INVENTORY MANAGEMENT AS A DETERMINANT FOR IMPROVEMENT OF CUSTOMER SERVICE

BY

MUSENGA FRANCIS MPWANYA

Dissertation

Submitted in fulfilment of the requirements
for the degree

MASTER OF COMMERCE

in the subject of

BUSINESS MANAGEMENT

in the

DEPARTMENT OF BUSINESS MANAGEMENT

FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES

at the

UNIVERSITY OF PRETORIA

STUDY LEADER: PROFESSOR P W C DE WIT

JULY 2005

ACKNOWLEDGEMENTS

I would like to thank God through my Lord and Saviour, Jesus Christ for the strength, intelligence, science and wisdom during the writing of this dissertation.

Special thanks to:

- Prof Piet de Wit for his guidance, inspiration, encouragement and patience.
- Rina Owen and Karien Malan for their assistance with the statistics.
- My beloved wife, Bilonda Yvette for her patience, understanding and motivation.
- My family for interest, prayers and words of encouragement.
- The librarians at the University of Pretoria for their capable assistance in locating research material.
- JMK Sanctuary (Pty) Ltd for material support.

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PART ONE: CONCEPTUAL AND THEORETICAL FRAME

CHAPTER 1: ORIENTATION

1.1 BACKGROUND

1.1.1 Understanding inventory management

Every management problem is a decision problem. Decision is an important task that all organisations have to take. The allocation of resource is a common issue to all organisations. Organisations have to acquire, allocate and control the factors of production which are necessary for the achievement of the business's objectives. Inventory management as one of the key activities of business logistics, has always been a major preoccupation for the company's survival and growth.

The aim of inventory management is to hold inventories at the lowest possible cost, given the objectives to ensure uninterrupted supplies for ongoing operations. When making decisions on inventory, management has to find a compromise between the different cost components, such as the costs of supplying inventory, inventory-holding costs and costs resulting from insufficient inventories (Hugo, Badenhorst-Weiss and Van Rooyen 2002:169).

According to Wild (2002:4), inventory control is the activity which organises the availability of items to the customers. It coordinates the purchasing, manufacturing and distribution functions to meet the marketing needs. This role includes the supply of current sales items, new products, consumables; spare parts, obsolescent items and all other supplies. Inventory enables a company to support the customer service, logistic or manufacturing activities in situations where purchasing or manufacturing of the items is not able to satisfy the demand. Lack of satisfaction could arise either because of the speed of purchasing or manufacturing is too protracted, or because quantities cannot be provided without stocks. Clodfelter (2003:279) adds that a good inventory control system offers the following benefits:

a. The proper relationship between sales and inventory can better be well maintained. Without inventory control procedures in place, the store or department can become overstocked or understocked.

b. Inventory control systems provide a business with information needed to take markdowns by identifying slow-selling merchandise. Discovering such items early in the

season will allow a business to reduce prices or make a change in marketing strategy before consumer demand completely disappears.

c. Merchandise control systems allow buyers to identify best-sellers early enough in the season so that re-orders can be placed to increase total sales for the store or department.

d. Merchandise shortages and shrinkage, can be identified using inventory control systems. Excessive shrinkage will indicate that more effective merchandising controls need to be implemented to reduce employee theft or shoplifting.

Emphasising the pertinence of the topic, in 2001, Gourdin noted that 'inventory is one area of logistics that has received a great deal of management attention over the past decade. Executives now realise that holding excessive stocks is simply too expensive. Therefore, a great deal of effort has been expended to eliminate unnecessary inventory without compromising customer service. However, there are numerous situations where inventory simply must be held, particularly when meeting the needs of global customers. Management's goal should be to hold only what is necessary to satisfy customer requirements and manage it effectively' (Gourdin 2001:82).

Inventory problems preoccupy profit- making organisations and nonprofit institutions as well. Inventories are common to agriculture, manufacturers, wholesalers, retailers, hospitals, churches, prisons, zoos, universities and national, state and local governments. Indeed, inventories are also relevant to the family unit in relation to clothing, pharmaceutical products, food and so forth. This indicates how inventories are important and deserve a serious attention in order to achieve organisational objectives.

1.1.2 Historical review of inventory management

Historically, inventory management has often meant too much inventory and too little management or too little inventory and too much management. There can be severe penalties for excesses in either direction. Inventory problems have proliferated as technological progress has increased the organisation's ability to produce goods in greater quantities, faster and with multiple design variations. The public has compounded the problem by its receptiveness to variations and frequent design changes (Tersine, 1982:5).

Since the mid-1980s the strategic benefits of inventory management and production planning and scheduling have become obvious. The business press has highlighted the

success of Japanese, European, North American firms in achieving unparalleled effectiveness and efficiency in manufacturing and distribution. In recent years, many of the firms have 'raised the bar', yet again by coordinating with other firms in their supply chains. For instance, instead of responding to unknown and variable demand, they share information so that the variability of the demand they observe is significantly lower (Silver, Pyke and Peterson, 1998: 9).

Silver, Pyke and Peterson (1998:10-11) continue arguing that in the United States of America and other Western Countries, productivity improvement was pursued through reducing the amount of direct manufacturing labour expended per unit of output. This was a valid strategy because of the high labour content in many manufactured products. However, the proportion of unit cost due to labour has been steadily decreasing in recent years. In fact, the ratio of purchased materials to sales (in dollars) reached 60 percent for U.S. firms in 1985. Even large manufacturing firms, such as the U.S auto assemblers, purchase up to 60 percent of the value of the product. This implies that management of raw materials inventories is an area that shows great promise for productivity improvement. Japanese firms received much deserved attention in the mid-to late 1980s because of their remarkable performance on quality and inventory management. The tremendous interest in Just-in-Time manufacturing (JIT) indicates that work-in-process inventory management is also an area ripe for improvement.

1.1.3 Customer service

In order to attain its organisational objectives, a business is to meet customers' needs. Customers' desire has always been a vital issue in a company not only to maintain sales but also to increase it. Harrison (2001:2) notes that 'to understand the customer there must, first, be some direct link with the customer and second, it is essential that these information channels speak the language of the customer. Learning what frustrates or delights the customer can be done on a one-to-one basis or in groups, with surveys and interviews. Information about customers' preferences, buying habits, attitudes toward particular products and service satisfaction can be collated to form specific customer profiles, which are not based on assumptions and perceptions.'

Monczka, Trent and Handfield (2002:88) add that customer service includes a wide set of activities that attempt to keep a customer satisfied with a product or service after the initial sale. Often, this means that a business has dedicated customer account managers who help in managing customer promotions, inventory control and delivery schedules. This may require providing customer training or having technical support personnel available to answer phone questions 24 hours a day. Customer service may also include a network of spare parts distribution centres that provide rapid replacement of parts and components.

