

**ANALYSIS OF SUPPLIER SERVICES
TO SMALL AND MEDIUM-SIZED
MANUFACTURERS IN THE
NORTHWEST PROVINCE**

LEIGH-ANNE COLEMAN

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by

LEIGH-ANNE COLEMAN
B.Comm., Hons. B.Comm.,
(PU for CHE)

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Study Leader: Prof. L.R.J. van Rensburg
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Dedicated to: Me I.L. Malan (mother) & Me L. Coleman
(sister).

Abstract

Analysis of supplier services to small and medium-sized manufacturers in the Northwest Province.

Business logistics is a concept which has shown considerable development in the post-World War II era. The concept of applying logistics as a business function initially emerged during the price wars era and evolved during the quest for quality era. Thereafter, business logistics had a promotion/marketing focus, which evolved to the point where it is now. Today, logistics can provide time and place utility, thus adding value to a business. The major focus in this respect is on increasing customer service.

In this dissertation the concept of logistics is examined by means of both a literature and empirical study. This study focuses mainly on the development of logistics, inbound logistics and outbound logistics. The main focus of the different chapters is effective customer service. Customer service as such is discussed in detail in chapter 4.

The main reason for this study was to determine whether suppliers comply with the proposed customer service standards. This was also investigated empirically, by determining the customer service factors importance as perceived from a manufacturer's point of view. From the many interesting findings of this study it was concluded that many suppliers did not comply with the proposed customer service standards. Future fields of study and recommendations are provided in an effort to contribute to the study field of logistics and its practitioners.

Opsomming

'n Ontleding van verskaffer dienste aan klein en mediumgrootte vervaardigers in die Noordwes Provinsie.

Logistiekbestuur is 'n konsep wat na afloop van die Tweede Wêreld oorlog begin ontwikkel het. Hierdie konsep as 'n ondernemingsfunksie het gedurende die prysoorlogera aanvanklik na vore gekom en het daarna tydens die soeke na kwaliteit, verder ontwikkel. Daarna het logistiek 'n bemarkings fokus getoon, waarna die konsep ontwikkel het tot die punt waar dit vandag is. Tans verskaf logistiek tyd- en pleknut ten einde waarde tot 'n onderneming te voeg. Die hoofokus hierna is verhoogde kliëntediens.

Die konsep logistiek word tydens hierdie studie deur middle van 'n literatuurstudie en empiriese navorsing ondersoek. Hierdie studie fokus hoofsaaklik op die ontwikkeling van logistiek, inkomende logistiek en uitgaande logistiek, met die klem op effektiewe kliëntediens. Kliëntediens as een van die belangrikste komponente van uitwaartse logistiek word in hoofstuk 4 bespreek.

Die rede vir die studie was om te bepaal of die verskaffers voldoen aan die vereistes van kliëntediens. Voorgenoemde is ook empiries ondersoek deur middel van vraelyste. Die doel hiermee was om te bepaal wat die belangrikheid van elke kliëntediensfactor is en wat daarrondom uit die oogpunt van die vervaardiger ervaar word. Van uit die studie se bevindinge kon tot die gevolgtrekking gekom word dat baie verskaffers nie aan die vereiste kliëntediensstandaarde voldoen nie.

Verdere terreine vir navorsing is geïdentifiseer en aanbevelings is gemaak met die doel om 'n bydrae ten opsigte van logistiek in teorie en praktyk te lewer.

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Glossary

Abbreviations

PKOSH:	Potchefstroom, Klerksdorp, Orkney, Stilfontein and Hartbeesfontein
PU for CHE:	Potchefstroom University for Christian Higher Education
BMR:	Bureau of Market Research
CLM:	The Council of Logistics Management
SKUs:	Stock keeping units
EOQ:	Economic order quantity
APICS:	American Production and Inventory Control Society
MRP:	Materials requirements planning
JIT:	Just-in-time
D-value:	Effect size

List of key terms

Competitive advantage: The relative efficiency in a particular economic activity of an individual or group of individuals over another economic activity, compared to another individual or group.

Customer: A customer is an individual or group of individuals to whom you provide one or more products or services are provided. A business can also be seen as a customer when the business pays to receive a service, or purchases goods.

Customer service: Customer service refers to the service a business offers to its customers, especially of industrial goods and expensive consumer goods, such as computers or cars. Customer service also includes after-sales service, such as a repair and replacement service, extended guarantees, regular mailings of information and freephone telephone calls in case of complaints. The appeal of business products is substantially influenced by the customer service offered.

Inbound logistics: Inbound logistics refer to all those activities related to the procurement of requirement for the business up to the point where these requirements are delivered to the production function. It also includes the co-ordination of the flow of materials during the production process until the final products are made available for storage and distribution.

Logistics management: Logistics management refers to the control of the movement of physical materials inside a plant. It is usually subdivided into **materials management**, which is the control of the movement of materials in the factory, from the arrival of raw materials to the packaging of the product;

which includes the storage of goods and the distribution to other distribution and consumers.

Outbound logistics: Outbound logistics is responsible for distributing the goods to customers.

Procurement/purchasing: Purchasing refers to all of the activities associated with the buying process.

Vendors/suppliers: A vendor/supplier refers to a person who sells goods or services.

Chapter 1

Problem statement and reason for this study

1.1 Introduction

Logistics requirements have started in the early days when human beings stockpiled food in caves to provide for times when needed. Logistics considerations were the underlying reason for many wars to gain control of key trade routes. As a precursor to the Gulf War it has been necessary for the United States and its allies to move substantial amounts of material far distances in what were thought to be impossible short time frames. The Persian Gulf effort has been referred to as the logistics war, and the importance of the integrated logistics pipeline or supply chain supporting the fighting effort was acknowledged by the military and civilian leadership (Coyle, Bardi, & Langley, 1996:27).

According to Coyle *et al* (1996) the Generals and Field Marshals from the earliest times understood the critical role of logistics. Strangely, it is only in the recent past that businesses have come to recognise the vital impact that logistics management can have in the achievement of competitive advantage. This lack of recognition partly springs from the relatively low level of understanding of the benefits of integrated logistics. It has taken approximately seventy years for the basic principles of logistics management to be clearly defined.

Business logistics is the study of how management can best provide a profitable level of distribution services to customers through effective planning, organising, and controlling of the move-store activities that facilitate product flow. Logistics is a vital subject. It is an economic fact of life that resources are widely dispersed geographically. Also, it seems that the

consumers no longer reside, if they ever did, where goods and services are located. Provision must be made for bridging the gap between supply and demand so that consumers can have goods and services when they want them, where they want them, and in the condition in which they want them. This is the logistics problem (Coyle *et al*, 1996; Lambert, Stock & Ellram, 1998).

In a free-enterprise economy, it is the responsibility of businesses to provide logistical services, and businesses have met this responsibility with a remarkable degree of efficiency and effectiveness. However, businesses operate within an environment that is constantly changing; owing to technological advancements, a dynamic economic climate, shifting legal requirements, and the availability of resources. Because of this, management philosophy changes with time in order to meet new demands for performance. Logistics represents new management thinking.

Business logistics has the objective of providing the customer with the desired levels of customer service. According to Coyle *et al* (1996) the logistics customer-service goal is to provide the right goods or services, at the right place, at the right time, and in the desired condition, at the lowest possible cost. This is accomplished through good management of the key logistics activities, namely transportation, inventory maintenance, order processing and the several additional activities that support these.

According to Taylor (1997), the outputs of logistics management are improved customer service and reduced supply chain costs. Through the achievement of improved customer service and reduced supply chain costs, logistics contributes to corporate performance. Integrated logistics management has been identified as the key to success in achieving overall quality, higher levels of customer service and increased cost-effectiveness (Fawcett, McLeish & Ogden, 1992:1).

This study identifies clearly that the idea of logistics has started many years before the real existence of trade between large and small businesses. Through the years, logistics has developed until where it is today. In this study the importance of effective logistics systems will be noted.

The reason for this study is to examine the supplier services to small and medium-sized manufacturers and to identify and examine the efficiency of these supplier services.

1.2 Aim of the research

1.2.1 Goal:

The goal of the study is to examine the supplier services to small and medium-sized manufacturers in the Northwest Province.

1.2.2 Research objectives:

The specific objectives of this study are to:

1. Examine the nature of logistics and the logistics activities.
2. Study the logistical inbound side of manufacturers.
3. Study the logistical outbound side of suppliers.
4. Empirically research the different aspects of logistics.

1.3 Methodology:

1.3.1 Literature

Theories from textbooks, periodicals, newspapers and theses were studied.

1.3.2 Empirical

The empirical part of the study consisted of completing structured questionnaires during surveys with management of manufacturing businesses in Potchefstroom, Klerksdorp, Orkney, Stilfontein and Hartbeesfontein (hereafter named the PKOSH-area).

The questionnaire was available in English and Afrikaans to accommodate the respondent's language preference. The technical preparation of the questionnaire was performed at the Statistical Consultation Service of the Potchefstroom University for Christian Higher Education. This service was also responsible for the input of data from the questionnaires, as well as the statistical processing.

1.3.2.1 Study population

In 1999 an industrial register was received from the Bureau of Market Research (BMR) of the University of South Africa. This industrial register consists of census of 381 manufacturing businesses in the Northwest Province. This list of businesses consists of large, medium-sized and small businesses. The large companies cover an estimate of 13% of the population and are also involved with the study of comparative situations. This classification is based on the guidelines within the National Small Business Act (act 102 of 1996).

The southern region of the Northwest Province includes towns and cities, such as Fochville, Potchefstroom, Klerksdorp, Stilfontein, Orkney, Hartbeesfontein, Ottosdal, Wolmaransstad, Bloemhof and Christiana. There are 109 manufacturing businesses, of the industrial register situated within these towns and cities. Of these 109 manufacturing businesses, 94 of them are in the PKOSH-area. Due to the fact that long distances need to be taken to reach a

relatively small number of businesses, it has been decided not to include the entire southern region of the Northwest Province in this study. The businesses within the highest population will be concentrated on, namely the PKOSH-area. All manufacturing businesses in the PKOSH-area, according to the BMR-census are included within this study. The total population is therefore included in the study and random sampling was not performed.

With regards to this study, all conclusions are made based upon the group respondents in the PKOSH-area.

1.4 Chapter structure of this study

This study is structured by the following chapters:

Chapter 1: Problem statement and reason for research

Chapter 2: The nature of logistics

Chapter 3: Inbound logistics and purchasing

Chapter 4: Customer service as an activity of outbound logistics

Chapter 5: Research results

Chapter 6: Summary, conclusions and recommendations

Chapter 2

The Nature of logistics

2.1 Introduction

Although logistics as a concept originated in the military, its application in the business environment has led many authors to appreciate the strategic value, logistics has for a business (McGins 1992:22). Many authors also point out that the absence of a logistics policy can be seen as a strategic disaster. It is therefore necessary to firstly examine and understand the concept of logistics.

In this chapter a literature study regarding the concept logistics and the different logistics activities will be discussed. To understand logistics in practice, it is essential to examine logistics in the business and in the economy.

2.2 Logistics defined

The concept logistics is also known as:

- Business logistics
- Channel management
- Distribution
- Industrial logistics
- Logistical management
- Materials management
- Physical distribution
- Quick-response system
- Supply chain management
- Supply management

What the above terms have in common is that they deal with the management of the flow of goods or materials from the point of origin to the point of consumption and in some cases even to the point of disposal. There are many definitions of logistics coined by authors, consultants and practitioners. The Council of Logistics Management (CLM), one of the leading professional organisations for logistics personnel, uses the term *logistics management* to describe:

"The process of planning, implementing and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption for the purpose of conforming to customer requirements."(Lambert *et al.*, 1998:3).

Stock and Lambert (1993) have also adopted this definition. In South Africa, this definition is found to be popular amongst logisticians.

Simply stated, logistics refers to the way whereby value is added to a product. Four types of utility can be distinguished, namely form utility, possession utility, time utility and place utility. Time and place utility are intimately supported by logistics. Coyle, Bardi and Langley (1992) argue that the value created by manufacturing a product is called "form utility". **Form utility** is the process of creating the goods or service. Form utility is also putting it in the proper form for the customer to use. Marketing adds a further value dimension called "possession utility." **Possession utility** is the value added to a product or service since the customer is able to take actual possession. This is, for example, made possible by credit arrangements and loans. Form and possession utility are not specifically related to logistics, but neither would be possible without getting the right items needed for consumption or production to the right place at the right time and in the right condition at the right cost. **Time utility** is the value added by having an item available when it is needed. This means to have all the materials and parts for manufacturing, so that the production line does not have to shut down. If

items are not on time, it does the customer no good. A sale will be lost and/or a customer may be lost. Time utility is closely related to **place utility**. Which means having the item or service available where it is needed. Items which are in the right form and available at the right time means nothing to a customer if it is not available at the place where it is needed. For example, if a product desired by consumers are in transit, in a warehouse, or in another store, it does not create any place utility for them. A customer cannot be satisfied without both time and place utility, which logistics directly supports (Lambert *et al.*, 1998:11). In strategic terms, logistics could be viewed as the interface between production and marketing. As far as quality is concerned, this could perhaps best be demonstrated by the following view: "Leading-edge firms typically implement a portfolio of unique logistical solutions to accommodate the quality-driven expectations of each key customer." (Bowersox and Closs 1996).

2.3 Development of logistics

Logistics dates back to the earliest forms of organised trade. In the early 1900's, when farm products were distributed, logistics gained attention as an area of study for the first time (Lambert *et al.*, 1998:5).

2.3.1 Competitive Pressures

Logistics received more attention as a major cost driver, at the time when interest rates were rising and energy costs increased in 1970. For many businesses, logistics costs became a more critical issue because of the globalisation of industries. This has affected logistics in two primary ways. Firstly, new ways to differentiate businesses and product offerings have evolved due to the growth of world class competitors. Logistics is a logical place to look, because domestic businesses should be able to provide a more reliable, responsive service to nearby markets than overseas competitors.

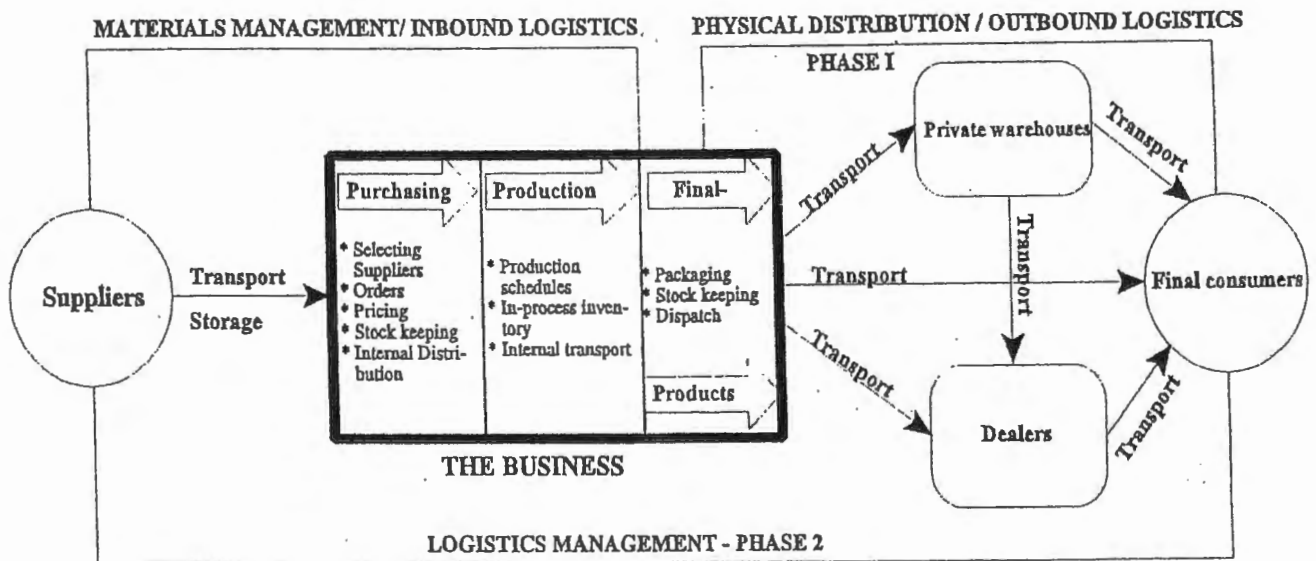
Secondly, the supply chain between the business and those it does business with become longer, more costly, and more complex because businesses increasingly buy and sell offshore. Excellent logistics management is needed to fully leverage global opportunities (Lambert *et al.*, 1998:6).

2.3.2 Information technology

At that time information technology started exploding. This enabled businesses to better monitor transaction intensive activities, such as the ordering, movement and storage of goods and materials. All this combined with the availability of computerised quantitative models, increased the ability to manage flows and to optimise inventory levels and movements. Factors, such as advanced information systems technology, an increased emphasis on customer service, growing recognition of the systems approach and total cost concept, the profit leverage from logistics, and the realisation that logistics can be used as a strategic weapon in competing in the marketplace, contributed to the growing interest in logistics (Lambert *et al.*, 1998:7).

Subsequently, the phases in the development of logistics management will be explained. In figure 2.1 two of the three different phases are depicted.

Figure 2.1: The logistics process



Source: Adapted from Van Rensburg, L.R.J., 2000:4.

The development of logistics management in three phases

During phase 1 attention was focused on physical distribution, which refers the final step of the logistics process. Every business strives to establish a competitive advantage by using different methods and exploiting opportunities. Businesses soon realised that another way of identifying a competitive advantage was by delivering a better service to customers. Phase 2 is the development of logistics management characterised by the concept called integrated logistics management. Activities related to the procurement of resources in order to make the finished goods available, are influenced by physical distribution, and not only by the effective delivering of requirements. The inbound and outbound logistics should be co-ordinated and this process is then called *integrated logistics management*.

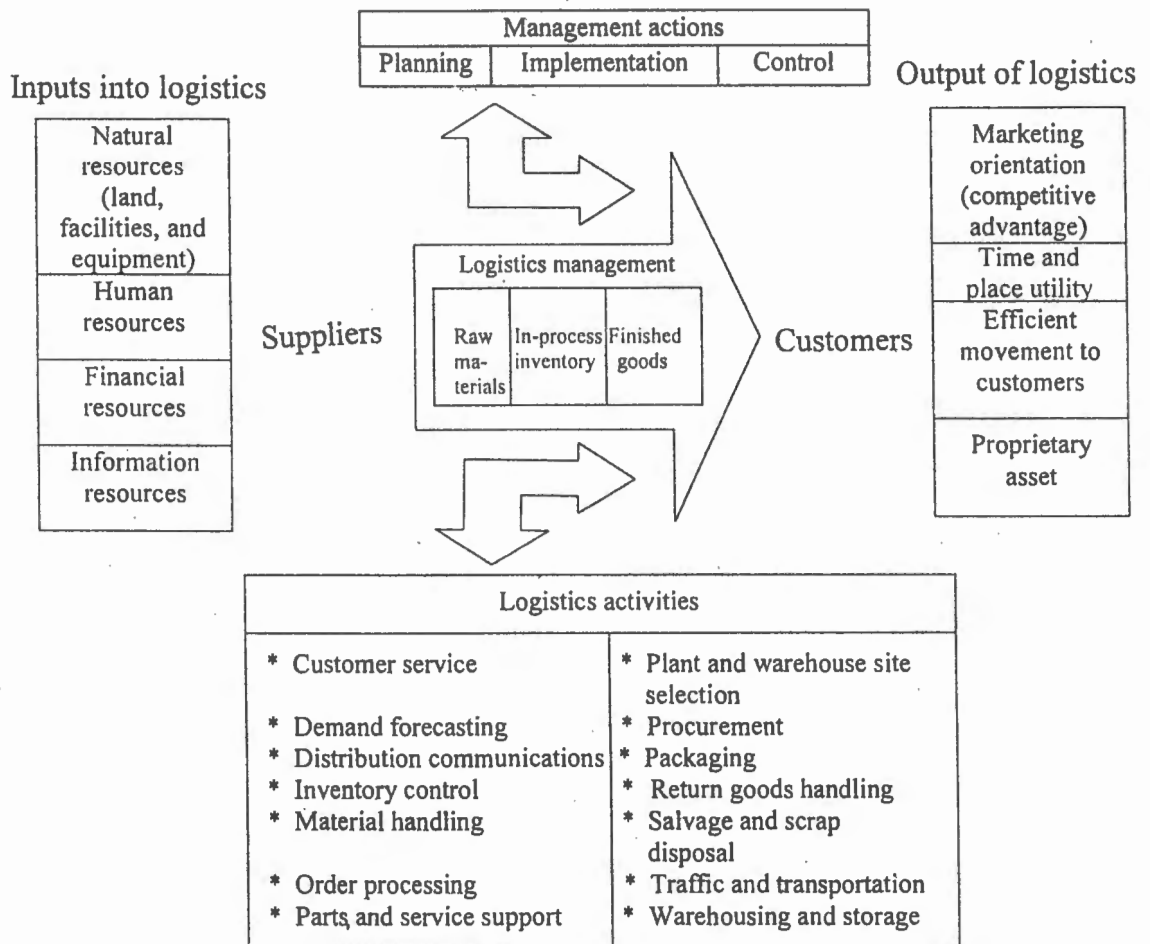
Phase 3 can be described as the management of the flow of materials in an industrial column or supply chain. The flow of components of certain products (referring to raw materials or semi-finished goods) should be co-ordinated (Van Rensburg, L.R.J., 2000:4).

