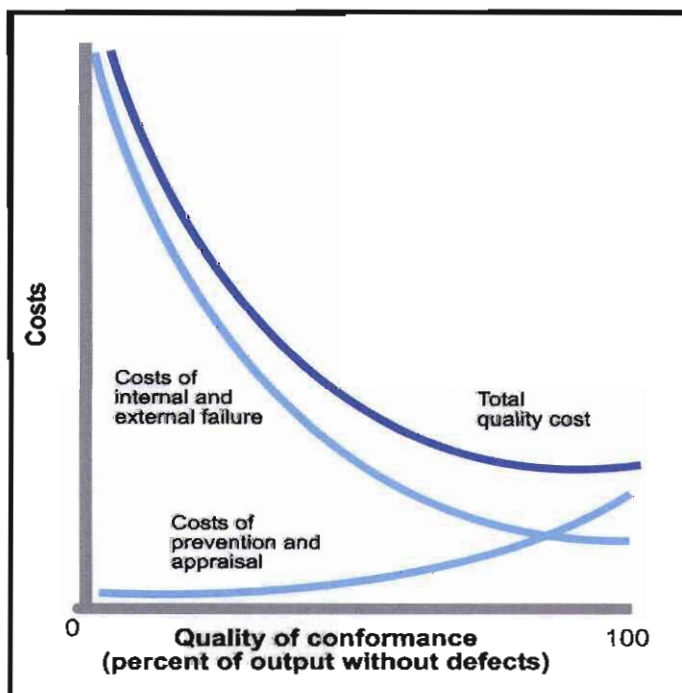
4. External failure costs

External failure costs are expenditures incurred when a defective product or service reaches the customer. External failure costs are usually the highest costs of a poor quality process. Examples of external costs are repair and replacement costs, costs of handling customer complaints, product recall, product liability costs, lost sales due to a reputation of bad quality and costs to restore reputation.

The above-mentioned cost can further be classified either as the price of **compliance**, or the price of **non-compliance**. Prevention and appraisal costs are compliance costs, because they are incurred to eliminate the costs of defects by ensuring products and services meet customer expectations. Internal and external costs are non-compliance costs, because they are incurred due to production imperfections and lead to the rejection of products or services (Drury, 2004:959 and Blocher *et al.*, 2005:694-695).

Prevention of poor quality reduces all other costs of quality, therefore optimal investment in compliance cost is essential (Drury, 2004:959 and Blocher *et al.*, 2005:694-695). Figure 3.5 below shows the total quality costs as a function of compliance costs.

Figure 3.5: The effect of quality costs on quality of compliance



(Source: Garrison *et al.*, 2006:62-63)

Figure 3.5 above shows that if the costs of compliance are low, total quality costs are high, and that most of the quality costs consist of non-compliance costs. If the organisation spends more on compliance costs, the defect rate drops, which leads to lower internal and external failure costs and lower total quality costs. Therefore by spending more on compliance costs, organisations will spend less on non-compliance costs (Garrison *et al.*, 2006:62-63).

In accordance with the above, it is clear that prevention costs are the most important costs in regard to TQM. Examples of prevention costs in the warehouse and distribution function are: inspection costs for damages once the goods have been received, vehicle maintenance costs, and 100% accurate labelling costs (ensure that the label corresponds with the number and colour of the pair of shoes inside the box). It is important for the warehouse manager to implement TQM tools in the receiving division, seeing that any mistakes made in the receiving division will impact on the dispatch department, and eventually on the customer.

The warehouse and distribution function should always focus on delivering a service of consistently high quality in a timely fashion. The right quantity of the correctly picked shoes must be delivered to the right destination at the right time. The warehouse and distribution function should make use of financial and non-financial measurements to determine how well they meet Tips shoes' needs and expectations. Performance measures will be discussed in chapter 4.

3.2.7 Cost management and the value chain

The value chain can be defined as a sequence of business activities in which usefulness is added to the products or service of the organisation to ensure value to the customer and therefore competitive advantage (Horngren *et al.*, 2006:4).

According to Drury (2004:961), the increasing attention to the value chain will lead to managing costs more effectively and an increase in customer satisfaction. The value chain is the linked set of value-creating activities that extends all the way from the production of raw materials through to the end-user of the product or service. These activities should be coordinated to improve customer satisfaction in terms of cost-effectiveness, quality and delivery.

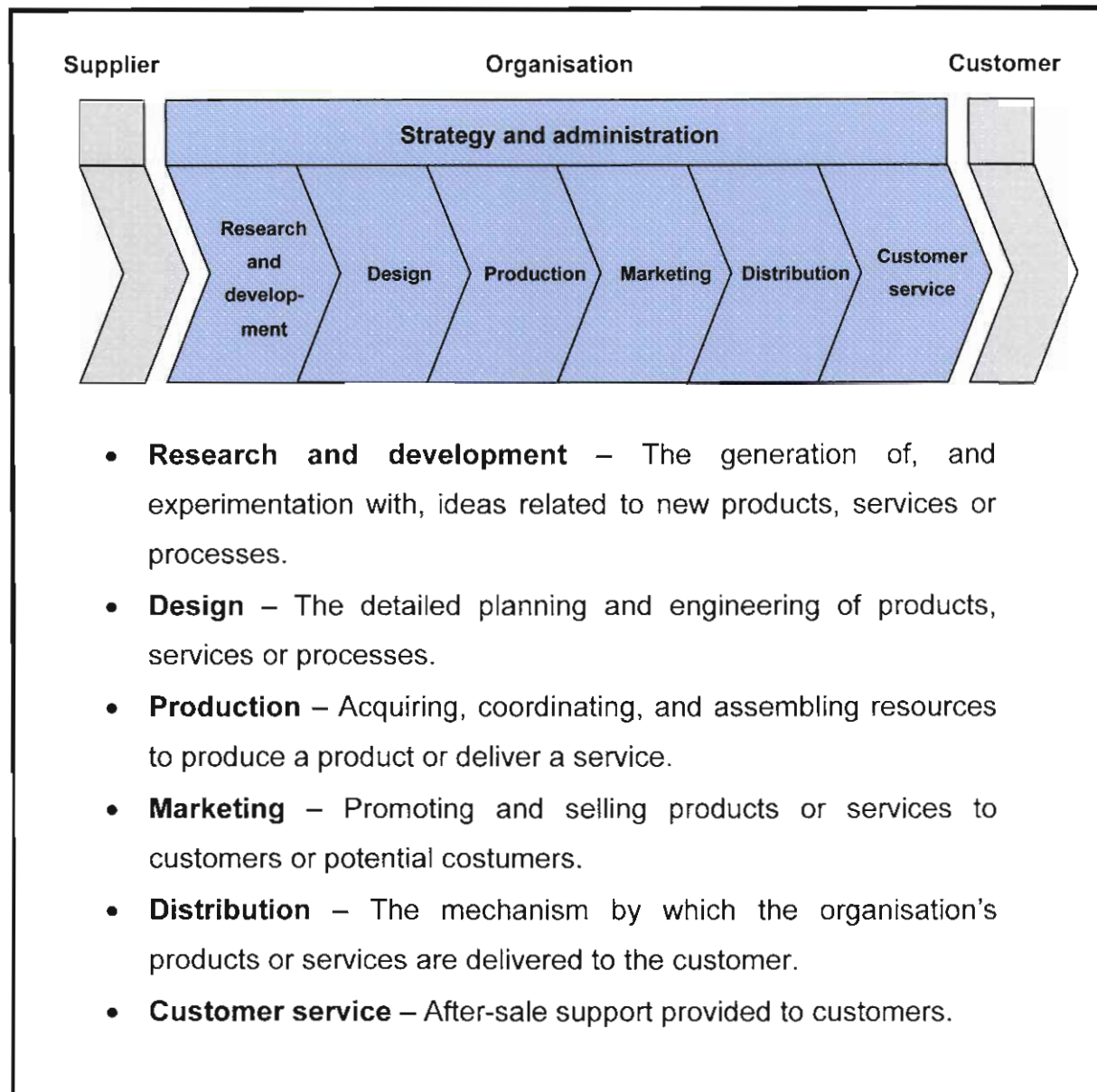
Ingram *et al.* (2003:17) state that the value chain includes internal and external activities. Each organisation occupies a selected part or parts of the entire value chain. Managing the value chain requires the organisation to look beyond its own operations to those of its customers and suppliers. Therefore organisations must develop a close relationship with customers and suppliers in order to reduce costs of excess inventories. In other words, value chains explicitly recognise that no organisation operates in isolation from suppliers and customers.

According to Coyle *et al.* (2003:18), the supply chain is a series of integrated organisations that must share information and coordinate physical execution to ensure a smooth, integrated flow of goods, services, information and cash.

Information flow is an extremely important success factor in the value chain. According to Jiambalvo (2004:13), the key is to take advantage of information flows up and down the value chain by making use of advanced information technology.

Figure 3.6 below illustrates the six business functions within the **value chain**, namely research and development, design, production, marketing, distribution and customer care.

Figure 3.6: The value chain



(Source: Drury, 2004:962 and Horngren *et al.*, 2006:4-5, adapted)

According to Blocher *et al.* (2005:41-42), an organisation should evaluate its value chain relative to the value chains of its competitors in the industry. The authors suggest the following two steps:

- **Step 1: Identify the activities in the value chain.**

Identify the industry's specific value chain which consists of value activities needed in the processes of designing, manufacturing and providing customer services. Assign costs, revenues and assets to value activities and determine the cost drivers of each value activity.

- **Step 2: Develop a competitive advantage.**

By studying the value activities and cost drivers identified in the previous step, the organisation determines the nature of its current and potential competitive advantages. The organisation should consider the following:

- **Identify competitive advantage**

Managers can better understand the organisation's strategic competitive advantage, whether it is cost leadership or differentiation, by analysing the value activities. Managers should determine whether each individual activity in the value chain is consistent with the overall strategy. Managers should determine those activities in which the organisation is most and least competitive.

- **Identify opportunities to add value**

By analysing value activities, activities which can add significant value for the customer can be identified. The warehouse and distribution function should be located close to the airport and close to their largest customers in order to provide faster and cheaper delivery.

- **Identify opportunities to reduce costs**

By analysing value activities the organisation can identify those parts of the value chain where it is not competitive. The warehouse and distribution function can outsource some of the smaller deliveries in order to reduce cost and improve speed and competitiveness.

- **Develop linkages among activities in the value chain**

It is important for managers to understand that activities in the value chain are not independent activities but are interdependent activities in which performance of one activity affects the performance and cost of the next activities in the value chain. The warehouse and distribution function's receiving stage should be a hundred percent correct, otherwise it will lead to faulty orders from the customer.

3.2.8 Benchmarking

According to Grinyer & Goldsmith (1995:2), benchmarking is the ongoing structured and objective process of measuring and improving products, services, practices and processes against the best identified in the world in order to achieve and sustain competitive advantage.

A benchmark is a standard or norm that others want to copy. Benchmarking is much more than comparing an organisation's processes with those of others and copying them. It is a strategic approach followed to ensure the achievement of best practices by implementing proven tools and methodologies (Hugo *et al.*, 2004:108).

According to Holloway *et al.* (1999:53), benchmarking is a process by which organisations study the best practices of other organisations and learn from them to enhance their own performance. It is an ongoing process of monitoring performance, adjusting key internal processes, comparing performance with the current best performances and examining changes. Mutual benefit over a period of time is expected if information about key processes is obtained through a co-operative partnership between organisations.

Swain *et al.* (2005:519-520) state that benchmarking involves the comparison of financial and operating performance against competitors or amongst internal departments. Swain *et al.* (2005:519-520) state that benchmarking usually consists of four steps:

- **Step 1** is to analyse the organisation's current practices, procedures and performance in a given process and to set objectives for improving them. This is a very important step, seeing that the practices of other organisations will not be as revealing if the organisation is not aware of its own strengths and weaknesses.
- **Step 2** involves selecting a benchmark or benchmarks. These benchmarks can be competitive organisations or internal departments. It is important to select the right benchmarks, because selecting the wrong benchmarks can lead to inappropriate procedures and unrealistic goals for the organisation.

- In **Step 3** detailed information on the benchmark's practices and procedures for the specific process identified in step 1 is collected and shared. Difficulty is often experienced in collecting data from competitor companies, but various sources offer benchmark data, and companies are often willing to share information with each other, especially when it leads to a win-win situation.
- **Step 4** involves carefully analysing the data selected in step 3 to determine which of the policies and procedures used by the benchmark organisations can be implemented in the organisation to determine its goals as specified in step 2.

According to Botten & Sims (2005:86), there are four types of benchmarking, namely:

1. Internal benchmarking

Internal benchmarking is a comparison between the different processes, divisions, business units or manufacturing operations within the same organisation. Internal warehousing activities that could be benchmarked are the costs activities, such as handling, material flow efficiency and effectiveness of communication.

2. Functional benchmarking

Functional benchmarking is a comparison between an organisation's internal functions and the best external practitioners of those functions, regardless of the industry. The warehouse and distribution function can compare its service with those of a commercial bank in order to isolate excellent processes that can be adopted to improve overall customer services.

3. Competitive benchmarking

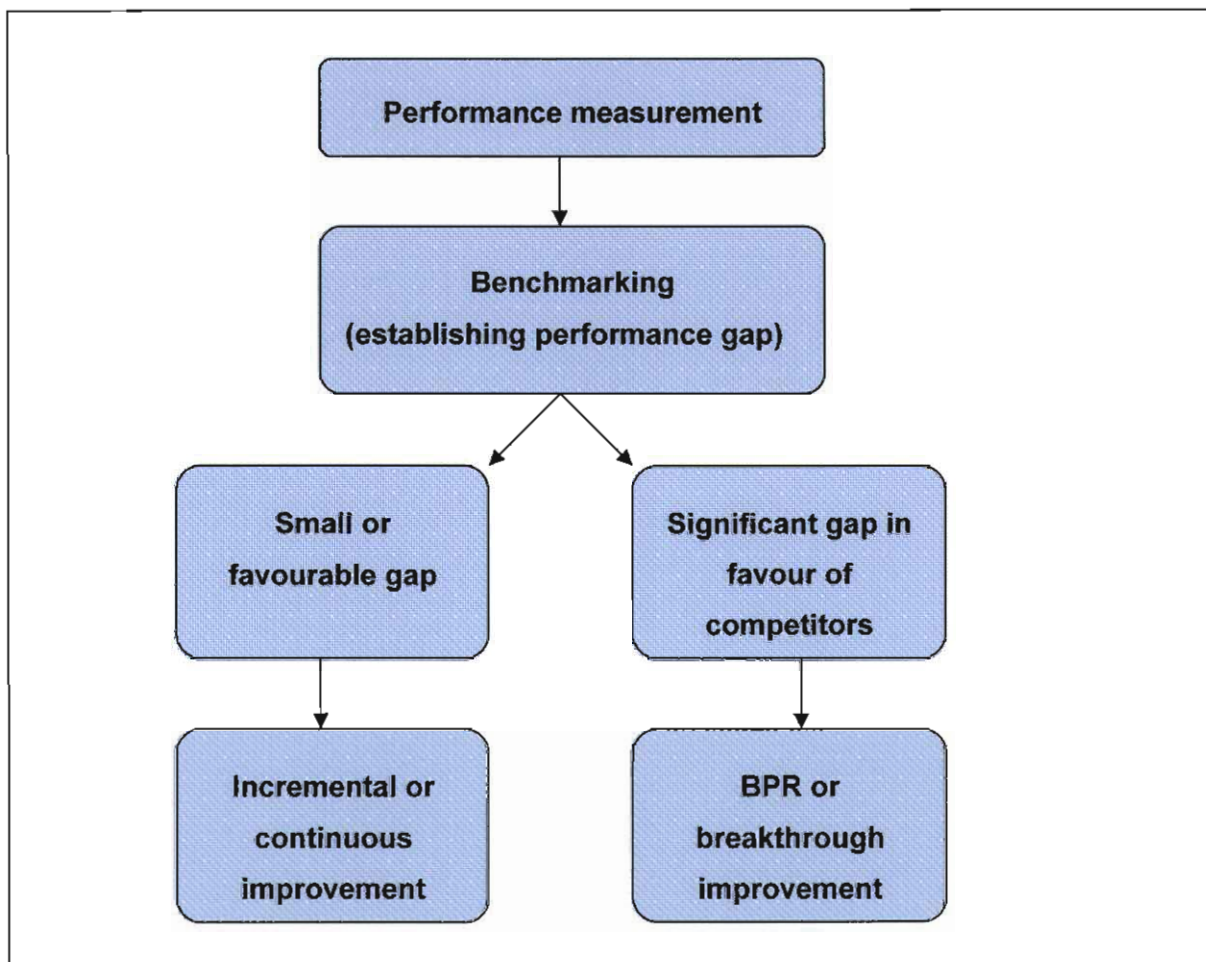
Competitive benchmarking is a comparison between an organisation and its direct competitors within the same industry. The warehouse and distribution function can compare the delivery rates with those of its competitors.

4. Strategic benchmarking

Strategic benchmarking is aimed at strategic action and organisational change.

According to Drury (2004:965), the main objective of benchmarking is to find out how certain activities can be improved and to ensure that the improvements are implemented. Therefore benchmarking will only add value if it is linked to improvement. The integration between benchmarking and improvement are shown in figure 3.7 below.

Figure 3.7: The integration between benchmarking and improvement



(Source: Hugo *et al.*, 2004:108)

Benchmarking of processes or activities reveals differences or performance gaps between the issues compared. The performance gap needs to be identified and evaluated to determine the implication and potential for improvement. Knowing the size of the gap will help the organisation to move from where it is to where it wants to be. If there is a small or favourable gap no radical changes should be made to the process or activity. Continuous improvement usually associated with TQM (as discussed in paragraph 3.2.6) and kaizen costing (as discussed in paragraph 3.2.3) are then used to ensure that the organisation improves in particular areas at a rate consistent with its vision and strategy. If there is a significant gap in favour of the competitor, more drastic measures are required. BPR (as discussed in paragraph 3.2.5) is then used to improve business processes or activities (Hugo *et al.*, 2004:109-110).

Drury (2004:965) states that benchmarking is cost beneficial, because an organisation can save time and money by avoiding mistakes made by the company that has been benchmarked. Benchmarking also assists organisations in avoiding duplicating the efforts of other companies.

Benchmarking can be used by managers in the warehouse and distribution function to monitor and control productivity and quality of their services. Managers can also benefit from using benchmarking as it aims at improving warehouse and distribution performance in terms of competitive and strategic advantage. Benchmarking can be used to achieve more with the same resources, which will lead to a reduction in costs and an improvement in profitability.

3.2.9 Just-in-time system (JIT)

Japanese companies, following the lead of Toyota Motor Company, were the first to use a management accounting system which focused on controlling the cost, quality and timeliness of inventory. This system became known as the just-in-time (JIT) system (Swain *et al.*, 2005:420-421; Garrison *et al.*, 2006:12-13 and Jiambalvo, 2004:56).

According to Swain *et al.* (2005:420), a JIT system can be defined as a system that emphasises removing waste of effort, time and inventory cost from the organisation. This leads to a decrease in or elimination of needless inventory in a production system.

In organisations that use a JIT production and inventory control system, materials are purchased and units are produced only as needed to meet actual customer demand. JIT is also considered a demand-pull system due to the fact that demand triggers each step in the manufacturing process (Horngren *et al.*, 2006:703-704). Close coordination among organisations and suppliers are essential to ensure that goods or materials are delivered just as they are needed for production or sale (Swain *et al.*, 2005:420-421 and Garrison *et al.*, 2006:13).

JIT seeks to achieve the following goals:

- The meeting of customer demand in a timely way
- High-quality products
- Lowest possible costs
- Elimination of non-value-adding activities
- A decrease in or elimination of inventories
- 100% on time delivery service

(Drury, 2004:967; Garrison *et al.*, 2006:13 and Jiambalvo, 2004:56).

According to Eldenburg & Wolcott (2005:514), the successful implementation of a JIT system requires organisations to:

- Find reliable suppliers
- Find a manageable number of suppliers
- Find suppliers with short transit times
- Develop efficient and effective handling processes
- Develop the commitment of management to the JIT system

3.2.9.1 Just-in-time and value-adding activities

The fundamental philosophy of JIT is to eliminate waste. Waste is defined as anything which does not add value to a product or service, such as non-value-adding activities.

Non-value-adding activities as discussed in, paragraph 2.6.2 are activities that are unnecessary and can be reduced or eliminated, for example setup work, material handling, and inspection. Value-adding activities as discussed in, paragraph 2.6.2 are

activities that customers recognise as adding value to the product or service they purchase (Pheng & Tan, 1998:621; Gunasekaran *et al.*, 1999:328; Drury, 2004:967-968 and Swain *et al.*, 2005:420-421).

Cycle time involved in manufacturing a product consists of process time, inspection time, move time, queue time and storage time. Only process time adds value to the product, the rest of the activities add cost to the product and are therefore non-value-adding activities within the JIT system. The JIT system focuses on reducing lead times in order to reduce the total costs. Cycle time measures will be discussed in more detail in paragraph 4.3.2.3(i).

3.2.9.2 Just-in-time purchasing arrangements

According to Horngren *et al.* (2006:698), JIT purchasing is the purchase of materials or goods to ensure that delivery is made just in time for production or sales. JIT purchasing works effectively if all materials or goods arrive at the right time, in the right place and in the right quantity. All materials and goods that arrive should be usable (Gunasekaran *et al.*, 1999:331).

Under a JIT purchasing system (Garrison & Noreen, 2000:12-13):

- *An organisation relies on a few ultra-reliable suppliers.* SLA's management should reduce their transporters from the port of discharge to the warehouse to only two reliable transporters that are rewarded with long-term contracts.
- *Suppliers should make frequent deliveries of small orders just before the goods are needed.* Stocks can be cut to the minimum. Undependable suppliers who do not meet delivery schedules must be weeded out.
- *Suppliers must deliver zero defect goods.* Suppliers must become so reliable that incoming goods should not need to be inspected. This will lead to savings in material handling expenses.

Retail organisations like Tip shoes must maintain some inventories or they would not be able to operate. But the amount of time the product spends on the shelf or in the warehouse can be reduced to a large extent. The JIT approach is in contrast to the warehousing operating system because (Drury, 2004:970 and Gunasekaran *et al.*, 1999:331):

- it reduces investment in raw materials and work in progress (WIP) stocks,
- throughput time and space requirements in the warehouse are reduced,
- process flow in the warehouse becomes continuous, and
- negotiating with fewer suppliers leads to a saving in the queuing time of batches.

3.2.9.3 Just-in-time performance measurement

According to Drury (2004:970), management accounting must support a JIT system. Therefore time-based performance measures are critical for management to evaluate and control a JIT system. Great emphasis must be placed on effective information systems that provide information regarding sales forecast, supplier reliability, set-up times, throughput cycle time, lead time, percentage of customer and suppliers' on-time deliveries, inventory level and defect rates (Swain *et al.*, 2005:422-423 and Drury, 2004:970).

For a JIT system to work effectively in the warehouse and distribution function there should be proper communication, co-operation and trust between the customer and the supplier. Removing non-value-adding activities along the whole supply chain should be the purpose of both the supplier and the customer.

3.3 SUMMARY

Activity-based costing represent the basis for cost management applications. Cost management describes the activities of managers in the short- and long-term in which they, implement programmes to control decisions that minimise costs of products or services, and/or increase the value or quality of the products or services (or at least maintain current value or quality) to ensure customer satisfaction. Cost management forms an important part of management strategies and their implementation. Therefore several approaches have been described throughout this chapter that fall within the cost management area.

Managers commonly use the following cost management tools to implement an organisation's strategy and to facilitate the achievement of success in respect of critical success factors: LCC, (TC), kaizen costing, ABM, BPR, costs of quality and TQM, value chain, benchmarking and JIT.

LCC estimates and accumulates costs involved over a product's entire life cycle. LCC assist managers to determine if profits earned during the manufacturing phase will cover the costs incurred during the pre- and post-manufacturing phase. LCC contributes to target costing (TC). TC is a technique that manages costs during the planning and design stage of a product or service. It is a structured process aimed at insuring that a product launched with specified functionality, quality and sales price can be produced at a life-cycle cost that generates a satisfactory level of profitability. Value engineering is used in TC to reduce product cost. Value engineering assists organisations in managing the trade-offs between functionality and cost.

TC is applied during the design stage of the product life cycle whereas, kaizen (continuous improvement) costing is the ongoing process of finding new ways to minimise and manage cost during the manufacturing process of the product life cycle. There is a close relationship between target and kaizen costing and they must be used together continuously to reduce cost and improve value.

BPR concerns a detailed examination of the current business processes and making radical changes to how the organisation currently operates. It involves fundamental rethinking and radical redesign in order to identify and eliminate non-value added activities, to reduce opportunities for error, reduce cost and improve quality, service, lead time, flexibility, innovation and customer satisfaction.

Total quality management (TQM) is a management system that seeks continuous quality improvement by ensuring that all business functions in the organisation understand, meet and exceed the needs of customers.

The value chain is a sequence of business activities in which usefulness is added to the products or service of the organisation. The value chain ensure value to the customer and therefore competitive advantage. In order to achieve and sustain competitive advantage benchmarking can be used, benchmarking is the ongoing structured and objective process of measuring and improving products, services, practices and processes against the best identified in the.

A JIT system is a system that emphasises removing waste of effort, time and inventory cost from the organisation. This leads to a decrease in or elimination of needless inventory in a production system. Which minimise costs and increase profitability.

SLA's management should consider making use of the relevant cost management tools described throughout chapter 3 in order to manage and reduce costs where possible so as to improve the current lack of profitability in the warehouse and distribution function.

CHAPTER 4

PERFORMANCE MEASUREMENT AND PERFORMANCE MANAGEMENT

4.1 INTRODUCTION

According to Swain *et al.* (2005:572), the increase in competitiveness in the market requires that organisations continually improve their information systems in order to support their strategy and assist management to operate its organisation more effectively and efficiently. Management needs more than only the traditional financial measures in order to measure their performance. Non-financial measures of quality and time, customer service, internal business processes, and learning and growth are becoming more important in the current competitive market.

Performance measurement is an effective way of increasing the competitiveness and profitability of an organisation through encouragement of productivity improvements. According to Tangen (2003:347), appropriate financial and non-financial performance measures can ensure that managers adopt a long-term perspective and allocate the organisation's resources to the most effective improvement activities.

The balanced scorecard (BSC) introduced by Kaplan and Norton in 1992 is a performance management system that focuses on conveying financial and non-financial information and assist managers in translating the organisation's vision, core competencies and strategies.

In this chapter, performance measures are firstly discussed, focusing on financial and non-financial measures. Secondly, the BSC is discussed as a performance management system that conveys financial and non-financial performance measures and focuses on the strategy of the organisation.

4.2 PERFORMANCE MEASUREMENT

Without performance measurement, there cannot be performance management. Performance measurement is the act of measuring performance, whereas performance management aims to respond to the measured outcome, using it to manage performance (Radnor & McGuire, 2003:246).

Neely *et al.* (1995:81) define performance measurement as the process of quantifying action, where measurement is the process of quantification and action correlates with performance. Performance is the efficiency and effectiveness of action, which leads to the following definitions:

- Performance measurement is defined as the **process** of quantifying the efficiency and effectiveness of action.
- A performance measurement is defined as a **metric** used to quantify the efficiency and/or effectiveness of an action.
- A performance measurement system (PMS) is defined as the **set of metrics** used to quantify the efficiency and effectiveness of action.

According to Verweire & Van Den Berghe (2004:6), performance measures should provide information from data that have been collected, analysed and reported. Such information should be used to make sound business decisions. Therefore performance measures should be clear, comprehensible, understandable, result-orientated, useful, valid, verifiable and accurate.

There are two types of performance measures; firstly, financial performance measures and secondly, non-financial measures. These are discussed below.

4.2.1 *Financial measures*

Traditionally managers relied on financial measures that provide information measured in rands or ratios of rands (Eidenburg & Wolcott, 2005:634). Some of the frequently used financial measures are discussed next.

4.2.1.1 Return on investment (ROI)

Return on investment (ROI) is a financial measure that measures the return (how much has been earned) on assets (investments) of an organisation (Swain *et al.*, 2005:355). The higher the ROI of an organisation or department in an organisation, the greater the profit earned per rand invested in the organisation or department in an organisation (Garrison *et al.*, 2006:556).