Bowersox, Closs and Cooper (2002:73-76) have underlined three fundamental attributes for customer service. These attributes will be briefly analysed in order to enlighten the theoretical part of this dissertation.

a. Availability.

Availability is the capacity to have inventory when desired by a customer. As simple as this may seem it is not at all uncommon for an organisation to expend considerable time, money and effort to generate customer demand and then fail to have products available to meet customer requirements. The traditional practice in organisations is to stock inventory in anticipation of customer orders. Typically, an inventory stocking plan is based on forecasted demand for products and may include differential stocking policies for specific items as a result of sales popularity, profitability and importance of an item to the overall product line and the value of the merchandise.

It should be clear that achieving high levels of inventory availability requires a great deal of planning. In fact, the key is to achieve these high levels of availability for selected or core customers while minimising overall investment in inventory and facilities. Exacting programs of inventory availability are not conceived or managed on average; availability is based on three performance measures: stockout frequency, fill rate and orders shipped completed.

b. Operational performance

Operational performance deals with the time required to deliver a customer's order. Whether the performance cycle in question is market distribution, manufacturing support, or procurement, operational performance is specified in terms of speed of performance, consistency, flexibility and malfunction recovery.

c. Service reliability

Service reliability involves the combined attributes of logistics and concerns a firm's ability to perform all order- related activities, as well as provide customers with critical information regarding logistical operations and status. Beyond availability and operational performance, attributes of reliability may mean that shipments arrive damage-free, invoices are correct and error-free; shipments are made to the correct locations; and the exact amount of product ordered is included in the shipment. While these and numerous other aspects of overall reliability are difficult to enumerate, the point is that customers demand that a wide variety of business details be handled routinely by

suppliers. Additionally, service reliability involves a capability and a willingness to provide accurate information to customers regarding operations and order status.

1.2 PROBLEM STATEMENT

1.2.1 Main problem

The main problem addressed in this study is the improvement of customer service in manufacturing industries in the Gauteng Province (especially in Pretoria and Johannesburg) through inventory management. It has to be noted that Vereeniging has not been taken into account because of a feeble number of manufacturing industries situated in that town.

Because of the pertinence related to this matter, Bertolini and Rizzi (2002:1-2) highlights that 'the optimal management of inventories is a primary objective for all the firms manufacturing make to stock finished goods. As a matter of fact, inventories have important implications for both the financial and the economic performance of the company; therefore it is widely acknowledged that an optimal inventory management policy allows companies to achieve higher profitability levels. In general terms, inventory management policies should be aimed at lowering the holding costs through higher inventory rotation, but without triggering substantial stockouts and backorders, caused by demand peaks and / or lead time delays.

In a nutshell, the problem could be stated as follows:

How can inventory management be a decisive factor to improve customer service in manufacturing industries located in Gauteng Province (especially in Pretoria and Johannesburg)?

1.2.2 Secondary problems

The secondary problems are very important because they help to clarify the main question or preoccupation, that is to say, they are the bridge through which we can answer the main problem. In this study, sub problems are:

a. Determination of the impact of product availability policies on customer's level of expectation.

b. Determination or test of inventory policies in connection with customers' needs in manufacturing industries in Gauteng Province (especially in Pretoria and Johannesburg).

c. Determination of the incidence of internal customer service on external customer service.

d. Measurement or test of the level of customers' satisfaction.

1.3 RESEARCH OBJECTIVES

The objectives of this study are to obtain answers to the questions and solutions to the problems stated in section 1.2. The primary objective of this study is to demonstrate or to show how inventory management can be a determinant to improve customer service in the South African manufacturing industries.

Other objectives are:

a. To determine whether product availability policies followed by manufacturing industries in Gauteng Province (Pretoria and Johannesburg) enable them to meet customers' levels of expectation.

b. To determine if inventory management policies enable manufacturing industries in Gauteng Province (Pretoria and Johannesburg) to respond to customers' needs.

c. To determine whether internal customer service impact on external customer service (satisfaction).

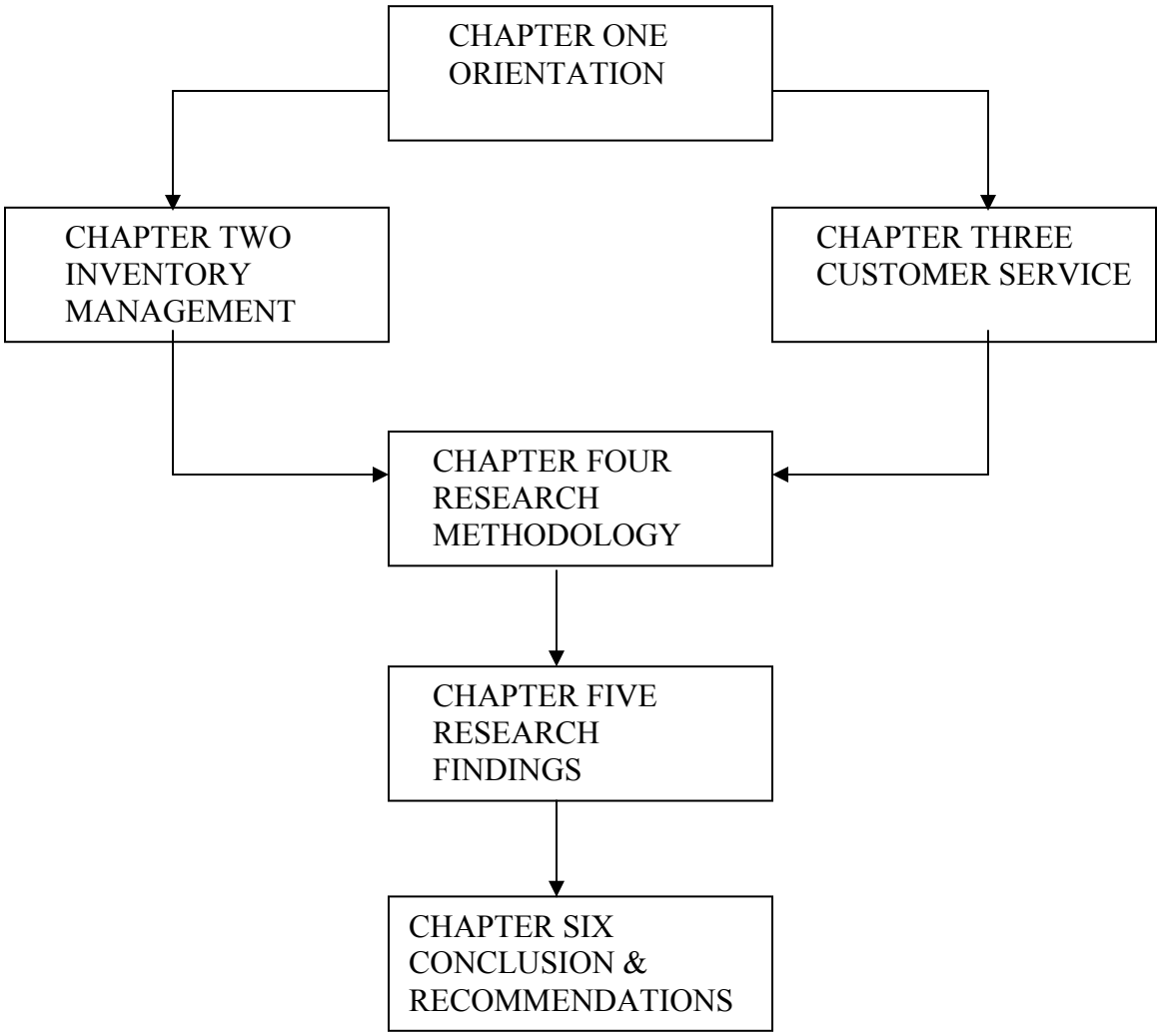
d. To measure or test the level of customers' satisfaction.