If the inbound side of logistics (materials management) is combined with the outbound side of logistics (physical distribution, which is closely related to customer service), additional opportunities for savings can occur. The inbound side of logistics combined with the outbound side of logistics can be described as *business logistics* or the *logistics system* (Coyle *et al.*, 1996:6).

2.4 The study field and the components of logistics management

Some of the many activities encompassed under logistics are given in figure 2.2. Suppliers provide raw materials, which logistics manage in the form of raw materials, in-process inventory and finished goods. The framework for logistics activities is provided by management actions through the process of planning, implementation and control. Competitive advantage, time and place utility, efficient movement to the customer and providing a logistics service mix, such that logistics become a proprietary asset of the business, are the outputs of the logistics system (Lambert *et al.*, 1998:4). These outputs are made possible by the effective and efficient performance of the logistics activities shown at the bottom of figure 2.2.

Figure 2.2: Components of logistics management



Source: Adapted from Lambert *et al.*, 1998:5.

The effective management of the logistics activities should result in effective customer service.

2.5 The logistics activities

The following diagram was compiled by using information from various authors named after each activity.

Figure 2.3: Logistics activities



2.5.1 Customer service

Customer service levels in many ways glue together other logistics areas. While customarily the logistics area does not completely control customer service decisions, logistics plays an extremely important role in ensuring that

the customer gets the right product at the right place and time. Customer service is multi-dimensional. In a broad sense, it is the output of the entire logistics effort. That is, customer service and some resulting level of satisfaction are what the logistics system ultimately provides the buyer. Good customer service supports customer satisfaction. It is a process that ensures that consumer needs are satisfied (Coyle *et al.*, 1996:46; Lambert *et al.*, 1998:17; Gourdin, 2001:5).

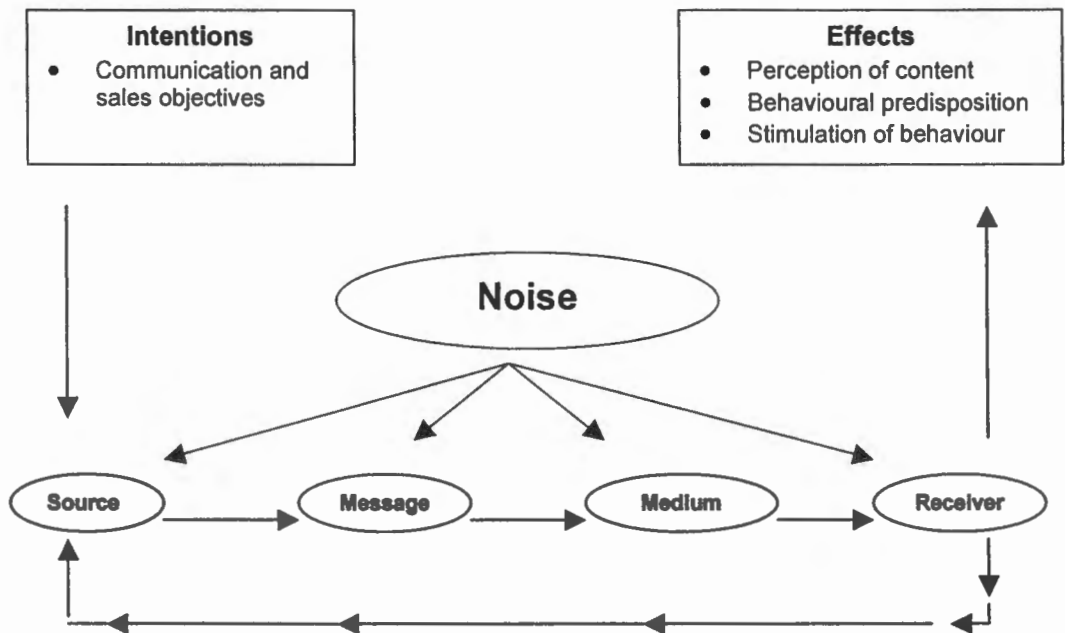
2.5.2 Processing orders

The processing of orders refers to an activity which is involved with the completing of customer orders. Order processing is a broad, highly automated area which consists of getting the orders from customers, checking on the status of orders and communicating to customers about them and actually filling out the order and making it available to the customer. The importance of this activity lies in the effectiveness and speed of processing orders (Coyle *et al.*, 1996:45; Lambert *et al.*, 1998:18).

2.5.3 Logistics communication

According to marketing theories, communications are becoming increasingly automated, complex and rapid. In general, communication refers to transmitting a message in order to evoke a discriminating response. According to Semenik (2002:176), communication is the process of sending a message to a receiver. A reason exists for communication efforts. Communication efforts in marketing begin with intentions. This is the beginning of the communication process. This can also be the case when logistics activities are performed.

Figure 2.4: The communication process



Source: Adapted from Semenik, 2002:177.

After the communication and sales objectives have been formed, a source is needed to carry these intentions further. A source is the marketer of the brand and in personal selling, the salesperson who represents the marketer. The source needs a message, which contains the information designed to inform or persuade consumers and business buyers or to broadcast what the intention of the message is. The medium such as the newspapers, radio, television, magazines, billboards, the internet and direct mail are examples of "vehicles" whereby messages are transmitted to receivers. The consumers or business buyers targeted by a business are the receivers of messages. The effects in a communication process are determined by identifying receivers' perception of message content. During the entire process noise exists. Noise is any disturbance that inhabits message transmission to the intended receiver. Many forms of noise exist and all these forms should be avoided when a message is transmitted. Feedback is necessary in the communication process to evaluate and improve all situations (Semenik, 2002:176). During the communication process, in the case of logistics, it is necessary to make

sure that everybody understands what is communicated, therefore making sure that all goes according to plan, for example, providing the right products at the right place.

2.5.4 Inventory management/control

The activity which organises the availability of items to the customers is named inventory control. This activity co-ordinates the purchasing, manufacturing and distribution functions to meet the marketing needs. It includes the supply of current sales items, new products, consumables, spare parts and all other supplies. Inventory enables a business to support the customer service, logistics or manufacturing activities. There should be enough items in stock to ensure the functioning of the business and to ensure that consumers can purchase according to their needs. Different inventory control methods can be used (Wild, 2002:4).

2.5.5 Forecasting demand

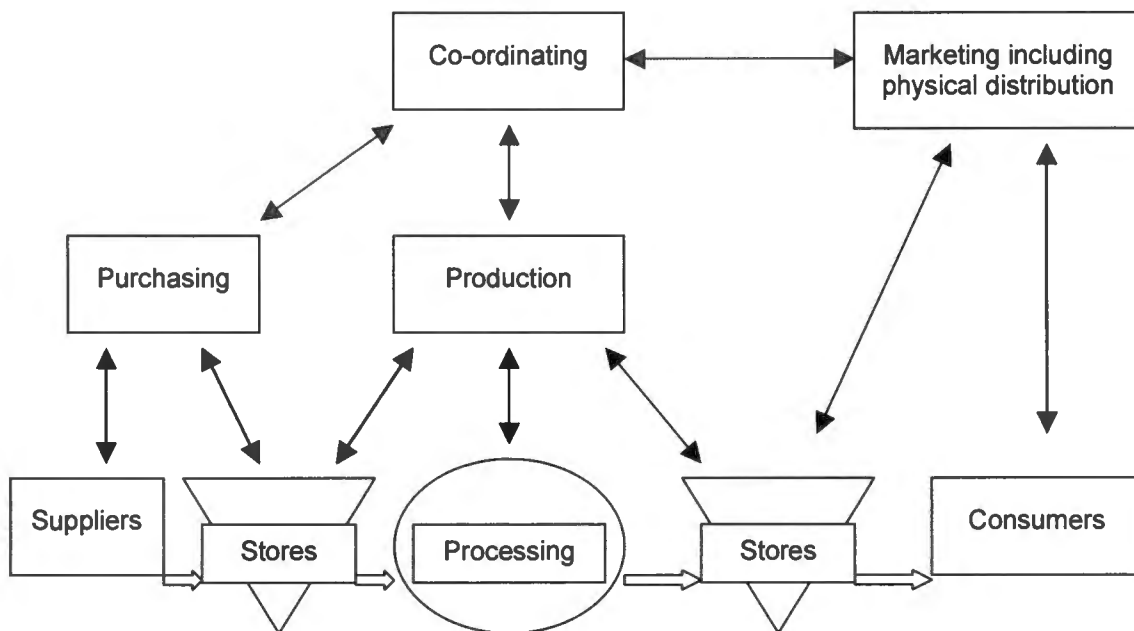
Forecasting refers to the process of organising a phenomenon's past in order to predict a future. To manipulate objectives, quantitative data by mathematical rules and to analyse the opinions of experts are ways to determine phenomenon pasts. It should be determined how many manufactured items should be distributed to various outlets in order to satisfy demand (Frechtling, 2001:8).

2.5.6 Transportation

Transportation systems are needed for the ever-growing needs for contracts between individuals as societies and for the movement of commodities. Commodities are part of national and global economies (Tolley & Turton, 1995:1). It includes selecting the best mode of transportation. The role of

transportation in the logistics system can be seen in perspective by noting the frequency or transport decisions. Figure 2.5 shows that transport is directly involved in the flow of products (raw material, semi-finished and finished products), but also indirectly involved in the co-ordination of several activities of the logistics system.

Figure 2.5: The role of transport in the logistics system



Explanation: a) Co-ordinating
 b) Interdependence
 c) Transport

Source: Adapted from Van Rensburg, A.M.J., 2000:103.

Figure 2.5 represents a logistical system where, the red arrows indicate the elements in the system which require co-ordination. The black arrows indicate the interdependence between suppliers, purchasing, stores, production, marketing, physical delivery and consumers during the entire process of delivering the product to the final consumer. The white arrow

indicates the role of transport in the logistics process concerning the delivering of the products. Transport therefore not only involves physical movement, but also has a direct effect on decision-making throughout the logistics system. Transport costs are directly influenced by the location of the factories, warehouses, suppliers and customers of the business. Inventory requirements are also influenced by the transport mode used, because costly, but fast transport services make smaller inventory levels possible. The form of transport largely determines the packaging required and the handling equipment for the loading and unloading of cargo. The design of loading docks primarily depends on the type of carrier. A method of order processing that makes maximum consolidation of consignments possible, has the advantage of volume discount, since carriers can transport larger consignments. The type of carrier selected, influences customer service objectives. Transport costs also represent the most substantial cost element of the logistics system (Van Rensburg, A.M.J., 2000: 104).

The transportation link permits goods to flow from one point to another, thereby bridging the buyer-seller gap in trading. The way and time in which this bridging is performed determine the efficiency of the operation supply chain facility and determines the competitive edge of the business (Coyle *et al.*, 1996:318). The geographical differences between suppliers and consumers result in the value added by transportation to a company by creating time and place utility. The value added is the physical movement of the goods to the place desired at the time desired (Coyle *et al.*, 1996:318). Transportation costs in the USA in 1994 was 6.3% of the GDP. In South Africa transportation costs increased from 7.82% of the GDP in 1994 to 8.25% of GDP in 1998, which emphasises the importance of transportation in a country's economy (Engler, 1997). In determining the transportation mode to be used in the conveyance of a consignment, a cost-service trade-off is necessary. If a business for example, switches from rail to air transportation, the result can increase speed, lower transit time, lower inventories, decreased warehousing space and less-stringent product packaging. The business

realises these advantages at the expense of higher transportation costs (Coyle *et al.*, 1996:319).

Although transport is the most important activity in logistics, it should be regarded as a sub-function of logistics together with storage, handling and inventory control. Optimisation of the transport activity does not necessarily lead to optimisation of the logistics function as a whole. The influence of a transport decision on other elements in the logistics system should therefore be taken into account, which implies a continuous application of the total cost approach (Coyle *et al.*, 1996:319; Van Rensburg, A.M.J., 2000:105).

Transport can also influence the following company decisions, namely production decisions, marketing decisions, purchase decisions and more importantly price decisions. Since transport costs constitute a significant part of the total cost of the end product, these costs should be considered during pricing decisions (Van Rensburg, A.M.J., 2000:105).

It should be emphasised that although efficient transport can raise the value of the product, this increased value is not through physical change or processing of the product. Transport creates value by providing time and place utility to raw materials and purchased products by making them available at the right time and place. Through this increase in value, transport contributes directly to increasing business revenue (Van Rensburg, A.M.J., 2000:106).

2.5.7 Warehousing and storage

Warehousing refers to the management of the space required to hold inventories. It involves problems, such as site selection, space determination, stock layout, stock retrieval, stock design and warehousing configuration. A number of important decisions are related to storage activities including how

many warehouses, how much inventory, where to locate the warehouses and what size the warehouse should be (Coyle *et al.*, 1996:44).

2.5.8 Establishing warehouses and plants

Before these decisions can be made thorough research needs to be performed. Making wrong decisions can be detrimental to the business's competitive advantage (Van Rensburg, L.R.J., 2000:3).

2.5.9 Materials management

Materials handling is the art and science of implementing movement in an economical and safe manner. This is important because a total logistics management system depends upon well-organised and integrated materials handling in order to provide the proper flow of materials to all essential parts of the business. Materials handling is usually concerned with mechanical equipment for short distance movements. Examples of materials handling equipment includes conveyors, forklift trucks, overhead cranes and containers (Coyle *et al.*, 1996:45; Magad & Amos, 1995:327).

2.5.10 After-sales service

To follow up, after a product has been purchased and the way customer problems are handled will influence the quality of customer service and whether the customer will return (Van Rensburg, L.R.J., 2000:3).

2.5.11 Salvage and scrap disposal (Reverse Logistics)

Material which is not used, should not be thrown away. An alternative use for it should be found (Van Rensburg, L.R.J., 2000:4).

2.5.12 Return goods handling

This activity must take place if there is a problem with the performance of the item or simply because the customer has changed his or her mind. All businesses should clearly state their policy regarding returned goods, since it can influence customer service (Lambert *et al.*, 1998:20).

2.5.13 Packaging

One of the objectives of logistics is to move goods with no more damage than is economically reasonable. A good design of the package for the product's protection helps to ensure damage-free movement (Gourdin, 2001:6).

2.5.14 Procurement

The purchase of materials and services from outside businesses to support the operations from production to marketing, sales, and logistics is called procurement (Lambert *et al.*, 1998:20).

2.5.15 Production planning

To satisfy customer needs by giving them a product, the manufacturing department needs components and raw materials in order to make the finished product. It is important that the primary focus should not shift, this will lead to customer dissatisfaction (Gourdin, 2001:6).

2.5.16 Information processing

All areas of the logistics system are linked together through information processing (Gourdin, 2001:6).

2.6 The role of logistics in the economy

Logistics can play *three critical* roles in the economy. *Firstly*, a large percentage of a country's total expenditure is built up out of logistic expenditures. Millions of rands are annually spent on transportation, storage facilities and stock keeping. All these expenditures contribute to a country's GNP and it also contributes to job and wealth creation opportunities. A country's logistics network consists of road and railroad networks, airports and harbour. All this adds value to the total investment in a country. A road can facilitate the movement of goods to an area which was impossible before. It creates opportunities for other businesses, resulting in creating job opportunities that result in better lifestyles. New roads that join cities and countries decreases transportation costs and encourages trade between these cities and countries (Van Rensburg, L.R.J., 2000:9).

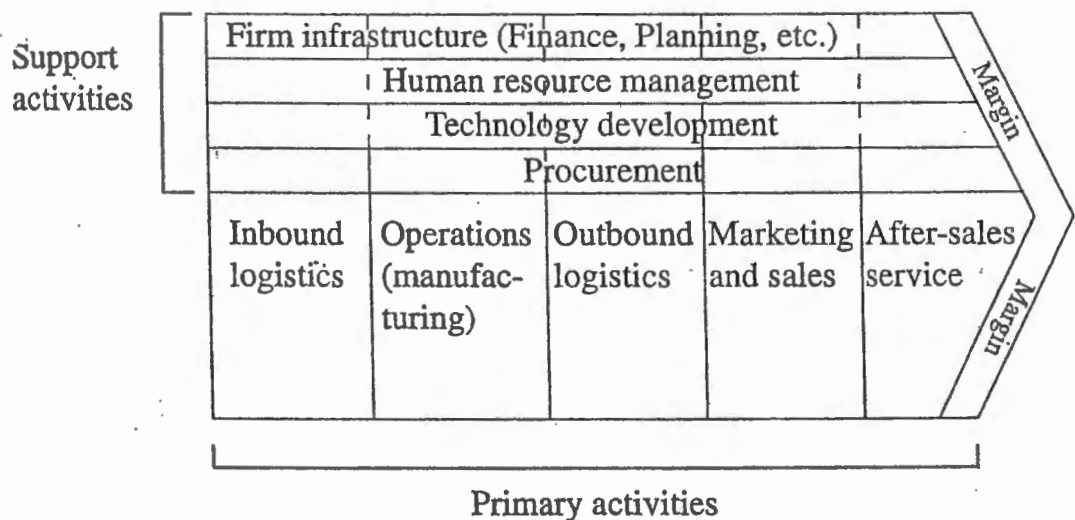
Secondly, the movement and flow of many economic transactions are supported by logistics. Therefore, it is an important activity in facilitating the sale of virtually all goods and services. To understand this role from a systems perspective, consider that if goods do not arrive on time, customers cannot buy them. If goods do not arrive in the proper place or in the proper condition, no sale can be made. Therefore, this is important as all economic activities throughout the supply chain will suffer if all these activities are not effectively managed (Lambert *et al.*, 1998:10).

Thirdly, logistics plays a value-adding role. The **seven Rs** of logistics mean that the right product should be available in the right quantities, in the right condition, at the right place, at the right time to the right consumer at the right cost. Thereby time and place utility is created (Van Rensburg, L.R.J., 2000:9).

2.7 The role of logistics in the business

The value chain concept of Michael Porter provides an excellent way to better understand how logistics fits into an organisation. This can be seen in figure 2.6. Porter’s model illustrates the activities that a business must perform in order to provide benefits to its customers (Gourdin, 2001:7).

Figure 2.6: The value chain



Source: Adapted from Gourdin, 2001:7.