ROI is calculated as net operating income divided by average operating assets (Garrison *et al.*, 2006:556). Therefore the formula can be set out as follows:

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Average operating assets}}$$

Or according to the Du Pont Perspective ROI should look at both margin and turnover in assessing performance management. The above calculation can be modified by introducing sales, as follows (Garrison *et al.*, 2006:556-557):

$$\begin{aligned} \text{ROI} &= \text{Margin} \times \text{Turnover} \\ &= \frac{\text{Net operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average operating assets}} \end{aligned}$$

Net operating income is calculated as earnings before interest and taxes and is sometimes referred to as EBIT (earnings before interest and taxes). Net operating assets are all assets used in the production of goods and/or services. Examples of net operating assets that would be included are cash, accounts receivable, inventory, and plant and equipment. Examples of non-operating assets that would not be included in the above calculation are investment in other companies or property, or a building rented to another company. The average of the operating assets between the beginning and the end of the year is generally used because of two reasons. First, the measure is intended to capture operations over a period of time. Secondly, it is used to

prevent manipulation by decreasing the investment at the time performance is measured (Eldenburger & Wolcott, 2005:597 and Garrison *et al.*, 2006:556).

a) Advantages of ROI

ROI can be used for inter-departmental comparisons within a company as well as comparisons of the company with others in the industry (benchmarking) (Eldenburger & Wolcott, 2005:597 and Drury, 2004:845). ROI prevents managers from over-investing in projects. Another advantage of ROI is that its components (sales, costs, investments) represent profitability as a single percentage (Horngren *et al.*, 2006:793-794) and motivates managers to increase sales, decrease costs and minimise asset investment (Eldenburger & Wolcott, 2005:597).

b) Disadvantages of ROI

However, the problem with ROI emerges when departmental managers are discouraged to invest in projects that reduce the departmental ROI, even though it improves the ROI for the overall organisation (Drury, 2004:845 and Eldenburger & Wolcott, 2005:599). Another disadvantage is that ROI does not include measures of risk. Managers can increase ROI by investing in riskier projects, which will have higher returns in the short term, but will add risk to the company in the long term (Eldenburger & Wolcott, 2005:600).

Although ROI is widely used to evaluate investment centres, because of its disadvantages, some organisations use a closely related measure called residual income, which is discussed next.

4.2.1.2 Residual income (RI)

Residual income (RI) is a financial measure that measures the rand amount of profits in excess of a required **rate of return** (Eldenburger & Wolcott, 2005:600). According to Garrison *et al.* (2006:561) and Swain *et al.* (2005:357), RI is the amount of net operating income that an investment centre is able to earn above the required rate of return on the average operating assets.

RI can be calculated as follows (Eldenbug & Wolcott, 2005:601; Garrison *et al.*, 2006:561 and Swain *et al.*, 2005:357):

$$\text{RI} = \text{Net operating income} - (\text{Required rate of return} \times \text{Average operating assets})$$

a) *Advantages of RI*

The RI approach encourages managers to invest in any project with returns equal or greater than the required rate of return. This means making investments that benefit the entire organisation (Garrison *et al.*, 2006:563; Swain *et al.*, 2005:357-358 and Eldenbug & Wolcott, 2005:601). An additional advantage is that when differences in risk occur, the organisation can adjust the required rate of return. Therefore departments with a higher risk can be evaluated at a higher required rate of return (Blocher *et al.*, 2005:778). Another advantage of RI is that it is possible to calculate a different investment charge for different types of assets. Therefore a higher required rate of return could be used for long-term assets (Blocher *et al.*, 2005:778).

b) *Disadvantages of RI*

According to Drury (2004:847), the problem with RI, however, is that it is not a percentage, thus managers find it difficult to compare the performance of departments with that of other departments or organisations, if they are different sizes.

4.2.1.3 Economic value added (EVA)

Economic value added (EVA) is an organisation's returns after taxes and after deducting the cost of capital (Blocher *et al.*, 2005:779). RI has been refined and renamed as EVA. EVA incorporates a number of adjustments to reduce the disadvantages of RI. EVA uses the organisation's cost of capital instead of a required rate of return (Blocher *et al.*, 2005:779). According to Drury (2004:848), the EVA concept extends the RI measure by incorporating adjustments to the divisional financial performance measure for distortion introduced by generally accepted accounting

practice (GAAP). These adjustments encourage managers to invest in research and development projects that have long-term value for the organisation.

EVA can be calculated as follows (Horngren *et al.*, 2006:796 and Eldenburg & Wolcott, 2005:601):

$$\text{EVA} = \text{Adjustment after tax operating income} - \left\{ \text{Weighted average cost of capital} \times \left(\text{Adjusted total assets} - \text{Current liabilities} \right) \right\}$$

a) *Advantage of EVA*

The weighted average cost of capital (WACC) equals after-tax average cost of all long-term financing for the organisation or department. With EVA the organisation or department can make use of its actual cost of capital, taking into consideration the industry and risk characteristics (Eldenburg & Wolcott, 2005:602). Another advantage of EVA is that it focuses managers' attention on creating value for shareholders by earning profits higher than the organisation's cost of capital (Blocher *et al.*, 2005:780).

b) *Disadvantages of EVA*

The problem with EVA, however, is that the appropriateness of the specific cost of capital, the level of risk and the adjustments are a matter of judgement. EVA is a complex measurement and consulting firms are often used to determine the appropriate adjustments which can be an expensive and time-consuming exercise (Eldenburg & Wolcott, 2005:603).

4.2.1.4 Profit-based financial performance measurements

a) *Contribution margin*

Contribution margin = Sales revenue – variable cost

Contribution margin is the amount of revenue that remains to cover fixed costs or fixed overheads and provide a profit for an organisation (Horngren *et al.*, 2006:62; Drury, 2004:271-272 and Swain *et al.*, 2005:58).

b) *Controllable profit*

Controllable profit = Sales revenue – (Divisional variable costs + divisionally separable controllable fixed costs)

Controllable profit is the most appropriate measure used to measure the performance of a department, since it measures the skill of managers to use the resources under their control effectively (Botten & Sims, 2005:397).

c) *Net income*

Net income = Operating income – Income taxes

Net income is operating income plus non-operating revenues, such as interest revenue, minus non-operating costs, such as interest cost, minus income taxes (Horngren *et al.*, 2003:63).

d) *Operating income* (Horngren *et al.*, 2006:40).

Operating income = Total revenues from operations – Cost of goods sold and operating costs excluding income taxes

e) *Net profit*

Net profit = Revenues – expenses (Firer *et al.*, 2004:27)

f) *Return on sales (ROS)*

$$\text{ROS} = \text{Operating income/revenues}$$

ROS is one component of ROI in the DuPont method of profitability analysis and it is also referred to as the income-to-revenue (or sales) ratio (Horngren *et al.*, 2006:797).

g) *Revenues*

$$\text{Revenues} = \text{inflows of assets}$$

Inflows of assets are usually cash or accounts receivable, received from customers for products and/or services provided (Horngren *et al.*, 2006:38-39).

h) *Sales margin*

$$\text{Sales margin} = \text{Sales} - \text{Variable cost}$$

This measurement determines the return on a specific product or service. It shows the effect of different selling prices and different priced input on a product or service. This measurement will assist management to make the best decisions regarding the making or selling of a given product or service (Botten & Sims, 2005:397).

i) *Shareholder value*

$$\text{Shareholder value} = \text{Corporate value} - \text{Debt}$$

Where: Corporate value = present value of cash flows from its activities over the forecast period + any residual cash flows following the end of that period, such as from disposal of assets (Botten & Sims, 2005:398).

The goal of an organisation must be to increase the wealth of the shareholders. According to Rappaport (as quoted by Botten & Sims, 2005:398) shareholder value is the net present value (NPV) of all the projects in which the organisation has invested, less any debt liabilities. Therefore to increase shareholders value, managers must use the assets at their disposal in activities that yield a positive NPV.

4.2.2 Non-financial measures

Non-financial measures provide performance information that cannot be measured in rands or percentage of rands. Defect rates, customer satisfaction, throughput time, and employee retention are some non-financial measures. Non-financial measures have been more frequently used in recent years to reflect performance that promotes long-term financial success (Eldenburg & Wolcott, 2005:635).

Botten & Sims (2005:424-425) and Drury (2004:1017) quote the measurements (which was developed by Fitzgerald *et al.*) of organisational performance across six dimensions. The five non-financial dimensions (competitiveness, quality of service, flexibility, resource utilisation and innovation) are shown in table 4.1 below (financial dimensions are discussed in paragraph 4.2.1).

Table 4.1: Six-dimensional performance matrix: non-financial measures of performance

<i>Dimensions of performance</i>	<i>Types of measures</i>	<i>Measures</i>
(1) Competitiveness	Relative market share and position Sales growth Measures of the customer base	Repeat business Number of customers

Table 4.1: Six-dimensional performance matrix: non-financial measures of performance (continued)

<i>Dimensions of performance</i>	<i>Types of measures</i>	<i>Measures</i>
(2) Quality of service	Reliability	Product reliability Punctuality Dependability of service and staff Delivery speed
	Responsiveness	Response times Number of phone lines Average time of phone call Appearance of staff
	Aesthetics/appearance	Appearance or taste of foods Look of buildings Of staff
	Cleanliness/tidiness	Of premises Of goods Congestion
	Comfort	Seating comfort Atmosphere Ambience Helpfulness of staff
	Friendliness	Attentiveness Intelligibility of information
	Communication	Clarity of signposting Clarity of staff-customer interaction Politeness
	Courtesy	Respect Propriety of staff towards customers Staff skill Expertise

Table 4.1: Six-dimensional performance matrix: non-financial measures of performance (continued)

<i>Dimensions of performance</i>	<i>Types of measures</i>	<i>Measures</i>
	Competence	Knowledge Thoroughness Walking distance Ease of finding way about
	Access	Product availability Range of products
	Availability	Equipment availability Physical security Product safety
	Security	Personal safety
(3) Flexibility	Volume flexibility	Number of orders/customers lost due to failure to meet demand Percentage of service availability Mix of staff availability Amount of slack in schedule for rush jobs
	Delivery speed flexibility	Customer waiting time Frequency of service Orders lost due to late delivery Customer/enquiry/job throughput time
	Specification flexibility	Number of different products or services delivered Skills mix of staff Level of investment in staff training and recruitment Customer order lost due to failure to accommodate specification Customer satisfaction with range and flexibility

Table 4.1: Six-dimensional performance matrix: non-financial measures of performance (continued)

<i>Dimensions of performance</i>	<i>Types of measures</i>	<i>Measures</i>
(4) Resource utilisation	Productivity Efficiency	Labour hours Percentage of slack or transit time Skill level of work performed by grade of staff Percentage of area used to serve customers Occupancy loading Input/Output ratios Cost per unit
(5) Innovation	Performance of the innovation process Performance of individual innovations	Average development cost per service Development cost of individual service Percentage of turnover spent developing new services/products/processes How many new services developed per annum Five new services that are successful Concept to service launch time Prototype to launch time Time to adopt new concept from outside the firm

In Botten & Sims (2005:424-425) and Drury (2004:1017), developed by Fitzgerald *et al.*

According to Tangen (2003:353), the choice of suitable measurement techniques, whether financial or non-financial, depends on a number of factors:

- the purpose of the measurement
- the level of detail required
- the time available for the measurement
- the existence of available predetermined data
- the cost of the measurement.

All financial and non-financial measurements have advantages and disadvantages, some are more complex than others and some are more appropriate to particular circumstances. Management should use the measures that offer data that are useful to monitor performance and take appropriate action.

4.3 PERFORMANCE MANAGEMENT

According to Folan & Browne (2005:674), performance management makes use of performance measurement data in order to effect positive change in organisational culture, systems and processes, by helping set performance goals, allocating and prioritising resources, informing managers either to confirm or to change current policy or programme directions to meet these goals, and sharing the results of performance in pursuing those goals.

Performance management is a process that helps managers of an organisation to develop, implement and change its strategy and objectives in order to satisfy its stakeholders' needs (Verweire & Van den Berghe, 2004:7).

According to Armstrong & Baron (2003:51), the basic objectives of performance management is to ensure that everyone understands where the organisation stands and what is to be achieved, to develop the capacity of people and the organisation to achieve it, and to provide support and guidance to individuals and teams to ensure continuous improvement. Thus the primary objective is to achieve organisational effectiveness, in order to ensure better results so as to meet shareholders' needs.

Communication between management and employees plays an important role in performance management. Organisational objectives should be well communicated to employees to ensure that they work as effectively and efficiently as possible and to ensure that they take responsibility for achieving their own goals in order to improve and meet the organisation's mission, vision and objectives (Verweire & Van den Berghe, 2004:7 and Armstrong & Baron, 2003:51).

The growth from performance measurement to performance management is perfectly illustrated by the development of the BSC, which will be discussed below.

4.3.1 Defining the Balanced Scorecard

The balanced scorecard (BSC) was developed by Robert Kaplan and consultant David Norton in the early 1990s. The need to link financial and non-financial measures of performance and the identification of key performance measures led to the appearance of the BSC. The BSC consists of a set of measures that gives top management a quick but comprehensive view of the organisational unit (i.e. a division/strategic business unit) (Drury, 2004:1001).

According to Horngren *et al.* (2006:457), the BSC balances the use of financial and non-financial performance measures to evaluate short-term and long-term performances in a single report. Horngren *et al.* (2006:457) define the BSC as a model that translates the organisation's mission and strategy into a set of performance measures that provides the framework for implementing the strategy.

The BSC is a performance management system that can be used in any organisation to support vision and mission with customer requirements and day-to-day work, manage and evaluate business strategy, monitor improvements in operational efficiency, build organisational capacity, and communicate progress to employees (Rohm, 2005:1).

Chan (2004:205) defines the BSC as a customer-based planning and process improvement system. The primary focus is to drive an organisation to change process by identifying and evaluating relevant performance measures. It is an essential part of the mission identification, strategy formulation and process implementation, with the

emphasis on translating strategy into a related set of financial and non-financial measures.

This **strategy** is a matter of choosing the market and customers segments the business unit intends to serve, identifying the critical internal and business processes that the unit must accept so as to deliver the value propositions to customers in the targeted market segments, and selecting the individual and organisational capabilities required by the internal, customer and financial objectives (Hansen & Mowen, 2003:594).

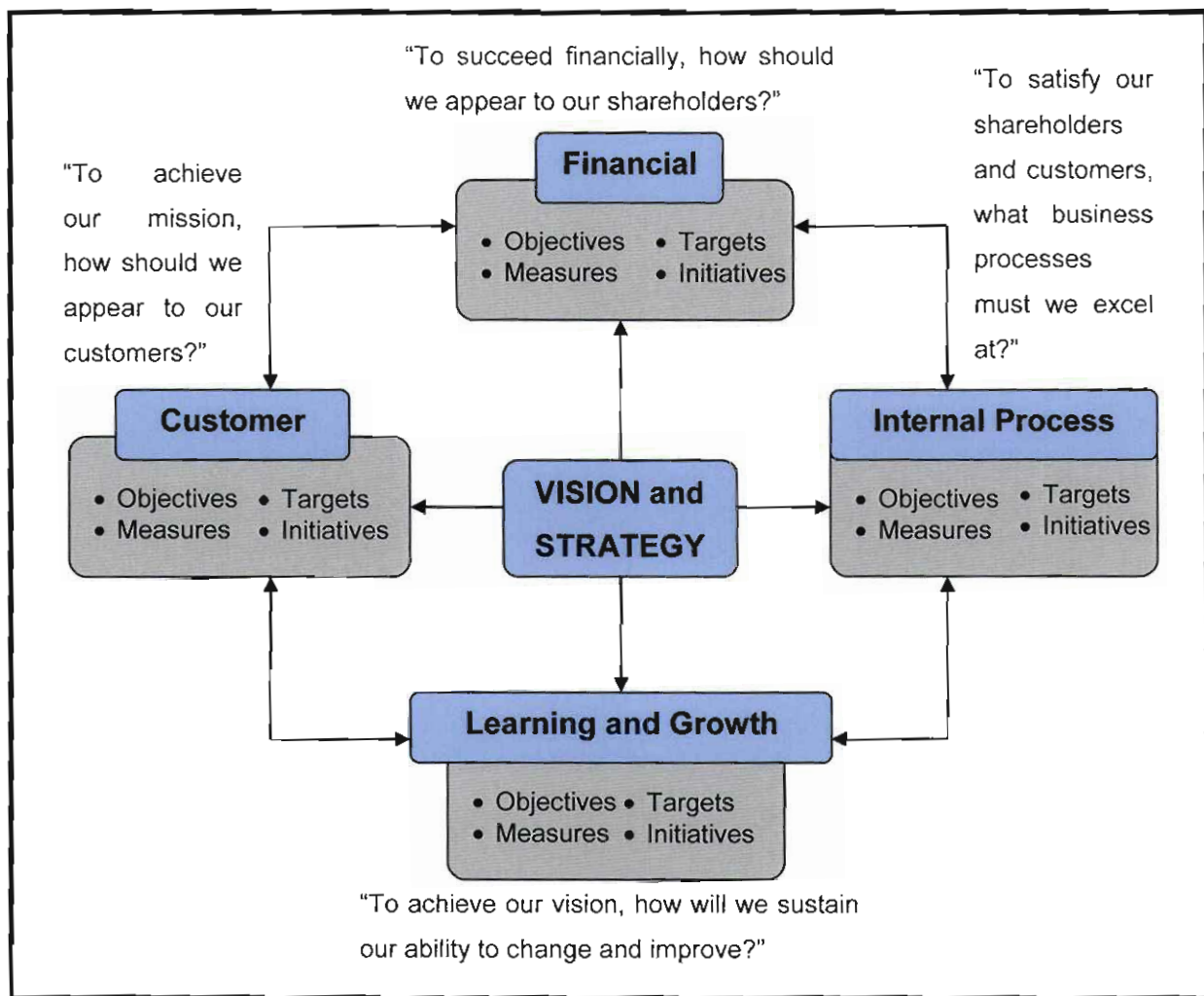
The BSC as illustrated in figure 4.1 below allows managers to look at the organisation from four different perspectives by seeking to provide answers to the following four basic questions (Drury, 2004:1001; Brewer & Speh, 2000:83-84 and Hendricks *et al.*, 2004:2):

1. To succeed financially, how should we appear to our shareholders?
(**Financial perspective**)
2. To achieve our vision, how should we appear to our customers?
(**Customer perspective**)
3. To satisfy our shareholders and customers, what business processes must we excel at? (**Internal business perspective**)
4. To achieve our vision, how will we sustain our ability to change and improve?
(**Learning and growth**)

According to Swain *et al.* (2005:575), the answers to the above questions verify the management **objectives** for the organisation, the **measures** that support those objectives, the short-term and long-term **targets** for those measures, and what **initiatives** need to be put into place to begin working toward the targets.

The four perspectives will be discussed in more detail in paragraph 4.3.2.

Figure 4.1: The balanced scorecard



(Source: Kaplan & Norton, 1996:9)

4.3.2 The four perspectives of the BSC

The BSC focuses on four perspectives of performance: financial, customer, internal business process, and learning and growth perspective. These four perspectives are discussed in greater detail below.

4.3.2.1 Financial perspective

According to Garrison *et al.* (2006:450), most organisations exist to provide financial reward (level of ROI) to the owners of the organisation. However, financial measures are not sufficient in themselves and by improving the non-financial measures in a well

designed BSC, improved financial measures should follow (Garrison *et al.*, 2006:450 and Drury, 2004:1006). According to Garrison *et al.* (2006:450), financial measures report on the results of past actions, whereas non-financial measures of key success drivers such as customer satisfaction are leading indicators of future financial performance.

According to Eldenburg & Wolcott (2005:638), the financial perspective assists management in determining an organisation's progress towards the desired financial goal and encourages managers to evaluate the effectiveness of their vision and strategy. Therefore, this perspective evaluates the profitability of the strategy. Financial measures are usually related to profitability, growth and owner's value. Common measures include ROI, RI, EVA (as per paragraph 4.2.1).

Because the financial performance measures have already been described in paragraph 4.2.1 we shall concentrate on the remaining three scorecard perspectives.

4.3.2.2 Customer perspective

The customer perspective is concerned with identifying the customer and market segment in which the organisation will compete, and with developing strategies to get them and keep them. Market share is the proportion of sales in a particular market that an organisation obtains. Market share can be measured in terms of sales revenues, unit sales volume or number of customers. The market share can be increased in two ways: retaining current customers or acquiring new customers (Drury, 2004:1006-1007 and Swain *et al.*, 2005:579).

According to Swain *et al.* (2005:577-580), there are two types of customer performance measures: leading measures and outcome measures. **Leading measures** focus on fulfilling customer expectations regarding cost, quality and time factors, thus **customer value**. Increasing customer value builds customer loyalty and increases customer satisfaction which brings us to outcome measures. **Outcome measures** determine if the improvements in leading measures result in more satisfied and loyal customers, thus the **customer perspective**.

According to Hansen & Mowen (2003:596), **customer value** is the difference between realisation and sacrifice, where realisation is what the customer receives (for example: product quality, reliability of delivery, delivery response time, image and reputation) and sacrifice is what is given up (for example: the price of the product or service and time required to learn to use the product or service). Thus, customers value the right combination of **cost, quality and time** (Hansen & Mowen, 2003:596 and Swain *et al.*, 2005:577).

The **customer perspective** is measured by customer satisfaction and loyalty. **Customer satisfaction** can be measured by making use of questionnaire surveys and customer response cards (Drury, 2004:1007 and Eldenburg & Wolcott, 2005:638). The number and nature of customer complaints and feedback from sales representatives will also be an indicator of customer satisfaction. The drawback of customer satisfaction measures is that they measure attitudes and not actual buying behaviour. **Customer loyalty** can be measured by the number of new customers referred by existing customers, since only a highly satisfied customer will recommend organisations' products or services to others (Drury, 2004:1007).

An organisation does not only want satisfied customers, it also wants **profitable customers**. This measure is the only financial measure in the customer perspective; this measure, however is critical to emphasise the importance of the right kind (the profitable kind) of customer. Activity-based costing as discussed in chapter 2 is a key tool in assessing customer profitability, seeing that it will assist management in identifying unprofitable segments of customers. For unprofitable existing customers, actions such as consuming less resources, or increasing prices should be taken. If neither of these strategies is successful, the customer should not be retained (Drury, 2004:1008 and Hansen & Mowen, 2003:596).

4.3.2.3 Internal business perspective

The internal business perspective helps managers identify the critical internal processes in which the organisation must excel in implementing its strategy. One goal of this analysis is to improve processes that will have the greatest impact on customer satisfaction. Another goal is to improve the efficiency of operations, which contributes

directly to achieving the organisation's financial objectives (Drury, 2004:1009 and Eldenburg & Wolcott, 2005:597).

According to Horngren *et al.* (2006:459), the internal business perspective comprises three sub-processes. They are

- innovation processes,
- operation processes, and
- post-sales service processes.

a) Innovation processes

The innovation processes are concerned with processes to identify customer needs and to create products, services and processes that will meet those needs (Eldenburg & Wolcott, 2005:639; Horngren *et al.*, 2006:459; Swain *et al.*, 2005:580 and Drury, 2004:1009). Organisations identify new markets, new customers and the needs of existing customers. Organisations then design and develop new products or services that enable them to reach the new identified markets and customers (Drury, 2004:1009).

According to Drury (2004:1010), as part of the innovation process, managers undertake market research to identify customer preferences in regard to quality, functionality and price, and also predict the potential market size. Accurate information on market size and customer preferences become essential for successful performance.

Organisations need to become aware that identifying and creating new products and services can provide a competitive advantage, therefore research and development have become a more important element in the value chain (Drury, 2004:1010 and Swain *et al.*, 2005:581).

b) Operating processes

Operation processes are concerned with production and delivery of existing products, services and processes that will meet the needs of customers. This process starts when a customer's order is received and finishes with the delivery of the product or

service to the customer (Drury, 2004:1010; Eldenburg & Wolcott, 2005:640 and Horngren *et al.*, 2006:459). The goals of these processes are to provide quality, efficiency, consistency and on-time delivery of products and services to customers (Eldenburg & Wolcott, 2005:640). According to Eldenburg & Wolcott (2005:640), in order to be competitive, organisations must improve their operational processes to meet or beat their competitors' prices, quality and on-time delivery, therefore measurements are developed to monitor and enhance performance in these critical areas.

(i) Cycle time measures

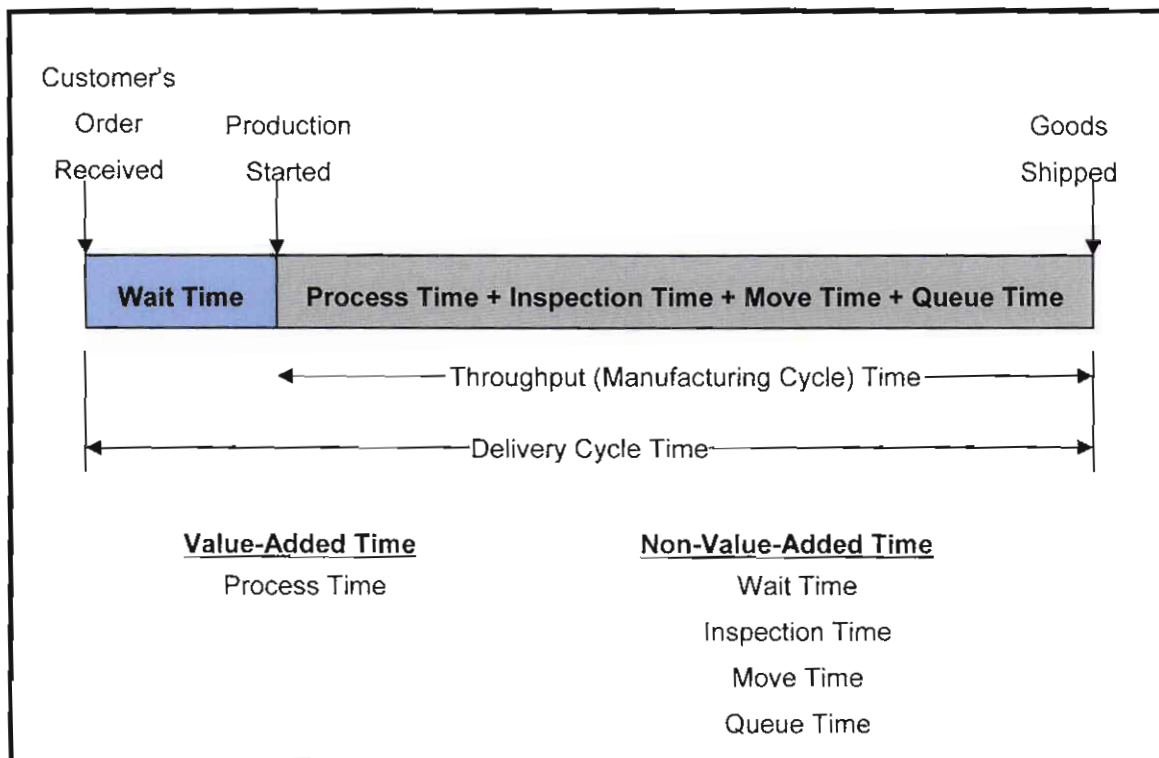
Many customers attach a high value to short and reliable lead times, measured from the time they place an order until the time when they receive the desired product or service. Many organisations have adopted a just-in-time (JIT) production system to achieve both low-cost and short lead time objectives. Cutting the **delivery cycle time** may therefore give an organisation a competitive advantage, hence most organisations should include this performance measure in their BSC (Drury, 2004:1011).

Throughput time is the time required to turn raw materials into completed products. The relationship between the delivery cycle time and throughput time are illustrated in figure 4.2 below. Throughput time consists of process time, inspection time, move time and queue time. Process time is the only activity that adds value to the service, while all the other activities are non-value-adding activities and should be eliminated as much as possible (Garrison *et al.*, 2006:456).

The throughput time, which is considered to be the key measure in delivery performance, can be put into perspective by using the performance measure of **manufacturing cycle efficiency (MCE)** (Garrison *et al.*, 2006:457).