1.4 STRUCTURE OF THE STUDY

Part one focuses on the conceptual and theoretical frame of this research study and consists of three chapters namely, orientation (Chapter one), inventory management (Chapter two) and customer service (Chapter three). Chapter one deals with the orientation of this study in which a short explanation of the research topic is done. This is then followed by the problem statement, the research objectives and the structure of the study. Chapter two provides an overview of the inventory management elements. Necessary literature linked to inventory management has been selected in order to feed this study. Chapter three handles with services offered to customers (internal and external) which have to be consequent to their requirements. Theories related to customers' expectations and satisfaction and continuous service improvement have been mentioned. Chapter three ends with an open discussion / polemic concerning performance measures for customer service from one hand and to another hand implementation of customer standards.

Part two presents the empirical phase of the study and consists of two chapters, namely research methodology (Chapter four), research findings (chapter five) and conclusions and recommendations (Chapter six). Chapter four contains the research design. As part of the research design, a hypothesis is stated. The research findings (chapter five) are centred on three areas, namely descriptive analysis per dimension of data, quantitative analysis of dimension relationships and hypothesis testing. Chapter six consists of conclusions and recommendations. Conclusions are based on results obtained in chapter five of the study and are interpreted with reference to both literature and empirical phases of the study. Part two ends by summarising the recommendations and conclusions obtained by the research. The study is diagrammatically structured as follows as shown in figure 1.1.

Figure 1.1: Structure of the study



CHAPTER 2: INVENTORY MANAGEMENT

2.1 INTRODUCTION

The control and maintenance of inventory is a vital problem experienced almost by all sectors of the economy. This topic is very important, as all organisations deal with inventories on a daily basis. Neglecting the importance of inventory in any organisation can lead to the closing down of the company, especially if the factors of production are not well managed in order to meet customers' needs or desires, the company will grind to a halt. The inventory problem consists of having sufficient items available when desired by the customers. The stock of items must be reasonable, meaning that it should not be too much or too little. The company should be in a position to meet customers' demand in terms of quantity and quality.

Managing inventory has became a special issue when selling globally because holding goods in non-domestic markets is virtually a necessity if customer service levels are to be maintained. Inventory management is of great importance especially for managers who must decide how much (if any) to hold and how to administer the rest of the logistics system more creatively in order to ensure that customer service does not suffer as a result of lower inventory levels. That's the reason why inventory management requires a particular attention or the support of the entire company's management levels in order to meet customers' satisfaction.

2.2 INVENTORY MANAGEMENT

2.2.1 Definition of inventory

The word 'inventory' has been defined in many ways, as indicated in the literature. Three definitions have been chosen which seem to be more appropriate to the topic developed in this dissertation. 'Inventories are stockpiles of raw materials, suppliers, components, work in process, and finished goods that appear at numerous points throughout a firm's production and logistics channel'(Ballou 2004:326). According to Chase, Jacobs and Aquilano (2004:545), inventory is the stock of any item or resource used in an organisation. An inventory system is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained, when stock should be replenished, and how large orders should be. Finally, Pycraft et al (2000:419) define inventory or stock as 'the stored accumulation of material resources in a transformation system. So a manufacturing company will hold stocks of materials, a tax office will hold

stocks of information and a theme park will hold stocks of customers (when it is customers which are being processed we normally refer to the stocks of them as a queues)'.

2.2.2 Motivation for holding inventory

2.2.2.1 Rationale for having inventory

There are many reasons that motivate companies to have stock. Bloomberg, Lemay and Hanna (2002:136-137) have identified five reasons for holding stock, namely:

a. Economies of scale. A firm can realise economies of scale in manufacturing, purchasing and transportation by holding inventory. If the business buys large amounts, it gets quantity discounts. In turn, transportation can move larger volumes and get economies of scale through better equipment utilisation. Manufacturing can have longer production runs if more material is inventoried, allowing per unit fixed cost reductions.

b. Balancing supply and demand. Some firms must accumulate inventory in advantage of seasonal demand. A toy manufacturer sees some demand year-round, but 60 percent or more of sales will come in the Christmas season. By manufacturing to stock, production can be kept level throughout the year. This reduces idle plant capacity and maintains a relatively stable workforce, keeping costs down. If demand is relatively constant but input materials are seasonal, such as in the production of canned fruits, then finished inventory helps meet demand when the materials are no longer available.

c. Specialisation. Inventory allows firms with subsidiaries to specialise. Instead of manufacturing a variety of products, each plant can manufacture a product and then ship the finished products directly to customers or to a warehouse for storage. By specialising, each plant can gain economies of scale through long production runs.

d. Protection from uncertainties. A primary reason to hold inventory ie. to offset uncertainties in demand. If demand increases and raw material stocks run out, the production line shuts down until more material is delivered. Likewise, a shortage of work in process means the product cannot be finished. Finally, if customer orders outstrip finished goods supply, the resulting stockouts could lead to lost customers.

Figure 2.1 shows the decisions a customer makes when a stockout occurs, but does not show the cost of stockouts to the firm.

Figure 2.1 : Customer decisions regarding a stockout .

Source : Bloomberg D J , Lemay S. and Hanna J B. 2002 . Logistics:137

e. Buffer interface. Inventory can buffer key interfaces, creating time and place utility. Key interfaces include (1) supplier and purchasing, (2) purchasing and production, (3) production and marketing, (4) marketing and distribution, (5) distribution and intermediary, and (6) intermediary and customer. Having inventory at these interfaces helps ensure that demand is met and stock outs are minimised.

2.2.2.2 Importance of inventory

Inventory plays an unnegligible role in the growth and survival of an organisation in the sense that failure to an effective and efficient management of inventory, will mean that the organisation will lose customers and sales will decline. Emphasising on the importance of inventory on the balance sheet of companies, Coyle, Bardi and Langley (2003:188) state that "inventory as an asset on the balance sheet of companies has taken an increased significance because of the strategy of many firms to reduce their investment in fixed assets, that is, plants, warehouses, office buildings, equipment and machinery, and so on.