Ongoing production, marketing, delivery, and servicing of the product of service are the primary tasks. Support activities deal with the purchased inputs, technology, human resources, and overall infrastructure, which is needed to support the primary activities. These constitute the primary activities in the value chain. It is important to note that two of the five primary activities focus on logistics: feeding raw materials, component parts, and related services into the production line (inbound logistics), and managing the flow of finished goods from the end of the production line to the customer (outbound logistics). The way the individual activities are performed, as well as the structure of the overall value chain is dictated by

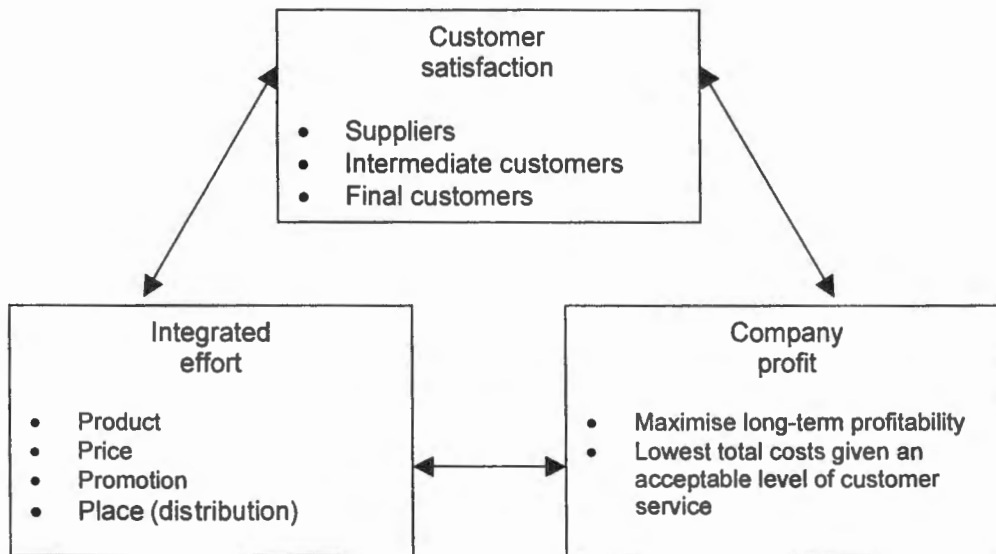
the strategy of the business. If a business possesses a sustainable competitive advantage it will succeed in the long run relative to its rivals. This advantage can come from an ability to provide comparable goods/services at lower costs or by differentiation (offering superior benefits to the buyer for the same cost). Whether, as a result of low costs or differentiation the intent is to offer more value to customers than they can receive elsewhere. In other words, competitive advantage grows through the way businesses organise and perform the discrete activities that comprise their respective value chains. This aspect will be discussed later in the chapter. The willingness of buyers to pay for their product or service, is the ultimate value of a business. It is profitable if this value exceeds the total cost of performing all the required activities (Gourdin, 2001:7).

As noted above, the logistics activities are interrelated with all the activities and functional areas of a business, such as marketing, manufacturing/operations, finance and accounting. Because logistics supports marketing, it is therefore important to examine the marketing concept.

2.7.1 Logistics supports marketing

Before logistics decisions can be made management must decide on an appropriate marketing strategy for the business. The marketing concept, as mentioned above, is a "marketing management philosophy which holds that achieving organisational goals depends on determining the needs and wants of target markets and delivering the desired satisfactions more effectively and efficiently than competitors." Thus, the marketing concept is a "customer-driven" perspective, which holds that a business exists to meet customer needs. The relationships between logistics and the three critical elements of the marketing concept (customer satisfaction, integrated efforts/systems approach, and adequate corporate profit), are shown in Figure 2.7. Logistics plays a key role in each of these elements in several ways.

Figure 2.7: Marketing/logistics management concept



Source: Adapted from Lambert *et al.*, 1998: 12.

Once a marketing strategy has been developed, managers utilise a mix of four key variables to implement the strategy. These variables are also known as the “four P’s” or the marketing mix, which is required for a business to be successful. Any marketing effort must integrate the ideas of having the right *product*, at the right *price*, publicised with the proper *promotion*, and available in the right *place*. Logistics plays a critical role particularly in support of getting the product to the right **place**. As discussed earlier, a customer can only be satisfied if a product or service is available to a customer when and where it is needed. Figure 2.8 summarises the trade-offs required between and among the major elements of the marketing mix and logistics. Thus, the business needs to use the “systems approach” in linking the needs foreseen by marketing with production, as well as logistics. To achieve customer satisfaction it is necessary that both the business and suppliers work together. When customers are satisfied, they will come back, the news will spread and a win-win relationship will be formed.

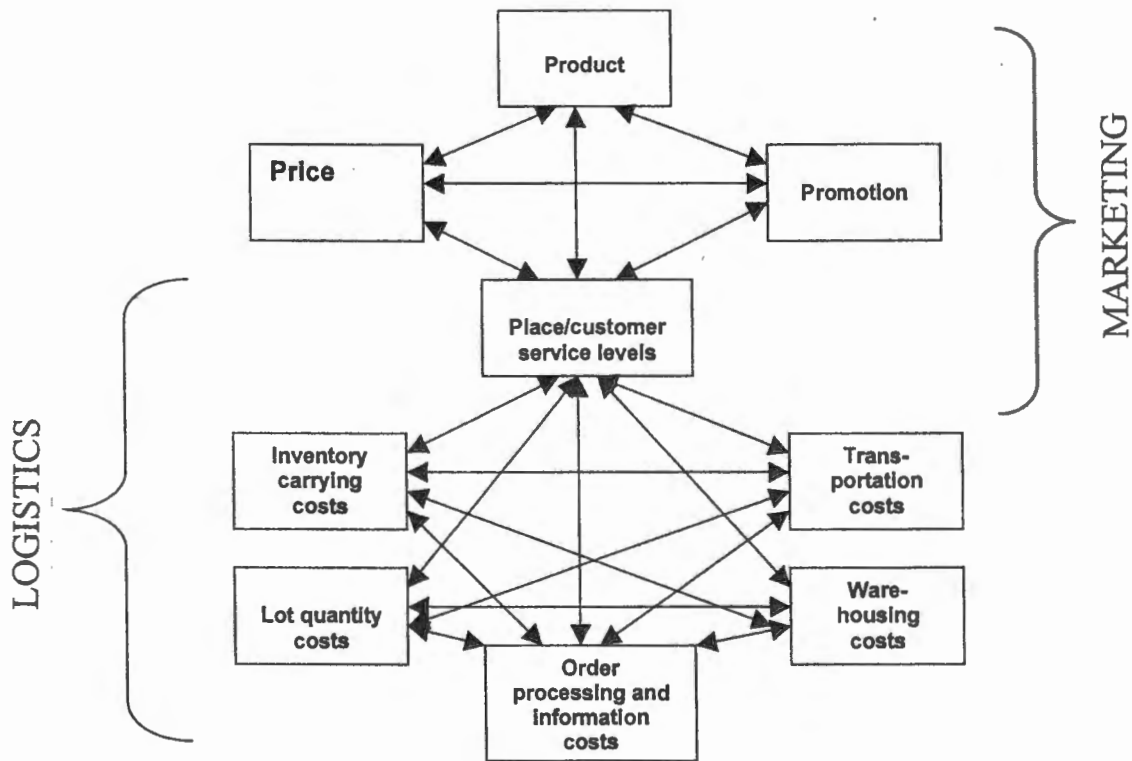
2.7.2 The importance of trade-offs in logistics

One way to accomplish what is shown in Figure 2.8, is through examining trade-offs among alternatives, thereby reducing the overall total cost of activities within a system. Figure 2.8 is subsequently described by exploring the manner in which each of the elements of the marketing mix interact and are affected by logistics operations.

2.7.2.1 Place

The key element of the marketing mix with which logistics interfaces directly is the place decision. The place decision is important because it encompasses logistics decisions regarding how best to supply the product to the customer. Place expenditures support the levels of customer service provided by the business. This includes on-time delivery, high order fill rates and consistent transit times. Decisions, such as selecting the right distribution channel, the right product and selecting the right mode of transport and storage facilities are all decisions made according to the specific place. The 7Rs of logistics are very important here, especially in selecting the best possible place to establish the business and warehouses (Lambert *et al.*, 1998:14).

Figure 2.8: Cost trade-offs required in marketing and logistics



Source: Adapted from Lambert *et al.*, 1998:13

2.7.2.2 Product

The product refers to the set of utilities or a bundle of need-satisfying attributes that a customer receives as a result of a purchase. In an effort to lower price, management may decide to change the product according to demand, for example, reduce product quality, eliminate product features, reduce the range of product offerings, reduce customer service or warranty support or increase the time between model changes. However, any of these actions may reduce the attraction of the product for consumers, creating a loss of customers and thereby a reduction in long-term profits. By understanding the trade-off and interrelationships between logistics and other marketing activities, poor decisions made by management can be avoided. All aspects of the product, such as size, shape, mass and packaging can affect the logistics functions (Lambert *et al.*, 1998:14).

2.7.2.3 Price

Price is the amount of money which is charged for a product or service. It is the amount that a customer pays for a product or service offering. Discounts for buying in quantities or for belonging to a certain class of customers, discounts for prompt payment, rebates, whether inventory is offered on consignment, and who pays delivery costs are some of the items that should be factored into price. By reducing the price of products, changing the terms or service offerings, suppliers may try to improve sales. When thinking of price, there are a few decisions that should be kept in mind, such as transportation and stock keeping costs. Logistics therefore directly influences the price of the product and should be kept to a minimum (Lambert *et al.*, 1998:14).

2.7.2.4 Promotion

Promotion is the value of the goods or services which is communicated to the market. Promotion is the technique used to stimulate demand for a product. Consumers should be informed, reminded and persuaded to buy a product and this is achieved through promotions. Promotion of a product or service can be a personal selling and/or an advertising strategy. Increasing advertising expenditure or size of the direct sales force can have a positive impact on sales. A point exists where the extra money being spent does not yield sufficiently high increase in sales or profits to justify the added expense. It is important for businesses to understand when they reach that point, so that they can avoid misallocating funds. These funds can be used to train the sales force, to provide more value-added services to the customer, or make the customer more aware of the added value it currently provides through superior logistics service. Logistics and communication should be co-ordinated so that everything goes according to plan (Lambert *et al.*, 1998:14).

When the business performs well on all the elements of the marketing mix, customer satisfaction can occur. Customer satisfaction can lead to continuous sales. By adjusting customer service levels to meet what the customer desires and is willing to pay, the business can simultaneously improve service levels and reduce cost. In other words, if the logistics system is planned well and followed accordingly, then customer service can be the result. Customer service is very important to all suppliers and businesses, since superior service can result in higher profits.

2.8 Logistics as a source of competitive advantage

"Competitive advantage is the position of enduring superiority over competitors in terms of customer preference which may be achieved through logistics". Managers are increasingly becoming aware that a well-run logistics system can provide the business with a sustainable competitive advantage (Christopher, 1998:4).

Through improved productivity and reduced costs, many businesses attempted to achieve a competitive advantage. In earlier times, competitive advantage was obtained by delivering flawless product quality. Later on it meant to provide superior customer service, which has become the objective of leading-edge businesses. This discussion highlights two aspects regarding competitive advantage. Firstly, the competitive advantage of businesses do not last forever. Even the best and most successful advances lose their individual determinance over time so that yesterday's competitive advantage become today's minimum acceptable standard. Secondly, businesses must constantly be searching for new ways to meet customers' needs better than the competition can, because the window of opportunity for any given strategic innovation may be relatively narrow (Gourdin, 2001:9).

To achieve meaningful competitive advantage, requires that a business must understand its customers and the additional value that their customers desire. They should also know the nature of the environment, in which they operate. The source of competitive advantage lies found in the ability to differentiate from competitors from the perspective of the customer. It is not possible to assume that good products will sell themselves. There are different platforms for competitive advantage, namely price/value, unique service features, notable product attributes, customer experience and accessibility (Christopher, 1998:5; Longenecker, Moore & Petty, 2000:98). **No competitive advantage lasts forever.** Research emphasises the importance of establishing a sustainable competitive advantage. A sustainable competitive advantage is a value-creating industry position, which is likely to endure over time. It goes without saying that a sustainable competitive advantage is better for a firm to have. It is important to think of new ways to invest performance outcomes so that the basis of the competitive advantage can be renewed over the long run (Longenecker *et al.*, 2000:113).

2.9 The systems approach and logistics management

Due to limited theories, Van Rensburg, L.R.J. (2000:17), was mainly used in the follow section.

"A system can be described as a set of interacting elements, variables, parts or objects that are functionally related to one another and that form a coherent group." From this definition it is important to note that the parts of a system interact in such a way that change in one part, can influence the functioning of another part of the entire system (Van Rensburg, L.R.J. 2000:17).

Thus, the above definition indicate that a business as a unit can also be described as a system. Every function of a business forms the different parts of the system. Every part is a smaller system in the larger system, since the system also consist of parts. The logistics function as a part or subsystem consists of all the logistics activities that should be performed. This can also be seen by looking at a business. A business consists of subsystems and the business can be a subsystem of a larger system. The important conclusion that can be made, is that any system forms part of a larger system and that the different subsystems can influence one another. All systems should be managed from this perspective.

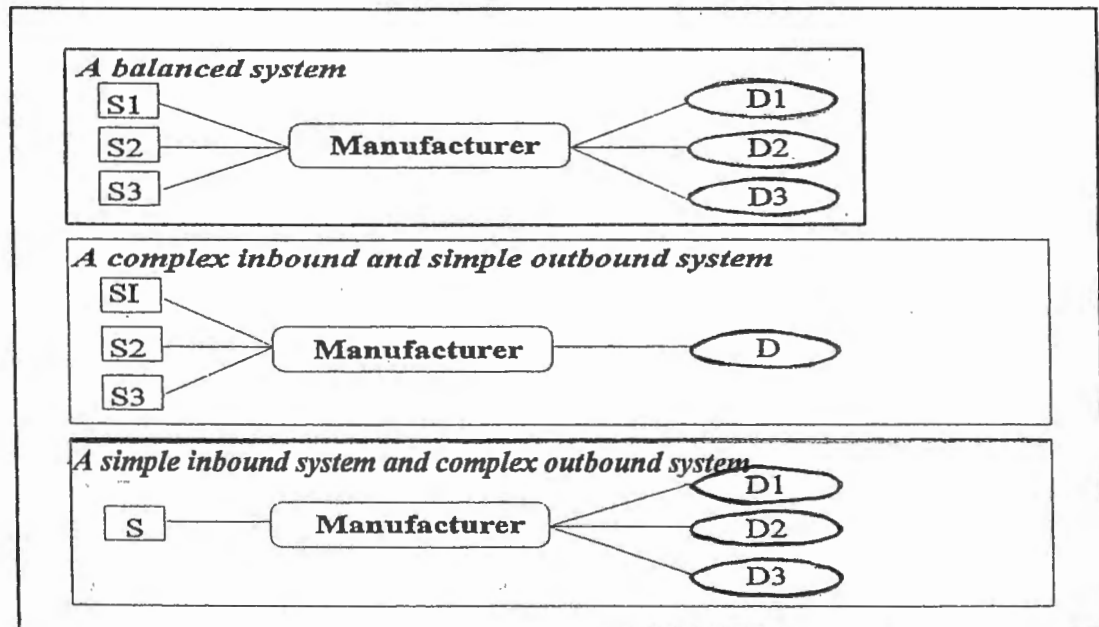
Management should base their decisions upon one of the four approaches for analysing logistics systems, namely inbound versus outbound logistics; cost centres; nodes versus links and the logistics system as a distribution channel. These approaches will subsequently be discussed.

*Approach 1: Inbound logistics and Outbound logistics*

The difference among businesses necessitates the use of different techniques. The nature of the systems used will vary among the different businesses. The logistics system of a business can be divided into two components. The difference of each business lies in the fact that different demands are placed upon transportation, storage and stock keeping with respect to the different sides.

The structure of inbound and outbound logistics systems differ. It is necessary for every business to analyse its situation to determine how these sides appear, since this will determine which side should receive the most management attention. Various possibilities exist. In Figure 2.9 the different possibilities are shown.

Figure 2.9: Different inbound and outbound logistics subsystems



Source: Adapted from Van Rensburg, L.R.J., 2000:18

Balanced system: A balanced system means that businesses receive supplies from various suppliers in different locations and ship to various customers in different locations. This means that these businesses have a reasonably balanced flow on the inbound and outbound sides of their logistics systems (Coyle *et al.*, 1996:47).

A complex inbound and simple outbound system: Some products can consist of thousands of parts and all these parts can be obtained from different suppliers. This calls for a highly intensified co-ordinated inbound logistics system. Since the product is distributed to a relatively small number of dealers, the outbound side needs less co-ordination of the logistics activities. The inbound side is then characterised by complex transportation, storage and stock keeping since the product can move itself. *Management would therefore focus intensively on the inbound side.*

Simple inbound logistics and complex outbound logistics: In this case only one raw material is used from which several final products are manufactured. The movement and storage of the raw material is relatively simple, but the transportation, storage and stock keeping of the final products pose a more complex system. *The outbound logistics system must receive more attention from management.*

Approach 2: Cost centres

The previously mentioned logistic activities are highly interrelated. These activities usually have a negative relationship, which means that if the cost of one activity increases, the cost of another can decrease. By looking at these activities as cost centres, trade-offs between and among them can result in lower overall cost and/or better services. For example, trade-offs can be made between transportation cost and inventory cost in order to determine the amount of total logistics costs. More warehouses can result in higher storage and inventory costs, but transportation costs can decrease to the degree that total logistics costs eventually also decreases. Another example is that switching from cheaper rail transport to more expensive road transport can result in decreased inventory costs, which can eventually decrease total logistics costs (Coyle *et al.*, 1996:48).

Approach 3: Nodes versus links

Another approach of analysing the logistics system in a business is in terms of nodes and links. *The nodes are established spatial points where the goods stop for storage or processing.* This implies that the nodes are plants and warehouses where the business stores material for conversion into finished products or goods in finished form for sale to consumers. Links on the other hand is that which represents the transportation network connecting the nodes in the logistics system (Coyle *et al.*, 1996:48).

Approach 4: The logistics system as a distribution channel

The fourth and last approach resembles the industrial column idea where all the role players in delivering a certain product are depicted. Approach 4 provides a complete picture of the entire system. It also provides the complexity of the system. Some products require complex channels, whereas others need less complex channels. According to these channels managers can determine how the logistics systems must be managed and which aspects will influence the co-ordination of the system.

The reasons why managers should examine these approaches are to understand that logistics is a system and should therefore be managed according to the systems approach. The business is the interface of logistics where the purchasing function will become clear if it is accepted that logistics is part of a larger system.

In many cases management understands how logistics works, they understand the theory but do they search for the best possible logistics system for the business or they merely use the current one since it has been used for many years.

2.10 Summary

In this chapter the concept logistics, was introduced. The development and study field of logistics were described. The different logistics activities were briefly discussed. The relevance of logistics to the business and economy as a whole was introduced. The concept of the systems approach was introduced and related to the role of logistics and its interface with marketing. Logistics as a source of competitive advantage was briefly discussed. In chapter three the inbound logistics system will be examined.

Chapter 3

Inbound logistics and purchasing

3.1 Introduction

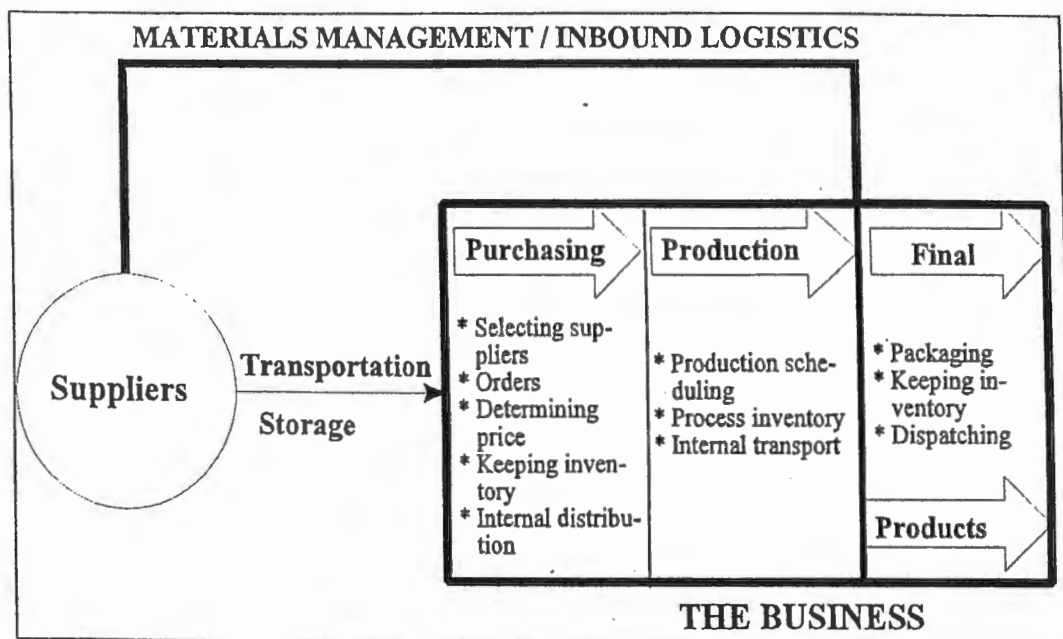
Inbound logistics embraces the flow of raw materials, component parts, and supplies into the production process. Often referred to as materials management, inbound logistics issues are frequently viewed as sub-areas of production since manufacturing is in some cases, the customer. However, this narrow perspective ignores the reality that decisions made with respect to purchasing and obtaining raw materials affect the finished good and thus can have a direct impact on the final consumer. As a result of the implementation of improvement programmes in engineering, manufacturing and logistics management many companies feel the need for improved relationships with suppliers. These relationships necessarily should result in lead-time reduction in new product development, and just-in-time delivery and zero defects on components. Traditionally, the purchasing department has acted as the intermediary, which records the agreements with suppliers on these issues and supervises their fulfilment (Coyle *et al*/1996:69).