MCE = value added time/throughput time

Figure 4.2: Delivery cycle time and throughput time



(Source: Garrison *et al.*, 2006:457)

(ii) Quality measures

The performance measurements that most organisations use to measure their performance regarding **quality** are the following (Kaplan & Atkinson, 1998:561 and Kaplan & Norton, 1996:119):

- process parts-per-million defect rates,
- yields (ratio of good items produced to good items entering the process),
- first-pass yields,
- waste,
- scrap,
- rework,
- returns, and
- percentage of processes under statistical process control.

(iii) Cost measurement

The performance measurement that will best measure the performance on the cost of the internal business processes of the organisation will be the concepts of activity-based costing (ABC) and activity-based management (ABM), as discussed in chapter 2 (Drury, 2004:1012 and Swain *et al.*, 2005:583).

4.3.2.4 Post-sales service processes

Post-sales service processes consider the service provided to customers after the sale of a product or service. Post-sales service includes warranty work, handling returns, correcting defects, and collecting and processing payments (Drury, 2004:1012-1013 and Swain *et al.*, 2005:640).

4.3.2.5 Learning and growth perspective

The learning and growth perspective defines the capabilities that an organisation must build to create long-term growth and improvement. The learning and growth perspective emphasises three capabilities (Drury, 2004:1013; Hansen & Mowen, 2003:600-601 and Homgren *et al.*, 2006:459):

- employee capabilities,
- information system capabilities, and
- motivation, empowerment and alignment.

a) *Employee capabilities*

Organisations make use of three core measurement outcomes which are the drivers of employee capabilities (Drury, 2004:1013 and Swain *et al.*, 2005:584):

- employee satisfaction,
- employee retention, and
- employee productivity.

Employee satisfaction is the driver of the other two measurements. Satisfied employees lead to employee productivity and the maximum percentage of retention. Employee satisfaction also leads to customer satisfaction (Drury, 2004:1013 and Swain *et al.*, 2005:584).

b) *Information system capabilities*

The strength of organisations' **information system capabilities** is critical to employee productivity. For employees to be effective in today's competitive environment they need relevant, accurate and timely information on the effects of their hard work to improve processes, satisfy customers and strengthen financial performance within the organisation (Swain *et al.*, 2005:584 and Drury, 2004:1014).

c) *Motivation, empowerment and alignment*

According to Drury (2004:1014), motivation plays an important role in the performance of employees. Motivation is maximised when individual objectives are aligned with the organisation's objective articulated in the BSC.

A reward system should be considered as an important part of motivation. According to Verweire & Van Den Berghe (2004:216), not only financial elements like incentives and bonuses should be taken into consideration, but non-financial elements, like recognition, involvement, information sharing and work-life balance should be taken into consideration as well. Therefore Verweire & Van Den Berghe (2004:216) suggest that organisations work on a "total reward" approach which they refer to as all forms of returns – direct and/or indirect, short and long term, financial and non-financial rewards which employees should receive in order to motivate them.

According to Armstrong & Baron (2003:210), performance management can motivate people by:

- clarifying the goals and expectations of the organisation,
- providing reinforcement through constant feedback,
- providing opportunities for employees to use and develop their skills,
- helping people increase their self-confidence by achievements and growth through their work – intrinsic motivation,
- providing opportunities for employees to feel that they add value to the organisation through recognition and praise – extrinsic non-financial motivation, and
- rewarding employees financially – extrinsic motivation.

The warehouse and distribution function must ensure that the performances of their employees are linked to a total reward system in order to ensure that employees are motivated to achieve performance in line with the organisations goal.

4.3.3 Implementing the balanced scorecard

Organisations can follow the following seven steps proposed by Eldenburg & Wolcott (2005:642-646) to implement their BSC:

- **Step 1: Clarify the vision, core competencies and strategies of the organisation**

The vision, core competencies and strategies of the organisation are central to the BSC approach, therefore they should be clarified. The vision must clearly indicate where the organisation wants to go, whereas the core competencies and strategy provide guidance to the vision of the organisation. By clarifying the vision, core competencies and strategies of the organisation, employees are assisted to understand where the organisation is going.

- **Step 2: Analyse perspectives to develop performance objectives and measures**

The next step is to analyse the four perspectives as discussed in paragraph 4.3.2. A set of performance objectives within each perspective must be formulated in order to achieve the vision and strategies identified in the previous step. These objectives must be monitored by making use of financial and non-financial measures as discussed in paragraph 4.2.1 and 4.2.2.

- **Step 3: Communicate, link throughout the organisation and refine**

Top management usually develops the BSC, but the success of the BSC depends on the efforts of employees throughout the organisation. In order for the BSC to succeed, it must be communicated both upwards (among top management) and downwards (to other employees) in the organisation. Links (common measures) must be developed to increase the likelihood that all employees will work together to achieve the same goal. The original BSC can be refined after organisations have implemented it at the lower levels.

- **Step 4: Establish performance targets and action plans**

The BSC should not only consist of measures to determine long-term vision and strategies, but should also establish specific performance targets and related action plans. Performance targets are set for three- to five-year periods and assist organisations to focus on their long-term results. Organisations must reward their employees for achieving performance targets as discussed in paragraph 4.3.2.5(c). Action plans give employees guidance about their efforts towards achieving targets.

- **Step 5: Analyse the collected BSC data**

The BSC measures are captured periodically and data are collected and analysed for different measures using different time frames. Systems to collect financial and non-financial data must be established before calculations and comparisons to performance targets can be made.

- **Step 6: Investigate variances and reward employees**

Actual results are compared to performance targets to determine variances. Significant variances are investigated to identify the causes, and lead to modification of action plans. If the BSC is used for employee compensation, rewards are distributed.

- **Step 7: Provide feedback and refine the BSC**

Feedback is an important part of the BSC, where results and experience are used to refine the process. Managers make use of the BSC to evaluate the success of their vision, core competencies and strategies as identified in paragraph 4.3.3.

4.3.4 An example of implementing the balanced scorecard

Table 4.1 presents an example of a BSC for SLA's warehouse and distribution function. It highlights the four perspectives of performance: financial, customer, internal business process, and learning and growth. SLA's warehouse and distribution department should set objectives, measures and performance targets to meet their vision and strategy. Performance measures can be adapted in order to provide better information on achievements.

An example of the implementation of the BSC in the warehouse and distribution function is provided next.

Table 4.2: BSC for SLA's warehouse and distribution function

FINANCIAL PERSPECTIVE			
Objectives	Measures	Target Performance	Actual Performance
Increase shareholder value (Profitable)	Revenue growth	Increase warehouse & distribution revenue by 15% per year	
	Growth through customer loyalty	Increase revenue from existing warehouse and distribution customers by 10% per year	
	Increase net profit margin	Maintain a minimum net profit margin of 25%	
	Remain within the budget	0% negative variance	

CUSTOMER PERSPECTIVE			
Objectives	Measures	Target Performance	Actual Performance
Increase customer satisfaction	Customer satisfaction survey	80% of warehouse and distribution customers give top two ratings out of five	
	Identify future growth and needs of customers	95% customer retention in warehouse and distribution	

INTERNAL BUSINESS PERSPECTIVE			
Objectives	Measures	Target Performance	Actual Performance
Elimination of non-value-adding activities	Percentage of activities that are value-adding activities	100% value-adding activities	
Reduce picking time	Accurate picking	100% first time pick as per order placed	
Maintain dispatch time	Number of late deliveries	0% late deliveries	
Reduce delivery time to customers	On-time delivery	100% POD (Prove of delivery) received on time	
Decreasing damaged and stolen inventory	Damaged and stolen goods	Maximum of 2% damaged or stolen inventory	
Improve business processes	Number of major improvements in business processes	4 improvements per year	

LEARNING AND GROWTH PERSPECTIVE			
Objectives	Measures	Target Performance	Actual Performance
Develop skills	Percentage of employees trained	80% of employees	
Research and development	Implementation of research and development	Implement 80% of research and development	
Improve information systems	Down time	2 days per year down time	
Improve information systems capabilities	Accurate and real-time feedback	100% data captured	

Source: Own research

4.3.5 Key elements of the balanced scorecard

There are a few key elements to ensure success of the BSC, which are as follows:

- Understand that the BSC is part of a bigger picture, starting with the clarity of vision, **strategy** and outcome (Richardson, 2004:7 and Hendricks *et al.*, 2004:6). The BSC framework forms a key component in an integrated business performance management process and plays a critical role in translating business strategy into measurable action. The BSC framework assists managers in connecting the strategic business performance and individual employee performance in order to manage the progress toward the achievement of business strategy (Richardson, 2004:7).
- The involvement and commitment of top management (leadership) is **critical** (Richardson, 2004:8; Chan, 2004:210 and Hendricks *et al.*, 2004:6). Ensure hands-on participation in the development, implementation and management of the BSC (Richardson, 2004:8).
- All participants should have a **clear vision** for the BSC right from the start (Richardson, 2004:8 and Chan, 2004:210). According to Richardson (2004:8), management should have a clear vision of what the BSC will look like, how it will operate, how it will be built and how the organisation will use it. By having a clear vision, this will assist management to focus and come to a quick consensus.

- Maximise the usage of the BSC by **fully deploying** it at all levels of the organisation (Richardson, 2004:8). According to Richardson (2004:8-9) and Hendricks *et al.* (2004:6), deploying the BSC across all levels (team, division and functional levels) in the organisation develops strategic awareness amongst all employees, ensuring that employees make “strategy their job”. This will assist employees in making decisions that will contribute to the business strategy in their day to day work. It is important to keep the BSC relatively simple and easy to use and understand in order to ensure cooperation by employees (Richardson, 2004:8-9).
- **Communicate** (Richardson, 2004:9 and Hendricks *et al.*, 2004:6). According to Richardson (2004:9), communication and education (training) on the organisation's strategy and the BSC are very important. Organisations must make use of every type of communication method available to ensure employees understand the strategy and the BSC. This will ensure a culture of performance excellence.
- **Extend the BSC** and make it “the way we work”. Extend the BSC until it becomes not only the measurement framework, but the framework within which the organisation operates (Richardson, 2004:9).

4.3.6 Critical analysis of using a BSC

The BSC has certain advantages and disadvantages, which will be discussed below.

4.3.6.1 Advantages of the balanced scorecard

- It encourages clarification and updating of the organisation's vision and strategy (Eldenburg & Wolcott, 2005:651);
- It improves communication and consensus of the strategy throughout the organisation, which leads to aligning departmental and personal goals to the vision and strategy of the organisation (Eldenburg & Wolcott, 2005:651 and Horngren *et al.*, 2006:462);
- It links strategic objectives to short-term and long-term performance objectives (Eldenburg & Wolcott, 2005:651);

- It places strong emphasis on financial and non-financial objectives and measures, which emphasis leads to improved financial performance (Horngren *et al.*, 2006:463 and Eldenburg & Wolcott, 2005:651);
- It helps managers use operational data for decision-making (Eldenburg & Wolcott, 2005:651);
- It limits the number of measures, identifying only the most critical ones with the purpose to help managers focus attention on measures that mostly effect the implementation of strategy (Horngren *et al.*, 2006:463);
- It motivates employee effort (Eldenburg & Wolcott, 2005:651);
- It promotes action toward achieving strategies (Eldenburg & Wolcott, 2005:651);
- It enables periodic performance reviews of development toward vision and strategy (Eldenburg & Wolcott, 2005:651);
- It provides feedback to assist learning or strategy development (Moodley, 2003:60);
- It is a simple and accessible model for performance, based on priority areas for attention in each of the four perspectives (Moodley, 2003:63);
- It minimises reliance on a single performance measure (Horngren *et al.*, 2006:463);
- It reduces optimisation of departments at the expense of the organisation as a whole (Horngren *et al.*, 2006:463);
- It avoids management dependence on short-term or incomplete financially based performance measures (Horngren *et al.*, 2006:463);
- It increases accountability. Goals are incorporated into the evaluation process and accountability is linked to compensation (Moodley, 2003:63), and
- It can assist stakeholders in their evaluation of the organisation (Moodley, 2003:64).

4.3.6.2 Disadvantages of the balanced scorecard

- Its implementation is expensive and time-consuming (Eldenburg & Wolcott, 2005:651);
- Non-financial performance measures are often ignored when evaluating employees (Horngren *et al.*, 2006:463);

- If too many performance measures are used, it takes the attention away from measures that are critical for implementing strategy (Horngren *et al.*, 2003:453);
- Improvements across all of the measures all of the time may be inconsistent with long-term profit maximisation (Horngren *et al.*, 2006:463);
- Performance measures may give contradicting signals and confuse management (Botten & Sims, 2005:430);
- It may cause resistance from departments or individuals (Eldenburg & Wolcott, 2005:651);
- The links among the four perspectives are not always accurate (Eldenburg & Wolcott, 2005:651);
- There is no apparent relation between the BSC and shareholder value (Botten & Sims, 2005:430);
- Both the cost and the benefits of initiatives should be considered before including them in the BSC (Horngren *et al.*, 2006:463);

4.4 SUMMARY

According to Swain *et al.* (2005:572), the increase in competitiveness in the market requires that organisations continually improve their information systems in order to support their strategy and assist management to operate its organisation more effectively and efficiently.

Performance measurement is an effective way of increasing the competitiveness and profitability of an organisation through encouragement of productivity improvements. Traditionally organisations were primarily just relying on financial measures that provide information measures in rands and ratios of rands, but that don't give the true reflection of the performance that are being measured, and thus, non-financial measures must also be taken into account during performance evaluation.

The balanced scorecard (BSC) introduced by Kaplan and Norton in 1992 is a performance management system that focuses on conveying financial and non-financial information and assist managers in translating the organisation's vision, core competencies and strategies.

This chapter illustrated how the BSC can be a basis for developing an effective performance measurement and management system. Managers can easily become overloaded with information, but the key of the BSC is to clearly clarify the vision and strategy of an organisation and then establish a set of performance measures that supports managers in achieving their goal. The BSC can therefore be used as a central tool in the implementation of the organisation's strategy.

The BSC approach recognises that management needs information on financial, customer, internal process, and learning and growth activities. Furthermore, the BSC approach recognises that measurement of these activities should not be limited to financial measures only, but should include non-financial measures as well.

Management of SLA can use the BSC approach in the warehouse and distribution function in order to find appropriate financial and non-financial performance measures to ensure a long-term perspective and that resources in the organisation are allocated to the most effective improvement activities, namely those identified in Chapter 2, by making use of activity-based costing.

CHAPTER 5

EMPIRICAL STUDY

5.1 INTRODUCTION

SLA has proved to be a market leader within the logistics services market whilst maintaining profitability in most of its core business functions, with the exception of the warehousing and distribution function.

The empirical study was conducted at SLA to analyse its warehouse and distribution function's existing cost management system. Relevant information was obtained from SLA by means of a structured questionnaire (Appendix A) used during interviews to obtain useful information from relevant employees and managers. The questionnaire consisted of 37 closed and 20 open questions regarding the use of activity-based performance management in the warehouse and distribution function.

In order to obtain the most accurate information regarding activity-based performance management in the warehouse and distribution function, employees and managers were identified to take part in the survey. They included the following five positions: the director, the financial manager, the business analyst, the warehouse manager and the warehouse team leader. 100% of the planned structured interviews took place. The information gathered by the interviews was used exclusively for research purposes and treated as highly confidential.

Permission to gather information by observation of activities and processes carried out by employees in the warehouse and distribution function was obtained from top management in SLA. The warehouse was visited and inspected, while the whole process, from beginning (receiving) to end (dispatch), was observed.

The following precautionary measures were taken regarding the structured questionnaire and the interviews:

- Professional advice regarding information gathering, interviews and questionnaires was obtained by referring to Struwig & Stead (2001).
- Appointments were scheduled with each of the participants.
- One day before the appointment, participants were reminded of the interview.
- An informational letter containing the background to the study was given to each participant one day before the interview.

In this chapter, the results of the interviews are given in chronological order of the questionnaire (Appendix A).

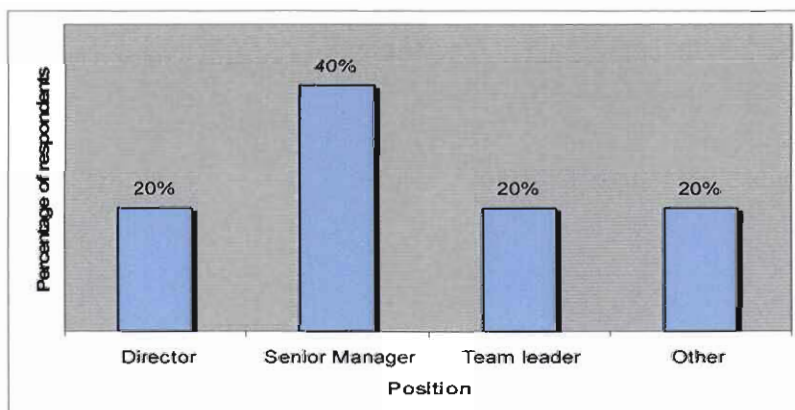
5.2 ANALYSIS OF THE QUESTIONNAIRE

5.2.1 Section A – Personal background

In Section A of the questionnaire, personal background regarding the respondents was obtained. The results were as follows.

1. In section A question 1 of the questionnaire (Appendix A) regarding the respondents' current position. The results were as follows:

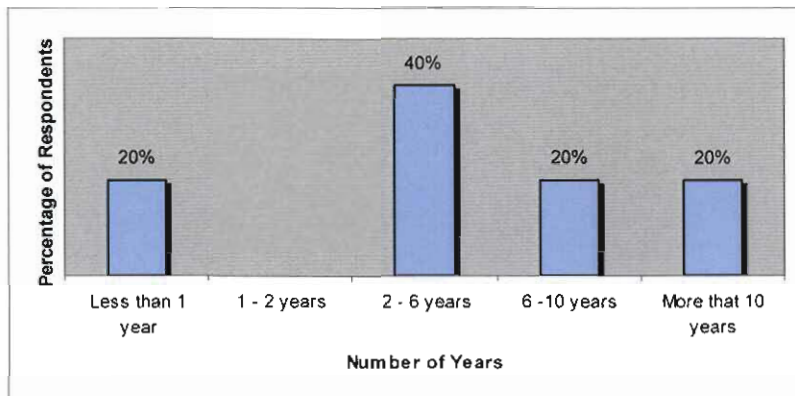
Diagram 5.1: The current position of the respondents



- One of the respondents was the director, two were senior management, one was a team leader and one (other) specified that he was the business analyst.

2. In section A question 2 of the questionnaire (Appendix A) regarding the respondents' years of experience in the logistics industry. The results were as follows:

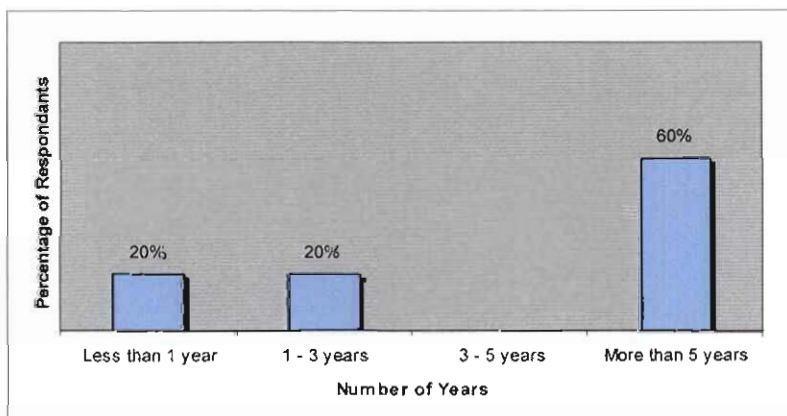
Diagram 5.2: Years of experience in the logistics industry



- One of the respondents had less than 1 year experience in the logistics industry, two of the respondents had between 2 and 6 years experience in the logistics industry, one had between 6 and 10 years experience in the logistics industry and one had more than 10 years experience in the logistics industry.

3. In section A question 3 of the questionnaire (Appendix A) regarding the number of years respondents had worked for SLA. The results were as follows:

Diagram 5.3: Number of years worked for SLA



- One of the respondents had worked for SLA for less than 1 year, two of the respondents had worked for SLA between 1 and 3 years and three of the respondents had worked for SLA for more than 5 years.

4. In section A question 4 of the questionnaire (Appendix A) respondents were asked to describe their responsibility and involvement in the warehouse and distribution function. The results were as follows:

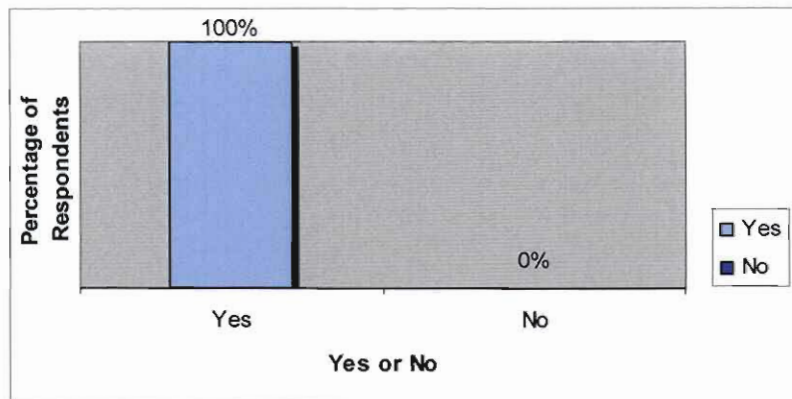
- The warehouse manager said that he took full responsibility for all activities in the warehouse and distribution function, from the receiving right through to the delivery of the shoes. He was also responsible for the invoicing, making out purchase orders and monitoring the employees in the warehouse.
- The director said that the warehouse manager reported to him.
- The team leader was responsible for the quality checks of invoicing and was involved in the warehouse and distribution project team.
- The financial manager was responsible for budget planning and variance analysis, and he compiled financial statements each month regarding SLA. The financial manager stated that there were no individual statements regarding the Tips shoes warehouse and distribution function, which formed part of the overall warehouse and distribution function.
- The business analyst was responsible for analysing distribution routes, testing the cost-effectiveness of the warehouse and the vehicles, seeing to it that rates were correctly loaded onto the software program and for ensuring that everything was invoiced out.

5.2.2 Section B – Background to the warehouse and distribution function

In Section B, background regarding the warehouse and distribution function was obtained. The results were as follows:

1. In section B question 1.a of the questionnaire (Appendix A) regarding the room for improvement in the profitability of the warehouse and distribution function. The results were as follows:

Diagram 5.4: Room for improvement regarding the profitability of the warehouse and distribution function

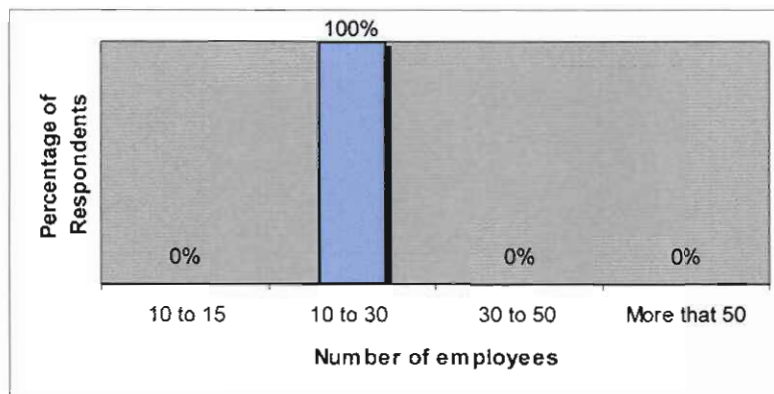


- 100% of the respondents indicated that there was room for improvement regarding the profitability of the warehouse and distribution function.
2. In section B question 1.b of the questionnaire (Appendix A), the respondents had to indicate why they were of the opinion expressed in question 1.a. The results were as follows:
- 40% of the respondents indicated that SLA was new in the retail business, that they had not really known the product (shoes) during the implementation phase, and that it was time to give attention to the process flow to make it more effective and to ensure optimal utilisation of resources.
 - 40% of the respondents indicated that the warehouse and distribution function was not optimal, seeing that the current rates structure did not cover the labour-intensive process. SLA could not increase their rates therefore costs needed to be managed more effectively so as to ensure profitability.
 - 20% of the respondents indicated that no proper financial analysis was done before a client was approved.
 - 60% of the respondents indicated that the warehouse and distribution function was not profitable enough and that there was always room for improvement.
 - 20% of the respondents indicated that the process flow ran in silos and that better coordination between the different stages and different departments should be implemented.

- 20% of the respondents indicated that in the past equipment was just purchased without doing further research regarding the price. The respondent indicated that much money could be saved in the long term on packaging and labelling, provided they invested in the right resources in the short term.

3. In section B question 2 of the questionnaire (Appendix A) regarding the number of employees in the warehouse and distribution function. The results were as follows:

Diagram 5.5: Number of employees in the warehouse and distribution function



- 100% of the respondents indicated that there were between 10 and 30 employees in the warehouse and distribution function.

4. In section B question 3 of the questionnaire (Appendix A) regarding the major elements of the warehouse and distribution function's strategy. The results were as follows:

Table 5.1: Ranking of major elements of the warehouse and distribution's strategy

Respondents	Nr 1	Nr 2	Nr 3	Nr 4	Nr 5	Average
Reduce cost	4	5	3	4	9	5
Increase profitability	3	2	4	3	8	4
Increase efficiency	6	4	2	2	2	3.2
Improve quality	7	3	6	6	5	5.4
Develop skills	8	6	7	7	7	7
Expand the market share	9	8	9	9	6	8.2
Develop new services	5	9	8	8	4	6.8
Reduce process time	2	7	5	5	3	4.4
Customer satisfaction	1	1	1	1	1	1

The element with the lowest average was the most important to the respondents. Thus the order of importance is as follows:

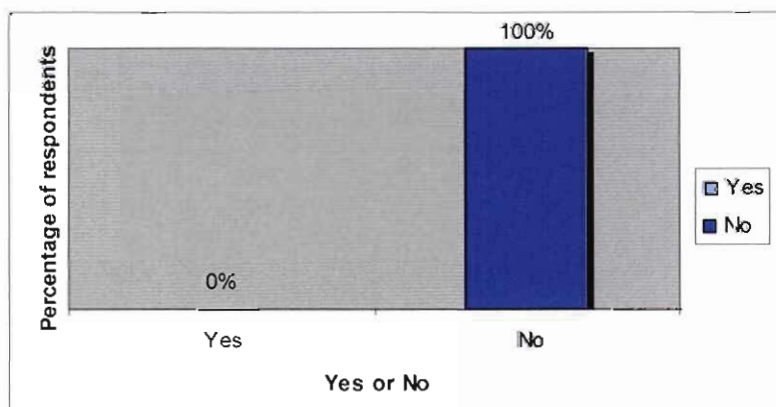
- Customer satisfaction
- Increase efficiency
- Increase profitability
- Reduce process time
- Reduce cost
- Improve quality
- Develop new services
- Develop skills
- Expand the market share

5.2.3 Section C – Fundamentals

In Section C, information was obtained regarding the use of activity-based costing, cost management and performance management in the warehouse and distribution function. The results were as follows:

1. In section C question 1 of the questionnaire (Appendix A) regarding the usage of an activity-based costing system in the warehouse and distribution function. The results were as follows:

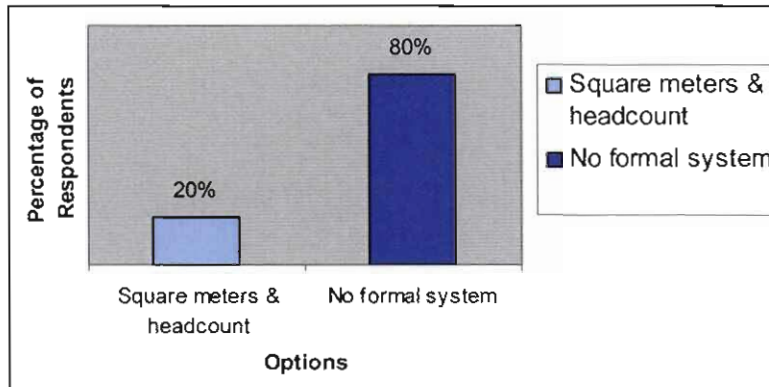
Diagram 5.6: Current use of an activity-based costing system



- 100% of the respondents indicated that they do not currently make use of an activity-based costing system in the warehouse and distribution function.