The research done by Holdren and Hollingshead (1999:1) in the United States of America witnesses that much of the $ 700 million worth of inventory held by American businesses is financed by bank loans with the goods pledged as security. An important industrial marketing relationship exists between inventory managers and commercial lending officers who write these inventory loans. Inventory managers need to provide their lenders with sufficient information to obtain financing at the lowest rate. Loan officers need to assess the degree of inventory risk in order to assign a proper interest rate. Issues of risk and return of inventory loans are matters of concern for both inventory managers and creditors.

Inventory management is an important concern for managers in all types of businesses. For companies such as J C Penny Limited, which operate on relatively low profit margins, poor inventory management can seriously undermine the business.
The challenge isn't to pare inventories to the bone to reduce costs or to have plenty around to satisfy all demands, but to have the right amount to achieve the competitive priorities for business most efficiently (Krajewski and Ritzman 1999:544).

Finally, according to the U.S Bureau of Census (in Ballou 2004:326-328), inventories are found in such places as warehouses, yards, shop floors, transportation equipment and on retail store shelves. Having these inventories on hand can cost between 20 and 40 percent of their value per year. Therefore, carefully managing inventory levels makes good economic sense. Even though many strides have been taken to reduce inventories through just-in-time, time compression, quick response and collaborative practices applied throughout the supply channel, the annual investment in inventories by manufacturers, retailers, and merchant wholesalers, whose sales represent about 99 percent of GNP, is about 12 percent of the U.S gross domestic product.

2.2.3 Types of inventory

According to Stock and Lambert (2001:232-235), inventories can be categorised into six distinct forms , that are :

a. Cycle stock. Cycle stock is inventory that results from the replenishment process and is required in order to meet demand under conditions of certainty, that is, when the firm can predict demand and replenishment times (lead times) almost perfectly. For example, if the rate of sales for a constant 20 units per day and the lead time is always 10 days, no inventory beyond the cycle stock would be required. While assumptions of constant demand and lead time remove the complexities involved in inventory management, let's look at such an example to clarify the basic inventory principles.

b. In-transit inventories. In-transit inventories are items that are en route from one location to another. They may be considered part of cycle stock even though they are not available for sale and /or shipment until after they arrive at the destination. For the calculation of inventory carrying costs, in-transit inventories should be considered as inventory at the place of shipment origin since the items are not available for the buyer, sale, or subsequent reshipment.

c. Safety or buffer stock. Safety or buffer stock is held in excess of cycle stock because of uncertainty in demand or lead time. The notion is that a portion of average inventory should be devoted to cover short-range variations in demand and lead time. Average inventory at a stock-keeping location that experiences demand or lead time variability is equal to half the order quantity plus the safety stock.

d. Speculation stock. Speculation stock is inventory held for reasons other than satisfying current demand. For example, materials may be purchased in volumes larger than necessary in order to receive quantity discounts, because of a forecasted price increase or materials shortage, or to protect against the possibility of a strike.

e. Seasonal stock. Seasonal stock is a form of speculative stock that involves the accumulation of inventory before a season begins in order to maintain a stable labour force and stable production runs or, in the case of agricultural products, inventory accumulated as the result of a growing season that limits availabilty throughout the year.

f. Dead stock is inventory that no one wants, at least immediately. The question is why any organisation would incur the costs associated with holding these items rather than simply disposing of them. One reason might be that management expects demand to resume at some point in the future. Alternatively, it may cost more to get rid of an item that it does to keep it. But the most compelling reason for maintaining these goods is customer service. Perarps an important buyer has an occasional need for some of these items, so management keeps them on hand as a goodwill gesture.

2.2.4 Inventory costs

According to Gourdin (2001:62-63), there are three types of costs that must be considered in setting inventory levels.

a. Holding (or carrying) costs are costs such as storage, handling, insurance, taxes, obsolescence, theft and interest on funds financing the goods. These charges increase as inventory levels rise. In order to minimise carrying costs, management makes frequent orders of small quantities. Holding costs are commonly assessed as a percentage of unit value, i.e. 15 percent, 20 percent, rather than attempting to derive a monetary value for each of these costs individually. This practice is a reflection of the difficulty inherent in deriving a specific per-unit cost for, for example, obsolescence or theft.

b. Ordering costs are those costs associated with placing an order, including expenses related to personnel in a purchasing department, communications and the handling of the related paperwork. Lowering these costs would be accomplished by placing a small number of orders, each for a large quantity. Unlike carrying costs, ordering costs are generally expressed as a monetary value per order.

c. Stock-out costs include sales that are lost, both short and long term. These charges are probably the most difficult to compute, but arguably the most important because they represent the costs incurred by customers (internal or external) when inventory policies falter. Failure to understand these costs can lead management to maintain higher (or lower) inventory levels than customer requirements may justify.

2.2.5 Inventory classification models

Inventory classification models help allocate time and money in inventory management from one hand and classifications systems enable companies to deal with multiple product lines and a multitude of stock-keeping units to another hand. Therefore, Bloomberg, Lemay and Hanna (2002:146-148) have identified two models related to inventory classification. These models will be discussed in order to provide background informations concerning inventory classification.

a. ABC analysis

Brown (in Bloomberg, Lemay and Hanna 2002:147) notes that the ABC analysis categorises products based on importance. Importance may come from cash flows, lead time, stockouts, stockout costs, sales volume, or profitability. Once the ranking factor is chosen, break points are chosen for classes A,B,C and so on.

The 80-20 concept is particularly useful in distribution planning when the products are grouped or classified by their sales activity. The top 20 percent might be called A items, the next 30 percent B items, and the remainder C items. Each category of items could be distributed differently. For example, A items might receive wide geographic distribution through many warehouses with high levels of stock availability, whereas C items might be distributed from a single, central stocking point (e.g. a plant) with lower total stocking levels than for the A items. B items would have an intermediate distribution strategy where few regional warehouses are used (Ballou 2004:69).

Ballou (2004:69) adds that another frequent use of the 80-20 concept and an ABC classification is to group the products in a warehouse, or other stocking point, in a limited number of categories where they are then managed with different levels of stock availability. The product classifications are arbitrary. The point is that not all product items should receive equal logistics treatment. The 80-20 percent concept with a resulting product classification provides a scheme, based on sales activity, to determine the products that will receive various levels of logistics treatment.

b. Critical value analysis

Critical value analysis (CVA) pays more attention to C items. Although it ranks products similarly to ABC, CVA analyses products based on stockout rates. Normally using three to five categories, CVA could evaluate products as follows:

1. Top priority: critical item, and no stockouts are permitted.
2. High priority : essential item, but limited stockouts are permitted.
3. Medium priority: necessary item, but occasional stockout permitted.
4. Low priority: desirable item, but stockouts are allowed.
5. Lowest priority: needed item, but stockouts are permitted on a wide basis.