In this chapter, the activities that constitute the inbound logistics system of the business will be examined and then the purchasing function will be explored briefly.

3.2 Describing inbound logistics

In figure 3.1 the scope of inbound logistics is depicted. "Inbound logistics refer to *all those activities related to the procurement of requirements for the business up to the point where these requirements are delivered to the production function. It also includes the co-ordination of the flow of materials during the production process until the final products are made available for storage and distribution.*" In many cases this process is called materials management (Van Rensburg, L.R.J., 2000:33).

Figure 3.1: Inbound logistics



Source: Adapted from Van Rensburg, L.R.J., 2000:34.

3.3 Materials Management

The American Production and Inventory Control Society (APICS) define materials management as:

"The grouping of management functions supporting the complete cycle of material flow, from the purchase and internal control of production materials to the planning and control of work in process to the warehousing, shipping and distribution of the finished product." (Aquilano, Chase & Davis, 1995:588.)

Materials management is an integral part of the logistics management process, which encompasses the administration of raw materials, subassemblies, manufactured parts, packing materials and in-process inventory. In other words when implementing materials management in business, top management should have a single-manager responsible for the planning, organising, motivating and controlling of all those activities principally concerned with the flow of materials into an business. Materials management is critical to the logistics process. The decisions made in a logistical process will directly affect the level of customer service offered, the ability of the business to compete with other businesses, and the level of sales and profits the firm is able to achieve in the marketplace. Without the efficient and effective management of inbound materials flow, the manufacturing process cannot produce products at the desired price and at the time they are required for distribution to customers.

Therefore, it is important that the logistics executive, understand the role of materials management and its impact on the cost-service mix of the business. In any business, not having the proper materials available when needed, can lead to disaster. This can slow down processes, lead to stock-outs and loss of profit. Customers will seek substitutes or shop elsewhere.

The importance of good supply management can be appreciated most when the desired goods are not available at the right time to meet operations or production needs. Good supply management means co-ordinating supply movements with operations requirements. The objective for materials management should be to provide the right material, to the right operating point, at the right time, and in a usable condition at a minimum cost (Lambert *et al.*, 1998:182).

3.4 Materials management activities

Eight materials management activities will subsequently be discussed.

3.4.1 Customer service

Customer service is somewhat multi-dimensional because, in one sense, the business is the customer. In this case the business is receiving customer service by purchasing for example the raw materials and component parts which can be transformed into finished goods. The customer service received on the inbound side is just as important as the service received on the outbound side, because it influences the cost, quality and availability of the finished products (Gourdin, 2001:179).

3.4.2 Transportation

As noted in paragraph 2.5.6. transportation is an important component of the inbound side, as well as of the total logistical system. For physical delivery, South Africa exports dispose of four transportation alternatives, namely sea, air, rail and road. *Sea* transport is very slow, but is relatively cheap. Three forms of cargo are transported by sea, namely bulk, break bulk and unitised cargo. *Air* transport includes freighter planes, passenger planes with cargo capacity, or combination planes conveying mainly cargo, with limited

passenger capacities. This transportation is very fast, but is more expensive. *Rail* transport is dependent on rail infrastructure. This transport is very cheap. *Road* transport constitutes the most flexible mode of transport. Road transportation is fast when delivering across borders. Handling is limited and there is a low risk of loss in comparison to sea or rail (Kroon, 1997:341).

3.4.3 Inventory management

It has been estimated that 30 percent of the working capital of a business is tied up in inventories; and that investment in inventory is equivalent to 70 percent of the total investment in plant and equipment. It has also been estimated that inventory costs are equal to 25 percent of the cost of goods (Constantin, 1966:322).

"Inventory is defined as the stock of any item or resource used in an business. An inventory system is the set of policies and controls that monitors levels of inventory and determines (I) what levels should be maintained, (II) when stock should be replenished, and (III) how large orders should be." In its complete scope, inventory can include inputs, such as human, financial, energy, equipment and physical items, such as raw materials; outputs such as parts, components and finished goods; and interim stages of the process, such as partially finished goods or work-in-process. The choice of which items to include in inventory depends on the business. Inventory of a manufacturing operation can include human resources, machines and working capital, as well as raw materials and finished goods (Aquilano *et al.*, 1995:422).

The conclusions drawn from the above are firstly that the major problem of inventory management is the stockout situation since customer relations are hurt and the reputation of the business is damaged. The second problem can be the excessive investment in inventory.

3.4.3.1 Types of inventory:

- *Normal* inventory is required to support the replenishment process under conditions of certainty. Therefore this inventory is needed during the normal functioning of a business.
- *Safety* stock is held in addition to normal inventory to cover uncertainty in demand and lead-time. Safety stock prevents inventory shortages. This safety stock should be set at a point that delivery of the reorder will take place before the item runs out of stock completely.
- *In-transit* inventory is en route from one location to another.
- *Speculative* stock is held for reasons other than meeting current demand needs.
- *Seasonal* inventory is accumulated in advance of a selling season.
- *Dead* stock is inventory that no one wants, at least immediately. These items may cost more to get rid of than to keep them. But the most compelling reason for maintaining these goods is customer service. Perhaps an important buyer has an occasional need for some of these items, so management keeps them on hand (Gourdin, 2001:61).

A general problem is identified, when too much inventory on hand, creates a problem of carrying costs and too little, creates a customer service problem. Management should thoroughly examine whether inventory should be available or whether no additional inventory should be carried in order to determine which option will provide the most benefits and profits to the business.

3.4.3.2 Purpose of inventory

Inventory should be carried for the following reasons:

- to protect against uncertainty,
- to support a strategic plan and

- to take advantage of economies of sale (Aquilano *et al.*, 1995:423).

3.4.3.3 Setting the right inventory levels

The goal in setting the right inventory levels is to maintain a balanced inventory so that customer service for each inventory item is maintained within its proper limits. The time at which inventory levels can be influenced most effectively is when orders are placed. At this point the major opportunity occurs for ensuring a balanced inventory and where customer satisfaction or excess inventories are created. A reorder level and minimum inventory level are required in a inventory control system. When inventory reaches the minimum inventory level a decision whether to reorder is made (Wild, 2002:112).

Safety inventory is primarily to cover random variations in demand, but it can also cover many other situations such as:

- supply failure,
- production shortfall,
- transport failure,
- slow, unreliable or inaccurate information and
- any other source of disruption of service.

Safety inventory is the buffer between supply and demand. It decouples customer service from manufacturing and enables each to operate independently and more effectively (Wild, 2002:99).

3.4.3.4 Symptoms associated with poor inventory management

The following eight are symptoms associated with poor inventory management.

- * Increasing numbers of back-orders.
- * Increasing rand investment in inventory with back-orders remaining constant.
- * High customer turnover rate.
- * Increasing number of orders cancelled.
- * Periodic lack of sufficient storage space.
- * Wild variance in turnover of major inventory items between distribution centres.
- * Deteriorating relationships with intermediaries, as typified by dealer cancellations and declining orders.
- * A large quantity of obsolete items (Lambert *et al.*, 1998:168).

3.4.3.5 Methods of reducing inventory levels

In many instances one or more of the following steps can reduce inventory levels:

- * Multi-echelon inventory planning. ABC analysis is an example of such planning.
- * Lead time analysis.
- * Delivery time analysis. This may lead to a change in carriers or negotiation with existing carriers.
- * Elimination of low turnover and/or obsolete items.
- * Analysis of pack size and discount structure.
- * Examination of procedures for returned goods.
- * Encouragement/automation of product substitution.

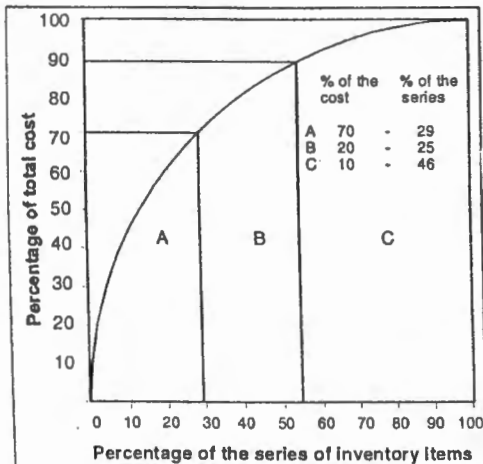
-
- * Installations of formal reorder review systems.
 - * Measurements of fill rates by stock keeping units (SKUs).
 - * Analysis of customer demand characteristics.
 - * Development of a formal sales plan and demand forecast by predetermined logic.
 - * Expand view of inventory to include inventory management and information sharing at various levels in the supply chain.
 - * Reengineering inventory management practices (include warehousing and transportation) to realise improvements in product flow (Lambert *et al.*, 1998:169).

It is important to discuss the different inventory management techniques. A few techniques are discussed in this section, ranging from the relatively simple to the very complex.

* **The ABC Approach**

The ABC approach is a simple approach to inventory management where the basic idea is to divide all inventory items into three groups. Pareto's law states that inventory items are divided into categories/groups based upon their contribution to the total cost of holding inventory for a business. Category/group A represents inventory which adds up to 70% of the cost. Category/group B the next 20 and the last category/group C the final 10%. Figure 3.2 illustrates a hypothetical example of the ABC comparison of items in terms of the percentage of inventory value represented by each group versus the percentage of items represented. Category A items can be fewer in quantity than category B items. Category C items will usually include the majority of the inventory items of the business. If managers are aware of which inventory items contribute most towards the total cost of keeping inventory, these items can be carefully managed (Ross, Westerfield, Jordan & Firer, 2001:588; Fawcett *et al.*, 1992:63).

Figure 3.2: ABC inventory analysis

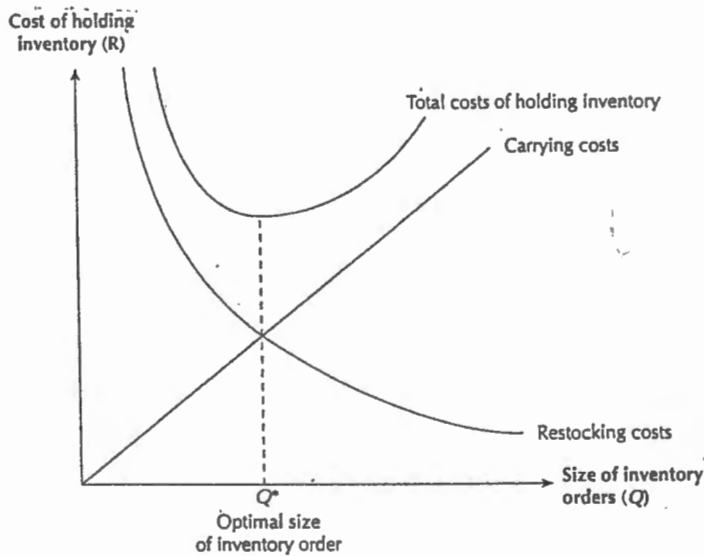


Source: Adapted from Steyn, 2002:140.

* The Economic Order Quantity (EOQ) Model

The economic order quantity (EOQ) model is the best-known approach to explicitly establish an optimal inventory level. The EOQ model provides on order size in units that minimises the total inventory costs, which includes carrying and ordering costs in a situation where demand and lead time are known for certain, this can be seen in figure 3.3. Figure 3.3 illustrates the various costs associated with holding inventory (on the vertical axis) against inventory levels (on the horizontal axis). As shown, inventory carrying costs rise and restocking costs decrease as inventory levels increase. With the EOQ model, an attempt is made to locate the minimum total cost point, called Q^* .

Figure 3.3: Cost of holding inventory



Source: Adapted from Ross *et al.*, 2001:589

In this case it is important to remember that the actual cost of the inventory itself is not included. The reason is that the *total* amount of inventory the business needs in a given year is dictated by sales. Management should determine how much inventory the business should have on hand at any particular time. More precisely, with this model management can determine what order size the business should use when its inventory is restocked. The EOQ can be calculated using the formula:

$$EOQ = \sqrt{\frac{2 OD}{C}} \quad \text{where:}$$

EOQ = number of units to be ordered

O = order cost per order

D = annual demand in number of units

C = carry cost per unit (Ross *et al.*, 2001:589; Gourdin, 2001:63).

* **Materials Requirements Planning (MRP)**

As technology has developed over the years production and inventory specialists have developed computer-based systems for ordering and/or scheduling production of demand-dependent type inventories. These systems fall under the general heading of materials requirements planning (MRP). The basic idea behind MRP is that, once finished goods inventory levels are set, it is possible to determine what levels of work-in-progress inventories must exist to meet the need for finished goods. Material requirements planning, however, is based on the precise calculation and timing of orders, including both the point at which they are issued and their delivery lead times. In general, MRP is best suited to batch production, where the demand for both the end product and its constituent parts are less consistent. This system consists of a set of logically related procedures, decision rules and records designed both to translate a master production schedule into time-phased net inventory requirements and to delineate how these requirements will be satisfied (Ross *et al.*, 2001:593; Gourdin, 2001:74).

* **Just-in-Time inventory**

Just-in-time (JIT) inventory evolved from other techniques. The goal of JIT is essentially to minimise such inventories, thereby maximising turnover. As the name suggests, the basic goal of JIT is to have only enough inventories on hand to meet immediate production needs. JIT represents a move away from holding substantial quantities of inventory. The result of the JIT system is that inventories are reordered and restocked frequently. Making such a system work and avoiding shortages require a high degree of co-operation among suppliers (Wild, 2002:59; Gourdin, 2001:76).

❖ **Advantages of JIT**

A few advantages of JIT have been identified. When using a JIT system, less warehouse space is needed and high quality products must be received or

else the entire benefit collapses. Another advantage is that because of the amount of inventory on hand, the higher the turnover will be (Wild, 2002:59; Gourdin, 2001:77).

❖ Disadvantage of JIT

In all cases where there are advantages there are disadvantages. The disadvantages of JIT are listed below:

- Risk of stock-outs
- Increased transportation costs
- Increased purchasing costs
- Small channel members may suffer
- Environmental issues

JIT represents a powerful tool for reducing inventory and improving production and service operations. Its principles can result in many improvements, but users are cautioned that JIT applications are not universal. JIT requires employee participation, industrial engineering, continuing improvement, total quality control and small lot sizes. JIT is an encompassing philosophy considering product design, process design, equipment selection, materials management, quality assurance, job design and productivity improvements. Because zero lead-time and zero idle time are hard to accomplish, some JIT projects are put quickly in place and later forgotten. Management support, commitment and training are needed to continue the progressing of JIT (Wild, 2002:59; Gourdin, 2001:78).

3.4.4 Warehousing and storage

Warehouses play a key role in improving the efficiency with which goods are moved. They allow for effectively trading-off the costs of the warehousing with lower transportation costs, while maintaining or improving customer service. Warehousing is available in various forms depending on the degree of ownership and control of warehousing operations the user desires. The

user can take advantage of warehousing in a variety of ways; the most popular are storage and break bulk. Warehousing must be looked upon as an added direct expense in the supply or distribution channel. This expense may be justified from the indirect cost savings that are realised. However, warehousing may be eliminated or substantially reduced through the use of just-in-time concepts (Ross, 1996:504).

3.4.5 Maintenance

Maintenance refers to all of the activities associated with the servicing and repair of equipment. Maintenance may comprise a large part of the inbound logistics system of a service business (Gourdin, 2001:181).

3.4.6 Information management

Information management is very important to both the inbound and outbound logistics sides. As the complexity of managing today's business expands and the speed by which information concerning products, customers and processes accelerates, logistics functions can have little hope of responding effectively without sufficient information and information systems (Gourdin, 2001:181).

3.4.7 Salvage and waste disposal

Management should try to gather waste and search for a market rather than putting such products on the dump. When waste is being disposed of, management should ensure that it is not harmful to the environment (Gourdin, 2001:181).

3.4.8 Production

Production control is a service-oriented activity that balances the needs of manufacturing, handling, marketing, finance, engineering and other departments. Production turns raw materials into the finished goods customers desire (Gourdin, 2001:182).

3.5 Procurement/purchasing

Purchasing policies fundamentally contribute to business success in several ways. Purchasing policies can significantly improve sales margins by realising substantial cost savings. Through better quality and logistics arrangements with suppliers, purchasing can contribute to a higher capital turnover ratio. Suppliers may contribute, when addressed properly, significantly to the innovation processes in a business. Purchasing thus has a more profound impact on the net results of the business. Purchasing is primarily responsible for inbound, or upstream, channel activities, whereas logistics spans both inbound and outbound relationships and material flows (Lambert *et al.*, 1998:346).

3.5.1 Activities of the procurement process

A business cannot provide its ultimate customers with product or service quality exceeding the quality initially received from its suppliers. If a supplier is late with a delivery or has quality problems, the quality and availability of the product or service to the customer will be affected, unless the business carries higher inventory. In such cases, the supplier increases the total cost of the product or service. It is important that purchasers understand the needs of their customers. This understanding will allow the purchasing function to make the "right" decisions to meet the needs of the business. The

following discussion is mainly taken from Coyle, Bardi and Langley (1996:73), since theories in literature are limited.

- *Identify or re-evaluate needs.* A transaction can take place if a new or existing need exist.
- *Define and evaluate user requirements.* The identified need should be described and studied.
- *Decide whether to make or buy.* Management should evaluate what will be the best to do. They should decide whether it be best to make the product or to buy the product.
- *Identify the type of purchase to determine the amount of time needed for the procurement process.* The three types of purchases ranging from least amount of time and complexity to most amount of time and complexity, are (I) a straight rebuy or routine purchase, (II) a modified rebuy, which requires a change to an existing supplier or input, and (III) a new buy, which results from a new user need.
- *Conduct a market analysis.* The entire market should be examined in order to determine the angle to be used.
- *Identify all possible suppliers.* Suppliers should be identified that are capable of satisfying customer's needs, even if they have not been used before.
- *Pre-screen all possible sources.* Pre-screening can reduce the pool of possible suppliers to those that can satisfy the user's demand.
- *Evaluate the remaining supplier base.* By eliminating the suppliers who do not meet the needs of customers, it is then necessary to determine which suppliers can best meet the user's negotiable requirements or desires.
- *Choose a supplier.* When choosing a supplier it is important to remember that the choice should be made carefully, because it will determine the relationship that will exist between the buying and supplying business.
- *Receive delivery of the product or service.* This activity occurs with the first attempt by the supplier or suppliers to satisfy the users need.

- *Make a post-purchase performance evaluation.* After the service/product has been performed or delivered, the performance has to be evaluated to ensure that the user's needs have been met.

3.5.2 The selection and evaluation of suppliers

In many cases, the most important activity is selecting the best supplier from the number of potential suppliers. The buying process is complex because of the variety of actors that must be considered when making such a decision (Stock & Lambert, 2001:481).

3.5.2.1 Selecting specific suppliers

The selection of suppliers consists of different phases. Since circumstances and products differ, this process does not always follow the same path. The most logical approach to select a specific supplier involves the following phases:

- **Survey phase**

This phase is the identification of potentially suitable suppliers. During this investigation all possible sources of information should be identified. Although some buyers rely on memory and experience for knowledge of sources of supply, competent buyers more correctly rely on the department's own records, published material and personal contacts. Sources of information concerning suppliers are plentiful. The following information can be used to trace suppliers:

- ✓ Sales and technical personnel
- ✓ Sales representatives and other visitors
- ✓ Visits to industrial exhibitions and displays
- ✓ Organised trade and industry and other associations
- ✓ Purchase records

- ✓ Trade journals
- ✓ Guides such as the Yellow Pages and telephone directories
- ✓ Catalogues, brochures and price lists
- ✓ Buyers' guides and computerised information services
- ✓ Advertisements
- ✓ Publications of organised trade and industry
- ✓ The Internet and the World Wide Web

After evaluating all the sources, a list of all potential suitable suppliers are compiled. Once the list has been compiled, the next phase in choosing a supplier follows, namely sifting the possibilities until only the best possible suppliers remain (Hugo, Badenhorst-Weiss & Van Rooyen, 2002:143).