2. In section C question 9 of the questionnaire (Appendix A) regarding the current system used to allocate costs in the warehouse and distribution function. The results were as follows:

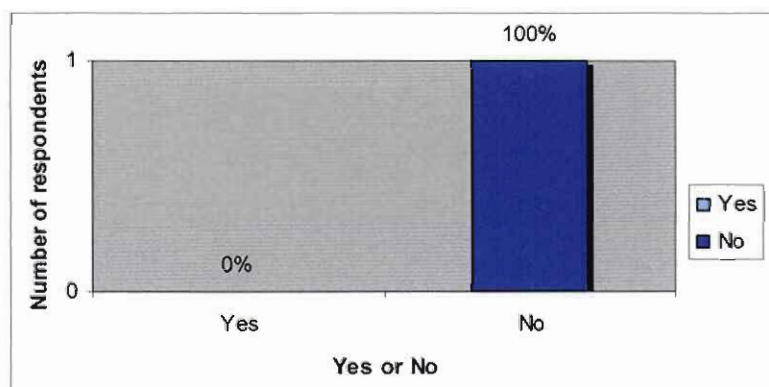
Diagram 5.7: The system currently used to allocate costs



- The majority, 80% of the respondents indicated that no formal system was used to allocate costs in the warehouse and distribution function and only 20% indicated that the warehouse and distribution function make use of square metres and headcount.

3. In section C question 10.a of the questionnaire (Appendix A) regarding the effectiveness of the current allocation system in the warehouse and distribution function. The results were as follows:

Diagram 5.8: Effectiveness of the current cost allocation system



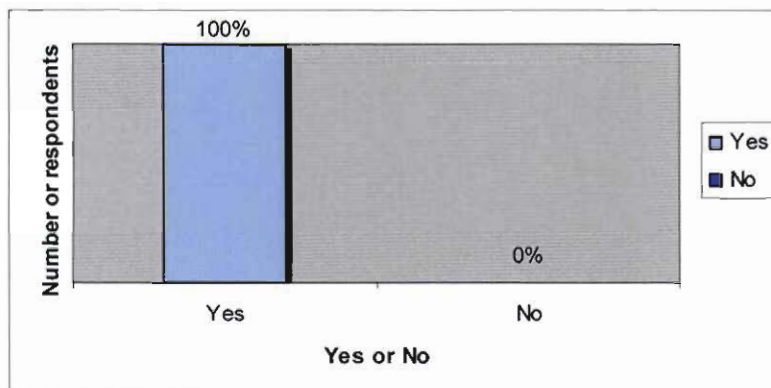
- 100% of the respondents indicated that the current cost allocation system in the warehouse and distribution function is not effective.

4. In section C question 10.b of the questionnaire (Appendix A) the respondents had to indicate why they were of their opinion in question 10.a. The results were as follows:

- 60% of the respondents indicated that costs are not allocated effectively and that it could not be determined which activities cost more than others, therefore problems could not be identified.
- 40% of the respondents indicated that there was no separate income statement or budget for the retail warehouse and distribution function, therefore it was difficult to determine its financial state of affairs. They did not know if the retail loss was carried by the tyre and motor warehouse and distribution function.

5. In the case of section C question 11.a of the questionnaire (Appendix A) regarding future plans to implement a formal system in the next two years in the warehouse and distribution function. The results were as follows:

Diagram 5.9: Implementation of a formal system in the next two years



- 100% of the respondents indicated that they were planning to implement a formal costs allocation system in the next 2 years.

6. In section C question 11.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion expressed in question 11.a. The results were as follows:

- 60% of the respondents indicated that the company was busy growing and if they did not implement a new system they were going to lose control over the organisation.
- 40% indicated that a new system would help them focus on the activities that cost too much, which in turn would help management manage cost and increase profitability.

7. In section C question 12 of the questionnaire (Appendix A) regarding the current process flow of the warehouse and distribution function. The results were as follows:

- Only 20% of the respondents answered question 12. The current process flow is indicated in figure 5.1 below:

Figure 5.1: Current process flow of the warehouse and distribution function

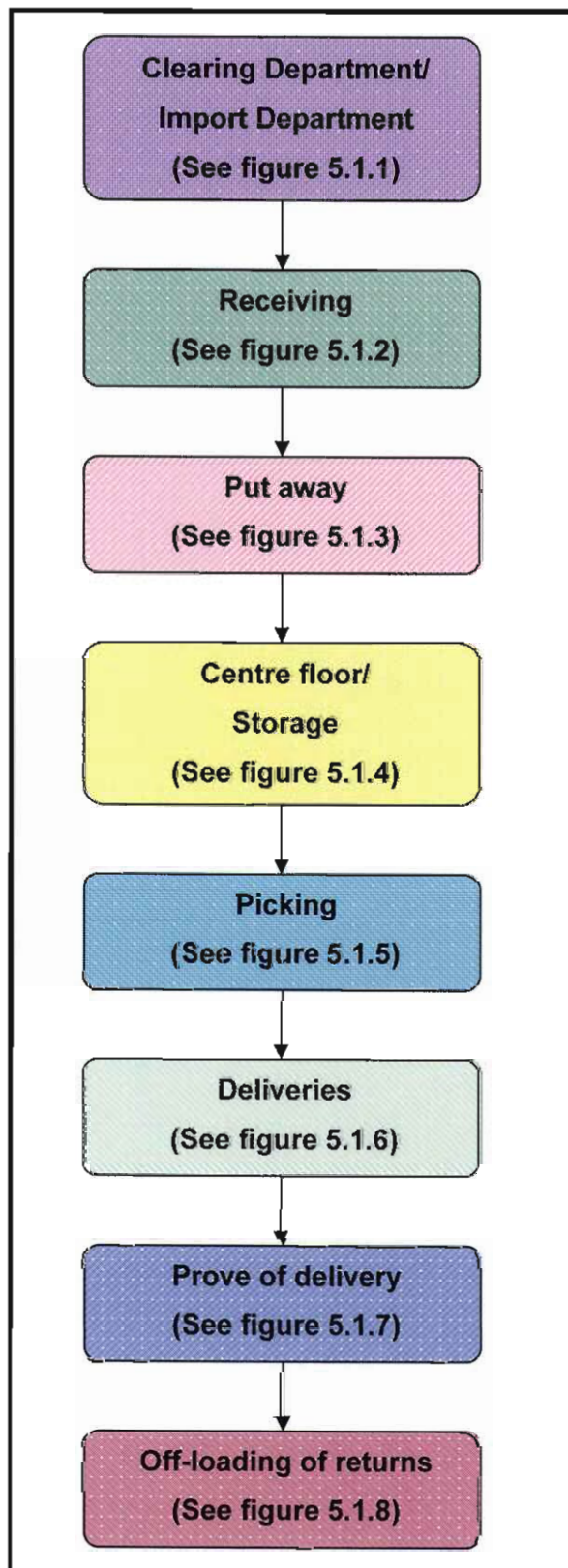


Figure 5.1.1: Clearing Department/Import department

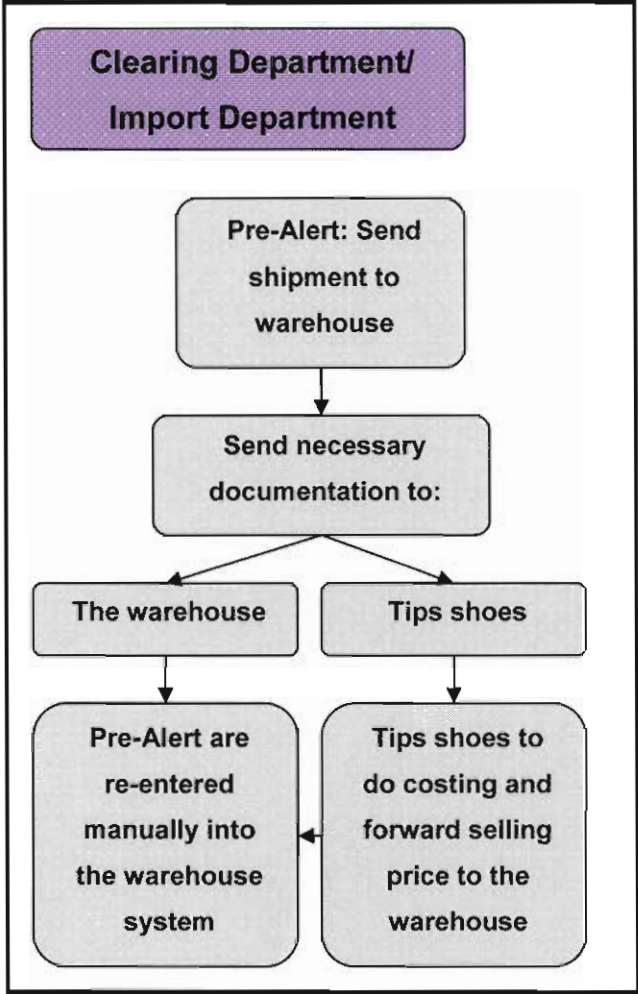


Figure 5.1.2: Put away

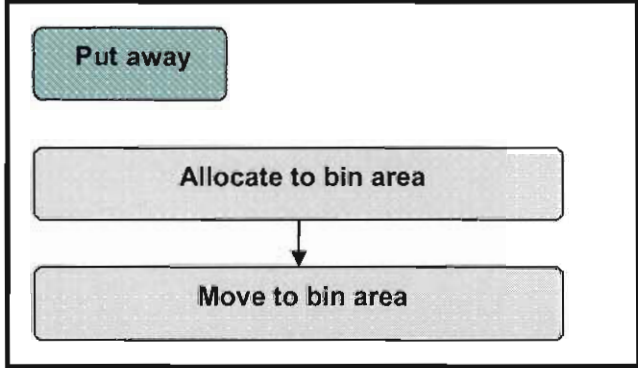


Figure 5.1.3: Receiving

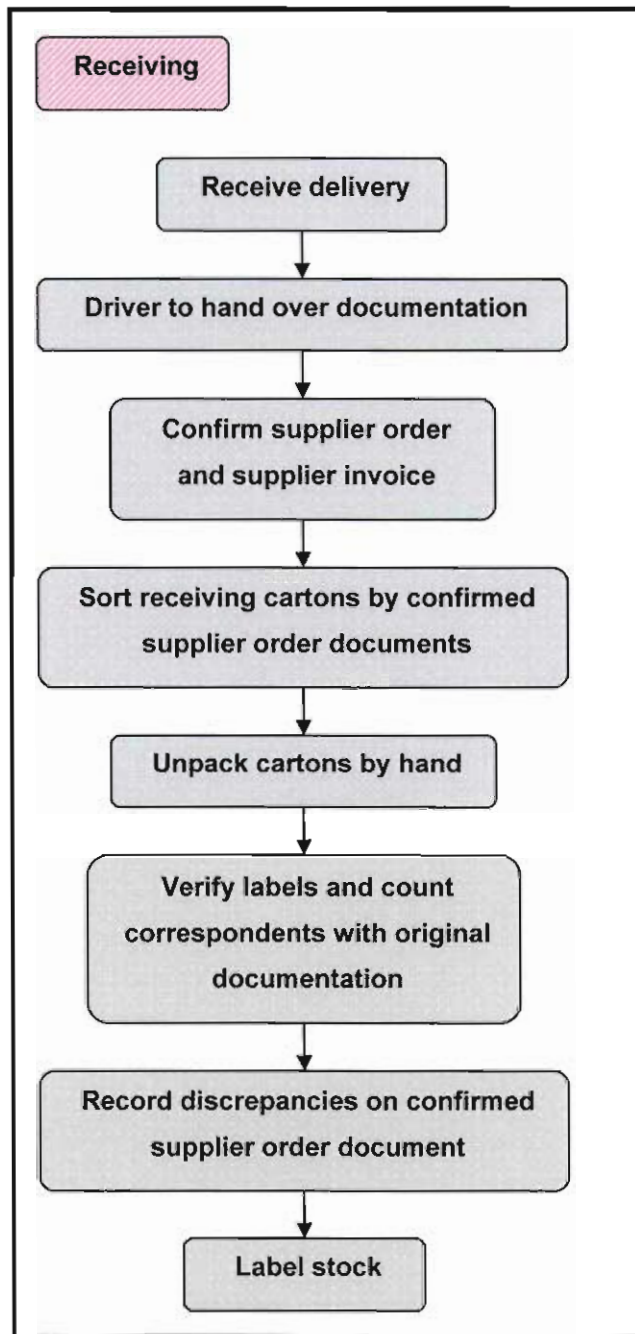


Figure 5.1.4: Centre Floor/Storage

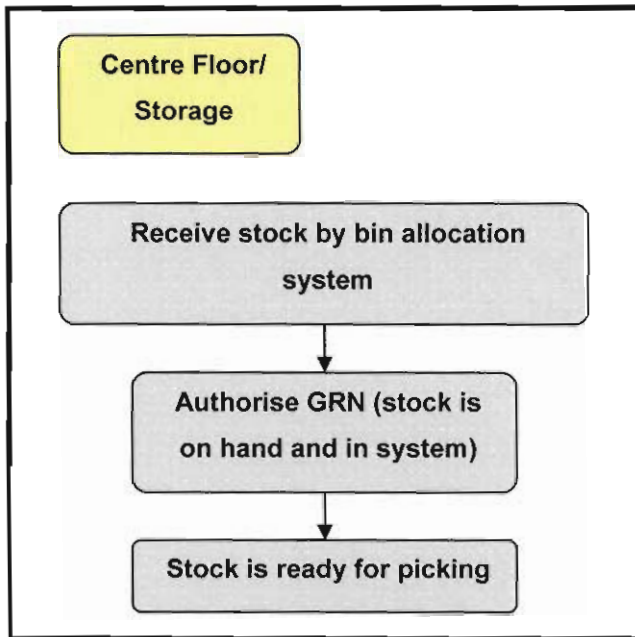
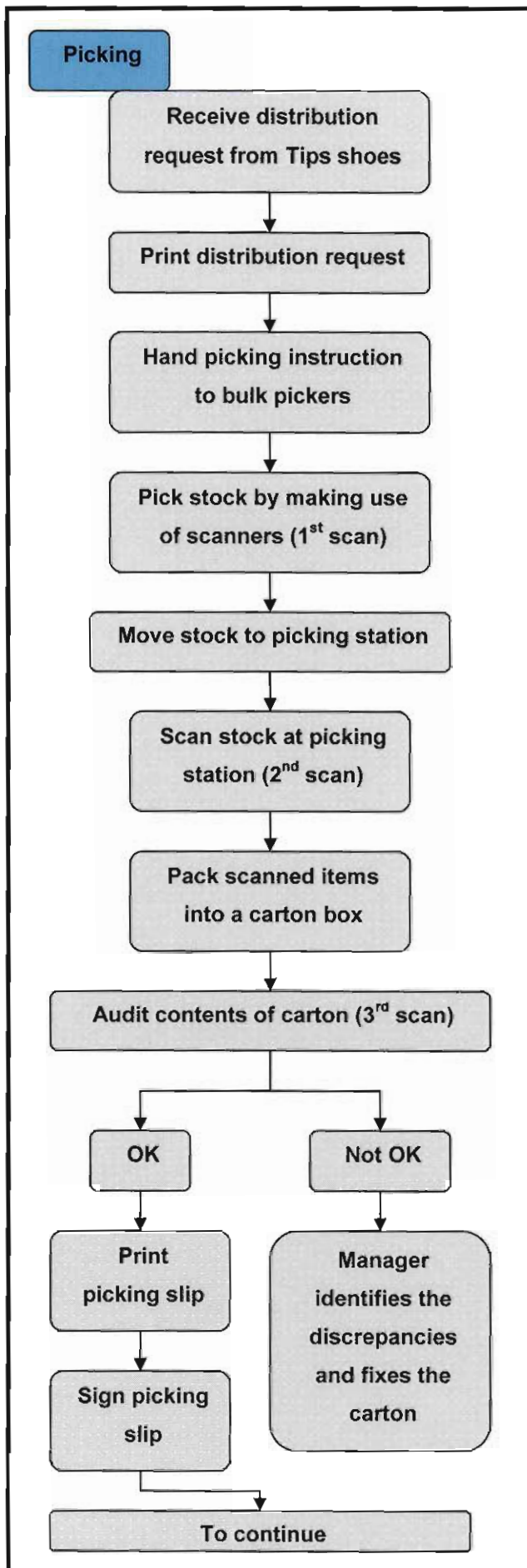


Figure 5.1.5: Picking



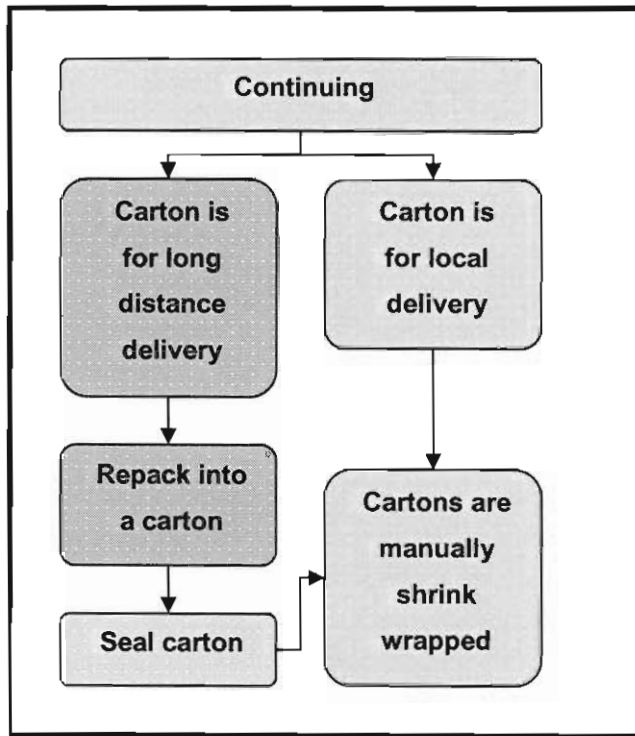


Figure 5.1.6: Deliveries

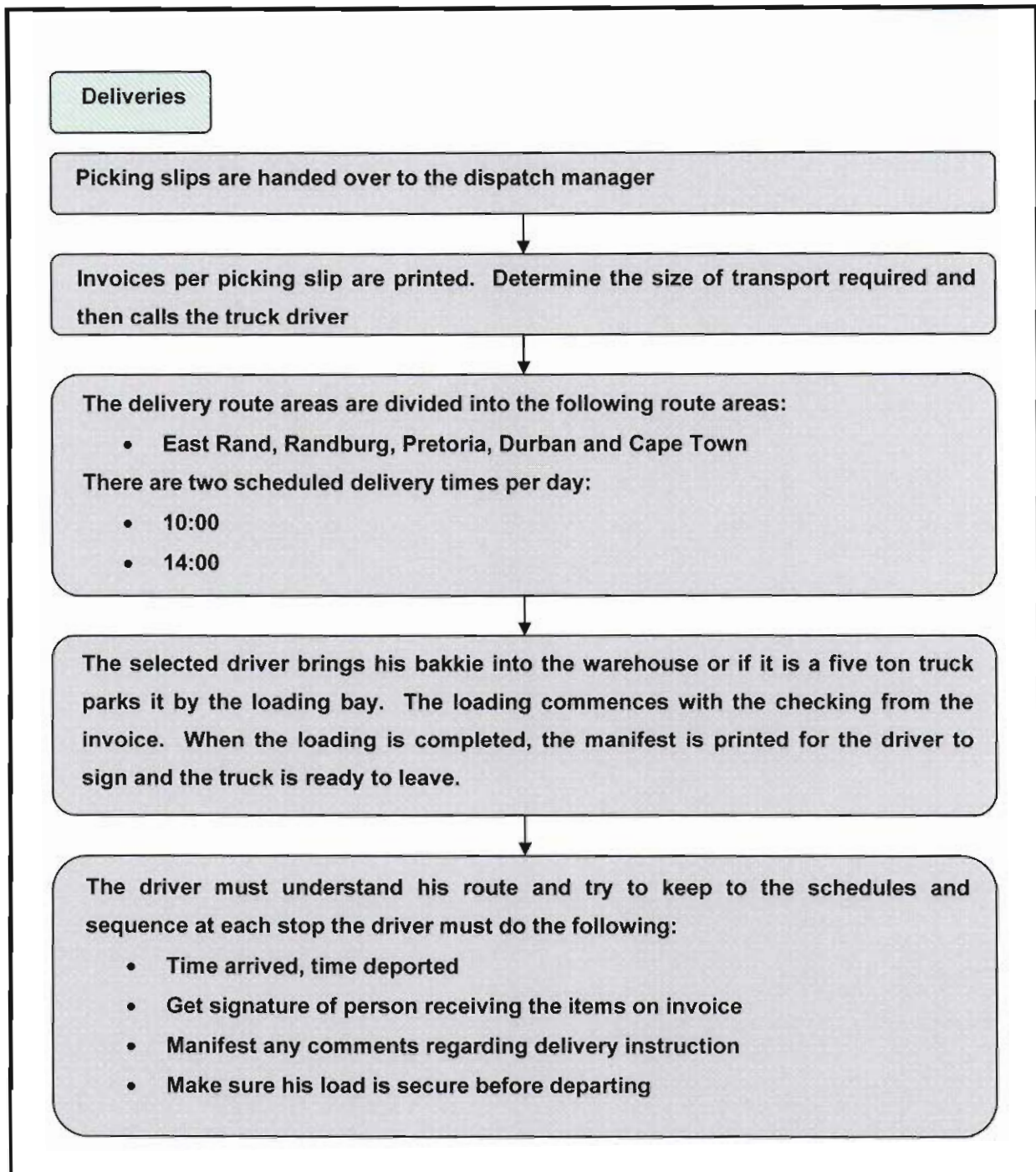


Figure 5.1.7: Proof of delivery

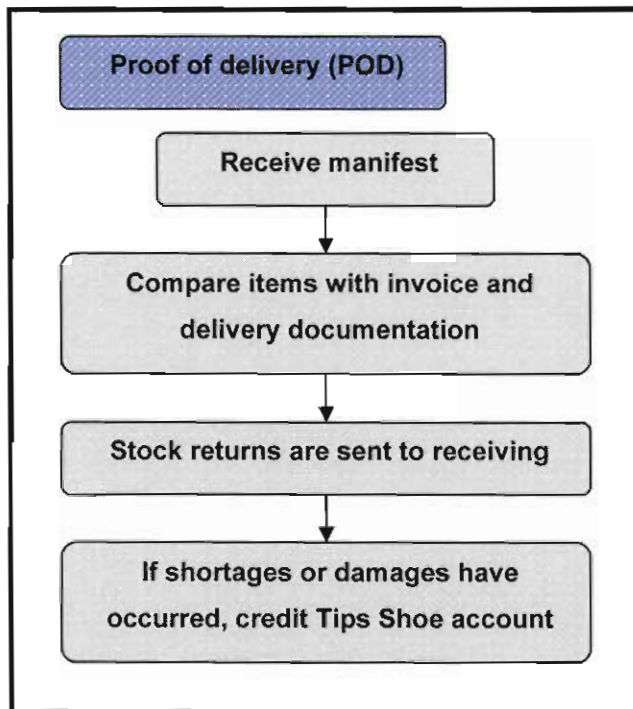
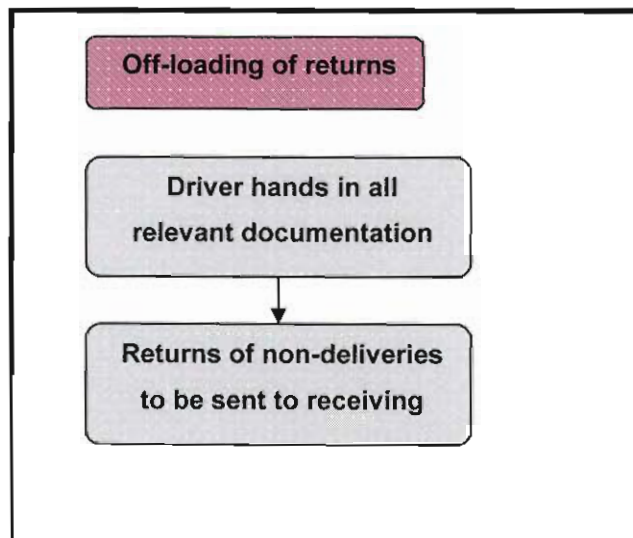


Figure 5.1.8: Off-loading of returns

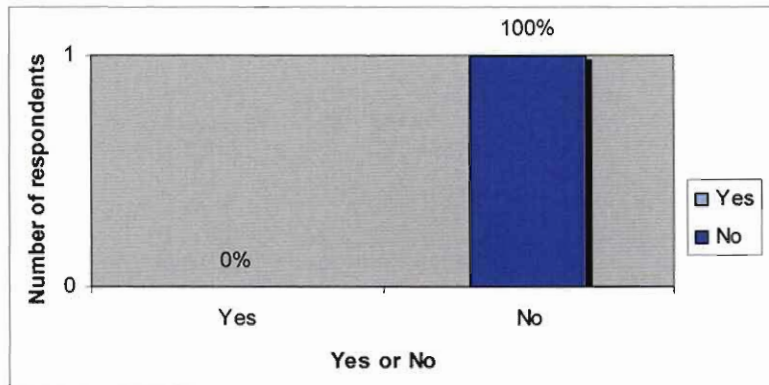


8. In section C question 13 of the questionnaire (Appendix A) regarding the activities in the warehouse and distribution function. The results were as follows:

- 100% of the respondents indicated that the activities consisted of receiving, putting away, storage, collections, picking, deliveries, proof of delivery and off-loading of returns.

9. In section C question 14.a of the questionnaire (Appendix A) regarding the value-adding activities in the warehouse and distribution function. The results were as follows:

Diagram 5.10: Value-adding activities



- 100% of the respondents indicated that not all of the current activities in the warehouse and distribution function are value-adding activities.

10. In section C question 14.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion expressed in question 14.a. The results were as follows:

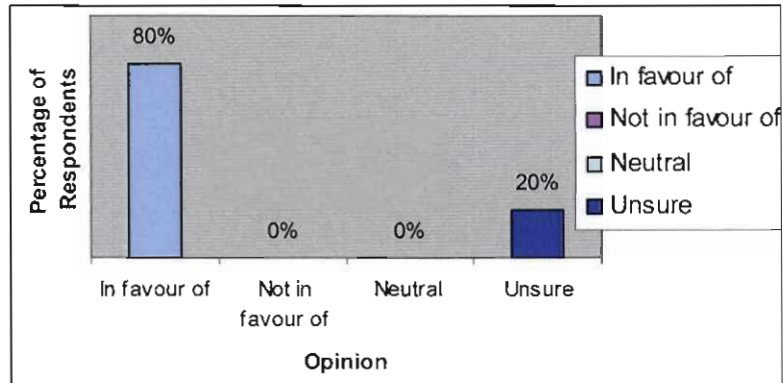
- 60% of the respondents indicated that the warehouse and distribution function could not be all value-adding, seeing that the warehouse and distribution function is not profitable enough.
- 40% of the respondents indicated that the process flow is currently very complex and that some of the very important information is captured manually. If a mistake is made during the receiving stage, it has an effect through the whole process flow.

11. In section C question 15 of the questionnaire (Appendix A) the respondents had to indicate the cost drivers for the activities mentioned in question 13. The results were as follows:

- 100% of the respondents indicated: handling, number of customer orders, number of deliveries, labour hours and number of cartons.