Stockout rates are assigned subjectively to each category. Top priority items might have zero stockouts, high priority items a 3 percent stockout rate, medium priority a rate of 6 percent, low priorirty 10 percent, and lowest priority 15 percent.

2.2.6 Symptoms of poor inventory management

A certain number of symptoms allow discovering poor inventory management. Lambert and Stock (2001:254-255) mention the following elements in order to diagnose poor inventory management:

a. Increasing number of back orders.
b. Increasing dollar investment in inventory with back orders remaining constant.
c. High customer turnover rate.
d. Increasing number of orders cancelled.
e. Periodic lack of sufficient storage- space.
f. Wide variance in inventory turnover among distribution centres and among major inventory items.
g. Deteriorating relationships with intermediaries as typified by dealer cancellations and declaring orders.
h. Large quantities of obsolete items.

In many instances, inventory levels can be reduced by one or more of the following steps:

a. Multi-echelon inventory planning. ABC analysis is an example of such planning.
b. Lead time analysis.
c. Delivery time analysis. This may lead to a change in carriers or negociation with existing carriers.
d. Elimination of turnover and / or obsolete items.
e. Analysis of pack size and discount structure.
f. Examination of returned goods procedures.
g. Encouragement / automation of product substitution.
h. Installation of formal re-order review system.
i. Measurement of fill rates by stock-keeping unit (SKU).
j. Analysis of customer demand characteristics.

2.2.7 Just-in-time inventory management

Harber et al .(in Biggart and Gargeya 2002:1) mention that the just-in-time (JIT) production system (as the Toyota Production System) was introduced by Shigeo Shing and Taichi Ohno at the Toyota Motor plant in the mid-1970. JIT production is called by many names : zero inventory production system (ZIPS), minimum inventory production system (MIPS), kanban production, kaizen production, stockless production, pull-through production and quick response (QR) inventory systems. JIT manufacturing, both as a philosophy and a disciplined method of production, has received much attention since its introduction. The JIT production philosophy is founded upon three fundamental principles: elimination of waste, continuous quality improvement and encouragement of worker participations planning and execution.

Gourdin (2001:76) adds that this just-in-time manufacturing philosophy requires manufacturers to work in concert with suppliers and transportation providers to get required items to the assembly line at the precise time they are needed for production.

JIT is a disciplined approach to improve manufacturing quality, flexibility and productivity through the elimination of waste and the total involvement of people. JIT is not simply reducing inventory; rather its overall objective is increased quality. If properly developed, a number of potential benefits can follow. To realise these benefits, certain conditions must prevail. The goals must include the respect for people and the elimination of waste. Respect for people includes creating a stable environment, motivation and trust, bottom round management, robotics, quality circles and subcontractor networks. The employees, not management, operate JIT. The employees determine problems and solve them. The employees increase product quality. If the employees do not believe in the JIT concepts, the system will fail no matter what management tries to do (Bloomberg, Lemay and Hanna 2002:165-166).

Gourdin (2001:76-78) has identified a number of basic tenets, advantages and disadvantages of JIT. These tenets, advantages and disadvantages will be briefly discussed in order to provide basic information on just-in-time inventory management.

2.2.7.1 Basic tenets of JIT

A successful JIT system is based upon the following key concepts:

a. Quality. With JIT, the customer must receive high quality goods. One of the historical roles of inventory has been to protect the customer against defective items; if a bad product is received it can be discarded and a new one drawn from inventory. With a JIT system, however, poor quality means the production line stops or the external customer gets a defective item. There are no “extra” items to replace the poor ones.

b. Vendors as Partners. Generally, firms using JIT rely on fewer vendors rather than more. Purchases are concentrated with a limited number of suppliers in order to give the buyer leverage with respect to quality and service. Purchasers also include vendors in the planning process, sharing information regarding sales and production forecasts so that vendors then have a clear idea of what their customers need.

c. Vendor co-location with customer. Ideally, suppliers should be located in close proximity to their customers. As the distance between vendors and buyers increases, so does the opportunity for system disruption and stock-outs. In order to minimise this risk, customers often demand that vendor facilities be co-located on the same site or at least in the same geographical era as their own.

2.2.7.2 Advantages of JIT

a. More inventory turns. Because there is less on hand, the inventory that is maintained stays for a shorter period of time. The problem with an extremely high number of turns is that it can raise the probability of stocking out to an unacceptable high level while raising ordering costs as well.

b. Better quality. As was mentioned earlier, high quality products must be received with a JIT system or else the entire benefit production process collapses. Customers concentrate their purchases with a small number of vendors in exchange for receiving high quality items and requisite service. The cost of failure on either count to the vendor thus become very high.

c. Less warehousing space needed. When there is less inventory, fewer and / or smaller warehouses are required. Under BMW's JIT production strategy, only a minimum amount of inventory is held on the production line at its new U.S. plant. In some cases, the time supply is a mere four hours. To ensure a reliable delivery system, the plan employs a pull strategy whereby part orders are automatically issued once the supply on the line falls below a critical level.

2.2.7.3 Disadvantages of JIT

Disadvantages of JIT are:

a. Risk of stock-outs. When firms eliminate inventory, the risk of stock-outs can rise. Managers attempt to minimise this occurrence by demanding very high levels of service from their vendors and logistics service providers. However, when co-location of customer and vendor is not feasible, for example, the resultant variability in the pipeline can lead to stock-outs despite management's best effort to prevent them.

b. Increased transportation costs. Since JIT requires frequent shipments of small quantities, transportation costs almost always rise. As long as these costs are more than offset by the inventory savings, it is advantageous for the organisation to permit them. However, it is possible to spend more on transport than is being saved with the JIT system, so management must ensure that movement expenses are closely monitored.

c. Increased purchasing costs. As mentioned earlier, purchasing discounts are generally associated with buying large quantities at a time.Theoretically, JIT means foregoing those price-breaks in favour of obtaining smaller amounts more frequently. Managers must make sure that purchasing costs are not rising more than what inventory costs are falling.

d. Small channel members may suffer. JIT is sometimes criticised as a system that allows strong organisations to unload their inventory on smaller firms in the channel. Theoretically, every company in the pipeline can utilise JIT, the reality, however, is that channel leaders may impose such stringent delivery criteria that vendors may feel compelled to hold inventory in order to satisfy them.

e. Environmental issues. In a micro sense, JIT can lead to high levels of traffic congestion and air pollution because additional transportation is often required to maintain customer service levels in the absence of inventory.