• **Investigation phase**

During this phase the suppliers on the list are investigated and evaluated in order to select the most suitable one. After developing a comprehensive list of potential suppliers, the buyer's next step is to evaluate each prospective supplier individually. A process of elimination develops selected lists of potential suppliers, with whom the buying business may be willing to do business. The supplier list should be complete enough to bring to bear every type of competition desired. A factor to consider when selecting a supplier is quality. Quality often refers to the specifications that a user desires in an item. Quality includes factors such as the life of the product, ease of repair, maintenance requirements, ease of use and dependability. Reliability, which comprises delivery and performance history, is a factor that is ranked second and third by many procurement professionals. The capability of the supplier is also very important. Capability includes the potential supplier's production facilities capabilities, technical capability, management and organisational capabilities and operating controls. These factors indicate the supplier's ability to provide a need quality of material in a timely manner. In addition to the price, the buying business should also consider the supplier's financial position. It is obvious that when the supplier is bankrupt or not in a financially stable position, then it is not a wise decision to consider this

supplier as the chosen one. In selecting a supplier, it is necessary to examine the desirable qualities, for example, packaging. Another supplier selection factor is the location (geographically). In this case the transportation cost will play a role (Coyle *et al.*, 1996:77).

The best supplier is best described by Professor Wilbur England of Harvard University:

"A good supplier is one who is at all times honest and fair in his dealing with the customers, his own employees, and himself; who has adequate plant facilities, and know-how so as to be able to provide materials which meet the purchaser's specifications, in the quantities required, and at the time promised; whose financial position is sound; whose prices are reasonable both to the buyer and to himself; whose management policies are progressive; who is alert to the need for continued improvement in both his products and his manufacturing processes; and who realises that, in the last analysis, his own interests are best served when he best serves his customers."(Dobler, Burt & Lee, 1990:195.)

After all the research findings have been compiled, it should be obvious who the most suitable suppliers are. It may be necessary to negotiate with these suppliers before a final decision can be made (Hugo *et al.*, 2002:148).

• Selection phase

The choice of a certain supplier must naturally be reconcilable with the supplier policy and also the factors that are important for specific purchases. Material quality problems can be minimised by simply selecting competent and co-operative suppliers in the first place. The following methods can be used:

- *Product testing:* By testing suppliers' products before purchasing them, is one way to determine the suppliers' potential and quality capabilities. Engineering tests are used to determine the quality of purchased materials. This test is usually conducted by the buying

business. When this is not practical, commercial testing agencies can be used. The object of product testing is twofold: (i) to determine that a potential supplier's quality level is to commensurate with the buyer's quality needs, and (ii) where feasible, to compare quality levels of several different suppliers. This permits the development of a list of qualified suppliers, which the buyers can compare on the basis of the quality/cost relationship (Dobler *et al.*, 1990:383).

- *Proposal analysis:* Another method whereby the purchasing function can assess a potential supplier's quality capabilities is called the proposal analysis. The bidders must indicate either directly or indirectly, in their proposals, how they intend to comply with the quality requirements of the purchase. The proposal should be thoroughly analysed to identify any misinterpretation or possible areas of overemphasis by the bidder that could result in excessive costs (Dobler *et al.*, 1990:384).
- *Capability survey:* If the written proposal is accepted, the next step in evaluating quality capabilities is an onsite capability survey. This involves a lot of time and expenses and most businesses conduct this survey only for their more important purchases and if government contracts require this. Specialists from design and process engineering, quality assurance, and sometimes maintenance are needed to give professional interpretation to the facts the survey uncovers (Dobler *et al.*, 1990: 384). Once a choice of a supplier has been made, the next phase follows (Hugo *et al.*, 2002:149).

• **Relationship phase**

Good, reliable suppliers are very important to a business and good relations with such suppliers should be established and maintained (Hugo *et al.*, 2002:149).

3.5.2.2 The importance of supplier goodwill

Management has long recognised that customer goodwill is a valuable asset. In fact, customer goodwill has legal recognition, and it is carried as an asset on many business balance sheets. Business is just beginning to realise that supplier goodwill is also an important business asset. A business develops customer goodwill by selling acceptable products at a fair price, supported by good service with the customers' interests in mind. Supplier goodwill is developed by the buying business by being open, impartial and scrupulously fair in all its dealings with suppliers. The purchasing function should motivate its suppliers to participate in a mutually profitable buyer-seller relationship. Both the buyer and seller must completely understand the mutual advantage of a continuing relationship. As relationships develop, the supplier can reduce its direct selling effort; consequently, it can afford to direct additional effort to the study of mutual problems that may reduce prices. The end result of good supplier relations is a meshing of the operations of both companies. The seller's production and distribution facilities in reality become an extension of the buyer's production line. Unforeseeable problems can arise, such as declines in sales and plant breakdowns, which causes material excess. As a result of unexpected shortages and excesses, some orders have to be cancelled, others spread out, and still others increased or accelerated. Purchasing function must have suppliers motivated by goodwill to co-operate with them in such emergencies. Otherwise, additional costs will be incurred needlessly (Dobler *et al.*, 1990:178).

3.5.2.3 Dishonest suppliers

Dishonest sellers exist everywhere, in both the industrial world and the consumer world. Dishonest suppliers can be a problem in source selection. A buyer's best protection against dishonest suppliers is the practice of thorough

and prudent investigation before becoming seriously involved with a supplier (Dobler *et al*, 1990:190).

Due to many reasons the management team of a business must consider other suppliers. They must not keep the same suppliers just for the reason of continuity. Research will show that business that do not frequently search for better and more efficient suppliers will not be able to deliver to the potential that they are capable of.

3.5.3 The eight basic objectives of purchasing and materials management

The basic objectives of purchasing and materials management can be summarised as follows:

- i) *To support business operations with an uninterrupted flow of materials and services.* From a logistical view this is the main reason for the existence of this function.
- ii) *To buy competitively.* This involves keeping abreast of the forces of supply and demand that regulate prices and availability of materials in the marketplace.
- iii) *To buy wisely.* To buy wisely involves a continual search for better values that yield the best combination of price, quality and service, relative to the buyer's needs.
- iv) *To keep inventory investment and inventory losses at a practical minimum.*
- v) *To develop reliable and effective sources of supply.* Co-operative suppliers that are willing to work with a buyer are an invaluable resource.
- vi) *To develop good relationships with the vendor community and good continuing relationships with suppliers.* Good relationships with

suppliers are imperative and good relationships with potential suppliers are invaluable.

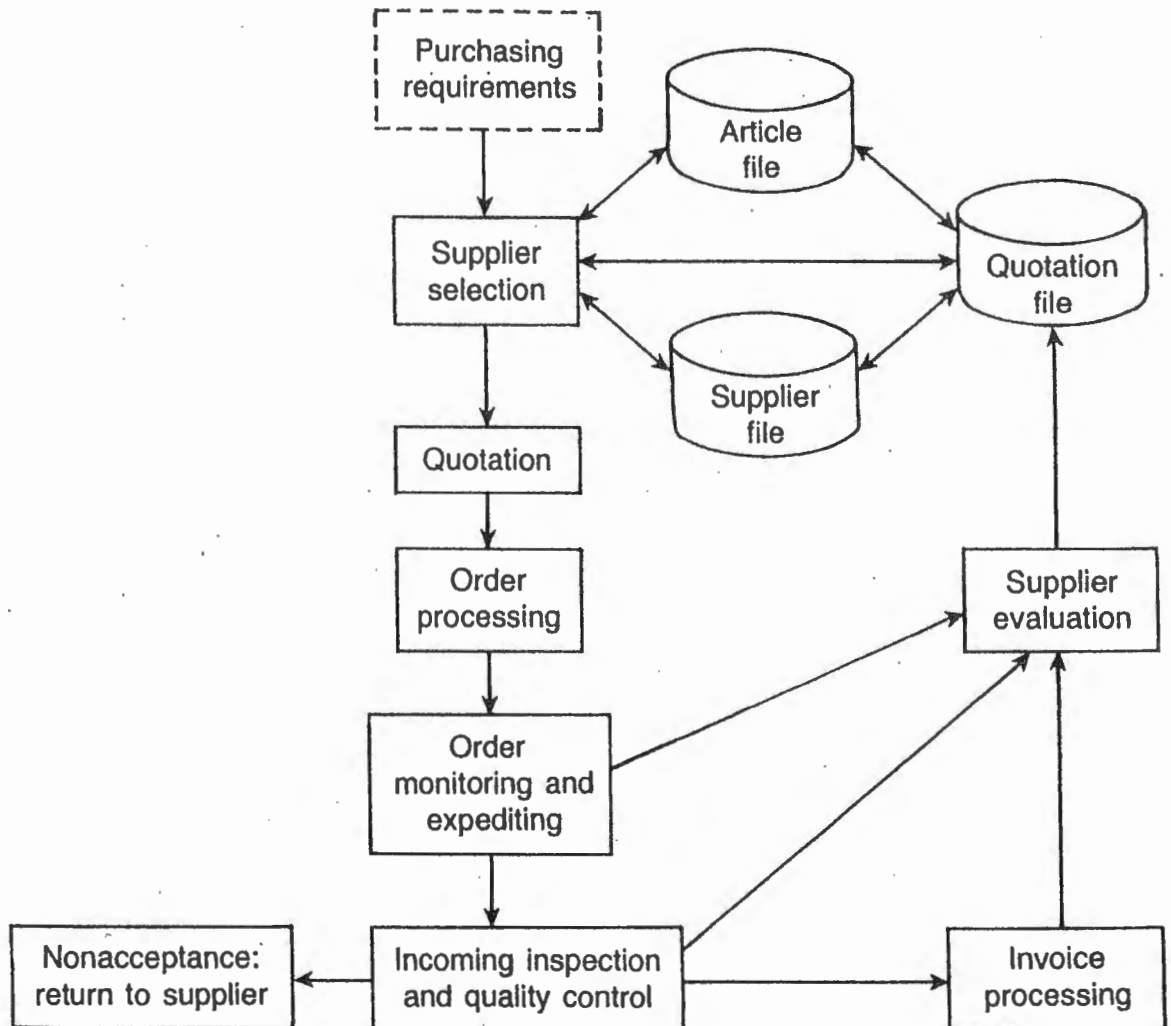
- vii) *To achieve maximum integration with the other departments of the business.*
- viii) *To administer the purchasing and materials management function in a professional, cost-effective manner.* Management should expect the preceding seven objectives to be achieved in a professional manner at a cost that commensurates with their value to the total business.

This involves the acquisition and development of highly competent personnel who are motivated to perform their responsibilities effectively, with the overall goal of helping the business maintain a competitive position in its industry (Dobler *et al.*, 1990:29).

3.5.4 Elements of the purchasing system

Figure 3.4 shows the most important elements of a purchasing information system.

Figure 3.4: Major elements of a purchasing information system



Source: Adapted from Van Weele, 2000:213.

These elements are now briefly described.

- *Requisitioning and ordering.* Requirements regarding goods or services to be purchased, are expressed in a purchasing requisition, which is used by internal users within the business. Purchasing to a purchase order document, transfers the data on the purchasing requisition. Specific supplier and product data are added, as the price per unit and the address where the order should be delivered. All purchase orders receive a purchase order number. This number

should be used by suppliers in future correspondence. The basis for delivery is the purchase order.

- *Order follow-up.* All orders must be monitored. Delivery of the goods by the supplier in accordance with the agreement must be checked. Effective monitoring should be the order of the day. Two important lists that should be monitored effectively are the delivery overdue list (which lists the purchase orders that should be delivered by a certain date but which have not been) and the incoming inspection report list (which lists the purchase orders which at delivery have been rejected by quality control).
- *Delivery.* Normally, the supplier delivers the goods. A delivery document (freight bill) is produced by the supplier when the goods are delivered. The goods will be checked against the (electronic) order copy. Both quantity and quality are inspected. When everything is in order, a copy of the delivery document is sent to the finance and administration functions. The goods are then released and shipped to the warehouse or the user. If the shipment by the supplier does not match the original order, a complaint form is filled in.
- *Invoice handling and payment.* After the delivery the supplier will send an invoice. Normally, invoices are sent to finance and administration who will match it with the original order and the delivery document. When matching is possible, the invoice will be paid to the supplier according to the agreed payment terms. When matching is not possible the invoice is sent for approval to the purchasing function, who will investigate the invoice (Van Weele, 2000:212).

3.6 Summary

In this chapter the elements of inbound logistics and purchasing were discussed. Inbound logistics activities add value to the finished product by ensuring that high-quality raw materials continually flow into the production process. The activity of inventory management was discussed in detail.

Purchasing is one of the most important components of an inbound logistics activity. The purchasing function is concerned with obtaining all goods necessary for maintaining and managing the company. In principle, this also includes contracting services. Purchasing has many vital responsibilities. None is more crucial than selecting the right source. The right source provides the right quality, on time, at the right price, and with the right level of service. Selection of the source is very important so that the benefits of partnerships are reached. The risk of partnership should, however, never be forgotten. Thus, careful selection of suppliers and the professional management of the relationships are essential. Outbound logistics and the most important component of outbound logistics will be discussed in chapter 4.

Chapter 4

Customer service as an activity of outbound logistics

4.1 Introduction

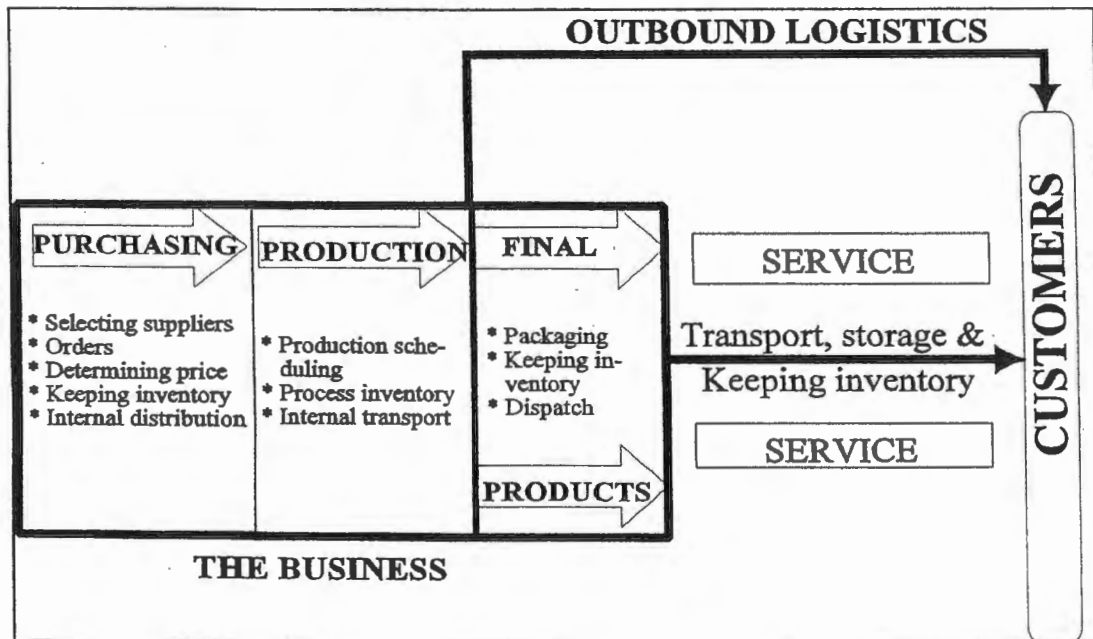
The most important component of any logistics system is customer service. All logistics activities should be structured to support the customer service objectives of the business. Outbound logistics is directly linked to the customers. Therefore, the outbound system will be the source of the most complaints and/or compliments. Since the ultimate purpose of any logistics system is to satisfy customers, customer service should be discussed in detail. The effectiveness of the customer service of a business will determine whether existing customers will remain loyal and whether potential customers will become customers. Therefore the customer service of a business has a direct impact on business profit.

In this chapter, customer service will be examined. The outbound logistics system primarily involves customer service since customer service is the fuel that drives the logistics system.

4.2 The nature of outbound logistics

In figure 4.1 the elements of outbound logistics are depicted.

Figure 4.1: The elements of outbound logistics



Source: Adapted from Van Rensburg, L.R.J., 2000:58.

Outbound logistics distribute the goods to customers and in viewing the elements of outbound logistics, it becomes clear that customer service is a focus point (Van Rensburg, L.R.J., 2000:57).

4.3 Customers and Customer service

Not every customer needs to, or should be treated like every other customer or class of customers. Because so little in general is known about customers' real service requirements, many businesses simply react by setting service levels too high. This results in higher distribution costs than necessary and ultimately in higher prices to the customer. Although service can be tailored to individual customers or customer groups, it is important to generalise

about service as much as possible. Suppliers cannot effectively manage separate service levels for customers numbering in the thousands. However, suppliers do often find it economical to provide different service levels to a limited number of customer groups.

4.3.1 Customer defined

"A customer is an individual or group of individuals to whom you provide one or more products or services." A business can also be seen as a customer when the business pays to receive a service, or purchases goods. In order to truly understand and respond to a customer, management should put themselves in their position. Management should try to understand why they choose to be a customer of the business. Customers can be influenced in a number of ways, for example, competitive influences. The aim should be to achieve the highest level of customer satisfaction with all customers (Smith, 1994:5).

4.3.2 Customer service defined

Customer service represents the output of the entire logistics effort. To have the right product available at the right time, in the right quality, without damage or loss, to the right customer, is an underlying principle of logistics system that recognises the importance of customer service. Different interpretations of what customer service means, exist but Stock and Lambert (2001) defines customer service as *"a process which takes place between buyer, seller, and third party. The process results in a value added to the product or service exchanged. This value added in the exchange process might be short term as in a single transaction or longer term as in a contractual relationship. The value added is also shared, in that each of the parties to the transaction or contract is better off at the completion of the transaction than they were before the transaction took place. Thus, in a*

process view: Customer service is a process for providing significant value-added benefits to the supply chain in a cost-effective way." (Stock & Lambert, 2001:98.)

Customer service, in a broad sense, is the measure of how well the logistics system is performing in providing time and place utility for a product or service. The following three descriptions of customer service can be given:

- **Customer service as an activity:** At this level customer service is seen as a particular task that a business must accomplish to satisfy the customers needs. Examples of this level of customer service are order processing, billing and invoicing, product returns and claims handling. Customer problems and complaints are handled at this level (Coyle *et al.*, 1996:113).
- **Customer service as performance measures:** At this level the emphasis of customer service is in terms of specific performance measures. Examples are percentage of orders delivered on time and completed and the number of orders processed within acceptable time limits (Van Rensburg, L.R.J., 2000:58).
- **Customer service as a philosophy:** Customer service is elevated at this level to a business to provide customer satisfaction through superior customer service (Coyle *et al.*, 1996:113).

The customer service levels of a business can be improved through one or more of the following actions (this topic will get more attention later in the chapter): (I) thoroughly researching customer needs, (II) setting service levels that make realistic trade-offs between revenues and expenses, (III) making use of the latest technology in order processing systems, and (IV) measuring and evaluating the performance of individual logistic activities (Lambert et al, 1998:69).

4.3.3 Elements of customer service

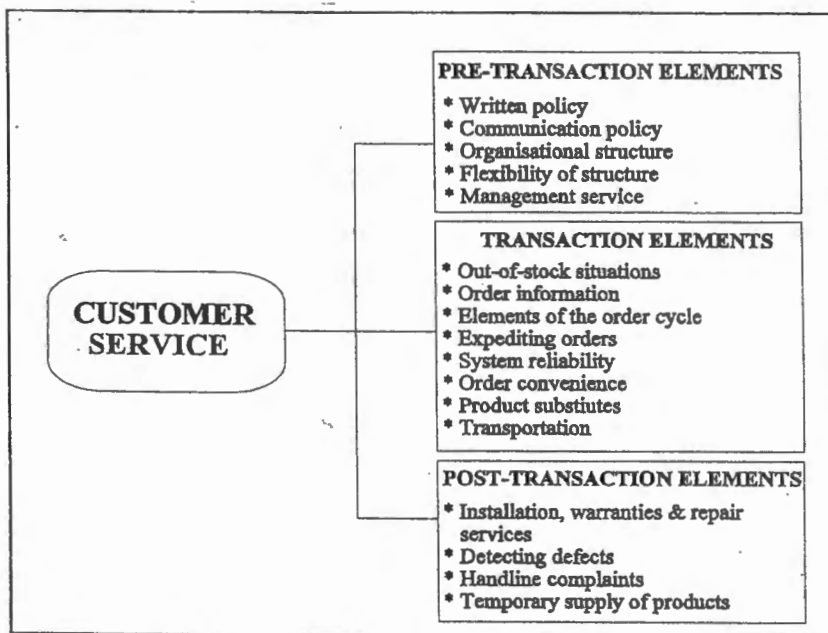
The elements of customer service were mainly taken from Van Rensburg (2000:59) and Gourdin (2001:42).