12. In section C question 16.a of the questionnaire (Appendix A) the respondents had to indicate their opinion of whether cost should be allocated to activities. The results were as follows:

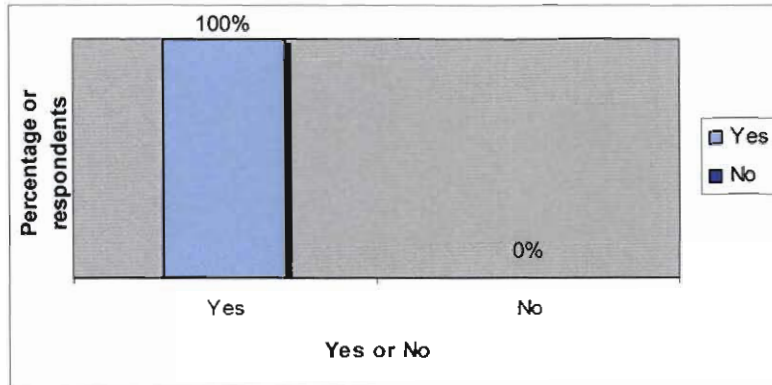
Diagram 5.11: Opinion on whether cost should be allocated to activities



- 80% of the respondents were in favour of allocating cost to activities and 20% were unsure.
13. In section C question 16.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion expressed in question 16.a. The results were as follows:
- 40% of the respondents indicated that activity based costing will assist management in being proactive by managing costs more effectively.
 - 20% of the respondents said that ABC would indicate the areas on which they needed to focus.
 - 20% indicated that having more detail is always better.
 - 20% indicated that ABC would assist management in determining the activities responsible for the low profit. Management could then focus on these activities and that would lead to higher profits.
 - 20% indicated that ABC would help them if they wanted to benchmark an activity.
 - The 20% who indicated that uncertainty was of the opinion that the implementation of an ABC system would be too expensive and it was an administration-intensive system.

14. In the case of section C question 17 of the questionnaire (Appendix A) regarding the use of ABC to determine the price or service fee more accurately. The results were as follows:

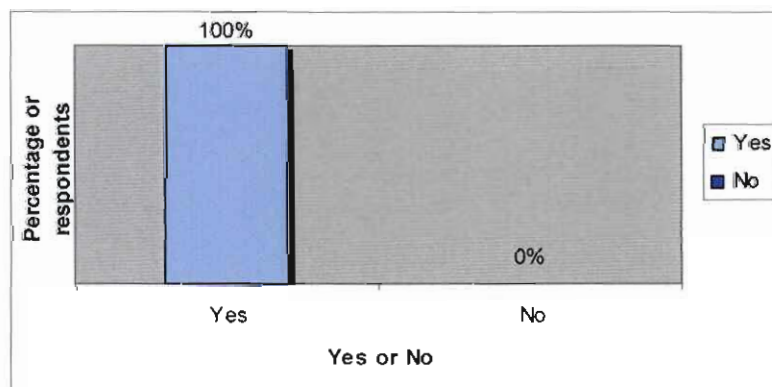
Diagram 5.12: The use of ABC to determine the service fee more accurately



- 100% of the participants indicated that by implementing ABC the service fee could be determined more accurately.

15. In the case of section C question 18.a of the questionnaire (Appendix A) regarding changing to an ABC system. The results were as follows:

Diagram 5.13: Changing to an ABC system



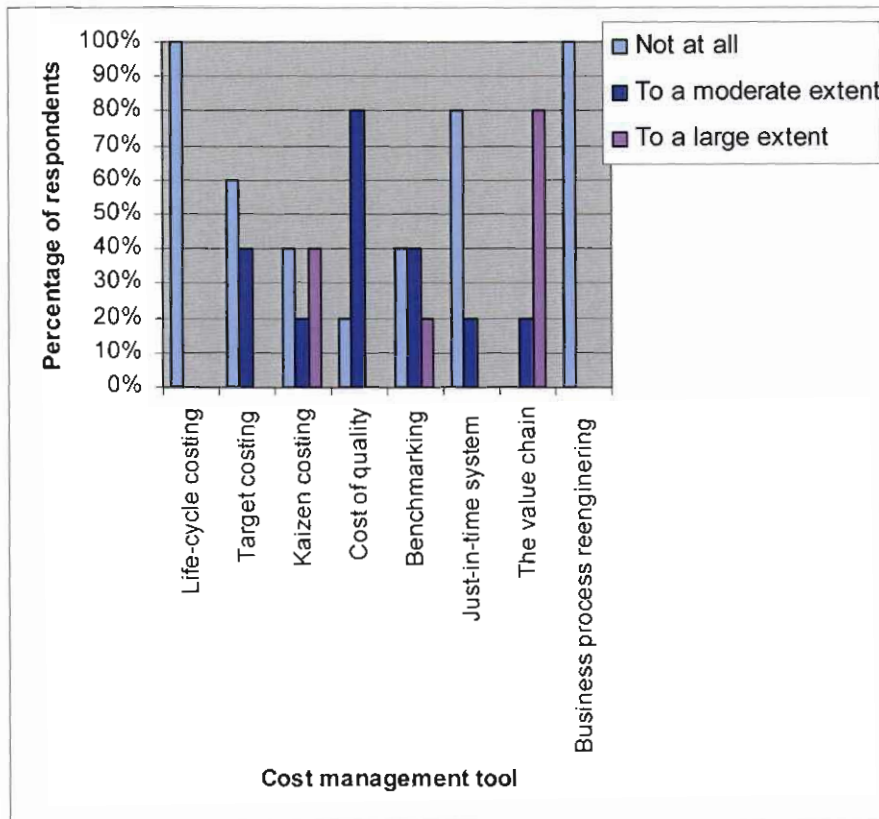
- 100% of the participants would consider changing to an ABC system.

16. In section C question 18.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion stated in question 18.a. The results were as follows:

- 100% of the respondents indicated that ABC would assist them in managing the warehouse and distribution function's costs.

17. In section C question 19.a of the questionnaire (Appendix A) regarding the usage of cost management tools. The results were as follows:

Diagram 5.14: The use of cost management tools



- 100% of the participants indicated that life-cycle costing and business process reengineering were not used in the warehouse and distribution function.
- 60% of the respondents indicated that target costing (TC) was not used at all, whereas 40% of the respondents indicated that TC was used to a moderate extent.
- 40% of the respondents indicated that kaizen costing was not used at all, whereas 20% indicated that was used to a moderate extent and 40% indicated that was used to a large extent.
- The majority of the respondents, 80% indicated that cost of quality is used to a moderate extent, whereas 20% indicated that it is not used at all.
- 40% of the respondents indicated that benchmarking was not used at all, 40% indicated to a moderate extent and 20% indicated that benchmarking was used to a large extent.
- The majority of the respondents, 80%, indicated that just-in-time (JIT) was not used at all, whereas 20% indicated that it was used to a moderate extent.

- The majority of the respondents, 80%, indicated that the value chain was used to a large extent, whereas 20% indicated that it was used to a moderate extent.
- The majority of the respondents, 100% indicated that they did not make use of business process reengineering at all.

18. In section C question 19.b of the questionnaire (Appendix A) the respondents had to briefly discuss their opinion in question 19.a if no. 1 had been selected. The results were as follows:

- 100% of the respondents indicated that life-cycle costing was not applicable.
- 40% of the respondents indicated that TC was not applicable, 20% indicated that TC was not an effective cost management system.
- 40% of the respondents indicated that Kaizen costing was not used due to a lack of knowledge.
- 20% of the respondents indicated that cost of quality was not used due to a lack of knowledge.
- 40% of the respondents indicated that it was difficult to get hold of competitor's information and they had never thought of making use of internal benchmarking.
- 80% of the respondents indicated that a JIT system was not applicable in the warehouse and distribution function, because there were too many variables that would influence a just-time-system, for example a customs stop or a customs inspection.
- 100% of the respondents indicated that they had never thought of making use of business process reengineering.

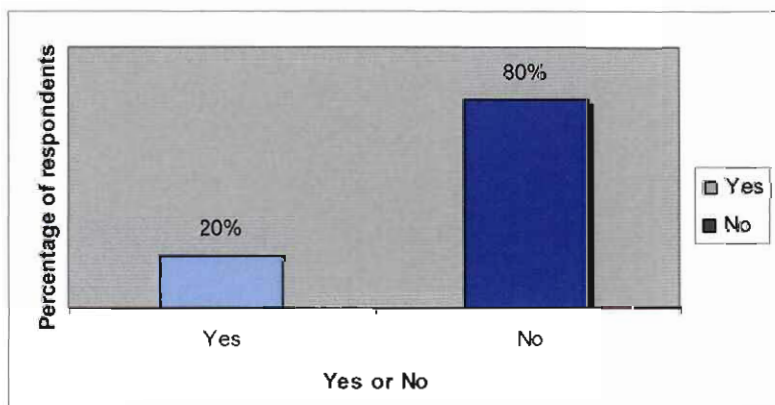
19. In section C question 19.c of the questionnaire (Appendix A) the respondents had to briefly discuss their opinion in question 19.a if no. 2 or 3 was selected. The results were as follows:

- 40% of the respondents indicated that TC was non-satisfactory. The competitor's price was available but a margin was never built in and this led to a loss of control over cost.

- 20% of the respondents indicated that kaizen costing was satisfactory, because cost was managed continuously. 40% of the respondents indicated that kaizen costing was non-satisfactory, because employees were not focused on reducing cost. The warehouse and distribution function was not profitable which means that kaizen costing was not used.
- 80% of the respondents indicated that it was non-satisfactory, because the information technology quality cost was too high, and that the quality of results were not good.
- 60% of the respondents indicated that benchmarking was non-satisfactory, because the warehouse and distribution function did not do it well.
- 20% of the respondents indicated that a JIT system was non-satisfactory, because information was not always in time and deliveries were not always made in time.
- 100% of the respondents indicated that the value chain was satisfactory, because the warehouse and distribution function formed a vital part of the value chain.

20. In section C question 20 of the questionnaire (Appendix A) regarding the use of a formal performance management system. The results were as follows:

Diagram 5.15: The use of a formal performance management system



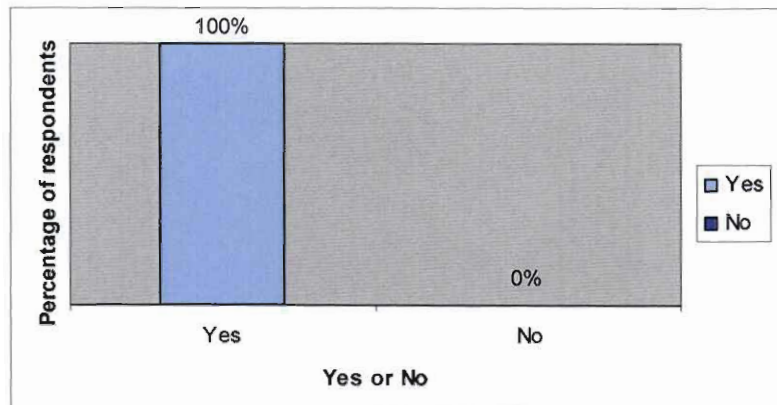
- 80% of the respondents indicated that they did make use of a formal performance management system. 20% indicated use was made of a formal management system.

Only one respondent indicated that he made use of a performance management system, so this respondent had to answer questions 21 to 25 and continue with question 27.

21. In section C question 21 of the questionnaire (Appendix A) regarding how long it took to develop the formal performance management system, the respondent indicated less than one year.
22. In section C question 22 of the questionnaire (Appendix A) regarding how long it took to implement the formal performance management system, the respondent indicated less than one year.
23. In section C question 23 of the questionnaire (Appendix A) regarding the people involved in developing the performance management system, the respondent indicated that he was the only one involved.
24. In section C question 24 of the questionnaire (Appendix A) regarding training received about performance management techniques; the respondent indicated that no one received training.
25. In section C question 25 of the questionnaire (Appendix A) regarding the effectiveness of the current performance management system in the warehouse and distribution function, the respondent indicated that the current system was ineffective.

26. In section C question 26 of the questionnaire (Appendix A) regarding the implementation of a formal performance management system in the next two years. The results were as follows:

Diagram 5.16: Implementing performance management in the next two years



- 100% of the respondents indicated that they were planning to implement a formal performance management system in the next two years.

27. In section C question 27 of the questionnaire (Appendix A) regarding key factors of the warehouse and distribution function's performance management. The results were as follows:

Table 5.2: Ranking of major key elements of the warehouse and distribution's performance management.

Respondents	Nr 1	Nr 2	Nr 3	Nr 4	Nr 5	Average
Achievement of financial targets	3	2	5	3	5	3.6
Development of skills	8	7	6	8	4	6.6
Improved customer care	1	1	1	2	3	1.6
Changes in behaviour	7	8	7	7	8	7.4
Motivation	5	6	8	6	7	6.4
Productivity	2	4	2	1	1	2
Development of competence	6	5	3	5	2	4.2
Improved quality	4	3	4	4	6	4.2

The key element with the lowest average is the most important to the respondents. Thus, the order of importance is as follows:

- Improved customer care
- Productivity
- Achievement of financial targets
- Improved quality
- Development of competence
- Motivation
- Development of skills
- Changes in behaviour

28. In section C question 28 of the questionnaire (Appendix A) regarding the importance of non-financial criteria of performance management in the warehouse and distribution function. The results were as follows:

Diagram 5.17: Importance of competence

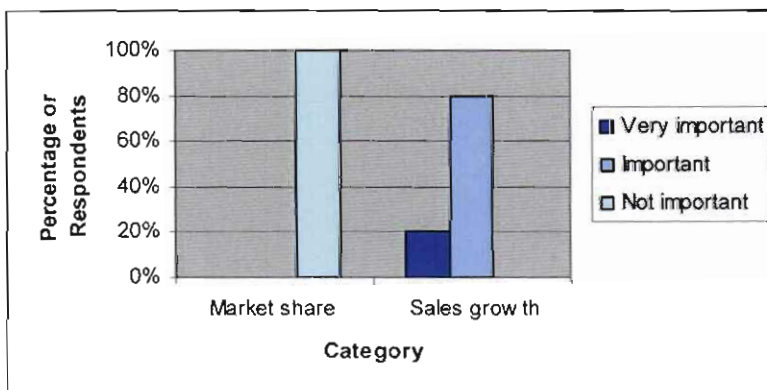
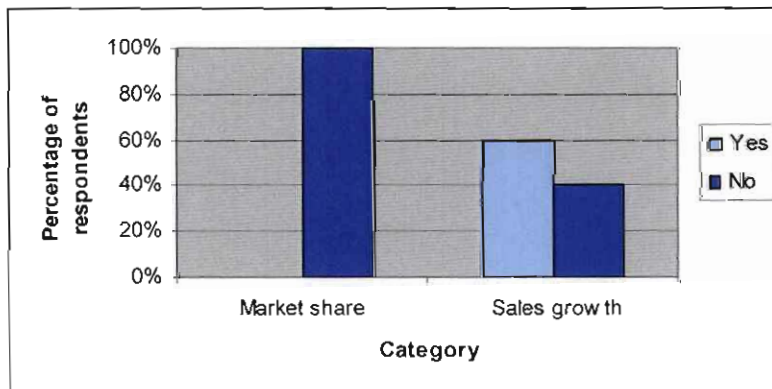


Diagram 5.18: Used as a measurement



- 100% of the respondents indicated that market share was not important to them and 100% of the respondents indicated that it did not get measured.
- The majority (80%) of the respondents indicated that sales growth was important to them, whereas 20% indicated that it was not important. 60% of the respondents indicated that sales growth was measured, whereas 40% indicated that it did not get measured.

Diagram 5.19: Importance of quality of service

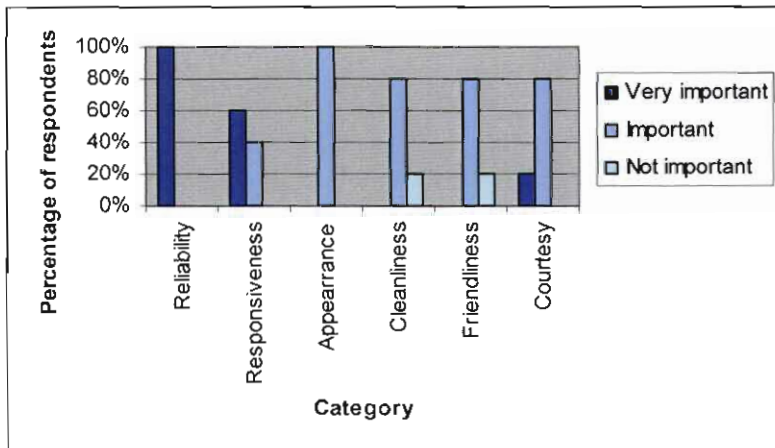
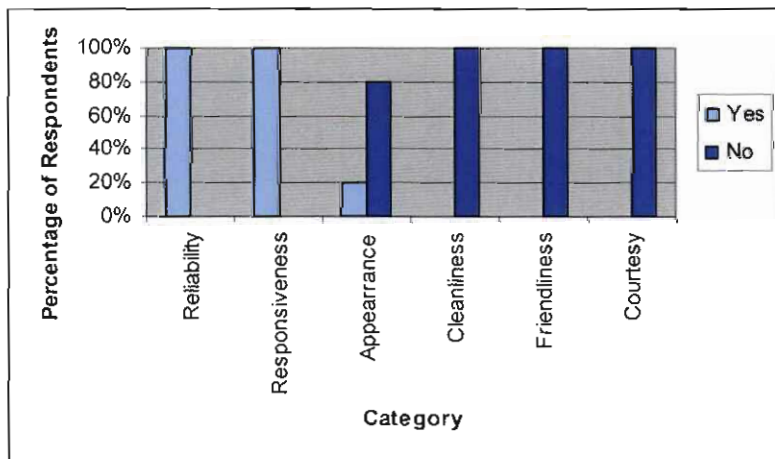


Diagram 5.20: Used as a measurement



- 100% of the respondents indicated that reliability was very important to them, and 100% indicated that reliability gets measured.
- 60% of the respondents indicated that responsiveness was very important to them, whereas 40% indicated that responsiveness was important to them. 100% of the respondents indicated that responsiveness was used as a measurement.

- 100% of the respondents indicated that appearance is important to them and the majority (80%) indicated that appearance did not get measured, whereas 20% indicated that appearance did get measured.
- The majority (80%) of the respondents indicated that cleanliness was important to them, whereas 20% indicated that cleanliness was not important. 100% of the respondents indicated that cleanliness did not get measured.
- The majority (80%) of the respondents indicated that friendliness was important to them, whereas 20% indicated that friendliness was not important. 100% of the respondents indicated that friendliness did not get measured.
- The majority (80%) of the respondents indicated that courtesy was important to them, whereas 20% indicated that courtesy was very important. 100% of the respondents indicated that courtesy did not get measured.

Diagram 5.21: Importance of flexibility

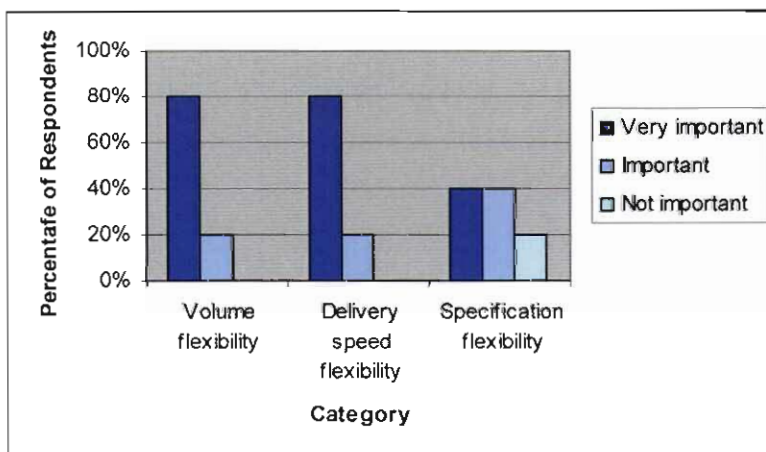
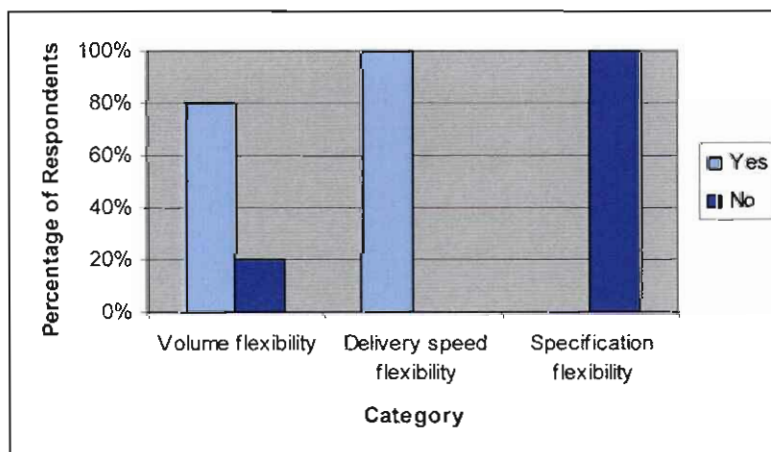


Diagram 5.22: Used as a measurement



- The majority (80%) of the respondents indicated that volume flexibility was very important to them, whereas 20% indicated that volume flexibility was important. 80% of the respondents indicated that volume flexibility did get measured, whereas 20% indicated that it did not get measured.
- The majority (80%) of the respondents indicated that delivery speed flexibility was very important to them, whereas 20% indicated that delivery speed flexibility was important. 100% of the respondents indicated that delivery speed flexibility did get measured.
- 40% of the respondents indicated that specification flexibility was very important to them, 40% indicated that specification flexibility was important and 20% indicated that it was not important. 100% of the respondents indicated that specification flexibility did not get measured.

Diagram 5.23: Importance of resource utilisation

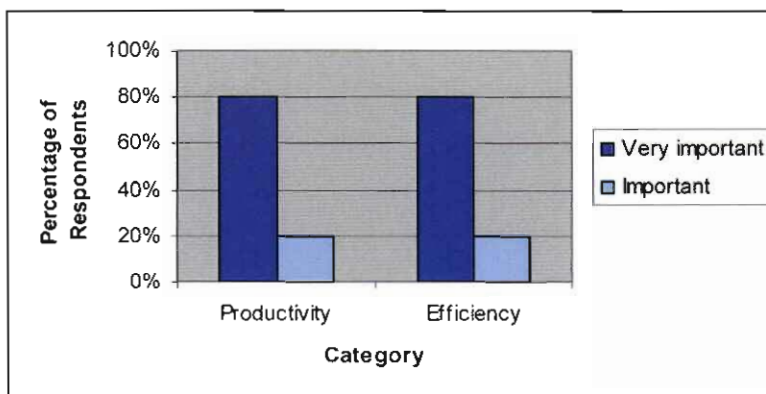
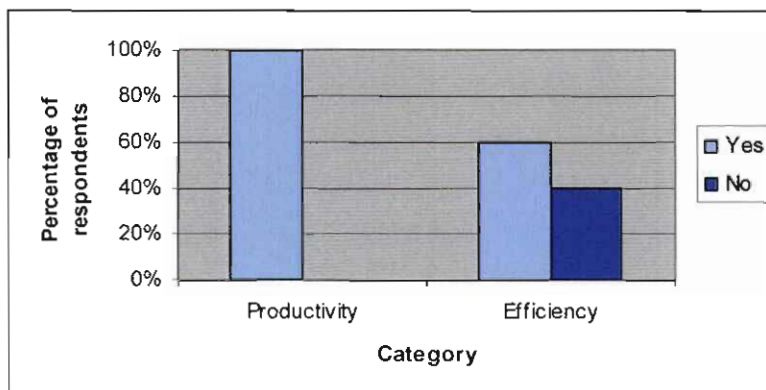


Diagram 5.24: Used as a measurement



- The majority (80%) of the respondents indicated that productivity was very important to them, whereas 20% indicated that productivity was important. 100% of the respondents indicated that productivity did get measured.

- The majority (80%) of the respondents indicated that efficiency was very important to them, whereas 20% indicated that efficiency was important. 60% of the respondents indicated that efficiency did get measured, whereas 40% indicated that efficiency did not get measured.

Diagram 5.25: Importance of innovation

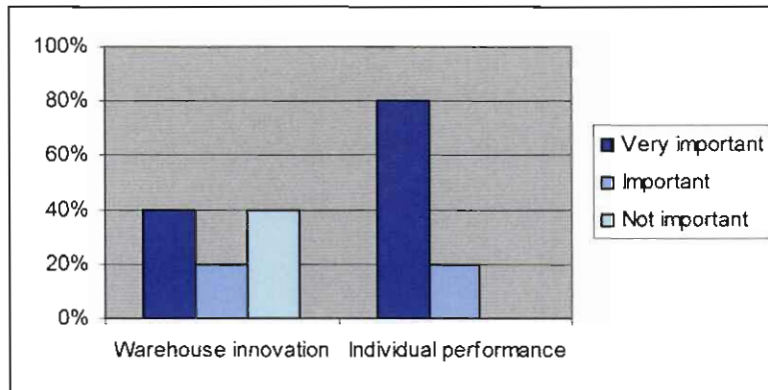
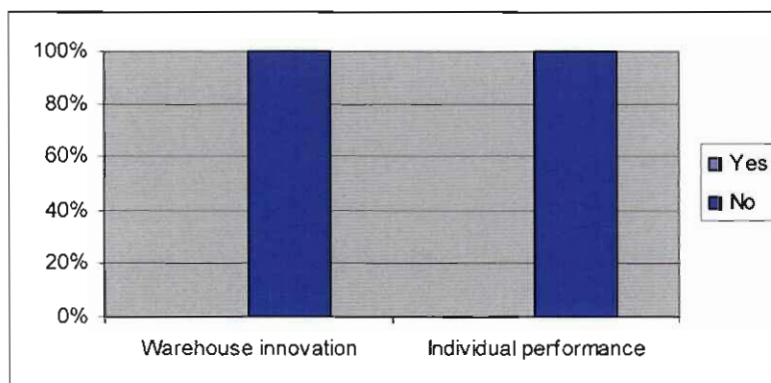


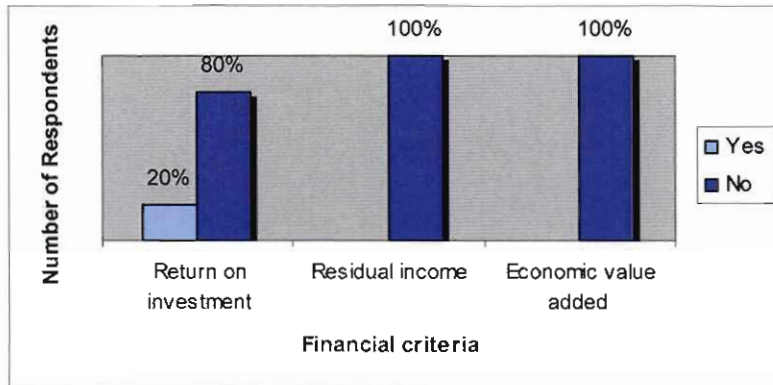
Diagram 5.26: Used as a measurement



- 40% of the respondents indicated that innovation is very important to them and 20% of the respondents indicated that innovation was important to them, whereas 40% indicated that innovation was not important to them. 100% of the respondents indicated that innovation did not get measured.
- The majority (80%) of the respondents indicated that individual performance was very important to them, whereas 20% indicated that individual performance was important. 100% of the respondents indicated that individual performance was not measured.

29. In section C question 29 of the questionnaire (Appendix A) regarding the use of financial performance measurements in the warehouse and distribution function. The results were as follows:

Diagram 5.27: Financial measures used for the warehouse and distribution function



- The majority (80%) of the respondents indicated that return on investment (ROI) was not used as a financial measurement in the warehouse and distribution function, whereas 20% indicated that ROI was used as a measurement.
- 100% of the respondents indicated that residual income (RI) was not used as a financial measurement in the warehouse and distribution function.
- 100% of the respondents indicated that residual economic value added (EVA) was not used as a financial measurement in the warehouse and distribution function.

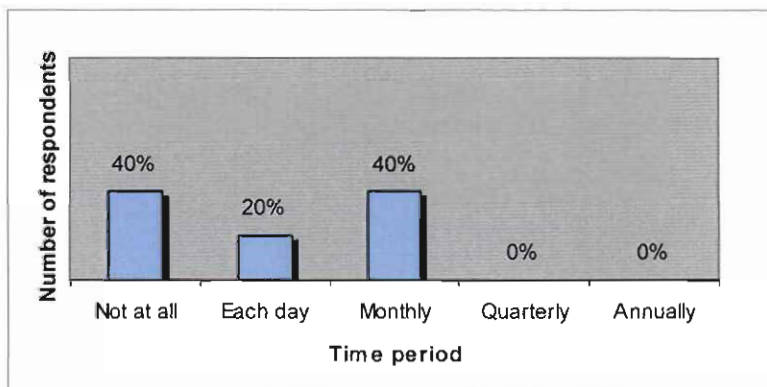
30. In section C question 30 of the questionnaire (Appendix A) the respondents had to indicate if they made use of any other financial measurements in the warehouse and distribution function. The results were as follows:

- 60% of the respondents answered this question and indicated that they made use of
 - Contribution margin
 - Net income
 - Operating income
 - Net profit
 - Budget variance analysis
 - Cost analysis

- 60% of the respondents also indicated that the above measurements are used for the warehouse as a whole and that it had never been done for a specific client.