2.2.8 Inventory control systems

Inventory control is the activity which organises the availabiliy of items to the customers. It co-ordinates the purchasing, manufacturing and distribution functions to meet the marketing needs.This role includes the supply of current sales items, new products, consumables, spare parts, obsolescent items and all other supplies (Wild 2002:1).

Wild (2002:7-8) adds that the purpose of the inventory control function in supporting the business activities is to optimise the following three targets:

- Customer service
- Inventory costs
- Operating costs.

The most profitable policy is not to optimise one of these at the expense of others.
The inventory controller has to make value judgements. If profit is lacking, the company goes out of business in the short term. If customer service is poor, then the customers disappear and the company goes out of business in the longer term. Balancing the financial and marketing aspects is the answer: the stock controller has a fine judgement to make.

The first target, customer service, can be considered in several ways, depending on the type of demand. In a general stores environment the service will normally be taken as ‘availability ex stock’, whereas in a supply to customer specification, the service expected would be delivery on time against customer requested date.

The second target, inventory costs, requires a minimum of cash tied up in stock. This has to be considered carefully, since there is often the feeling that having any stock in stores for a few months is bad practice. In reality, minimising the stock usually means attending to the major costs: very low-value items are not considered a significant problem.
Low inventory can also be considered in terms of space, or other critical resource. Where the item is voluminous, or the stores space restricted, the size of the items will also be a major consideration.

The third target, avoiding operating costs, has become more of an issue as focus has been placed on inventory management. The prime operating costs are those associated with the stores operations, inventory control, purchasing and the associated services. The development of logistics, linking distribution costs with inventory, has added this new set of transportation costs to the analysis.

According to Hugo, Badenhorst-Weiss and Van Rooyen. (2002:193-194), inventory control is ensuring a sufficient level of stock and satisfying demands regarding quantity, quality, time and place and to control prices. They mention four types of inventory control systems:

- A system with fixed ordering quantities
- A cyclical ordering system
- A JIT approach
- A materials requirement planning (MRP) system.

In order to provide basic information on inventory control systems, each of the four above- mentioned models will be discussed in paragraphs following.

a. Fixed order quantities

According to Hugo, Badenhorst-Weiss and Van Rooyen (2002:194-195) the basic characteristic of the system is that whenever stocks are replenished, the same fixed quantity is ordered (the economic order quantity) every time. This can graphically be represented by the following figure:

Figure 2.2 : Fixed order quantity system

Source : Hugo. W M J, Badenhorst-Weiss .J A and Van Rooyen. D C. 2002 . Purchasing and Supply Management :195

Inventory is issued from an existing inventory level (A) and depleted over a period of time up to t1, when the re-order level (B) is reached and further depleted over the period to t2, when the safety-inventory level (C) is reached. No safety inventory is issued, because the ordered fixed quantity is received at time t2, and inventory is replenished to level A2. The process repeats itself and a fixed quantity is ordered whenever the re-ordering level (B2; B3) is reached.

Three important characteristics to remember for the fixed order quantity system are:

-That supplier lead times have to be constant [(t2-t1) = (t4-t3) = (t6-t5)]
-The maximum demand within that lead time (should be forecasted than A3-C3 insufficient inventory could very well be available)
-The system is fairly simple to control and the EOQ is ordered on every occasion.

b. Cyclical ordering system

According to Hugo, Badenhorst-Weiss and Van Rooyen (2002:195-196) the cyclical ordering system's most prominent characteristic is that the level of all inventory items are received at fixed, predetermined times to determine whether sufficient inventory is available. The review cycles vary according to the nature of the inventory, but longer review cycles require higher maximum (as well as average) inventory levels. Shorter review cycle however mean more orders and higher replenishment costs.

Figure 2.3 : Cyclical ordering system

Source : Hugo. W M J, Badenhorst-Weiss. J A and Van Rooyen. DC. 2002 . Purchasing and Supply Management : 196

An important characteristic to remember for the cyclical ordering system is the minimum inventory level has to be calculated for every item according to the lead time and length of review cycle (in days or week).

c. Just-in- time approach

Just-in-time systems focus on reducing inefficiency and unproductive time in the production process to continuously improve the process and the quality of the product or service. Employee involvement and inventory reduction are essential to JIT operations. Just-in-time systems are known by many different names, including zero inventory, synchronous manufacturing, lean production, stockless production (Hewlett-Packard), material as needed (Harley-Davidson) and continuous flow manufacturing (IBM) [Krajewski, L J & Ritzman , LP.1999:735]. Details regarding JIT have been given in the point 2.2.7 of this dissertation.

d. Materials requirements planning (MRP) systems

The availability of cost-efficient computer systems has allowed firms to make great progress controlling dependent-demand inventory. A widely used system that controls dependent-demand inventory is the material requirements planning (MRP) system. This system relies on production schedules developed for final part numbers in the master production schedule (MPS) to determine the timing and quantities of materials required for components or subassemblies (Monczka, Trent and Handfield, 2002:585).

Coyle et al. (in Gourdin 2001:74) explains that MRP deals specifically with supplying materials and component parts whose demand depends upon the demand for a specific end product. Essentially, MRP begins by determining how much of the final product customers desire, and when they need it. Then MRP breaks down the timing and need for components (all of which could have different lead times) based upon that scheduled end-product need. A MRP 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 those requirements will be satisfied. The program also replans net requirements and coverage as a result of changes in either the master production schedule, demand, inventory status, or product composition.

Emphasising on the pertinence of the use of MRP in business organisations, Chandra and Kumar (2001:3) underline that without a MRP model, it is impratical and tedious to plan requirements of component parts and assemblies needed to assemble the final product in the quantities required during future time horizons.
Krajewski and Ritzman (1999:689) note that MRP translates, or explodes, the master production schedule and other sources of demand into the requirements for all subassemblies, components and raw materials needs to produce parent items. This process generates the material requirements plan for each component item.
An item's gross requirements are derived from three sources:

- The MPS for immediate parents that are end items,
- The planned ordered releases for parents below the MPS level, and
- Any other requirements not originating in the MPS, such as the demand for replacement parts

The research done by Smaros et al (2003:1) in Finland on the impact of increasing demand visibility on production and inventory control efficiency reveals that for products with stable demand a partial improvement of demand visibility can improve production and inventory control efficiency, but that the value of visibility greatly depends on the target products' replenishment frequencies and the production planning cycle employed by the manufacturer.