- *Availability of the item:* The item should be available to all customers, to satisfy demand.
- *After-sales service:* If response is quick in handling problems then customers are satisfied.
- *Telephone availability to handle orders:* Personnel should be available, friendly and honest when handling enquiries.
- *Convenience of orders:* Deals with ordering accessibility, hours for pick-up and delivery, frequency of sales calls, technical assistance and after-sales service.
- *Technical support:* These personnel should have enough technical knowledge to attend to clients.
- *Delivery time:* This relates to how long it takes for the goods to be delivered after the order has been placed.
- *Reliability:* The ability of the business to commit to certain goals and schedules will determine the business reliability.
- *Demonstrating equipment:* The willingness of the business to provide information regarding the product, as well as to demonstrate how the product works.
- *Availability of published material.*

- *Communication:* Communication relates to activities such as answering customer inquiries billing and information management.

Service represents a large number of individual factors, a great many but not all of which are under the control of the logistician. A more detailed description can also be given by distinguishing the three stages of ordering. Different aspects are distinguished during the pre-transaction stage, the transaction stage and the post-transaction stage (see figure 4.2).

Figure 4.2: Elements of customer service



Source: Adapted from Van Rensburg, L.R.J., 2000:60

- * **Pre-transaction elements:** According to Van Rensburg (2000:59) and other noted authors, this element involves establishing a climate for good customer service. Providing a written statement of customer service policy – such as when goods will be delivered after an order is placed, the procedure for handling returns, back-order procedures and methods of shipment – lets customers know what to

expect in the way of service. Establishing contingency plans when labour strikes or natural disasters affect normal service, creating organisational structures to implement customer-service policy, and providing technical training and manuals for customers also contribute to good buyer-supplier relations.

- *Written policy:* The customer service policy statement should (a) be based on customer needs, (b) define service standards, (c) determine who reports the performance measurements to whom and with what frequency, and (d) be operational or capable of being implemented (Stock & Lambert, 2001:98).
- *Communicating policy:* This policy is a very important aspect. All policies should be well communicated.
- *Organisational structure:* Policies should be managed properly. A responsible person should be able to provide sufficient information regarding customer service.
- *Flexibility of structure:* The structure should be flexible to accommodate unplanned events (Stock & Lambert, 2001:99).
- *Management services:* Manuals assisting clients to manage inventory more effectively should be distributed by management.

* **Transaction elements:** When discussing the transaction elements, Van Rensburg (2000:60) is quoted. These elements are directly a result of the delivering of products to customers. Setting stock levels, selecting transportation modes and establishing order-processing procedures are examples of transaction elements in customer service. These elements, in turn affect delivery times, accuracy of order filling, condition of goods on receipt and stock availability, which are the aspects of service that the customer experiences.

- *Stockout level:* When a situation appears that products are not available when customers need them, it should be recorded and the reasons for this occurrence should be determined.

- *Order information:* All information regarding orders should be kept. The responsible people should be able to give relevant information regarding the order to the customer at any stage during and after the order.
 - *Elements of the order cycle:* The order cycle refers to the total time that elapses from customer initiation of the order until the goods reach the consumer. The elements of an order cycle are placing the order, processing the order, order communication, preparing the order and dispatching the order and delivery. The cycle should be kept as short as possible. Effective monitoring is needed (Stock & Lambert, 2001:100).
 - *Expediting orders:* This refers to the shipment that receives special handling in order not to lose the client. The extra cost incurred this way can be less than the cost of losing that client (Stock & Lambert, 2001:100).
 - *System reliability:* Extra costs and especially a loss of clients is the outcome of inaccuracies in a system. Management should ensure that all deadlines and promises are kept.
 - *Transportation:* Reliable and trustworthy transportation should be used to move goods between field locations to avoid stockouts (Stock & Lambert, 2001:100).
 - *Product substitutes:* It happens that products ordered are not available in the size or colour indicated by the client. It should be determined whether the client will be satisfied with the product and/or whether its size or colour is different. It should be determined if the customer prefers the new product or if she/he still prefers the older product when it is available again. A product substitution record should be kept to monitor the performance.
- * **Post-transaction elements:** These elements represent the array of services needed to support the product in the field, to protect consumers from products that are defective, to provide for the return

of packages and/or to handle claims, complaints and returns. These activities take place after the sale of the product, but must be planned for in the transactional and pre-transactional stages.

- *Installation, warranties and repair services:* Businesses should be willing to assist customers in the installation of technologically advanced products. Warranties should also be granted. Repair of products should be done. These elements of customer service can be a significant factor (Stock & Lambert, 2001:101).
- *Detecting defects:* Businesses should be able to detect and recall products, which prove to be dangerous in order to avoid litigation. This function should be free of charge (Stock & Lambert, 2001:101).
- *Handling complaints:* Systems should be in place to handle complaints effectively. A data basis of claims, complaints and returns should be maintained in order to provide valuable consumer information (Stock & Lambert, 2001:102).
- *Temporary product replacement:* This refers to the willingness of a business to supply the customer with a temporary product while the product is being repaired or ordered (Stock & Lambert, 2001:102).

Customer service is the sum of all of these elements, because customers react to the total mix. Of course, some of the elements are more important than others. Also, the logistician has greater influence on those that are directly under his or her organisational authority.

4.4 Customer service and the internal customer

Customer loyalty and satisfaction are becoming more difficult and more important to maintain in today's competitive business world. Keeping customers satisfied is the key to ensure that they return. Customer satisfaction does not only apply to the end user of business products or services, but also to the employees of a business and how they work together to produce products and services. Gaining and keeping customer loyalty

through customer-satisfaction efforts start with activities along the internal chain of events inside a business. The goal of any customer-satisfaction effort should be to improve external satisfaction levels by first improving internal customer relationships. One of the key ingredients for determining and managing customer satisfaction both inside and outside the business, is feedback. Customer loyalty is the result of satisfaction and effective feedback management inside and outside the business (Gourdin, 2001:56).

4.5 Identify customer service needs

Managing customer service is a matter of establishing logistics activities at levels that provide the planned level of logistics customer service. However, before such management can take place, it is important to identify the key element that determines service. In addition, it is necessary to determine customer needs for service and how these needs can be measured. Only after these needs are known, management of customer service can set customer-service standards and plan for special services when the regular distribution system fails or when products must be recalled. Measuring logistics customer service is not particularly meaningful unless the customer needs for service can be estimated. Although it would be ideal to set service levels from a knowledge of the sales-service relationships for a single customer or groups of customers, this knowledge is generally not available to businesses. One substitute is to determine customer requirements for service and set logistics-service levels to meet these requirements. The reality is that no two customers will ever be exactly the same in terms of their service requirements. It is important to develop or set a service criteria that is meaningful to customers. A three-stage process is identified, namely identifying the key components of customer service, establishing the relative importance of customer service components and identifying customer service segments. These stages will subsequently be discussed.

4.5.1 Identifying the key components of customer service

A mistake made by management is to assume that “we know what our customers want.” It is obvious that it is important to develop an understanding of the service needs of customers through detailed research. To identify the key source of influence on the purchase decision, is the first step in a research of this type. Given that a clear indication of the source of decision-making power can be gained, the customer service researcher at least knows whom to research. A small-scale research programme should be initiated based upon personal interviews with a representative sample of buyers, once the decision-making unit in a specific market has been identified. The reason and importance of this initial step, in measuring customer service, is that relevant and meaningful measures of customer service are generated by the customers themselves (Christopher, 1998:49).

4.5.2 Establishing the relative importance of customer service components

One way to identify the importance which a customer attaches to each element of customer service is to take the components generated in step 1 and to ask a representative sample of customers to rank them from the most important to the least important (Christopher, 1998:50).

4.5.3 Identifying customer service segments

In the previous step, the importance attached by different respondents to each of the service attributes were identified. This last step is performed to determine if any similarity of preference emerges. One technique that can be used to identify customer service segments, is the use of cluster analysis which is a computer-based method for looking across a set of data and

seeking to match respondents across as many dimensions as possible (Christopher, 1998:51).

4.6 Setting service standards

If a business wants to control its service performance, control against pre-determined standards should take place. The ultimate standard will obviously be to achieve 100 per cent conformity to customer expectations. This implies a complete match between what the customer expects and what the business is willing and able to provide. The establishment of a customer service policy must start with an analysis of customer demand. The degree of product substitutability and number of competitors determine the amount of units of lost sales and the resultant cost of these lost sales units that can be expected during a stockout. For those products characterised by a degree of substitutability, the need for high inventory levels or use of premium transportation is greater than for products with lesser substitutability. More specifically, the business must determine for each product or product line whether its customers will wait until stock-out items are replenished or during the stockout the customer will purchase from competitors.

The analysis must be performed for various market territories since the number of competitors and customer brand loyalty will differ among territories. This requires specific service levels for specific territories. Consideration must also be given to the customers' operational needs. This means that the customer may have definite requirements for delivery dates so as to enable the customer to detect efficiencies in the production process and marketing campaigns. Such requirements must be known in order to enable the seller to tailor (differentiate) the product offering and thereby increase or at least maintain sales and profits. The market analysis must concern itself with an examination of current competitor service levels. At the minimum, a business must establish a service level policy that equals that of its competitors.

A service level less than the level provided by competitors means that the business is placing itself in a competitively disadvantageous position. The real concern is whether the business can provide a better service than competitors at a cost that does not put the business at a price disadvantage. As discussed earlier, the internal side of the business should be satisfied and thus internal service standards will occur.

Examples of key areas where standards are essential are:

- orders received on time
- orders received complete
- orders received damage-free
- orders filled accurately
- orders billed accurately

When setting service standards management should not adopt easy achievable standards. Such standards may be too low to be of practical value. Unrealistically low levels will not help to establish a competitive advantage, whereas when a meaningful standard is set it will help to differentiate the business from its competitors. Management should also keep in mind when adopting these standards that the business should formally communicate these standards to all their customers. Finally, management should remember that a business should develop procedures to measure, monitor and control the customer service quality (Coyle *et al.*, 1996:119; Christopher, 1998:61).

4.7 Methods of establishing a customer service strategy

According to Stock and Lambert (2001:102) and Van Rensburg (2000:61), four methods have been identified to establish an effective customer service strategy. These methods are as follows:

- Customer reaction to out-of-stock situations
- Cost/Income trade-off

- ABC analysis
- Customer service audit

These methods will subsequently be discussed.

4.7.1 Customer reaction to out-of-stock situations

One method to determine the level of customer service is to determine customer reaction if the desired product is not available. When products or services are not available when they are needed and at the place where they are needed, then the risk of losing a customer appears. The customer will have the choice of buying a substitute at the same place or leaving the store to buy at another store. The major problem occurs when the customer leaves the store and does not return again. This means that both a sale and a customer are lost.

4.7.2 Cost/Income trade-off

The sum of the expenditures for the logistics activities of transportation, warehousing, order processing and information systems, production set-ups and purchasing, and inventory management can be viewed as the business expenditure for customer service. To achieve least-cost logistics, management must minimise total logistics cost, given a specified level of customer service. Thus, the costs associated with improving the level of service can be compared to the increase in sales required to recover the additional costs.

4.7.3 ABC analysis

This method has been discussed earlier in chapter 3 as an inventory control technique. This technique can also be performed with customers and

products. In this case the products and customers can be categorised as follows (see table 4.1 below):

- # Category A: Products that are the least, but the most profitable
- # Category D: Products that usually perform 80% of the product range, but seems to be the most profitable.
- # Category A: Customers that are the most profitable dealers to the manufacturer
- # Category E: Customers that are the least profitable, since they buy in small quantities.

The customer-products combination is the best where products and customers are in category A. This combination should receive the best service possible.

Table 4.1: A customer-product profitability matrix

Customer Classification	Product categories			
	A	B	C	D
A	1	2	6	10
B	3	4	7	12
C	5	8	13	16
D	9	14	15	19
E	11	17	18	20

Source: Adapted from Van Rensburg, L.R.J., 2000:63

4.7.4 Customer service audit

Five steps have been identified when customer service is audited, namely:

- Step I: External audit
- Step II: Internal audit
- Step III: Identify possible solutions

- Step IV: Determine the level of customer service
- Step V: Implementing

These steps will subsequently be discussed.

- Step I: External audit

It is necessary to examine the customers in order to identify their needs. According to this information, the business can provide the correct product in the form the customer prefers. It can also be determined how customers experience or perceive the level of service, which is provided.

- Step II: Internal audit

This subject was discussed briefly earlier in this chapter. The internal customer is just as important as the external customer. A satisfied internal customer will perform his/her work eagerly and will help to satisfy the external customer.

- Step III: Identify possible solutions

After step I and II have been completed, numerous problems will have been identified. Certain solutions can be developed for enhancing customer service.

- Step IV: Determine the level of customer service

This has been discussed in paragraph 4.6, where customer service standards should be determined. All employees should have knowledge regarding standards and should be able to help develop new and better standards.

- Step V: Implementing

At this stage audits have been done and possible solutions have been developed. Customer service standards have been set and now the implementation of the strategy remains. This strategy should be monitored regularly.

4.8 Barriers to quality customer service

Gourdin has explained that there are a number of impediments to provide quality customer service on a continuous basis. Some of these variables are controllable by management and some are not. According to Gourdin (2001:47) the following are the controllable and uncontrollable factors.

4.8.1 Controllable factors

- *Lack of customer segmentation:* Some businesses offer all their customers the same level of service. This strategy could result from a conscious decision by management, but it may also reflect a lack of appreciation for customers' needs. Not all customers are the same and they all should not necessarily receive the same service. Managers must be careful of not spending more on customer service than they need to, and may in fact, be alienating those premier buyers by making them feel less valued by the business.
- *Misuse as a selling tool:* Better customer service is often promised as an incentive to close a sale. Benefits, such as faster delivery may be offered even though they are not, in fact, a part of the customer service strategy of the business. This misuse of customer service virtually guarantees customer dissatisfaction. Businesses can't always keep up with the promises made.
- *Short-term management decisions:* When businesses find themselves in a financial difficulty, managers search for ways to improve short-run profitability. Two options are immediately available to a business. The first one is to cut inventories. This action includes the lowering of costs and reduction of assets. In other words, this action benefits the business dually. The second action is to shorten the duration of accounts receivable. This means that customers pay sooner. This will improve the cash flow of the business. However, both of these decisions can have long-term negative implications for customer

service. Reducing inventories by itself can ultimately lead to more stock-outs and lost sales. To reduce the grace period for accounts receivable, is essentially the same as increasing the price, because interest income for those lost days disappears. Thus, sales can decrease over time. All these options should be thoroughly considered before implementing them.

- *Employees:* Customer service starts with the employees. Therefore, if unqualified workers and insufficient employees are hired, this can result in poor customer service. Competent, friendly and honest people must be employed and educated thoroughly in the customer service philosophy of the business. These employees should know what their responsibilities are. They should know what actions they are empowered to take in order to satisfy the customer. Management should make it clear what they expect from their employees and how customers should be treated. Hard-working employees that are prepared to go the extra mile for the business, should be rewarded.

4.8.2 Uncontrollable factors

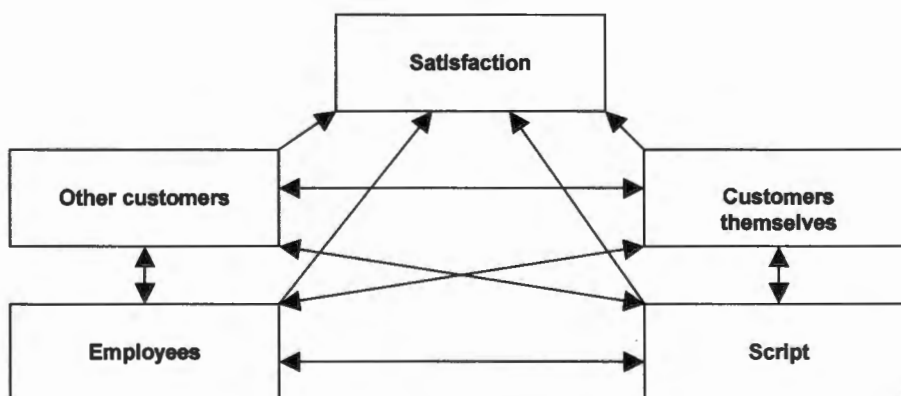
Customers may still be dissatisfied, despite management's best procedures and intentions. Some factors beyond the control of the business can bear on buyers' overall assessment of their experience. Figure 4.3 depicts the uncontrollable variables impacting customer satisfaction. Some of the influences can adversely impact the customer service strategy of the business and highlight the interactions that can develop between these forces.

- *Customers:* Customers can sometimes be their own worst enemy. Customers do not always follow directions, comply with procedures or generally do what they are supposed to do. It often happens that a customer is having a bad day, which can result in the customer feeling dissatisfied.
- *Other customers:* Where many customers are present, the number and behaviour of other customers can influence the level of

satisfaction. If a restaurant is crowded with loud people, for example, customers seeking a quiet leisurely meal will probably be dissatisfied with their experience, but in the same restaurant, customers seeking a place with a nice vibe and atmosphere will be satisfied.

- *Employees:* Employees, just like customers, can have bad days. Though indoctrinated to behave in a certain way, they can occasionally let their emotions override their training with respect to customer treatment. Rude employees can totally undo the entire customer service effort of the business.
- *Script:* "A script describes a typical sequence of behaviours a customer must undertake to accomplish a task at a particular business." This is rarely written down. Customers are supposed to know what to do simply based on experience or observing others. If the script is too confusing or difficult to understand, customers will be dissatisfied.

Figure 4.3: Uncontrollable variables impacting customer satisfaction



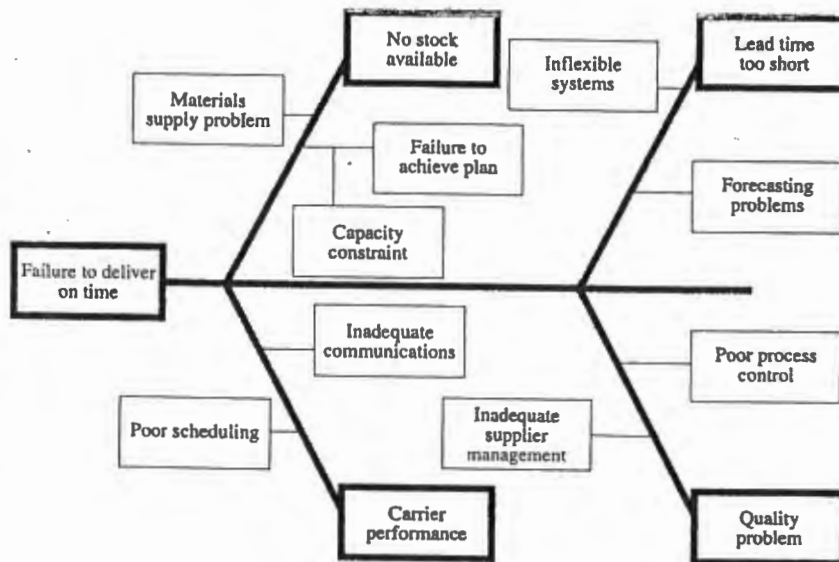
Source: Adapted from Gourdin, 2001:49

4.9 Improving customer service performance

An effective customer service strategy must be based on an understanding of how customers define service. The internal and external customer must be kept in mind. A customer service strategy, that advances the business objectives for long-term profits, return on investment or other relevant measures of performance can be selected, once the business has determined the customer's view of service. Customer service, which generates the lowest cost, is not always the best, but rather the option that retains the "right" or "desired" customers. Management can improve the customer service offered by the business, by using the following ways:

- *Understand customer needs:* Management must learn what services their customers most value. They should also know how much customers are willing to pay. As discussed earlier, customers expectations vary, since they are different. Many techniques can be used to identify the main customer of the business. Management should provide customers with the service they desire without spending more on customer service than what is necessary. When understanding customer needs, it is also important to identify the critical fail points in a service process. This can be done by the use of a cause-and-effect analysis, using a fishbone diagram. In an investigation of failure to meet the customers requested delivery date, for example, the poor carrier performance or lead times are too short. It is then important to investigate these failures. The steps in identifying the problem are as follows: plot the causes and effects in the form of a fishbone diagram. By doing so, the key areas where management should focus their attention, can be identified and whether failure should be reduced or eliminated. Figure 4.4 is an example of a simplified fishbone diagram.