31. In section C question 31 of the questionnaire (Appendix A) regarding how regularly performance measurements in the warehouse and distribution function are evaluated. The results were as follows:

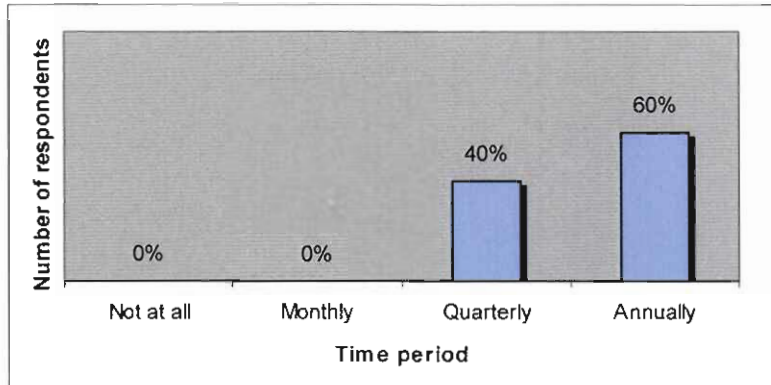
Diagram 5.28: Performance evaluation



- 40% of the respondents indicated that performance does not get evaluated at all, 20% indicated that performance was evaluated every day, whereas 40% indicated that performance was evaluated monthly in the warehouse and distribution function.

32. In section C question 32 of the questionnaire (Appendix A) regarding how regularly employees were sent on training courses in the warehouse and distribution function. The results were as follows:

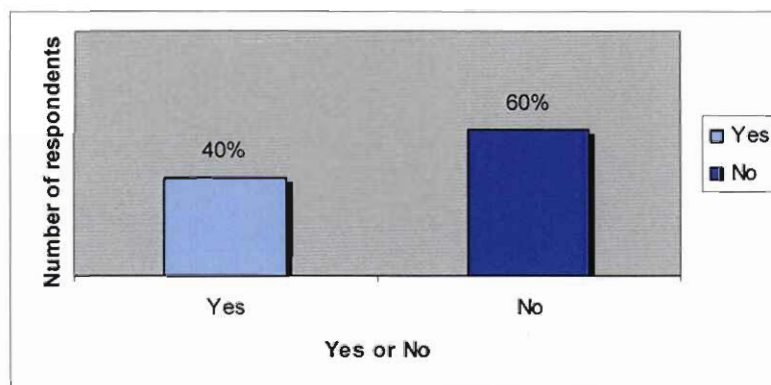
Diagram 5.29: Training courses



- 40% of the respondents indicated that employees were sent on training courses quarterly and 60% indicated that employees in the warehouse and distribution function were sent on training courses annually.

33. In section C question 33 of the questionnaire (Appendix A) regarding how adequately employees in the warehouse and distribution function were informed about performance management. The results were as follows:

Diagram 5.30: Employee informed about performance management



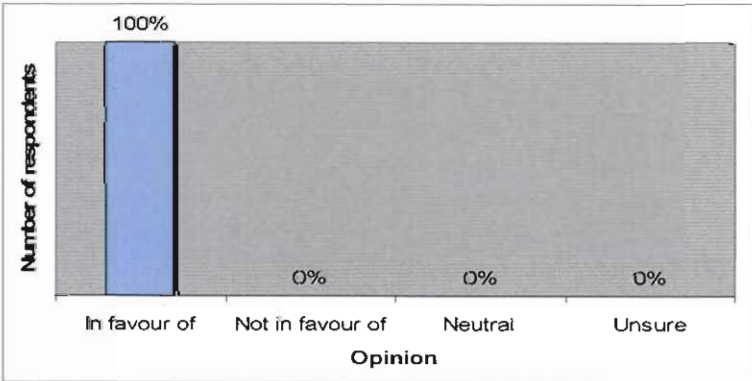
- 40% of the respondents indicated that employees were adequately informed about performance management, whereas 60% indicated that employees in the warehouse and distribution function were not adequately informed about performance management.

34. In section C question 34 of the questionnaire (Appendix A) regarding the reward system used to motivate employees in the warehouse and distribution function. The results were as follows:

- 100% of the respondents indicated that picking targets and incentives were used to motivate employees in the warehouse and distribution function.

35. In section C question 35.a of the questionnaire (Appendix A) regarding the respondents' opinion of the balanced scorecard (BSC). The results were as follows:

Diagram 5.31: Opinion of the balanced scorecard



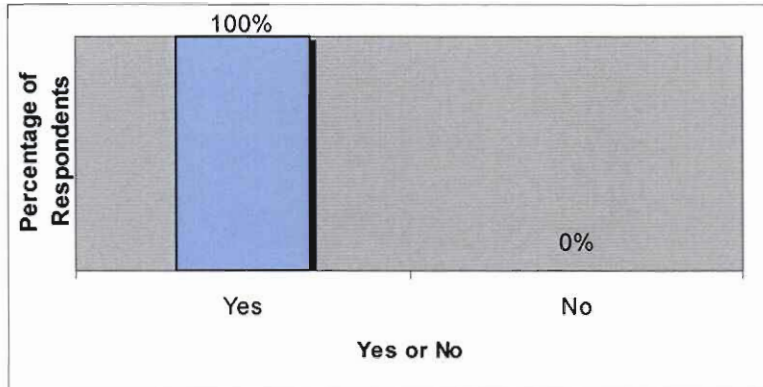
- 100% of the respondents were in favour of the BSC.

36. In section C question 35.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion expressed in question 35.a. The results were as follows:

- 20% of the respondents indicated that the BSC had been used by a previous employer and that it was a very fair system, to be recommended to SLA.
- 40% indicated that the BSC would ensure that all measurements were built around the mission and vision of the company.
- 40% indicated that the BSC would help them focus on the correct areas and assist management in being proactive.

37. In section C question 36.a of the questionnaire (Appendix A) if the BSC would assist management in measuring and managing performance more accurately. The results were as follows:

Diagram 5.32: Managing performance in the warehouse by using the BSC



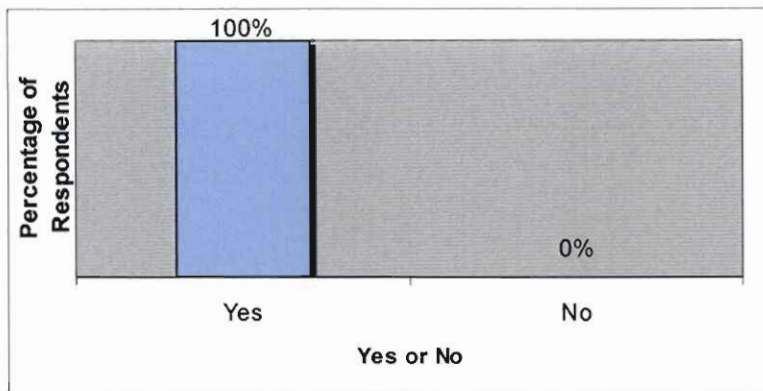
- 100% of the respondents indicated that by using the BSC to measure and manage performance, these would be done more accurately.

38. In section C question 36.b of the questionnaire (Appendix A) the respondents had to indicate why they were of the opinion expressed in question 36.a. The results were as follows:

- 100% indicated that "what gets measured gets managed".

39. In section C question 37 of the questionnaire (Appendix A) the respondents had to indicate if they thought that by measuring and managing their performance it would affect their process costs and profitability positively. The results were as follows:

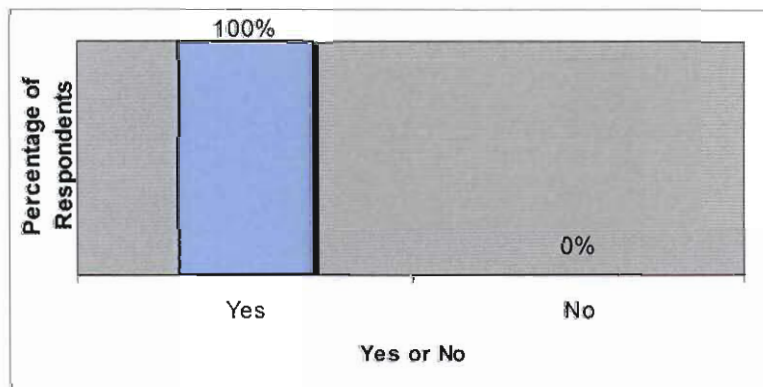
Diagram 5.33: Will performance management affect profitability positively?



- 100% of the respondents indicated that measuring and managing their performance would influence cost and profitability positively.

40. In section C question 38 of the questionnaire (Appendix A), asking if the respondent would consider changing to the BSC. The results were as follows:

Diagram 5.34: Changing to the balanced scorecard



- 100% of the respondents indicated that they would consider changing to the BSC approach.

5.3 SUMMARY

The empirical study was conducted at SLA, to analyse their warehouse and distribution function's existing cost and performance management system. Relevant information was obtained from SLA by means of a structured questionnaire (Appendix A) that was used during the interviews. The information gathered included information such as personal background, warehouse and distribution background, the current use of activity-based costing, cost management tools and their current performance management system. The results can be summarised as follows:

- As illustrated in Diagram 5.2, the majority (80%) of the respondents had been working in the logistics industry for more than two years, whereas 60% of the respondents had been working for SLA for more than five years. The respondents consisted of the director, two senior managers, one team leader and the business analyst.
- As illustrated in Diagram 5.4, 100% of the respondents said that there was room for improvement regarding the profitability of the warehouse and distribution function.
- As illustrated in Diagram 5.5, there were between ten and thirty employees in the warehouse and distribution function.
- As illustrated in Table 5.1, the most important elements of the warehouse and distribution function's strategy were customer satisfaction, increasing efficiency and increasing profitability.
- As illustrated in Diagram 5.6, the warehouse and distribution function did not make use of an activity-based costing system and as illustrated in Diagram 5.8; their current system was not effective.
- As illustrated in Figure 5.1, the main activities in the warehouse and distribution function consisted of receiving, putting away, centre floor/storage, picking, delivery and offloading of returns. The warehouse and distribution function was labour intensive and as illustrated in Diagram 5.10 not all activities were value-adding activities.
- As illustrated in Diagram 5.14, the warehouse and distribution function does not make use of life-cycle costing and business process reengineering at all. The majority (80%) of the respondents indicated that they did not make use of a JIT system. The majority (60%) of the respondents indicated that they did not make

use of TC. The majority 80% of the respondents indicated that they did make use of kaizen costing. 80% of the respondents indicated that they made use of cost of quality. 60% indicated that they made use of benchmarking, and 80% indicated that they made use of the value chain.

The above indicate the current use of activity-based costing, cost management and performance management in the warehouse and distribution function. In chapter 6, conclusions and recommendations regarding activity-based performance management for the warehouse and distribution function in SLA will be made.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

Strategic Logistical Alliance (SLA) is committed to become and remain the number one third-party logistics provider in the South African market. SLA sets high standards for itself, but these standards can only be achieved if the company is profitable and financially successful.

In the era of a competitive global environment and technology-based organisations, managers are pressured to find ways to maintain their competitive advantage. SLA needs to position itself as a well-known and respected competitor through the use of two strategic weapons. The first of these is the achievement of high quality service levels, and the second a competitive pricing structure.

As stated in the problem statement in chapter 1, paragraph 1.3, SLA has proven to be a market leader within the logistics services market whilst maintaining profitability in most of its core business functions, with the exception of the warehousing and distribution function.

In this chapter the achievement of the objectives as stated in paragraph 1.4 will be addressed in order to solve the problem as stated in paragraph 1.3. The data gathered from the literature study in chapters 2, 3 and 4 and the data obtained from the structured interviews were taken into account to reach conclusions and recommendations regarding the use of an activity-based performance management system in the warehouse and distribution function of SLA.

Conclusions and recommendations will be made under the following headings: Activity-based costing, cost management and performance management.

6.2 ACTIVITY-BASED COSTING AND ACTIVITY-BASED MANAGEMENT

6.2.1 *Activity-based costing*

Part of the primary objective as stated in paragraph 1.4.1 is to analyse the existing cost allocation system in the warehouse and distribution function. Most of the respondents indicated that the warehouse and distribution function does not currently make use of a formal allocation system (see diagram 5.7). One person indicated that they make use of square metres and headcount to allocate the costs, but all participants indicated that it is not an effective method (see diagram 5.8).

The main shortcoming of the current allocation system is that the true cost of the service is not revealed.

- The true cost is needed to **analyse cost and profitability** of individual products, services and customers. If the true cost is incorrect, this will lead to an incorrect net income, incorrect cost of sales and incorrect profitability of a product or service.
- The true cost is a tool which assists management in decision-making, which forms part of the secondary objective (see paragraph 1.4.2). To determine a competitive and accurate **pricing** structure of a product or service, it is very important to determine the true cost of the product or service.
- True cost is a tool which assists management during planning and control, and it forms part of the secondary objective (see paragraph 1.4.2). The true cost is important for variable budgeting purposes, the use of these budgetary techniques relies heavily on the accuracy of the calculation of true cost.

The above sets out the importance of determining the true cost of a product or service. This means that the correct cost allocation system must be used to ensure that costs (fixed or variable) are accurately allocated and that the true cost can be determined.

ABC is a cost allocation system that will assist management in making **more accurate cost allocations**. ABC is a costing method based on the principle that products and/or services require an organisation to carry out activities, that these activities require resources and that these resources require an organisation to incur cost.

The use of ABC in the warehouse and distribution function is therefore highly recommended, seeing that:

- ABC provides an understandable representation of where resources are spent in an organisation. ABC reduces the unpredictability in cost measurement by closely matching cost allocations to the actual use of resources by operating activities.
- ABC assists managers in focusing on activity-level measurement. After identifying activities and cost drivers, managers are more aware of the cause-and-effect relationships. This awareness motivates managers and employees to look for ways to advance performance simply because they have more information about the cost effects of an activity.
- ABC relies on a greater number of cost drivers to allocate overheads on a cause-and-effect basis and therefore cost can be traced more accurately. ABC also assists in determining the areas and/or customers that generate the greatest profit or loss. Product and customer profitability analysis can be performed by making use of activity-based management (ABM), which may significantly alter management perceptions of the status of an operation as a more accurate and effective allocation of costs is obtained.
- ABC identifies value-adding activities, which are those activities that add value from the customer's point of view.
- ABC assists managers in identifying non-value adding activities so that they can be improved, or in order to add value from the customer's point of view, or so that the activity can be eliminated in order to decrease cost.

- ABC identifies many activity costs that are not directly linked to production at all but are traditionally allocated to products as production cost. On the other hand, it identifies many marketing, selling and administrative costs that should be included to establish better pricing estimates.

The first secondary objective of the study is to implement activity-based performance management systems effectively and efficiently so as to ensure business success through continuous improvement. In order to implement an ABC system effectively and efficiently, refer to paragraph 2.4, where the steps of implementing an ABC system are discussed. For an example of the implementation of an ABC system in the warehouse and distribution function, refer to paragraph 2.4.5.

6.2.2 Activity-based management

The warehouse and distribution function does not currently make use of activity-based management (ABM), seeing that they indicated that not all of their activities are value-adding activities (see diagram 5.10). ABM is a cost management system that focuses on the management of activities, therefore the warehouse and distribution function should consider making use of ABM (see paragraph 2.6), together with ABC.

Activities consume costs, therefore by managing activities, **cost will be managed**, which will lead to **continuous improvement**. ABM is very dependent on the quality of information provided by activity-based costing. ABM **adds value** to activities (by eliminating waste and reducing delays due to defects) and thus leads to an increase in **customer satisfaction, profitability** (by making fewer demands on resources), **efficiency** and better **quality** within the warehouse and distribution function. ABM will also assist management of the warehouse and distribution function to make decisions about

- pricing and product mix,
- how to reduce costs,
- how to improve processes, and
- product or service design.

It is highly recommended that the warehouse and distribution function makes use of ABM in order to achieve the secondary objective (see paragraph 1.4.2) of a more effective and efficient activity-based performance management system.

6.3 CONCLUSIONS AND RECOMMENDATIONS REGARDING COST MANAGEMENT

Part of the primary objective, as stated in paragraph 1.4.1, is to analyse the existing cost management system in the warehouse and distribution function. Currently the warehouse and distribution function does not manage its cost effectively in order to minimise cost and increase the quality of the service they deliver.

In order to achieve the secondary objective (see paragraph 1.4.2) to improve the current cost management system in order to achieve an overall competitive advantage, it is highly recommended that the warehouse and distribution function makes use of cost management tools. Cost management will assist management in the warehouse and distribution function in

- implementing programmes to control decisions that minimise costs of products or services, and
- increasing the value or quality of the products or services to ensure customer satisfaction, and
- increasing the profitability.

Cost management forms an important part of management strategies and their implementation, and therefore conclusions and recommendations regarding the usage of different cost management tools will be discussed next.

6.3.1 *Life cycle costing (LCC)*

In order to reduce cost it is important for the warehouse and distribution function to take note of **all** costs applicable to the service they deliver. The cost not only includes service cost but includes the costs incurred during the pre- and post-service phase. The warehouse and distribution function does not make use of life cycle costing (LCC) (see diagram 5.14).

The warehouse and distribution function should seriously consider making use of LCC, seeing that there is a possibility that costs are currently determined inaccurately. The cost of a service should include all costs from the planning and design, service delivery and post-service delivery stages.

LCC contributes to target costing (TC). TC is a technique that manages costs during the planning and design stage of a product or service. Conclusions and recommendations regarding TC are discussed below.

6.3.2 Target costing (TC)

The warehouse and distribution function does not make use of target costing (TC), a finding that is based on the research done in chapter 5. It is highly recommended that the warehouse and distribution function consider making use of TC.

TC is a cost management tool which assists management in determining whether cost should be decreased in order to satisfy customer demands at an acceptable level of profitability. TC involves four steps (see paragraph 3.2.2) which the warehouse and distribution function should consider. Value engineering is used in TC to reduce cost and is discussed next.

6.3.3 Value engineering

Value engineering (see paragraph 3.2.2.2) requires the use of **functionality analysis**, a process of examining the performance and cost of each major function of the product or service in order to find ways to attain a desired balance of functionality and target cost. It is recommended that the warehouse and distribution function make use of **value engineering** in order to support TC. The warehouse and distribution function should make use of value engineering to examine all types of service functions as well as the total service costs in order to achieve the target cost. This will assist management in achieving TC more easily, which will lead to lower prices for the service and give them a competitive advantage.

6.3.4 Kaizen costing

The warehouse and distribution function does not make use of Kaizen costing effectively (see diagram 5.14 and paragraph 5.2.3(19)). The warehouse and distribution function should consider making use of Kaizen costing. Kaizen costing together with TC is used to reduce costs (see figure 3.2). Kaizen costing can be defined as **continuous improvement**, being the ongoing process of finding new ways to minimise and manage cost during the service process without forfeiting the quality and functionality of the product or service.

When making use of Kaizen costing the warehouse and distribution function must realise that it relies on employee empowerment (see paragraph 3.2.3). Therefore the warehouse and distribution manager should encourage employees to be innovative and to find ways of improving the process and reducing costs. It is also very important that employees must be motivated never to forfeit the quality and functionality of the service when making suggestions to improve the process in order to reduce costs.

6.3.5 Business process reengineering (BPR)

The warehouse and distribution function does not make use of business process reengineering (BPR) at all (see diagram 5.14). BPR requires a detailed examination of the current business processes and radical changes to organisational operation. This involves fundamental rethinking and radical redesign in order to eliminate unnecessary activities, to reduce opportunities for error, **reduce cost** and improve productivity. Improved quality, service, lead time, flexibility, innovation and customer satisfaction (see paragraph 3.2.5) should also be included in the process. Based on the above it is recommended that the warehouse and distribution function make use of BPR.

The warehouse and distribution function must consider making use of BPR together with ABC and ABM in order to identify and eliminate non-value-adding activities. BPR will lead to **higher profitability** and **improve competitiveness**.

The process flow of the warehouse and distribution function with recommendations will now follow in figure 6.1:

Figure 6.1: Process flow of the warehouse and distribution function

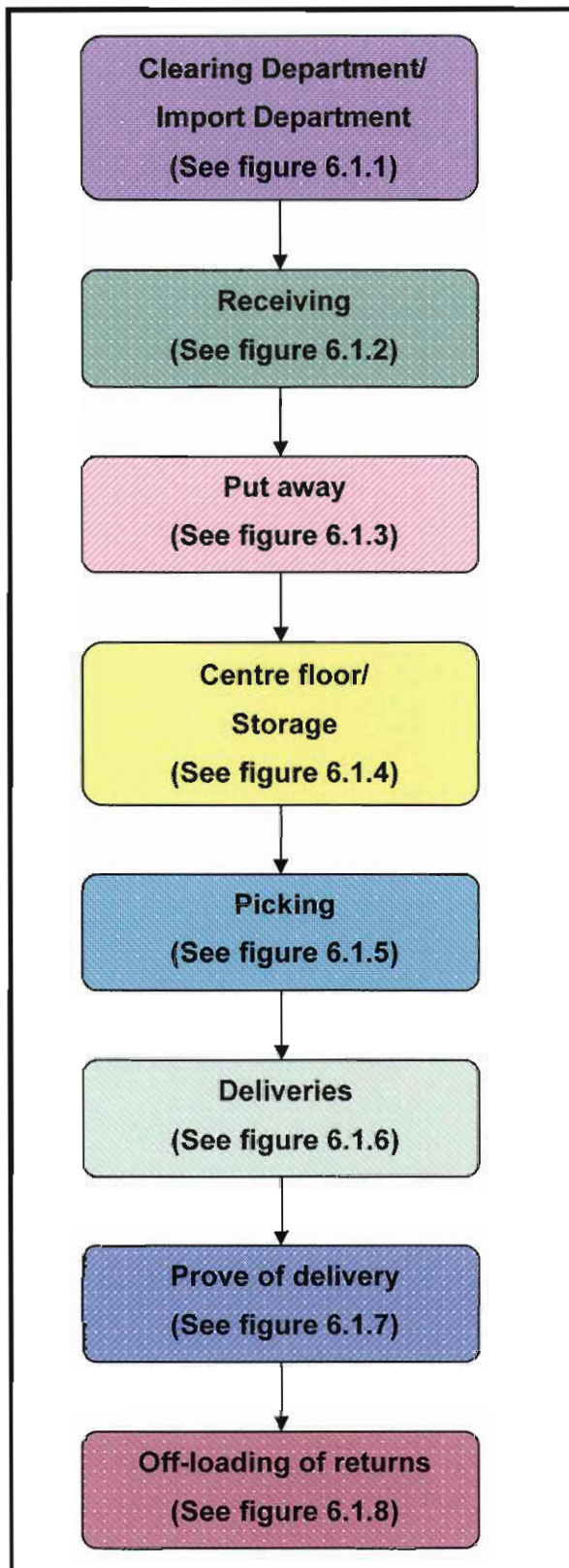


Figure 6.1.1: Clearing Department/Import Department

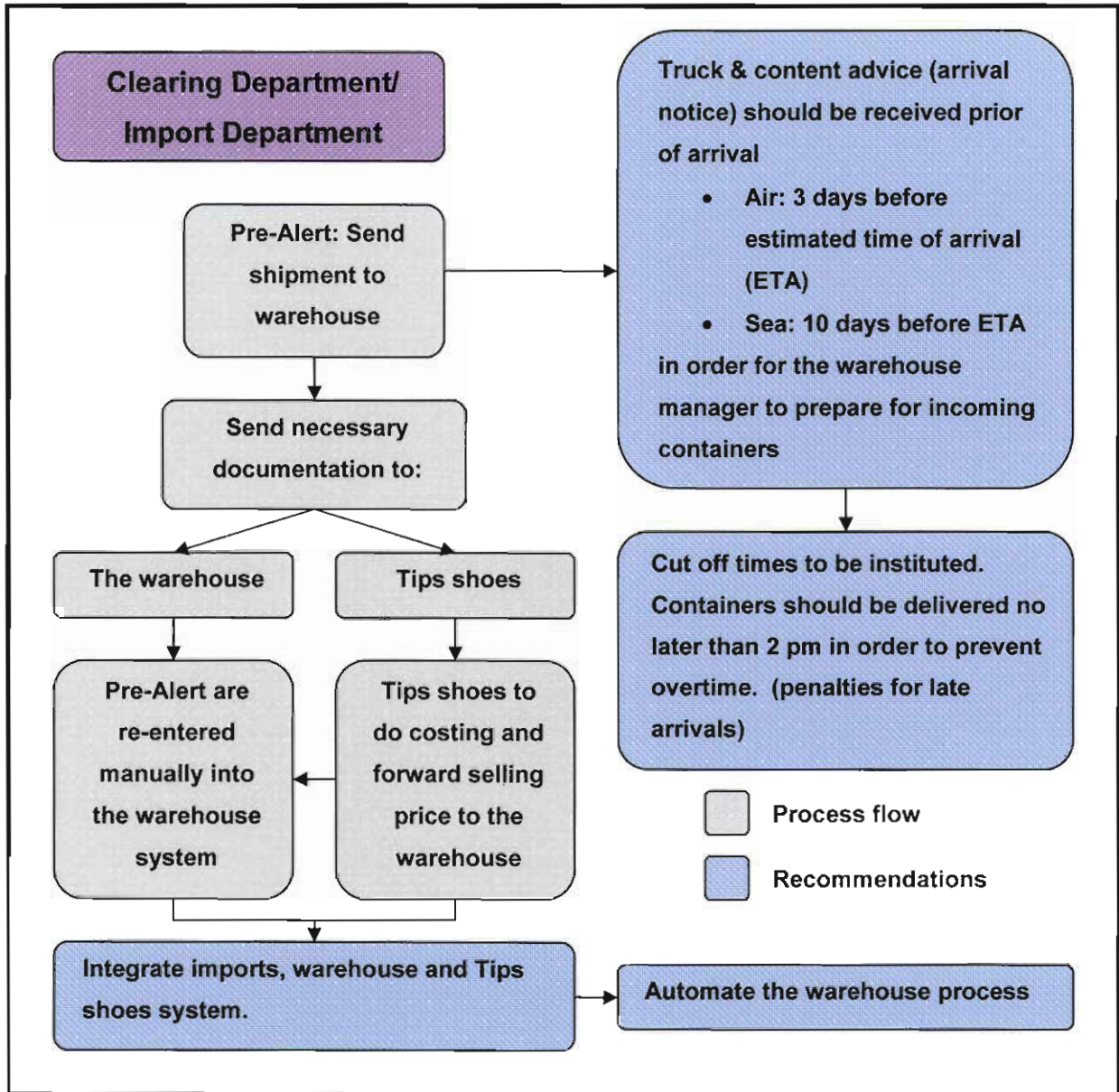


Figure 6.1.2: Receiving

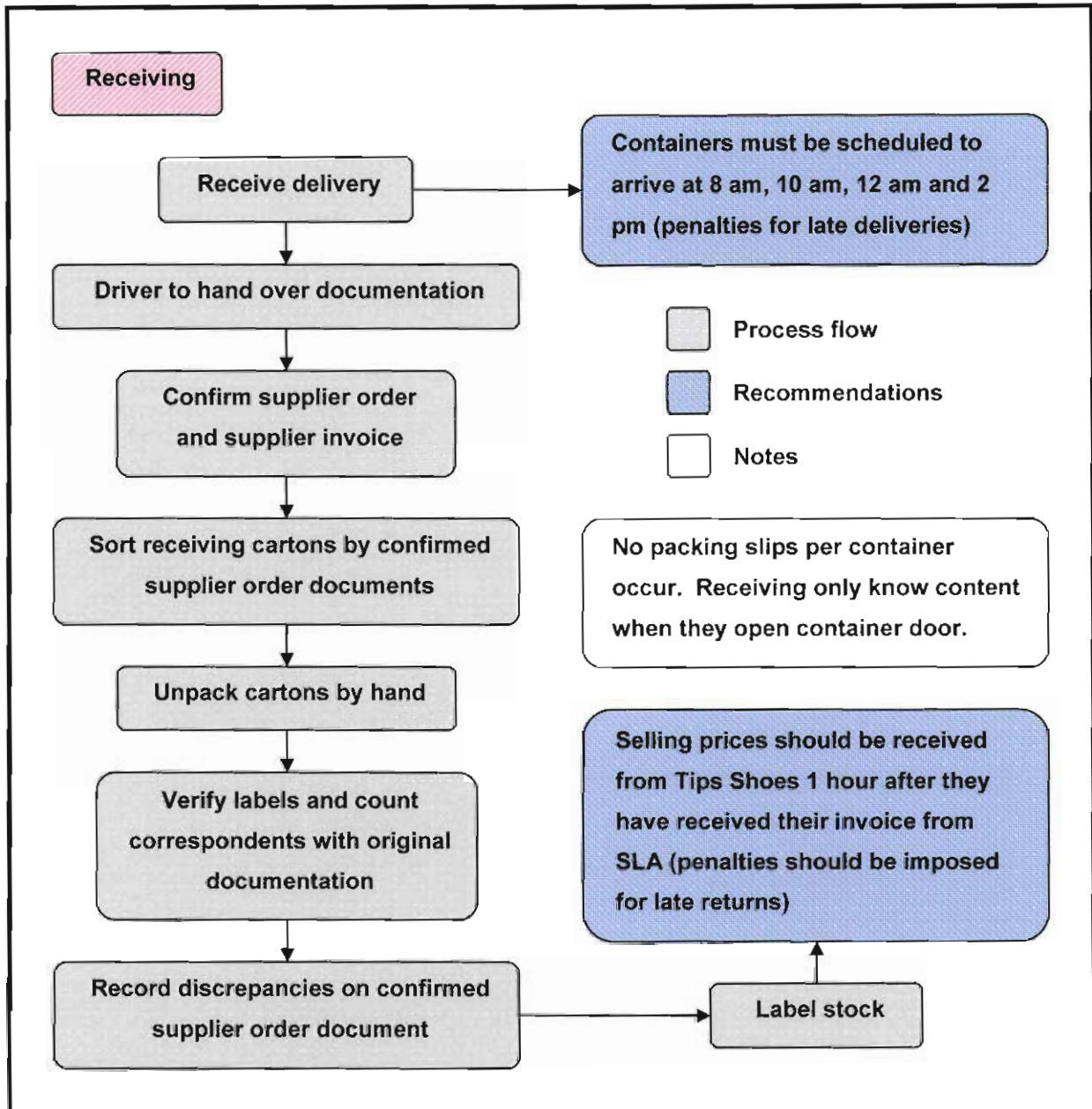


Figure 6.1.3: Put away

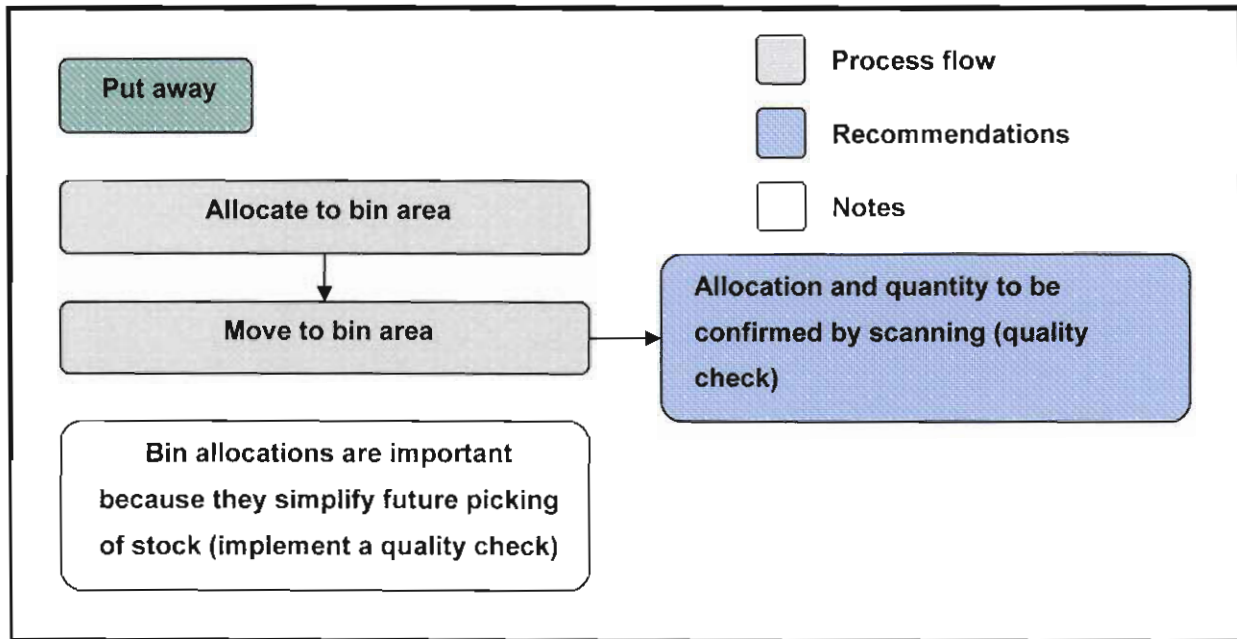


Figure 6.2.4: Centre Floor/Storage

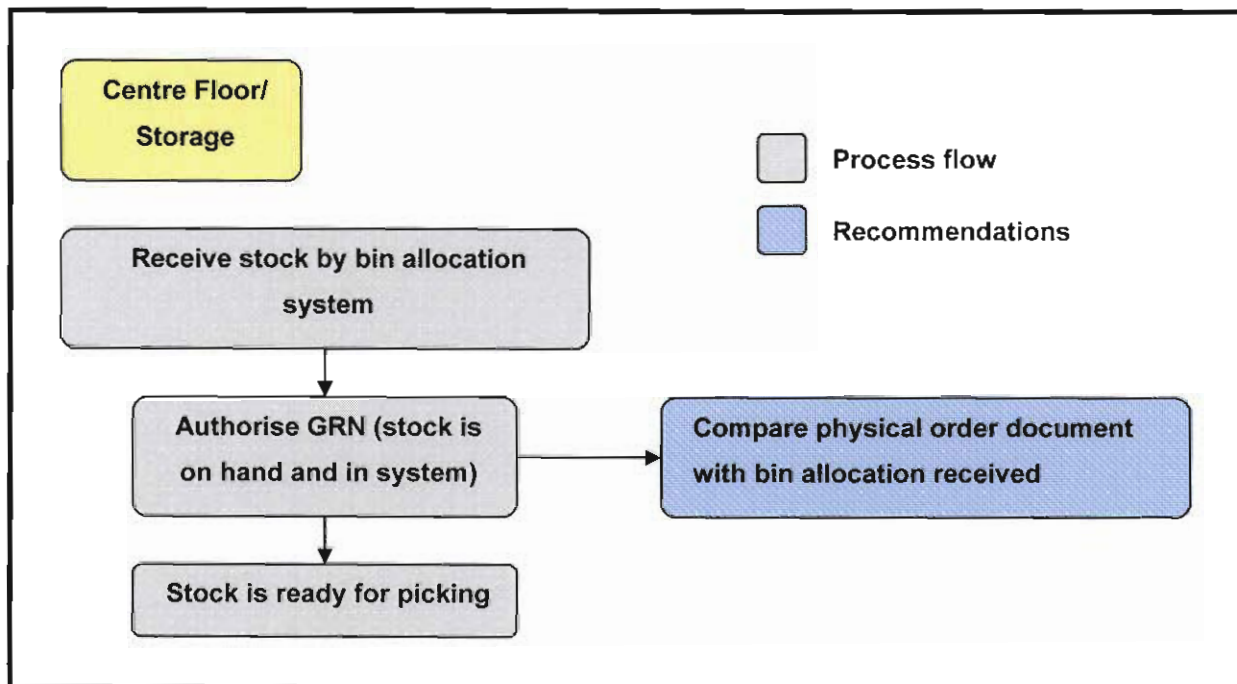
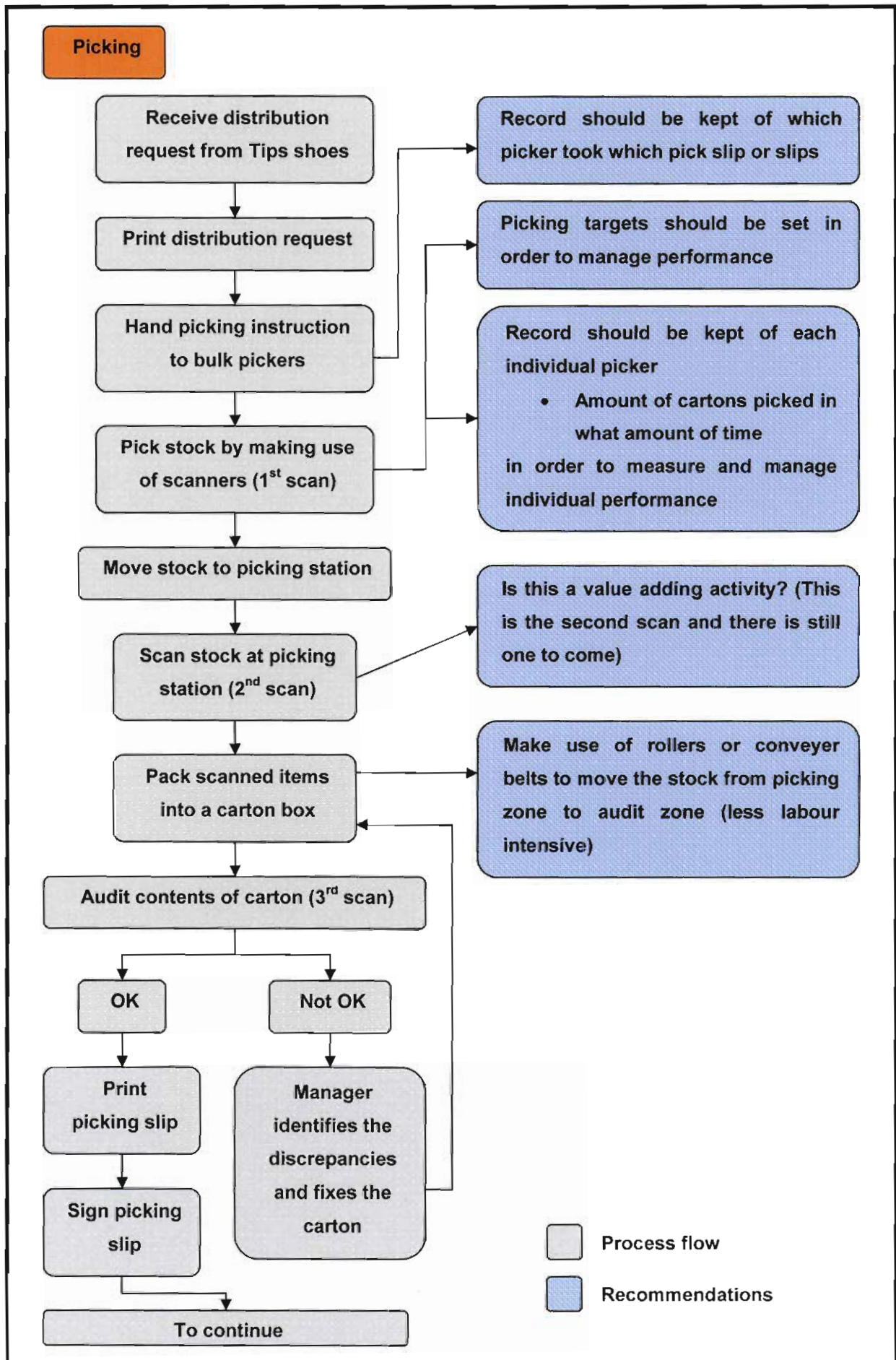


Figure 6.1.5 Picking



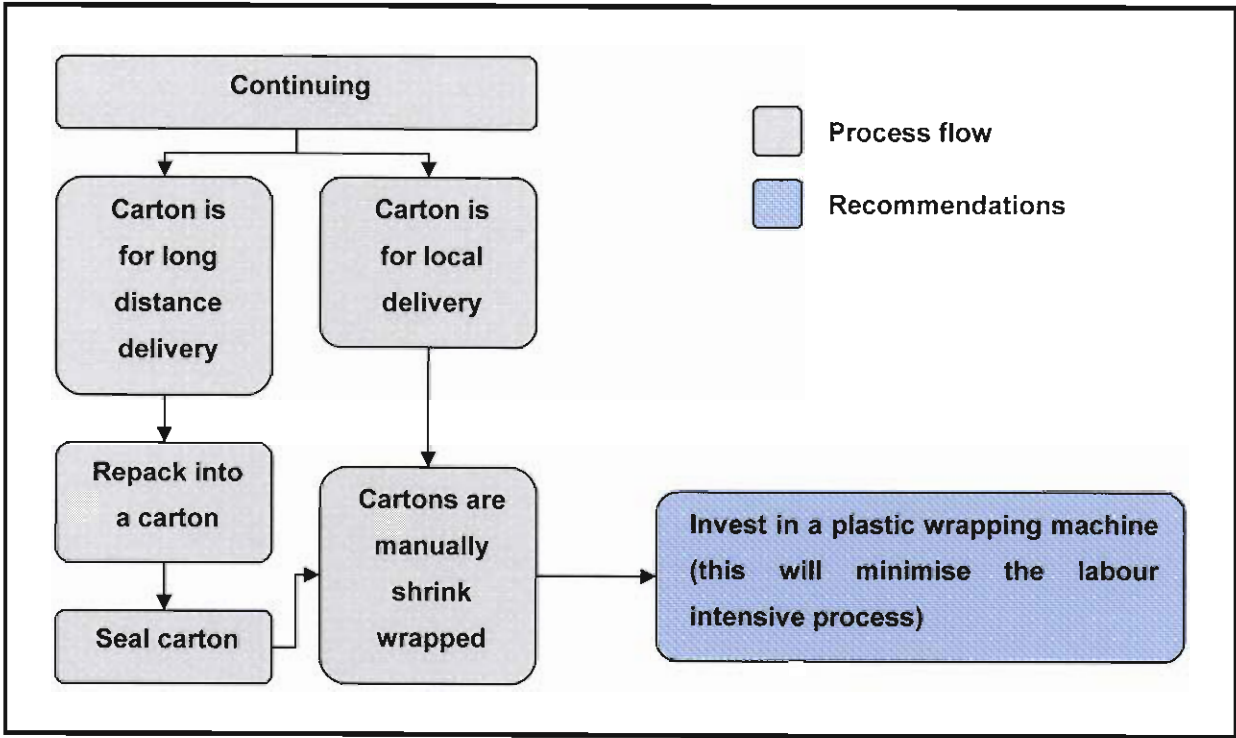


Figure 6.1.6: Deliveries

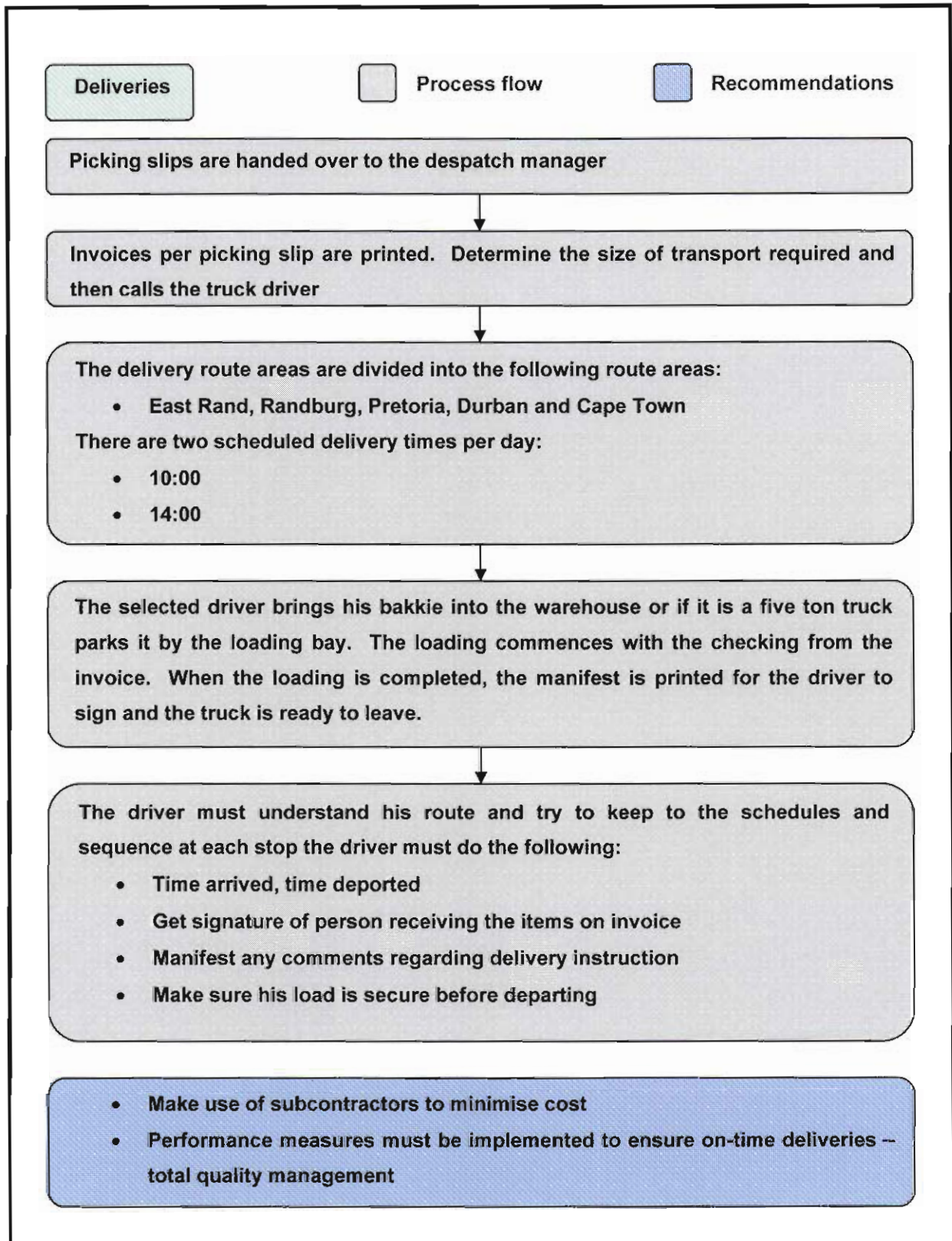


Figure 6.1.7 Proof of delivery

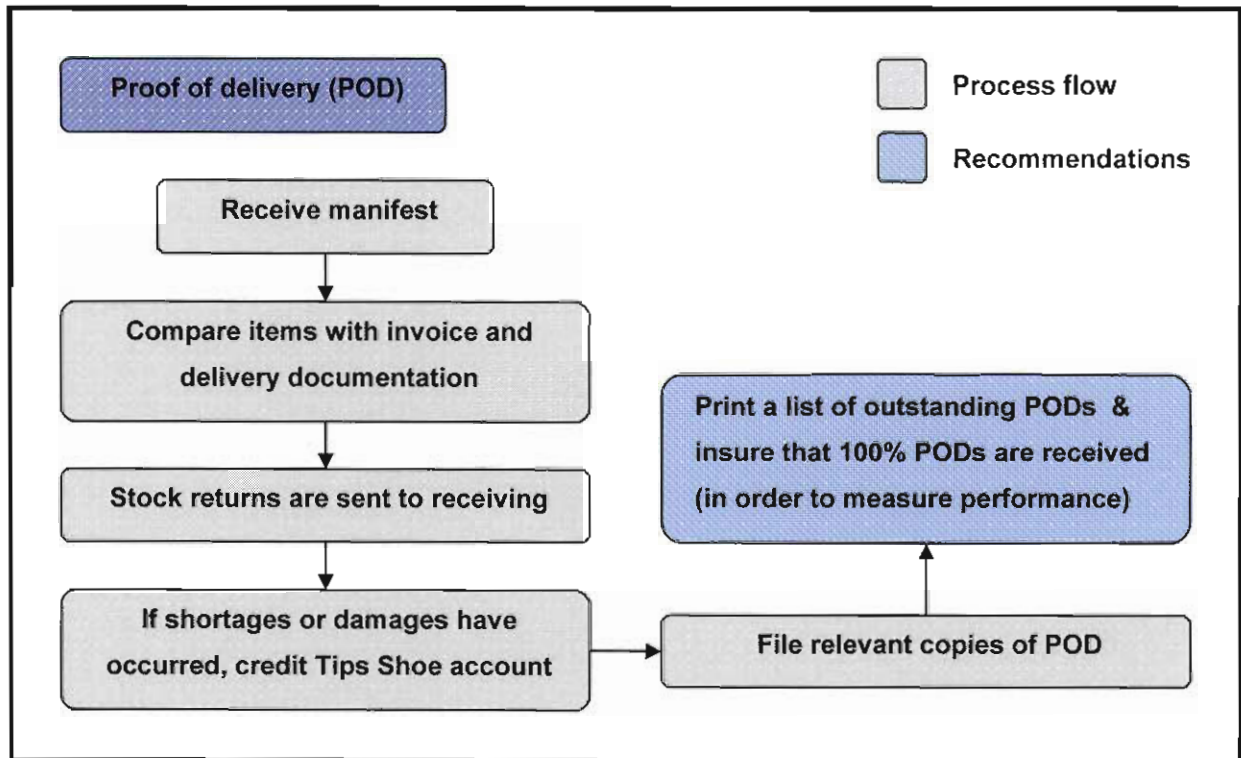
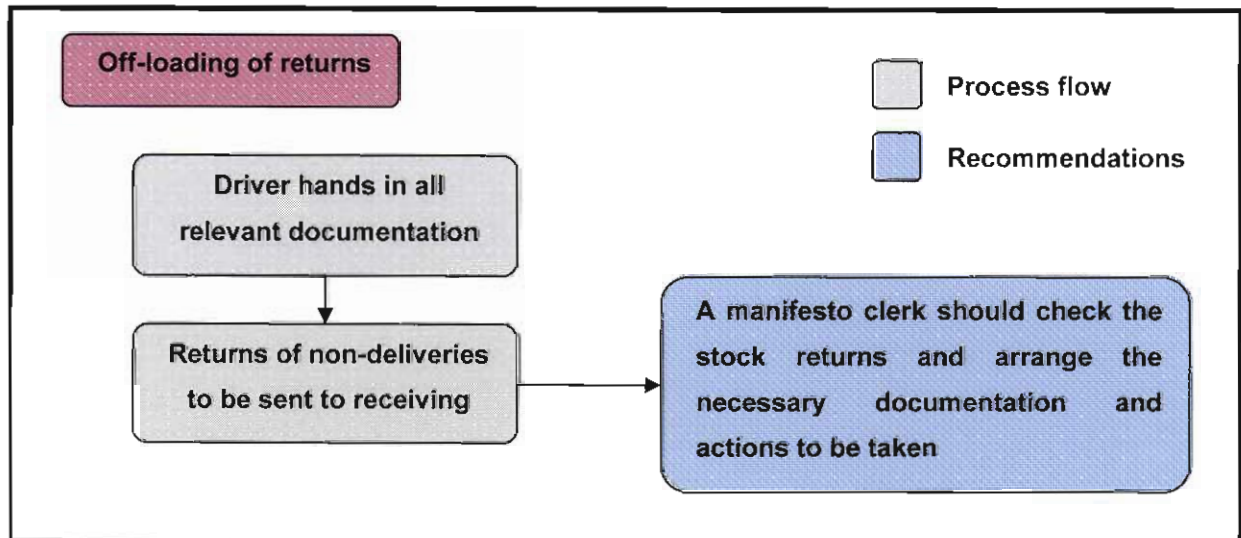


Figure 6.1.8: Off loading of returns



6.3.6 Cost of quality and Total Quality management

The warehouse and distribution function currently makes use of cost of quality and total quality management (TQM) to a moderate extent (see diagram 5.14). Results of research performed has indicated that the current use hereof is unsatisfactory owing to the fact that they are not aware of how much investment is made in quality, and that the quality of their service is still too low.

It is recommended that the warehouse and distribution function make use of a **cost of quality report** (see paragraph 3.2.6). Cost of quality can be classified into four categories. These four categories are prevention costs, appraisal costs, and internal and external costs, which will enable management to measure and manage their cost of quality. It is highly recommended that the warehouse and distribution function spend more on compliance costs (prevention and appraisal costs), in order to spend less on non-compliance costs (internal and external costs). This will lead to lower total cost of quality.

The **foundations** of TQM (see paragraph 3.2.6) are customer focus, continuous improvement and teamwork. It is highly recommended that the warehouse and distribution function focus on these foundations. Making use of TQM should encourage employees to work together as a team to improve quality on a continuous basis, using a set of tools and techniques.

If the warehouse and distribution function implement the above it will lead to lower quality costs, higher customer satisfaction, continuous quality improvement of services and the improvement of competitiveness, effectiveness, and flexibility.

6.3.7 The value chain

The warehouse and distribution function makes use of the value chain and indicated that this is satisfactory; they see themselves as a vital part of the value chain.

The warehouse and distribution function must realise that the value chain is a sequence of business activities in which usefulness is adding to the products or services of the organisation to ensure value to the customer and therefore a competitive advantage. By increasing the attention to the value chain and developing a close relationship (sharing information) with suppliers and customers in order to reduce costs and excess inventories costs will be managed more effectively in the warehouse and distribution function and customer satisfaction will be increased.

6.3.8 Benchmarking

The warehouse and distribution function does make use of benchmarking. Its current use is insufficient due to its infrequency.

SLA is committed to become and remain the number one third-party logistics provider in the South African market (see paragraph 1.3), therefore the use of **benchmarking** (see paragraph 3.2.8) on a **regular basis** is highly recommended to assist them in achieving their goal. Benchmarking is a very powerful cost management tool, which will assist management in the ongoing measurement and improvement of services delivered by the warehouse and distribution function. Benchmarking will assist the warehouse and distribution function to achieve and sustain a competitive advantage.

6.3.9 Just-in-time (JIT)

Most of the respondents indicated that the warehouse and distribution function does not make use of a just-in-time (JIT) system (see diagram 5.14). As the products are imported, there are too many variables for effective use of a JIT system. These variables include: truck breakdowns, customs stop and customs inspection, as well as the warehouse and distribution function. A further hindrance to the application of a JIT system is that none of the parties have control over the process.

A hundred percent JIT system cannot be implemented in a warehouse, due to the fact that a warehouse must maintain some inventories for it to be able to operate. By making use of JIT purchasing principles (see paragraph 3.2.9.2) the amount of time the product spends in the warehouse can be reduced to a large extent. The JIT approach contrasts the warehousing operating systems because of the following factors:

- Reduction in investment in raw materials and work in progress (WIP) stocks;
- reduced throughput time and space requirements in the warehouse;
- continuous process flow in the warehouse; and
- negotiating with fewer suppliers leading to saving queue time of batches.

Therefore it is recommended that some of the JIT principles be implemented in the warehouse and distribution function.

6.4 CONCLUSIONS AND RECOMMENDATIONS REGARDING PERFORMANCE MEASUREMENT AND PERFORMANCE MANAGEMENT

6.4.1 Performance measurement

There was no correspondence among the respondents as to how regular performance measurements in the warehouse and distribution function are evaluated (see diagram 5.28). 40% of persons interviewed indicated that it is not evaluated at all, 20% indicated that it happened on a daily basis, and 40% indicated that it happened on a monthly basis. Performance evaluation must be conducted at least on a monthly basis, to act as an early warning system, in order to implement remedial action. Employees must also be aware of the standards against which their performance will be evaluated. Management will need to put a system in place by means of which employees will receive feedback on their performance on a regular basis. This feedback will assist management of the warehouse and distribution function to implement corrective action before it is too late.

Performance measurement is an effective way of increasing the competitiveness and profitability of the warehouse and distribution function through encouragement of productivity improvements. Therefore it is recommended that the warehouse and distribution function make use of appropriate financial and non-financial performance measures to ensure that managers adopt a long-term perspective and allocate the organisation's resources to the most effective improvement activities.