2.2.9 Inventory management improvement

Gourdin (2001:72) has identified six activities in order to improve inventory management. These activities will be explained in order to provide some background information on the improvement of inventory management in business organisations.

a. Top management commitment. Because lower inventories have an impact on many different parts of the logistics systems, senior leadership must ensure that all of those activities are working together to meet customer needs without the luxury of excess stock.

b. ABC analysis of all inventory items. Management must first understand that goods in inventory are the most important in terms of their contribution to the objectives of the organisation. These few items that generate the most profits, for example, or are deemed mission-essential by the firm's most important customers would be designated "A" items and perharps maintained at virtually 100 percent availability . The bulk of the goods in inventory would be denoted "B" items that might be supported at, for instance, 80 percent levels. Finally, there could be some low-demand items classified as "C" which are maintained at very low levels or possibly not stocked at all.

c. Improved performance of other logistics activities. Managers should ensure that the rest of the logistics system is functioning efficiently. It may be that inventory policies have evolved as a way to obscure other problems that should be dealt with directly. By reviewing transportation, order processing, and warehousing functions, for example, management may find that order-cycle variability can be reduced by improving those activities that would lower the need for inventory.

d. Improved demand forecasting. Demand forecasting is also a way of reducing variability, this time in terms of expected versus actual sales. Better forecasting techniques can be utilised to more accurately predict actual sales.

e. Inventory management software. Software is currently available for virtually any type of inventory management situation and allows managers to track sales by item, costs length of time in inventory and other vectors as well. Many of the more comprehensive packages are structured around some variation of material requirements planning (MRP) or distribution requirements planning (DRP) depending on the nature of the inventory concerned. Briefly, MRP manages material and in-process inventory for production while DRP deals with finished product inventory. Together DRP and MRP provide precise control over material flow through the logistics system, from supplier to customer.

f. Postponement involves modifying or customising products after the main manufacturing process is complete. Final configuration of products can be delayed untill the distribution cycle, or even performed after delivery.

Braglia, Grassi and Montanari (2004:1), leaning on their research done on the multi-attribute classification method for spare parts inventory management have found that any improvement in the management of this type of inventory is desirable and useful in practice, leading to both improved factory performance and reduced investment in inventories.

2.2.10 Inventory management policies

Bowersox, Closs and Cooper (2002:308-314) have identified four policies in view of the sane inventory management. These policies will be discussed in order to provide solid information on the inventory management.

a. Inventory control is the managerial procedure for implementing an inventory policy. The accountability aspect of control measures units on hand at a specific location and tracks additions and deletions. Accountability and tracking can be performed on a manual or computerised basis.

Inventory control defines how often inventory levels are reviewed to determine when and how much to order. It is performed on either a perpetual or a period basis. Clodfelter (2003: 278) adds that the control system allows you to determine mistakes that have been made or identify areas that need your immediate attention. To be most effective, the inventory control system must also provide information in a timely manner to allow you

to make decisions while problems can still be corrected. Dysney and Towill (in Smaros et al. 2003:4) based on the benefit of demand visibility in production and inventory control, note that controlling the manufacturer's production and inventory using the customer's sell-through data, must be done instead of using order or delivery data.

Two models are usually used to control inventories:

* Perpetual review.

A perpetual inventory control process reviews inventory status daily to determine inventory replenishment needs. To utilise perpetual review, accurate tracking of all Stock-Keeping Units is necessary. Perpetual review is implemented through a re-order point and order quantity. The formula for calculating the perpetual review re-order point is

ROP = DXT+SS

Where:

ROP= Re-order point in units
D= Average daily demand in units
T= Average performance cycle length in days; and
SS= Safety or buffer stock in units.

* Periodic review

Periodic inventory control reviews the inventory status of an item at regular time intervals such as weekly or monthly. For periodic review, the basic re-order point must be adjusted to consider the extended intervals between reviews. The formula for calculating the periodic review re-order point is:

ROP= D (T+ P/2) + SS

Where:

ROP= Re-order point
T= Average performance cycle length
D= Average daily demand
P= Review period in days, and
SS= Safety stock.

b. Reactive methods

The reactive or pull inventory system, as the name implies, responds to a channel member's inventory needs by drawing the product through the distribution channel. Replenishment shipments are initiated when available warehouse stock levels fall below a predetermined minimum or order point. The amount ordered is usually based on some lot-sizing formulation, although it may be some variable quantity that is a function of current stock levels and a predetermined maximum level.

Classical reactive inventory logic is rooted in the following assumptions. Firstly, the system is founded on the basic assumption that all customers, market areas and products contribute equally to profits.

Secondly, a reactive system assumes infinite capacity at the source. This assumption implies that products can be manufactured as desired and stored at the production facility untill required throughout the supply chain.

Thirdly, reactive inventory logic assumes infinite inventory availability at the supply location. The combination of assumptions two and three implies relative replenishment certainty. The reactive inventory logic provides for no backorders or stockouts when processing replenishment orders.

Fourthly, reactive decision rules assume that performance cycle time can be predicted and that cycle lengths are independent. This means that each performance cycle is a random even and that extended cycles don't generally occur for subsequent replenishment orders. Although reactive logic assumes no control over cycle times, many managers are unable to influence performance cycle length through expediting and alternative sourcing strategies.

Fifthly, reactive inventory logic operates best when customer demand patterns are relatively stable and consistent. Ideally, demand patterns should be stable over the relevant planning cycle for statistically developed inventory parameters to operate correctly. Mostly reactive system decision rules assume demand patterns based on

standard normal, gamma, or Poisson distribution.When the actual demand function does not resemble one of the above functions, the statistical inventory decision rules based on these assumptions will not operate correctly.

Sixthly, reactive inventory systems determine each distribution centre's timing and quantity of replenishment orders independently of all other sites, including the supply source. Thus, there is a little potential to effectively coordinate inventory requirements across multiple distribution centres. The ability to take advantage of inventory information is not utilised in a serious defect when information and its communication are among the few resources that are decreasing in cost in the distribution channel.

The final assumption characteristic of reactive inventory systems is that performance cycle length cannot be corrected with demand. The assumption is necessary to develop an accurate approximation of the variation of the demand over the performance cycle. For many situations higher demand levels create longer replenishment performance cycles since they also increase the demands on inventory and transportation resources. This implies that periods of high demand should not necessarily correspond to extended performance cycles caused by stockouts or limited product availablity.

c. Planning methods

Inventory planning methods use a common information base to coordinate inventory requirements across multiple locations or stages in the supply chain. Planning activities may occur at the plant warehouse level to coordinate inventory allocation and delivery to multiple destinations. Planning may also occur to coordinate inventory requirements across multiple channel partners such as manufacturers and retailers.

1. Fair share allocation

Fair share allocation is a simplified inventory management planning method that provides each facility with an equitable or " fair share"of available inventory from a common source such as a plant warehouse. Using fair share allocation, the inventory planner determines the amount of inventory that can be allocated to each warehouse from the available inventory at the plant. The calculation to determine the common days by supply is:

$$DS = \frac{AQ + \sum_{j=1}^{n} Ij}{\sum_{j=1}^{n} Dj}$$

Where:

DS= Common days supply for warehouse inventories
AQ= Inventory units to be allocated from plan warehouse;
Dj= Daily demand for warehouse j, and
Ij= Inventory in units for warehouse j,.