Figure 4.4: Example of a cause-and-effect analysis using a fishbone diagram



Source: Adapted from Stock & Lambert, 2001:131

When focussing on the critical areas, the business will find ways to introduce fail-safe systems. Effective monitoring is essential in order to identify potential problems easily (Gourdin, 2001:50; Stock & Lambert, 2001:131).

- *Monitor service delivery:* Due to the uncontrollable variables discussed earlier and variables disrupting plans, management should receive constant customer feedback. This will ensure that any service problems are quickly identified and corrected. Customer surveys and interviews can provide useful insights, as can personal experience. Managers can put themselves in the place of the customers. They can buy the product, trace a shipment through the logistics system of the business, place a complaint and then evaluate their customer service strategies based upon the personal experience (Gourdin, 2001:50).
- *Train employees:* All employees, especially the front-line worker must understand the customer service strategies of the business, what their

role is and how to implement those plans. In most cases, the only interaction the customer has with the business is with the front-line worker. This front-line worker, who is the lowest-ranked person, is very important to the business. He/she should understand the critical role they play in providing customer satisfaction and receive the training necessary to perform their tasks. These workers should have the freedom and authority to take whatever action they deem necessary to keep the customer happy (Gourdin, 2001:50).

4.10 The consequences of poor customer service

- *Stock-outs:* The most important customer service consideration is product availability. This is because buyers are faced with a number of choices when confronted with an empty shelf. First, the option that is detrimental to the business, is that the customer simply leave the store and go somewhere else. Hopefully the customer will return to the store at another time. The other option is that the customer remain in the store and buy a substitute product, or perhaps the product desired in a different form. These options have one of two results. Firstly the opportunity exists to try a competitor's product or secondly, they are forced to make multiple trips to purchase the item(s) desired. Stockouts can cost the manufacturer sales since customers may find a competing product they like just as well or they may simply get tired of seeing an empty shelf. All parties must make sure that stockouts do not occur because customers dissatisfaction tends to be quicker to develop than customers satisfaction (Gourdin, 2001:51).
- *Variable lead times:* Order-cycle time is almost as important a customer service issue, as product/service availability. "*Order-cycle is the elapsed time between order placement and product delivery.*" (Gourdin, 2001:51.)
- *Customer alienation:* Losing a customer can cost as much as eight times more than retaining a customer. A customer that remains a long

time with a business is a valuable relationship and everything should be done to keep this relationship. Loyal customers buy more and cost less with each subsequent sale. It is important to remember that the optimum level of customer service is the one that obtains and retains the most profitable customers, which leads to the profitability of the business (Gourdin, 2001:53).

4.11 Summary

In this chapter outbound logistics was viewed. It was identified that customer service is the most important component of the outbound logistics system. This is the reason why customer service was discussed in more detail. Not only do customer service decisions have a direct impact on the customers and employees of the business, but they also determine the way in which the rest of the logistics mix will be structured. The issues of service, quality and excellence are much talked about and the fact remains that the customer in today's marketplace is more demanding, not just of product quality, but also of service. Invariably, misidentifying important customer service variables can lead to dissatisfied buyers and ultimately, lost sales. It was also identified that service must be tailored to meet the needs of different customers. Customer service was defined and the elements were discussed. The importance of the internal customer was mentioned. The needs of customers and standards of customer service were explained. The different methods of improving customer service performance and the consequences of poor customer service were finally discussed.

Chapter 5

Research results

5.1 Introduction

In this chapter the method used for obtaining data will be discussed followed by the results of the surveys. The questionnaires were designed to meet the gap between the expected- and the perceived performance. It was also designed to evaluate service from a consumer's point of view. The questions have been adapted to meet the unique requirements of this specific study.

5.2 Research Methodology

5.2.1 Questionnaire

The questionnaire was presented in both English and Afrikaans. The questions were designed in a way that they are easily understood. This enabled respondents to read the item quickly, understand the meaning and answer without difficulty or delay. The technical preparation of the questionnaire was performed by the Statistical Consulting Service of the PU for CHE.

The questionnaire consisted of the following sections:

Section A: Importance of factors considering when selecting and evaluating vendors (suppliers):

In this section, the importance and perceived performance of each question were evaluated. Forty-one questions were asked in this section. Of these questions, each question had to be evaluated according to the importance of each factor as seen from the respondents point of view. For all forty-one questions, the respondents also had to fill in the perceived performance according to each factor for every supplier(vendor) that they used. There is space provided for four suppliers, in other words suppliers A, B, C and D. These questions were closed-ended questions. The reason is that such questions take less time to complete, there is less chance of misunderstanding the question, greater uniformity of responses exists and researcher bias is reduced. The evaluation was done using a five-point scale, ranging from one that is "not important at all", two which is "not important", three that is "important", four is "very important" and five is "extremely important".

Section B: Measurement of overall performance:

This section consisted of four questions. All of them were closed-ended questions and question one, used scale type questions. This question used a seven-point scale starting at "extremely poor" and ending with "excellent". In question two and three, only a "yes" or "no" for each supplier had to be marked. In question four, the respondent had to mark one reason per supplier, why he places orders at the specific supplier. A choice of six were given for each supplier.

Section C: Information regarding your business:

Section C consisted of three questions. Question one supplied seven frequencies for each supplier, which the respondent could choose from to answer the question of how often orders are placed at the various suppliers. This scale ranged from "no fixed pattern" to "daily". Question two asked how often suppliers were evaluated. A seven-point scale was used and it started with "never" and ended at "constantly" for each supplier. Question three gave seven factors for each supplier according to which suppliers could be evaluated. The respondent had to mark the relevant answer or answers for each supplier.

5.2.2 Information gathering

It is important for management to accept the idea that customer satisfaction measurement is more than just a survey of customers. Although surveys are used to provide information, the survey is only one part of what needs to be a business strategy to identify strengths and weaknesses of the business (Gulledge, 1996:8).

According to Bhoto (1997:39) no other technique is as effective as spending time with customers in a one-on-one interview in their own environment. Thus, it was decided to identify a few fieldworkers. These fieldworkers were specially chosen and trained to handle any question. During the month of September, the fieldworkers made appointments with logistical managers. Many logistical managers were not available or just too busy to see the fieldworkers. In many cases, any person on the management team who was willing to help the fieldworkers, answered the questionnaire. After an appointment was made, the fieldworker met the manager on his own premises and recorded the manager's answers to the different questions, while making sure that all questions were

answered correctly. The questionnaire was accompanied by a letter explaining the target audience and the expectations of the fieldworkers in conducting and completing the structured interview. It took approximately 45 minutes to answer all the questions of the questionnaire.

5.2.3 Study population

As mentioned earlier, a register obtained from the BMR (Bureau of Market Research), was used to identify the study population. This register had a census of 381 manufacturing companies in the Northwest Province. From the 381 manufacturing companies, 94 were in the PKOSH area. Of the 94-manufacturing companies in the PKOSH area, 46 questionnaires were retrieved for interpretation. The other 48 consists of 12 businesses which were unwilling to participate in this study and 36 that did not exist. Thus the study population consisted of **58** manufacturing companies, which implies a response rate of **79%** for this study. This indicates statistical significance.

Table 5.1 Response rate of the survey

Description	Amount	Percentage
Total study population identified in the PKOSH area	94	100%
Questionnaires returned and usable	46	49%
Unwilling to partake in this study	12	13%
Untraceable businesses	36	38%
Study population used in this study after refining the data basis	58	100%
Thus response rate for this study: (46 / 58)		79%

5.2.4 Processing of questionnaires

The Statistical Consultation Service of the PU for CHE was responsible for the capturing, analysing and scoring of the data using the software program SAS. Section A had 41 closed ended questions. The 41 questions had to be answered as follows: one answer had to be provided for each question regarding how important the question is for the respondent. Thereafter, for each question, depending on how many suppliers the respondent has, the respondent had to answer how he perceives each supplier on every question.

Table 5-2 Example of how section A had to be answered

EXAMPLE						PERCEIVED PERFORMANCE OF VENDORS/SUPPLIERS (Scale of 1 to 5)			
FACTORS CONSIDERED	Scale of importance								
	1	2	3	4	5	A	B	C	D
	* Product quality				X		2	5	4
* Average lead time			x			4	3	5	3

An average of the importance column for each question was determined. An average of the perceived column for each question was determined. Then the average of the difference between the average importance and average perceived columns for each question was determined. An effect size (d-value) was determined.

The d-value is calculated as follows: the difference between the average importance and the average perceived is divided by the standard deviation of the difference between the importance and perceived. The following formula can be used:

$$d = \frac{\bar{X} (I - P)}{SD (I - P)}$$

The following guidelines can be used when interpreting the effect size (Steyn, 1999:3).

- If $d < 0,2$ = small effect
- If $0,5 \leq d < 0,8$ = medium / reasonable effect; and
- If $d \geq 0,8$ = big effect and is practical meaningful.

BUT for the purpose of this study, the following guidelines were used:

- * If $d < 0,5$ = insignificant effect
- ** If $0,5 \leq d < 0,8$ = moderate effect
- *** If $d \geq 0,8$ = significant effect

Frequencies were determined for section B, questions 2 to 4 and section C, question 1 and 3.

Section B, question 1 used the 7-point scale. For this question, averages were calculated. Section C, question 2, also used a 7-point scale and averages were calculated for this question.

5.3 Results of this study

All 46 questionnaires had answers filled in at the first supplier. Out of these 46, 45 respondents answered in the space provided for the second supplier, namely supplier B. Thus, only one respondent implied that they only had one supplier. 33 out of the 46 respondents had 3 suppliers and 29 out of the 46 respondents had 4 suppliers.

Table 5.3: How many suppliers per respondent/manufacturer

Vendors/Suppliers	Respondents
1 Vendor	1 Respondent
2 Vendors	12 Respondents
3 Vendors	4 Respondents
4 Vendors	29 Respondents
	46 Respondents/Questionnaires

The goal was to find a general feeling of the different suppliers for each question. Due to confidentiality, no supplier names were mentioned. Therefore, A, B, C and D were used. In doing so, for example, respondent one could have marked a supplier by the name of *\$* as "vendor A" and respondent four used the same supplier and marked vendor *\$* as "vendor C". Thus, averages for each question were made and used to make conclusions.

Section A of questionnaire

Table 5.4 gives the result for Section A, questions 1 to 41.

Table 5.4: Results of section A, questions 1 –41

No.	Question	Importance of each factor	D-value	Meaning
1	Management capability of vendor	4.043	0.272	*
2	Customer service policy of vendor	4.087	0.677	**
3	Adaptability of policy and system	3.783	0.234	*
4	Availability of information	4.196	0.402	*
5	Convenience of placing orders	4.283	0.534	**
6	Accuracy of prices and information	4.587	0.853	***
7	Product quality	4.696	0.887	***
8	Lead time	3.804	0.549	**
9	Availability of products	4.304	0.649	**
10	Ability to fill orders in time	4.435	0.992	***
11	Product assortment	3.891	0.604	**
12	Cash discounts for settling accounts in advance	3.739	0.226	*
13	Quality discounts	3.761	0.278	*
14	Expediting orders	3.955	0.560	**
15	Friendliness of personnel	4.022	0.416	*

16	Knowledge of salespeople	4.565	0.888	***
17	Helpfulness of salespeople	4.130	0.484	*
18	Ability to handle urgent orders	4.261	0.729	**
19	After-sales service	4.087	0.737	**
20	Handling complaints and claims	4.283	0.807	***
21	Speed and willingness when handling defects	4.196	0.712	**
22	Price competitiveness	4.261	0.641	**
23	Speed when handling order mistakes	4.304	0.768	**
24	Providing credit when making purchases	3.630	0.304	*
25	Accessibility of salespeople	4.022	0.568	**
26	Providing transportation	2.478	0.171	*
27	Notification of problems in advance	4.239	0.679	**
28	Notification of price changes in advance	4.565	0.990	***
29	Ability to accurately forecast delivery dates	4.043	0.519	**
30	Enquiries from the suppliers	3.674	0.478	*
31	Willingness to help with storage	3.304	0.117	*
32	Supplier's assistance with promotions	3.478	0.290	*
33	Supplier consistently adheres to delivery dates	3.717	0.320	*
34	Supplier's warehouses are in the immediate vicinity	3.543	0.297	*
35	Ability to change delivery dates	3.783	0.466	**
36	Personal promotional gifts to you	2.478	0.302	*
37	Supplier absorbs transportation cost of damaged goods	4.244	0.730	**

38	Ability to fill special orders	4.065	0.727	**
39	Supplier takes special care to ensure prompt deliveries	4.152	0.645	**
40	Telephone etiquette of personnel handling incoming orders	3.891	0.266	*
41	Product and price knowledge of personnel processing the orders.	4.457	0.653	**

No. = Number of the question

Question = Question asked

Importance of each factor

= This is how important each factor was, according to the respondent

D-value = Effect size presented as an average

Interpretation of d-values:

* If $d < 0,5$ = insignificant effect

** If $0,5 \leq d < 0,8$ = moderate effect

*** If $d \geq 0,8$ = significant effect

Detailed conclusions will be drawn of each question in the chapter 6. In this section the results of section A, will be discussed briefly.

The following factors were identified as factors which all suppliers supply the manufacturers effectively, are:

- ⇒ Management capability of vendors
- ⇒ Adaptability of policy and system
- ⇒ Availability of information
- ⇒ Cash discounts for settling accounts in advance
- ⇒ Quality discounts
- ⇒ Friendliness of personnel
- ⇒ Helpfulness of salespeople

-
- ⇒ Providing credit when making purchases
 - ⇒ Providing transportation
 - ⇒ Enquiries from the suppliers
 - ⇒ Willingness to help with storage
 - ⇒ Supplier's assistance with promotions
 - ⇒ Supplier consistently adheres to delivery dates
 - ⇒ Supplier's warehouses are in the immediate vicinity
 - ⇒ Personal promotional gifts to you
 - ⇒ Telephone etiquette of personnel handling incoming orders

It may be the case that the abovementioned factors did not apply to the manufacturers or their suppliers, but it is informative to note that suppliers perform on certain levels. Factors that must be emphasised, are the factors where the suppliers provide efficient service and assistance to their customers. For example quality discounts and providing credit and transportation, helpfulness of salespeople are all aspects which play a major role in selecting different suppliers.

Factors with a moderate effect:

- ⇔ Customer service policy of suppliers
- ⇔ Convenience of placing orders
- ⇔ Lead time
- ⇔ Availability of products
- ⇔ Product assortment
- ⇔ Expediting orders
- ⇔ Ability to handle urgent orders
- ⇔ After-sales service
- ⇔ Speed and willingness when handling defects
- ⇔ Price competitiveness

-
- ⇔ Speed when handling order mistakes
 - ⇔ Accessibility of salespeople
 - ⇔ Notification of problems in advance
 - ⇔ Ability to accurately forecast delivery dates
 - ⇔ Ability to change delivery dates
 - ⇔ Supplier absorbs transportation cost of damaged goods
 - ⇔ Ability to fill special orders
 - ⇔ Supplier takes special care to ensure prompt deliveries
 - ⇔ Product and price knowledge of personnel processing the orders

The abovementioned factors are factors that need attention. Suppliers should focus more on detail when looking after their clients. Suppliers should invest in people that can focus on the abovementioned factors. It is common sense that all employees should have the basic product and price knowledge. The clients/manufacturers should have the ability and freedom to place orders conveniently and to place special orders. Products should always be available. It is always favourable to have an open relationship which can facilitate the discussion of problems in advance. Employees should always be friendly, patient and sufficient. When mistakes are made in connection with orders these orders should get special attention. After-sales service is necessary in all cases, since this will improve relationships with clients and improve profits.

The following factors were identified as factors with significant effects:

- ↑ Accuracy of prices and information
- ↑ Product quality
- ↑ Ability to fill order in time
- ↑ Knowledge of salespeople
- ↑ Handling complaints and claims
- ↑ Notification of price changes in advance

The six factors mentioned above are factors the respondents expect from their different suppliers, but do not receive. These are some of the main reasons why other potential suppliers are considered. If suppliers do not have the “package” the customer insists on, then business with these suppliers should be ended. If suppliers do not make an effort to improve themselves, then they will lose their clients. If clients are treated badly, they will not remain clients and profits will decrease. All clients should be informed of any price changes and the correct information regarding all activities of the business, including the product and prices, should be clear at all times. It is essential that the correct quality of the product should be delivered and that the orders should be delivered in time. This is one of the main reasons for the business transaction and therefore suppliers should adhere to the proposed standards previously agreed upon.

Section B of the questionnaire

Question 1

Table 5.5: Scale indicating the level of satisfaction

Use the following to indicate your level of satisfaction regarding the service provided by different vendors. *(Mark only one per Vendor)*

VENDOR	SCALE INDICATING THE LEVEL OF SATISFACTION						
	Extremely poor	Very poor	Poor	Satisfactory	Good	Very good	Excellent
A			#			##	
B			#		√		##
C		#			√		##
D			#		√		##
Conclusion					√		

minimum that was filled in
maximum that was filled in

Zemke (1997:12) reports that according to the Strategic Planning Institute of Cambridge, businesses focussing on the quality of customer care can keep customers up to 50 percent longer, have 20 percent to 40 percent lower marketing costs and experience 7 percent to 17 percent better net returns.

An overall “good” was achieved. This indicates that there is room for improvement. According to Kotler (1991:18), the satisfied customer tends to:

- buy again;
- talk favourably to others about the business;
- pay less attention to competing brands and advertisements, and
- buy other products from the same business.

Question 2 and 3

Section B, question 2 and 3 walks hand in hand. Question 2: **Have you ever discussed any problems regarding service with any vendor?**
Question 3: **Was the vendor’s response satisfactory?**

Table 5-6: Discussing problems with suppliers

Have you ever discussed any problems regarding service with any vendor?

VENDOR	YES (1)	NO (2)
A	84.78%	15.22%
B	77.78%	22.22%
C	78.79%	21.21%
D	86.21%	13.79%
Average	81.89%	18.11%

81.89% of all the suppliers have complained about service problems, this indicates that substantial improvement is necessary. A small percentage of only 18.11% have never complained and were satisfied or perhaps worst, did not have the guts to complain.

Zemke (1997:12) also notes that businesses which have improved customer loyalty by 5 percent, have improved profits from 25 percent to 85 percent and that customer satisfaction drives loyalty.

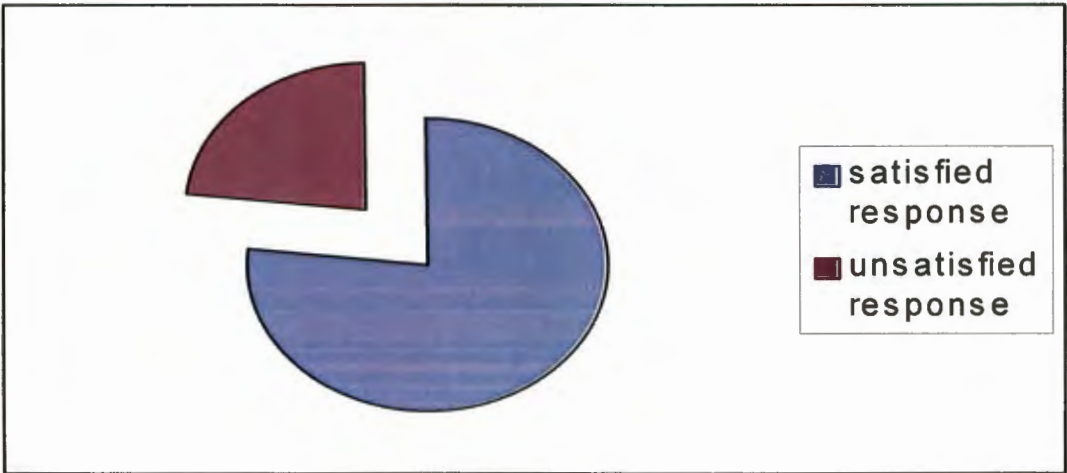
Table 5.7: Vendors response to problems

Was the vendor’s response satisfactory?