When the warehouse and distribution function makes choices concerning which financial and non-financial measurement to use, they should keep the following factors in mind (see paragraph 4.2.2):

- The **purpose** of the measurement;
- the level of **detail** required;
- the **time** available for the measurement;
- the **existence** of available predetermined data; and
- the **cost** of the measurement

6.4.1.1 Financial performance measures

80% of the respondents indicated that the warehouse and distribution function does not make use of return on investment (ROI), and 20% of the respondents indicated that they make use of ROI as a financial measurement for the SLA as a whole. The warehouse and distribution function does not make use of residual income (RI) or economic value-adding financial measurements at all. The latter are essential in order to analyse the profitability and performance of the warehouse and distribution function by comparing the financial ratios from month to month as well as by comparing it with competitors.

ROI is a financial measure that measures the return on assets of an organisation or department. It is highly recommended that the warehouse and distribution function make use of ROI as a financial measurement because:

- ROI can be used for inter-departmental comparisons within SLA as well as comparisons of SLA with others in the industry;
- ROI prevents managers over investing in projects; and
- ROI represents profitability as a single percentage and motivates managers to increase sales, decrease costs and minimise asset investment

RI is a financial measure that measures the rand amount of profits in excess of a required rate of return. It is highly recommended that the warehouse and distribution function make use of RI as a financial measurement because:

- The RI approach encourages managers to invest in any project with returns equal or greater than the required rate of return; this means making investments that benefit the entire;
- when differences in risk occur the warehouse and distribution function can adjust the required rate of return; and
- RI makes it is possible to calculate a different investment charge for different types of assets.

Economic value added (EVA) is an organisation's returns after taxes and after deducting the cost of capital. It is highly recommended that the warehouse and distribution function make use of EVA as a financial performance measurement because:

- With EVA the SLA or the warehouse and distribution function can make use of its actual cost of capital, taking into consideration the industry and risk characteristics;
- EVA focuses managers' attention on creating value for shareholders by earning profits higher than the organisation's cost of capital.

6.4.1.2 Non-financial performance measures

Regarding the non-financial measurement of competence (see diagram 5.17 and 5.18) the warehouse and distribution function indicated that sales growth is important to them and that it does get measured. The warehouse and distribution function indicated that market share is not important to them, and they did not use it as a performance measurement. It is highly recommended that the warehouse and distribution function measure their market share. Market share is the proportion of sales in a particular market that an organisation obtains. Market share can be measured in terms of sales revenue, unit sales volume or number of customers. The market share will assist management in determining customer satisfaction and customer loyalty (see paragraph 4.3.2.2), which form an important part of the balanced scorecard (BSC).

Regarding quality of service (see diagrams 5.19 and 5.20) reliability and responsiveness it is very important to the warehouse and distribution function and it is measured, whereas appearance, cleanliness, friendliness and courtesy are also important to the warehouse and distribution function, but these are not used as a measurement. Although the warehouse and distribution function does not measure the above, it is important for management to motivate employees to be aware of their appearance, cleanliness, friendliness and courtesy, by setting an example and by making use of a total reward system.

Regarding flexibility (see diagrams 5.21 and 5.22) of the service delivered by the warehouse and distribution function, volume flexibility, delivery speed flexibility and specification flexibility are important to them. Volume flexibility and delivery speed flexibility are used as a measurement, whereas specification flexibility is not used as a measurement.

Regarding resource utilisation (see diagram 5.23 and 5.24), productivity and efficiency are very important to the warehouse and distribution function and these are used as a measurement. It is recommended that BPR be used to improve productivity, seeing that BPR and productivity go hand in hand (see paragraph 3.2.5) and will help the warehouse and distribution function achieve higher levels of profitability and improve competitiveness. Benchmarking can be used by managers in the warehouse and distribution function to monitor and control productivity. Performance measurement of productivity and efficiency is an effective way of increasing the competitiveness and profitability of the warehouse and distribution function. The warehouse and distribution function must make use of the learning and growth perspective (see paragraph 4.3.2.5) in order to improve productivity and efficiency. They must focus on employee capabilities, information system capabilities, and motivational empowerment and alignment.

Regarding innovation in the warehouse and distribution function, 40% of the respondents indicated that warehouse innovation is very important to them, 20% indicated that is important and 40% indicated that it is not important. Most of the respondents indicated that individual performance is very important to them. The respondents also indicated that warehouse innovation and individual performance do not get measured. It is highly recommended that warehouse innovation be used as a non-financial performance measurement. The innovation process (see paragraph 4.3.2.3(a)) is concerned with processes to identify customer needs and to create services to meet those needs. Making use of innovation as a measurement will assist management in the warehouse and distribution function to design and develop new products or services that enable them to achieve newly identified markets and customers.

It is highly recommended that the warehouse and distribution function measure individual performances. This will assist management in determining whether individuals are motivated, and whether they work in a productive manner.

Increased competitiveness in the market requires that the warehouse and distribution function continually improves its information systems in order to support its strategy and assist management in operating the warehouse and distribution function more effectively and efficiently. Management in the warehouse and distribution function cannot only make use of financial measurements in order to measure their performance. Non-financial measurements of competitiveness, quality of service, flexibility, research utilisation (productivity and efficiency) and innovation are important measures in the current competitive market (see table 4.1 in chapter 4), which management of the warehouse and distribution function must consider using.

6.4.2 Performance management

Part of the primary objective, as stated in paragraph 1.4.1, is to analyse the existing performance management system in the warehouse and distribution function. There are a few shortcomings regarding the current performance management system, which will be discussed below.

Regarding how adequately employees in the warehouse and distribution function were informed regarding performance management (see diagram 5.30), 40% of the respondents indicated that employees are adequately informed about performance management and 60% indicated that employees are not adequately informed about performance management. It is highly recommended that management of the warehouse and distribution function inform their employees about performance management, its uses and benefits. Managers will have to communicate (see paragraph 4.3.3) with their employees on a regular basis and inform them about issues that will affect them or will be affected by them. The above will increase the success and likelihood that all employees work together to achieve the goal of the warehouse and distribution function.

According to the respondents, 40% indicated that employees in the warehouse and distribution function are sent on training courses (see diagram 5.29) quarterly, whereas 60% indicated that they are sent on training courses on an annual basis. It is highly recommended that management of the warehouse and distribution function develop their employees' skills levels (see paragraph 4.3.2.5(c)) on a regular basis by sending them on relevant training or development courses.

The respondents indicated (see section C question 34) that picking targets and incentives are used to motivate employees in the warehouse and distribution function. Motivation plays an important role in the performance of employees. It is highly recommended that not only financial elements (see paragraph 4.3.2.5(c)) like incentives be used as a reward system, but that non-financial elements, like recognition, involvement, information sharing and work-life balance should be considered as well. The warehouse and distribution function must ensure that the performances of its employees is linked to a total reward system in order to ensure that employees are motivated to achieve performance in line with the goal of the warehouse and distribution function.

6.4.2.1 The balanced scorecard

The balanced scorecard (BSC) balances the use of financial and non-financial performance measures to evaluate the short-term and long-term performances in a single report (see paragraph 4.3.1). The BSC is a performance management system that can be used in any organisation to support the vision and mission with customer requirements and day-to-day work, manage and evaluate business strategy, monitor improvements in operational efficiency, build organisational capacity and communicate progress to employees

The BSC will assist managers in looking at the warehouse and distribution function from four different perspectives and will provide answers to the following four basic questions

- To succeed financially, how should the warehouse and distribution function appear to their shareholders? (**Financial perspective.**)
- To achieve their vision, how should the warehouse and distribution function appear to their customers? (**Customer perspective.**)
- To satisfy their shareholders and customers, what business processes must the warehouse and distribution function excel at? (**Internal business perspective.**)
- To achieve their vision, how will the warehouse and distribution function sustain their ability to change and improve? (**Learning and growth.**)

80% of the respondents (see diagram 5.15) indicated that the warehouse and distribution function does not make use of a formal performance management system. According to 20% of the respondents the warehouse and distribution function does make use of a formal performance management system, but only one respondent was involved in the development of that system, it is less than a year old, no one has received training in performance management and the system is ineffective.

The usage of the BSC in the warehouse and distribution function is therefore highly recommended, seeing that

- the BSC encourages clarification and updating of the warehouse and distribution function's vision and strategy,
- the BSC improves communication and consensus of the strategy throughout the organisation, which leads to aligning the warehouse and distribution functions and personal goals to the vision and strategy of the organisation,
- the BSC **links strategic** objectives to short-term and long-term performance objectives,
- the BSC places strong emphasis on financial and non-financial objectives and measures, which leads to improved financial performance,
- the BSC helps managers use operational data for decision-making,

- the BSC limits the number of measures, identifying only the most critical ones with the purpose of helping managers focus attention on measures that mostly affect the implementation of strategy,
- the BSC motivates employee effort,
- the BSC promotes action toward achieving strategies,
- the BSC enables periodic performance reviews of development toward vision and strategy,
- the BSC provides feedback to assist learning or strategy development,
- the BSC is a simple and accessible model for performance, based on priority areas for attention in each of the four perspectives,
- the BSC minimises reliance on a single performance measure,
- the BSC reduces optimisation of departments at the expense of the organisation as a whole,
- the BSC avoids dependence on short-term or incomplete financially based performance measures,
- the BSC increases accountability; goals are incorporated into the evaluation process and accountability is linked to compensation, and
- the BSC assists stakeholders in their evaluation of the organisation.

The first secondary objective is to implement activity-based performance management systems effectively and efficiently so as to ensure business success through continuous improvement. In order to implement a performance management system effectively and efficiently, refer to paragraph 4.3.3, where the steps of implementing a BSC approach is discussed. For an example of the implementation of the BSC in the warehouse and distribution function, refer to paragraph 4.3.4.

6.5 SUMMARY

The primary objective (see paragraph 1.4.1) of this study was to analyse the existing cost allocation system, the cost management system and the performance management system of SLA, focusing on the warehousing and distribution function. In paragraphs 6.2 to 6.4 an analysis was made of the existing systems in order to draw conclusions and make recommendations to address the shortcomings of the existing systems.

In paragraph 6.2 it became clear that the warehouse and distribution function did not make use of an efficient cost allocation system and this led to the shortcoming that true cost of the warehouse and distribution function services could not be determined accurately. The first secondary objective (see paragraph 1.4.2) is to implement an activity-based performance management system effectively and efficiently so as to ensure business success through continuous improvement. An activity-based costing system is therefore recommended to uncover the true cost of the warehouse and distribution function's services by more accurately allocating cost to their services (see the secondary objective in paragraph 1.4.2). The true cost is a tool which assist management in decision making, planning and controlling, which forms part of the secondary objective (see paragraph 1.4.2). The true cost will assist management in analysing the cost and profitability of their services. It will assist them in determining a competitive and accurate pricing structure. Therefore by implementing an effective and efficient activity-based costing system the third secondary objective as stated in paragraph 1.4.2 it will assist management in better decision-making, planning and controlling, by providing timely and useful information to ensure accurate cost allocation, the ability to determine the true cost of activities and facilitating performance management.

In paragraph 6.3 it was made clear that the warehouse and distribution function did not manage its cost effectively. In order to achieve the secondary objective (see paragraph 1.4.2) to improve the current cost management system in order to achieve an overall competitive advantage, managers of the warehouse and distribution function should make use of the following cost management tools to implement their strategy and facilitate the achievement of success in respect of critical success factors: life-cycle costing (LCC), target costing (TC), kaizen costing, activity-based management (ABM),

business process reengineering (BPR), costs of quality and total quality management (TQM), value chain, benchmarking and just-in-time (JIT). By implementing the above cost management techniques it will assist management in maintaining customer satisfaction, strengthening their competitive position, minimising the cost of their services and increasing profitability without forfeiting the value or quality of the service to the customer.

In paragraph 6.4 conclusions were drawn and recommendations made regarding the current use of performance measurement and performance management in the warehouse and distribution function. In order to achieve the secondary objective (see paragraph 1.4.2) to measure performance in order to achieve an overall competitive advantage the BSC is highly recommended. The BSC balances the use of financial and non-financial performance measures to evaluate the short-term and long-term performances in a single report. The BSC is a performance management system that can be used by the warehouse and distribution function to support the vision and mission with customer requirements and day-to-day work, manage and evaluate business strategy, monitor improvements in operational efficiency, build organisational capacity and communicate progress to employees

In the era of the competitive global environment and technology-based organisations, managers are pressured to find ways of maintaining their competitive advantage. Management has the responsibility to maintain their competitive advantage whilst maintaining the profitability in all departments of the organisation. SLA has proven to be a market leader within the logistics services market whilst maintaining profitability in most of its core business functions, with the exception of the warehousing and distribution function.

For management of the warehouse and distribution function to achieve their goal of becoming and remaining a profitable department within SLA, a combination of tools should be used, which include activity-based costing, cost management and performance management. Therefore it can be concluded that the effective and efficient use of activity-based performance management will enable management in the warehouse and distribution function achieve their goal of becoming and remaining a profitable department within SLA.

Appendix

Appendix A: Questionnaire

The following questionnaire was used during the empirical study.

**QUESTIONNAIRE
REGARDING THE SUGGESTED
IMPLEMENTATION OF
ACTIVITY-BASED PERFORMANCE MANAGEMENT IN THE
WAREHOUSE AND DISTRIBUTION FUNCTION**

Instructions for the completion of the questionnaire:

1. Please be assured that the information gathered by the questionnaire will be used exclusively for research purposes and will at all times be treated as highly confidential.
2. In order for the study to be successful, participants will need to answer all questions in as much detail as possible. If you cannot answer the question, please indicate it by writing down N/A (not applicable).
3. Objective and unbiased responses are encouraged to ensure the further success of this process.
4. Please indicate your answer by marking the relevant block with an "X".
5. Some questions need to be written out; therefore no block will be provided to be marked with an "X".
6. Please complete the questionnaire in upper case.
7. If you do not understand a question, please do not hesitate to ask the researcher for clarification.
8. After completing the questionnaire, the researcher might contact you for a follow-up discussion on certain questions for clarification purposes.

Your contribution is much appreciated.

Section A – Personal background

1. What is your current position?

Director	
Senior manager	
Team leader	
Other (please specify below)	

2. How many years of experience do you have in the logistics industry?

Less than 1 year	
1 - 2 years	
2 - 6 years	
6 -10 years	
More than 10 years	

3. How long have you been working for SLA?

Less than 1 year	
1 - 3 years	
3 - 5 years	
More than 5 years	

4. Describe your responsibilities and involvement regarding the warehouse and distribution function.

Section B – Warehouse and distribution background

1.a Would you say that there is room for improvement regarding the profitability of the warehouse and distribution function?

Yes No

1.b Why are you of this opinion?

2. Approximately how many people does SLA employ in the warehouse and distribution function?

5-10 employees	<input type="checkbox"/>
10-30 employees	<input type="checkbox"/>
30-50 employees	<input type="checkbox"/>
More that 50	<input type="checkbox"/>

3. What are the major elements of the warehouse and distribution function’s strategy?
(Please rank factors in order of importance, with 1 being most important.)

Reduce cost	<input type="checkbox"/>
Increase profitability	<input type="checkbox"/>
Increase efficiency	<input type="checkbox"/>
Improve quality	<input type="checkbox"/>
Develop skills	<input type="checkbox"/>
Expand the market share	<input type="checkbox"/>
Develop new services	<input type="checkbox"/>
Reduce process time	<input type="checkbox"/>
Customer satisfaction	<input type="checkbox"/>
Other (please specify below)	<input type="checkbox"/>

Other: _____

Section C – Fundamentals

1. Does SLA currently make use of an activity-based costing system in the warehouse and distribution function?

Yes No

If your answer to question 1 is "yes", please continue from question 2 below. If your answer is "no", continue from question 9.

2. How did the company implement the activity-based costing system?

Only external consultants	<input type="checkbox"/>
Mostly external consultants	<input type="checkbox"/>
Only internal implementations	<input type="checkbox"/>
Mostly internal implementations	<input type="checkbox"/>
Other (specify below)	<input type="checkbox"/>

Other: _____

3. Did you have any difficulty in implementing the activity-based costing system?

Yes No

If yes, briefly discuss the difficulties:

4. For what duration has the warehouse and distribution function made use of an activity-based costing system?

Less than an year	<input type="checkbox"/>
Between one and two years	<input type="checkbox"/>
Longer than two years	<input type="checkbox"/>

5. Do you consider the activity-based costing system to be more accurate in comparison to your traditional costing system?

Yes

No

Briefly discuss your answer above:

6. What is your general feeling about the results achieved by an activity-based costing system?

Satisfied	<input type="checkbox"/>
Neutral	<input type="checkbox"/>
Unsatisfied	<input type="checkbox"/>
Unsure	<input type="checkbox"/>

Briefly discuss your answer above:

7. What advantages does an activity-based costing system have for your company?

8. What disadvantages does an activity-based costing system have for your company?

Please continue from question 13.

9. Describe the system that is currently used to allocate costs in the warehouse and distribution function.

Current System: _____

No formal system is used:

10.a Would you say that the current system is effective?

Yes No

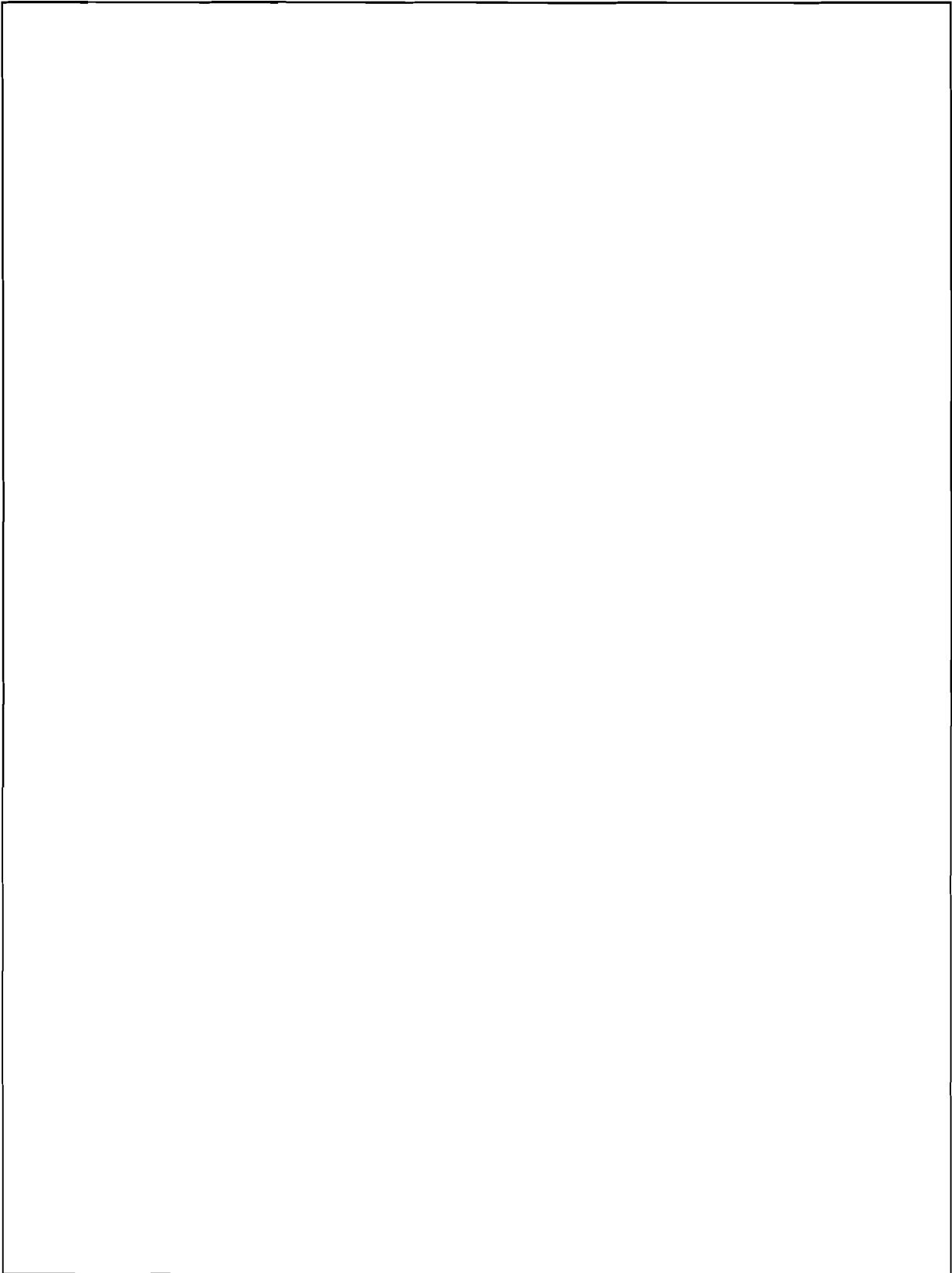
10.b Why are you of this opinion?

11.a If there is no formal system in place, do you have any plans to implement a formal system in the next two years?

Yes No

11.b Why do you say this?

12. What is the current process flow in the warehouse and distribution function?

A large, empty rectangular box with a thin black border, occupying most of the page. It is intended for a student to draw or write their answer to the question above.

13. What are the warehouse and distribution function's primary activities?

14.a Do you think that all the current activities in the process flow are value-adding activities?

Yes No

14.b Why are you or this opinion?

15. What are the cost drivers for the activities mentioned in question 14?

16.a What is your opinion where cost is allocated according to activities?

In favour of	<input type="checkbox"/>
Not in favour of	<input type="checkbox"/>
Neutral	<input type="checkbox"/>
Unsure	<input type="checkbox"/>

16.b Why are you of this opinion?

17. Do you think that the price or service fee could be determined more accurately by implementing an activity-based costing system?

Yes No

18.a Would you consider changing to an activity-based costing system?

Yes No

18.b Why do you say this?

19.a To what extent are the following cost management tools used in SLA's warehouse?

1. Not at all
2. To a moderate extent
3. To a large extent
4. Totally

	1	2	3	4
Life-cycle costing				
Target costing				
Kaizen costing				
Cost of quality				
Benchmarking				
Just-in-time system				
The value chain				

19.b If "1" was selected for one of the above tools, briefly discuss why?

Life-cycle costing	
Target costing	
Kaizen costing	
Cost of quality	
Benchmarking	
Just-in-time system	
The value chain	

19.c If "2, 3 or 4" was selected, is it satisfactory or not, and briefly discuss why?

	Satisfactory	Non-satisfactory
Life-cycle costing		
Target costing		
Kaizen costing		
Cost of quality		
Benchmarking		
Just-in-time system		
The value chain		

20. Is there a formal system in the warehouse for the evaluation of performance-management processes?

Yes

No

If your answer to question 23 is “yes”, please continue from question 24. If your answer is “no”, continue from question 29.

21. How long did it take to develop the system?

One year	<input type="checkbox"/>
Two years	<input type="checkbox"/>
More than two years	<input type="checkbox"/>

22. How long did it take to implement the system?

One year	<input type="checkbox"/>
Two years	<input type="checkbox"/>
More than two years	<input type="checkbox"/>

23. Who was involved in the development of the system?

Senior management	<input type="checkbox"/>
Team leaders	<input type="checkbox"/>
All staff	<input type="checkbox"/>

24. Who received training in performance management techniques?

Team leaders	<input type="checkbox"/>
All staff	<input type="checkbox"/>
No one	<input type="checkbox"/>

25. How effective is SLA's current warehouse and distribution's performance-management system?

Very effective	<input type="checkbox"/>
Moderate effective	<input type="checkbox"/>
Effective	<input type="checkbox"/>
Ineffective	<input type="checkbox"/>

No formal system is used:

Please continue from question 30.

26. If you do not operate formal performance-management processes, do you plan to implement a performance management system in the next two years?

Yes No

27. What are the key factors which you use to determine whether performance management is effective? (Please rank factors in order of importance, with 1 being most important)

Achievement of financial targets	<input type="checkbox"/>
Development of skills	<input type="checkbox"/>
Improved customer care	<input type="checkbox"/>
Changes in behaviour	<input type="checkbox"/>
Motivation	<input type="checkbox"/>
Productivity	<input type="checkbox"/>
Development of competence	<input type="checkbox"/>
Improved quality	<input type="checkbox"/>

28. How important are the following non-financial criteria in the measurement of performance in SLA's warehouse and distribution function?

	Very important	Important	Not very important	Is it used as a measurement?	
				Yes	No
Competence					
Market share					
Sales growth					
Quality of service					
Reliability					
Responsiveness					
Appearance					
Cleanliness					
Friendliness					
Courtesy					
Flexibility					
Volume flexibility					
Delivery speed flexibility					
Specification flexibility					
Resource utilisation					
Productivity					
Efficiency					
Innovation					
Warehouse innovation					
Individual performance					

29. How important are the following financial criteria in the measurement of performance in SLA's warehouse and distribution function?

	Yes	No
Return on investment		
Residual income		
Economic value added		

30. Please indicate if you make use of any other financial measures not mentioned in the previous question.

31. How regular is performance in the warehouse and distribution function evaluated?

Not at all	
Monthly	
Quarterly	
Annually	

32. How often are employees in the warehouse and distribution function sent on training courses to enable them to improve their performance?

Not at all	
Monthly	
Quarterly	
Annually	

33. Are employees adequately informed about performance management?

Yes No

34. What reward system is used to motivate employees in the warehouse and distribution function?

35.a What is your opinion of the balanced scorecard?

In favour of	
Not in favour of	
Neutral	
Unsure	

35.b Why are you of this opinion?

36.a Do you think that performance in the warehouse and distribution function can be measured and managed more accurately by implementing the BSC approach?

Yes No

36.b Why are you of this opinion?

37. Do you think by measuring and managing your performance it will affect your process cost and profitability positively?

Yes No

38. Would you consider changing to a balanced scorecard model?

Yes No

DEFINITIONS OF TERMS

Activity-based costing (ABC) – is a costing method based on the principle that products and/or services require an organisation to carry out activities and that those activities require of an organisation to incur costs. In activity-based costing, systems are designed so that any costs that cannot be directly accredited to a product or service flow into the activities that makes the cost necessary. The cost of each activity then flows to the product(s) or service(s) that make the activity necessary, based on their particular use of that activity (Hicks, 1999:6 & Griful-Miquela, 2001:135).

Activity – is an event, task or unit of work with a particular purpose; for example, designing products, setting up machines, operating machines, and distributing products. A type of task or function performed in an organisation (Horngren *et al.*, 2006:144-145).

Balanced scorecard – a formal approach used to help organisations translate their vision into objectives that can be measured and monitored using both financial and non-financial performance measures (Horngren *et al.*, 2006:457).

Benchmarking – is the ongoing structured and objective process of measuring and improving products, services, practices and processes against the best identified in the world in order to achieve and sustain competitive advantage (Grinyer & Goldsmith, 1995:2).

Cost driver – activities and cost objects are linked by cost drivers, therefore a cost driver is a unit of activity that causes or influences costs (Lin *et al.*, 2001:708 and Stapleton *et al.*, 2004:586).

Cost of quality – cost incurred to ensure high quality and/or the costs arising as a result of, the production of a low-quality product or service (Horngren *et al.*, 2006:847).

Economic value added (EVA) –is an organisation's returns after taxes and after deducting the cost of capital (Blocher *et al.*, 2005:779).

Just-in-time (JIT) – the purchase of materials (or goods) so that they are delivered just as needed for production (or sales) (Horngren *et al.*, 2006:850).

Kaizen costing – planning process for achieving continuous improvement in product cost, quality and functionality. It is similar to target costing, but occurs after the product has been designed and the first production cycle has been completed (Blocher *et al.*, 2005:384).

Life-cycle costing (LCC) – is the method of measuring all costs involved in creating, producing and utilising a product or service. LCC is not only the costs incurred by the organisation measuring these costs but also the costs incurred by the suppliers and the customers of the product or service (Swain *et al.*, 2005:579).

Residual income (RI) – is a financial performance measure that measures the amount of profits in excess of a required **rate of return** (Eldenburg & Wolcott, 2005:600).

Return on investment (ROI) – is a financial performance measure that measures the return (how much has been earned) on assets (investments) of an organisation (Swain *et al.*, 2005:355).

Target costing (TC) – is a structured process aimed at insuring that a product launched with specified functionality, quality and sales price can be produced at a life-cycle cost that generates a satisfactory level of profitability (Cooper & Slagmulder, 1997:72).

Value chain – the sequence of business activities in which usefulness is added to the products or service of the organisation to ensure value to the customer and therefore competitive advantage (Horngren *et al.*, 2006:4).

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