VENDOR	YES (1)	NO (2)
A	74.36% of 84.78%	25.64%
B	82.86% of 77.78%	17.14%
C	80.77% of 78.79%	19.23%
D	68.97% of 86.21%	31.03%

The overall feeling was satisfactory, but room for improvement exists. Suppliers should strive for a 100% response satisfactory.

Figure 5.1: Satisfied and unsatisfied response



According to Kotler (1991:16), disappointed customers bad-mouth the product to eleven acquaintances, while satisfied customers may good-mouth the product to only three.

Question 4

Table 5.8: Reasons for purchasing from a specific vendor

**Indicate the main reason for purchasing from the specific vendor.
(Mark only one per Vendor)**

VENDOR	REASONS					
	Lowest price	Product assortment	Speedy and reliable delivery	Situated nearby	Availability of specific products	Good customer service in general
A	22.22%	15.56%	4.44%	13.33%	20.00%	24.44%
B	6.82%	15.91%	11.36%	18.18%	22.73%	25.00%
C	18.75%	25.00%	21.88%	0.00%	9.38%	25.00%
D	14.29%	25.00%	7.14%	10.71%	25.00%	17.86%
Average	15.47%	20.37%	11.21%	14.07%	19.28%	23.08%

The main reason why manufacturers buy at a specific supplier is because of the "good customer service in general" that has been perceived or provided. It is obvious that customer service is an important aspect and should be monitored on a regular basis. Other reasons indicated by manufacturers for buying at specific suppliers were "product assortment" and "availability of specific products".

Section C of the questionnaire

Question 1

Table 5.9: Reasons for placing orders at different vendors

How often do you place orders at the different vendors?

VENDOR	FREQUENCY						
	No fixed pattern for orders (according to needs)	Annually	Biannually	Once every three months	Monthly	Weekly	Daily
A	13.33%	2.22%	2.22%	2.22%	28.89%	37.78%	13.33%
B	11.36%	0%	2.27%	0%	36.36%	38.63%	11.36%
C	9.09%	0%	3.03%	0%	27.27%	39.39%	21.21%
D	10.34%	0%	0%	0%	13.79%	58.62%	17.24%
Average=	11.03%	2.22%	2.51%	2.22%	26.58%	43.61%	15.79%

The orders of respondents are mainly placed on a weekly basis and sometimes on a monthly basis. This implies that once a week the manufacturer and the supplier is in contact, which can emphasise that good relations should be built.

Question 2

Table 5.10: When vendors get evaluated

How often do you evaluate the different vendors?

VENDOR	FREQUENCY						
	Never	Annually	Biannually	Quarterly	Monthly	Weekly	Constantly
A	#			√			# #
B	#				√		# #
C	#				√		# #
D	#				√		# #
Average					√		

It was identified that some suppliers were not evaluated, which can mean that new and potential suppliers are not considered. Overall, those suppliers which were evaluated, were evaluated on a monthly basis.

Question 3

Table 5.11: Which factors are used to evaluate suppliers?

How do you evaluate the suppliers?

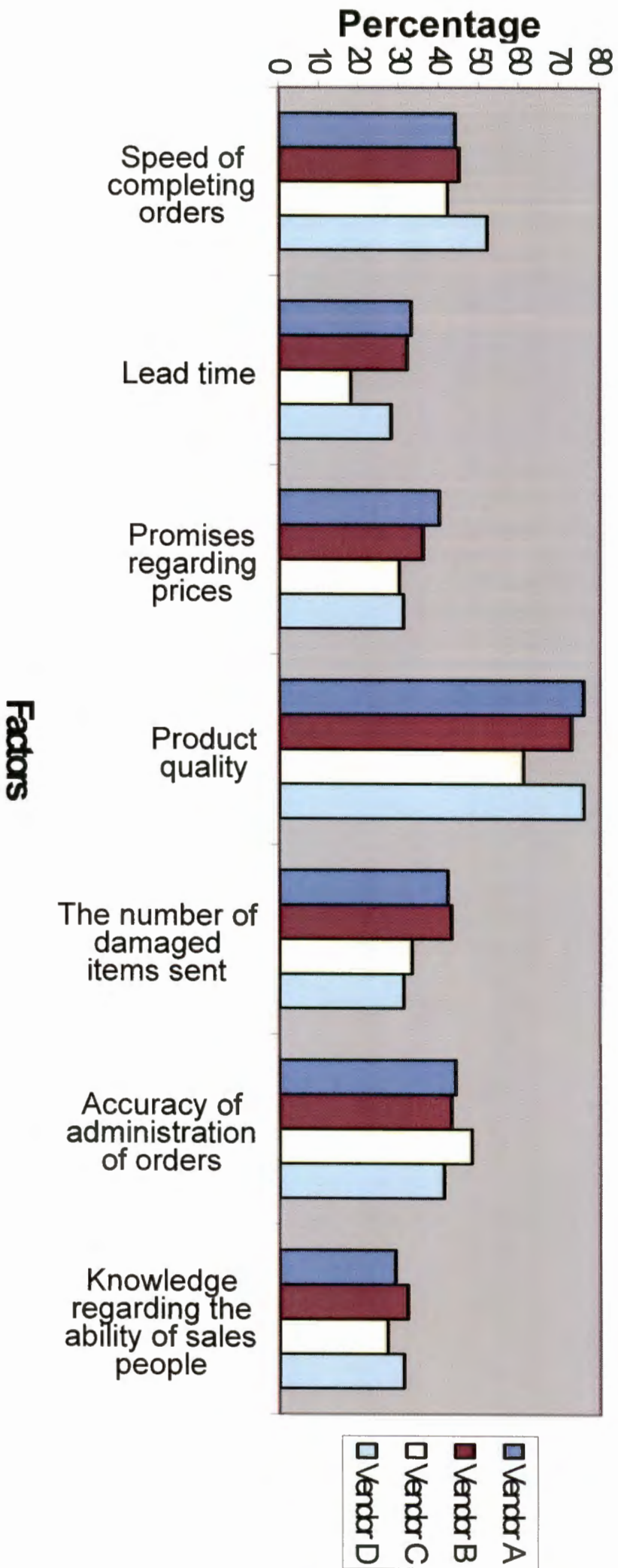
Meaning of numbers 1 to 7

1. Speed of completing orders; 2. Lead time; 3. Promises regarding prices; 4. Product quality; 5. The number of damaged items sent; 6. Accuracy of administration of orders; 7. Knowledge regarding the ability of sales people.

VENDOR	FACTORS						
	1	2	3	4	5	6	7
A	44.44%	33.33%	40.00%	75.56%	42.22%	44.44%	28.89%
B	45.45%	31.82%	36.36%	72.73%	43.18%	43.18%	31.82%
C	42.42%	18.18%	30.30%	60.61%	33.33%	48.48%	27.27%
D	51.72%	27.59%	31.03%	75.86%	31.03%	41.38%	31.03%
Average	46.01%	27.73%	34.42%	71.19%	43.82%	44.37%	29.75%

After it had been identified in section C, question 2, that some suppliers get evaluated on a monthly basis, the major factor on which they were evaluated, were identified as “product quality”. For all respondents, “product quality” seemed to be the main factor followed by “speed of completing orders”, “accuracy of administration of orders” and “the number of damaged items sent”. This can also be seen in figure 5.2.

Figure 5.2: Section C, question 3 for the different vendors



5.4 Limitations of the study

- ◆ A major disadvantage of this study was the limited literature available regarding this study. Although closely related articles and books were used in the literature study it was a set back.
- ◆ Another limitation of this study was the unwillingness of the respondents to participate in this study. Some respondents did not keep their appointments, which left the fieldworker to make other arrangements for another appointment. Many businesses have also moved, which made it difficult to track them. Some were even untraceable.
- ◆ A large sample could have enabled the researcher to calculate more statistically reliable correlations. The service provided by suppliers was not a substantial problem, though still a limitation, but would have been better for the reliability and validity of the study if research could have been launched on a provincial or national level.
- ◆ The feedback from fieldworkers was that the different respondents had different qualifications and did not necessarily understand the meaning of each concept, even after the concepts have been explained. Each business is different and is managed according to what the management team thinks is right.
- ◆ A better result could have been received if, in all cases, the logistics manager completed the questionnaire, as intended.

Chapter 6

Summary, conclusions and recommendations

6.1 Overview of the study

The main reason of this study was to determine if the suppliers of various manufacturing businesses in the PKOSH area are living up to the proposed standards in terms of customer service. To examine this, it was necessary to study logistics in detail. Therefore chapter one identified the reason for this study, the objectives, the study population and the method used to achieve the objectives. Chapters two, three and four were devoted to the literature study. Chapter two introduced logistics and successfully achieved objective one. A definition of logistics was given and the development of logistics was briefly discussed. The identified activities gave a good idea what logistics really is. To understand the role of logistics in practice, it was decided to examine logistics in the business and in the economy. According to Christopher (1998:4), managers are increasingly becoming aware that a well-managed logistics system can provide the business with a sustainable competitive advantage, which is necessary in today's business environment for success.

To achieve objective two, chapter three described the inbound side of logistics. Eight inbound activities were identified and discussed in detail. Activity 3 namely inventory management was examined in more detail. Aspects, such as the types of inventory, purpose of inventory, symptoms, methods and techniques were discussed. These aspects can enable managers to look at the different ways inventory can be held in order to save costs and manage inventory effectively. Purchasing plays an important role. Suppliers, as well as

the choice of the right suppliers were emphasised in this chapter. It was identified that the selection of the right source is very important and that the benefits of partnerships can be reached. The importance of supplier goodwill and dishonest suppliers were introduced and should play a major role in the finding of the best suitable supplier. It was also identified that these suppliers should be managed effectively.

Chapter four discussed the outbound side of logistics. Thereby objective three was achieved, although this chapter mainly focussed on customer service, since customer service is the most important component of the outbound logistics side. Customer service decisions have a direct impact on the customers and employees of the business and these decisions determine how the rest of the logistics mix should be structured.

Chapter five displayed the contents of the questionnaire, how the information was gathered in the PKOSH area, the response rate and the method used to interpret the results of the survey. The abovementioned agree with objective four. Finally, the results of the study were given, with the help of different tables and figures. The limitations of this study were also portrayed.

6.2 Conclusions

A survey was conducted in the PKOSH area and many interesting results were given in chapters. To conclude on the results:

- It was seen that only 1 manufacturer had only 1 supplier, 12 manufacturers had 2 suppliers, 4 manufacturers had 3 suppliers and 29 manufacturers had 4 suppliers.
- Section A, questions 6, 7, 10, 16, 20 and 28 need special attention. These are the factors the respondents feel strong about, in other words, the factors are extremely important to them but they perceive these factors on a low level. The suppliers do not live up to the proposed standards of customer service according to the abovementioned 6 factors.
- Section A, questions 2, 5, 8, 11, 14, 18, 19, 21, 22, 23, 25, 27, 29, 35, 37, 38, 39 and 41 are all factors that have moderate effects, but should not be thought of as not being a problem. Some of these factors are almost a significant effect and all factors named above should be improved on. These factors can also play a role in the decision to change suppliers, and therefore the suppliers should try their best to improve on these factors.
- A "good" was achieved on the scale of satisfaction and this gives way for improvement on the scale. The suppliers should strive for the ultimate, in order to achieve an "excellent".
- It is noted that manufacturers have the freedom to talk to their suppliers about service problems, but it is not good to note that some of the suppliers responses were negative.

- Customer service plays a major role in the decision where to purchase and from whom to purchase.
- Other reasons, such as product assortment and availability of a specific product, also play a role in where to purchase.
- The placement of orders mainly occurs on a weekly basis.
- Suppliers should be monitored and evaluated regularly. According to this study, suppliers are mostly evaluated on a monthly basis and the main factor on which the suppliers gets evaluated on, is product quality.

6.3 Recommendations

Based on the literature study, customer service expectations and conclusions based on empirical data, the following recommendations are made. They can be used as guidelines in managing an effective business.

- √ Regardless of their relative importance, the company must co-ordinate all functional efforts aimed at customer service. Providing extraordinary levels of customer service is a wise investment for any company. Good customer service will provide the basis for enduring customer relations based on trust and commitment.
- √ The management and staff must interact and be dedicated to deliver sufficient customer service.
- √ The training of employees should be an ongoing process, whereby employees level of skill and quality of life can continually be improved.

- √ Customer perceptions and suggestions should be measured on a regular basis.
- √ It is important to evaluate suppliers regularly, in order to make sure that they deliver the requirements according to the business. Both current suppliers and potential suppliers should be evaluated. Current suppliers should be evaluated according to the stated business ethics.
- √ Due to economic situations currently experienced, businesses need to attract and keep customers. Businesses must be able to deliver excellent service if they want to survive.
- √ In this study it was learnt that when the inbound logistics side (materials management) is combined with the outbound side (customer service), additional opportunities for savings can occur.
- √ All inbound and outbound logistics activities should be monitored in order to effectively implement these activities in the business.
- √ The different structures of inbound and outbound logistics systems should be examined in order to identify which side should receive the most management attention.
- √ Inventory should never reach the stockout level in order to prevent the loss of sales or the loss of customers.
- √ Inventory should be managed effectively, because an excessive amount of inventory can result in increasing carrying cost. The different techniques in holding and determining inventory should be examined. Depending on the business, JIT can be suggested.

- ✓ Internal customers can help to determine the needs of customers. They should have the freedom to participate in the decision-making process.
- ✓ Because orders are placed often, the manufacturer and the respondent are in contact regularly during a year. Therefore, a sound relationship should be established between the two parties.
- ✓ A set of standards should be set, for measuring services.
- ✓ An effective customer service strategy should be formulated. All the different strategies should be considered and the most appropriate one should be chosen.
- ✓ Good customer relations can be the result of providing effective service. Service is, however, a continuous activity. This implies continuous efficiency, reliability, courteousness, care and professionalism.
- ✓ Thus, the most important aspect of any business is the customer. Whatever a supplier's approach to resource management, marketing is fundamentally about attracting and keeping customers. Customers will only be attracted to a supplier and be loyal to the business if the business offers them a proposition, meeting their needs. Customers will only remain loyal if they remain satisfied with the service once they have experienced it. A balance should be kept between attracting new customers and keeping existing customers satisfied.

6.4 Future fields of study

- ◆ A supporting study that may assist businesses to deliver a better quality of service.
- ◆ This study can be duplicated using a broader population. This may lead to better and more meaningful results.
- ◆ This study can be performed in other sectors.
- ◆ A more in-depth study of internal customer demands can be performed.

After conducting both a literature and empirical study, it can now be concluded that all the objectives of this study have successfully been accomplished on the basis of the conclusions and recommendations.

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Appendix

1. Cover letter
2. Questionnaire



Potchefstroomse Universiteit

vir Christelike Hoër Onderwys

Privaatsak X6001 Potchefstroom 2520
Tel (018) 299 1111 Faks (018) 299 2799
<http://www.puk.ac.za>

SKOOL VIR ENTREPRENEURSKAP, BEMARKINGS- EN TOERISMEBESTUUR

Tel (018) 299-1420
Faks (018) 299-1421
E-Pos onblrvr@puknet.puk.ac.za

Geagte Deelnemer

10 Oktober 2002

Ons is tans besig met ons Meestersgraad-studies aan bogenoemde Universiteit. Ons ondersoek onderskeidelik *"Die produklewensiklus as basis vir strategieëbepaling by sekere vervaardigingsondernemings in die Noordwes Provinsie"*, en *"The analysis of supplier services to small and medium size manufacturers"*.

Ons sal dit hoog op prys stel indien u die vraelys voltooi, aangesien u onderneming deel van 'n relatief klein steekproefpopulasie uitmaak. U respons kan dus 'n beduidende verskil in die resultate maak.

Die vraelyste behoort nie meer as 30 minute van 'n tyd in beslag te neem nie. Byvoorbeeld dank daarvoor. Ons kan u verseker dat alle inligting vertroulik hanteer sal word.

Dankie vir u bereidwilligheid

Grethe Huisamen

Leigh-Anne Coleman

Ek tree as studieleier vir die bogenoemde studente op, en sal dit baie waardeur indien u met hierdie studie behulpsaam sal wees.

Baie dankie

PROF LR J VAN RENSBURG
DIREKTEUR

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Direkteur: Professor LR J van Rensburg



STRICTLY CONFIDENTIAL

QUESTIONNAIRE NUMBER

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PLEASE COMPLETE THE FOLLOWING QUESTIONNAIRE.

**SECTION A: IMPORTANCE OF FACTORS CONSIDERED WHEN
SELECTING AND EVALUATING VENDORS (Supplier)**

EXAMPLE						PERCEIVED PERFORMANCE OF VENDORS			
Factors considered	Scale of importance					(Scale of 1 to 5)			
	1	2	3	4	5	A	B	C	D
* Product quality				x		2	5	4	1
* Average lead time			x			4	3	5	3

Task: 1. Evaluate the importance of each factor. 2. Evaluate the performance of the vendor.						Task 2 Perceived performance of the vendor (Scale of 1 to 5)			
Factors considered	Task 1 Importance								
	1	2	3	4	5	A	B	C	D
1. Management capability of vendor									
2. Customer service policy of vendor									
3. Adaptability of policy and system									
4. Availability of information									
5. Convenience of placing orders									
6. Accuracy of prices and information									
7. Product quality									
8. Lead time									
9. Availability of products									
10. Ability to fill orders in time									
11. Product assortment									
12. Cash discounts for settling accounts in advance									
13. Quality discounts									
14. Expediting orders									
15. Friendliness of personnel									
16. Knowledge of salespeople									
17. Helpfulness of salespeople									
18. Ability to handle urgent orders									
19. After-sales service									
20. Handling complaints and claims									
21. Speed and willingness when handling defects									

	1	2	3	4	5	A	B	C	D
22. Price competitiveness									
23. Speed when handling order mistakes									
24. Providing credit when making purchases									
25. Accessibility of salespeople									
26. Providing transportation									
27. Notification of problems in advance									
28. Notification of price changes in advance									
29. Ability to accurately forecast delivery dates									
30. Enquiries from the suppliers									
31. Willingness to help with storage									
32. Supplier's assistance with promotions									
33. Supplier consistently adheres to delivery dates									
34. Supplier's warehouses are in the immediate vicinity									
35. Ability to change delivery dates									
36. Personal promotional gifts to you									
37. Supplier absorbs transportation cost of damaged goods									
38. Ability to fill special orders									
39. Supplier takes special care to ensure prompt deliveries									
40. Telephone etiquette of personnel handling incoming orders									
41. Product and price knowledge of personnel processing the orders.									

SECTION B: MEASUREMENT OF OVERALL PERFORMANCE

1. Use the following to indicate your level of satisfaction regarding the service provided by different vendors. (Mark only one per Vendor)

VENDOR	SCALE INDICATING THE LEVEL OF SATISFACTION						
	Extremely poor (1)	Very poor (2)	Poor (3)	Satisfactory (4)	Good (5)	Very good (6)	Excellent (7)
A							
B							
C							
D							

2. Have you ever discussed any problems regarding service with any vendor?

VENDOR	YES (1)	NO (2)
A		
B		
C		
D		

3. Was the vendor's response satisfactory?

VENDOR	YES (1)	NO (2)
A		
B		
C		
D		

4. Indicate the main reason for purchasing from the specific vendor. (Mark only one per Vendor)

VENDOR	REASONS					
	Lowest price	Product assortment	Speedy and reliable delivery	Situated nearby	Availability of specific products	Good customer service in general
	(1)	(2)	(3)	(4)	(5)	(6)
A						
B						
C						
D						

SECTION C: INFORMATION REGARDING YOUR BUSINESS

1. How often do you place orders at the different vendors?

VENDOR	FREQUENCY						
	No fixed pattern for orders (according to needs)	Annually	Biannually	Once every three months	Monthly	Weekly	Daily
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A							
B							
C							
D							

2. How often do you evaluate the different vendors?

VENDOR	FREQUENCY						
	Never	Annually	Biannually	Quarterly	Monthly	Weekly	Constantly
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A							
B							
C							
D							

3. How do you evaluate the suppliers?**Meaning of numbers 1 to 7**

1. Speed of completing orders; 2. Lead time; 3. Promises regarding prices;
4. Product quality; 5. The number of damaged items sent; 6. Accuracy of administration of orders; 7. Knowledge regarding the ability of sales people.

VENDOR	FACTORS						
	1	2	3	4	5	6	7
A							
B							
C							
D							