2. Distribution requirements planning (DRP)

DRP is a more sophisticated planning approach that considers multiple distribution stages and their unique characteristics. DRP is the logical extension of manufacturing requirement planning (MRP), although there is one fundamental difference between the two techniques. MRP is driven by a production schedule that is defined and controlled by management policy. On the other hand, DRP is driven by customer demand. So, while MRP generally operates in a dependent demand situation, DRP operates in an independent demand environment where uncertain customer demand drives inventory management.

d. Adaptive logic

A combined inventory management system may be used to overcome some of the problems inherent in rising either a reactive or a planning method. The factors that might make a reactive system better in one situation may change over time to favour the use of an inventory planning system. Thus, the ideal approach is an adaptive inventory management system that incorporates elements of both types of logic and allows different strategies to be used with specific customer or product segments.

2.3 SUMMARY

Inventory management is one of the important key activities of business logistics. Because of its role in business organisations, Schonsleben (2000:395) adds that inventory is one of the most important instruments of logistics planning and control. While inventory on work in process is linked to the production process, physical inventory on stock or in buffer storage is unnecessary from the standpoint of added value and is considered as waste of time and money (tied-up capital).

Bowersox, Closs and Cooper (2002:326) are of the opinion that inventory typically represents the second largest component of logistics cost next to transportation.
The risks associated with holding inventory increase as products move down the supply chain closer to the customer because the potential of having the product in the wrong place or form increases and costs have been incurred to move the product down the channel. In addition to the risk of lost sales due to stockouts because adequate inventory is not available, other risks include obsolescence, pilferage and damage.

According to Hill (2000:392), inventory is a significant asset in most organisations. Its effective management, therefore, is a key task within the auspices of operations. But controlling inventory is far from easy. It involves a complex set of decisions due to the many forms inventory takes and functions it provide. In addition, inventories are the result of functional policies within an organisation as well as the short and long term decisions in purchasing, operations and sales.

The optimal management of inventories is a primary objective for all the firms manufacturing make to stock finished goods. As a matter of fact, inventories have important implications for both the financial and the economic performance of the company, therefore it is widely acknowlegded that an optimal inventory management policy allows companies to achieve higher profitabilty levels. In general terms, inventory management policies should be aimed at lowering the holding costs through higher inventory rotation, but without triggering substantial stockouts and backorders, caused by demand peaks and / or lead time delays (Bertolini and Rizzi 2002:1-2).

As all organisations are concerned with inventory management, a particular accent has to be put to it. A sane inventory management implies the coordination of strategic functions (production, finance, and marketing) of the organisation in order to reach objectives.
The achievement of any organisation's objectives is linked to the relationships of functional goals. That's the reason why strategic policies related to inventory management have to be arrested or conceived in order to achieve the organisational goals. Because, failure to that, an organisation will grind to a halt.

CHAPTER 3: CUSTOMER SERVICE

3.1 INTRODUCTION

Manufacturing industries purchase raw materials from suppliers, transform them into finished goods in order to be sold to customers. Customers' needs or markets' needs in general have always been a great worry for organisations either of the public or private sector. Customer service is one of the most important key activities of business logistics in the sense that it allows to determine in concrete terms customers' needs and wants for logistics in order to be positively met or answered.

Leaning on service marketing, Hoffman and Bateson (2002:4-5) establish fundamental differences between goods and services summarised by a scale of market entities.
That explanation is shaped by the following figure:

Figure 3.1: Scale of market entities

Source: Lynn Shostack (in Hoffman and Bateson 2002). Essentials of service marketing: Concepts, Strategies & Cases. 5

Hoffman and Bateson (2002:5) explain that figure 3.1 displays a range of products based on their tangibility. Pure goods are tangible dominant, whereas pure services are

intangible dominant. Businesses such as fast food, which contain goods and services components, fall in the middle of the continuum. Firms that manufacture goods and ignore, or at least forget about, the services (intangible) elements of the offerings are overlooking a vital component of their businesses.

Managing service is a delicate task that requires a proper knowledge of the matter in order to effectively and efficiently responds to customers' expectations. For O' Laughlin and Copacino (in Figueiredo et al. 2003:3), customer service requirements command the structure of the supply chain, including manufacturing, marketing, and logistics and to understand such requirements is a fundamental step for the design of a customer service strategy that meets customer satisfaction. Bowersox, Closs and Cooper (2002:73) add that the primary value of logistics is to accommodate customer requirements in a cost-effective manner. Although most senior managers agree that customer service is important, they sometimes find it extremely difficult to explain what it is and what it does. While common expressions of customer service include 'easy to do business with' and 'response to customers' to develop a full understanding of customer service, a more thorough framework is required.

Kiely and Armistead (2004:2) referring to technological and demographic changes, underline the point that integrated knowledge systems will enable a wide range of tailored services to be offered. However, such technological opportunities will have to be balanced against the costs of automation and the expectations and technical readiness of customers. Demographic projections and changing lifestyles will produce an increase in the number of people employed in customer service, together with an increase in 'non-standard' employment contracts. Changes in technology and employee expectations will mean that future customer service professionals are increasingly likely to work from home or other locations.

It is imperative to highlight that the identification of specific customer service needs and the response to those needs by using available resources in order to satisfy those customer requirements remain a priority number-one for all successful business organisations in general and manufacturing industries in particular. Failure to do that, business organisations are doomed to disappear or to close doors.

3.2 UNDERSTANDING CUSTOMER SERVICE

3.2.1 Definition of customer service

Before defining the concept 'customer service', it is necessary to comment a little about the service concept. Because the service concept is vulgarly used in all areas of life and

sometimes its proper meaning is difficult to be figured out. That's the reason why the correct understanding of this concept is of a great importance in the sense that it will throw light on the other sections of this dissertation. For Johnston and Clark (2001:44):

a) A service concept is the mental picture that is held by customer, employees and shareholders about the service provided by the organisation.

b) A service concept embraces the service experience, the service outcome, the service operation and the value of the service.

Gronroos (in Gronroos 2000:46) defines the service concept as a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and / or physical resources or goods and / or systems of the service provider, which are provided as solution problems.

For a good understanding of the service concept, Chase, Jacobs and Aquilano (2004:220-221) insert the notion of service businesses and that of internal services. They insist on the fact that service operations management issues exist in two broad organisational contexts:

a. Service business is the management of organisations whose primary business requires interaction with the customer to produce the service. These include such familiar services providers like banks, airlines, hospitals, law firms, retail stores and restaurants. Within this category, we can make a further major distinction: facilities-based services, where the customer must go to the service facility and field-based services where production and consumption of the service take place in the environment (for example, cleaning and repair services).

b. Internal services are the management of services required to support the activities of the larger organisations. These services include such functions as data processing, accounting, engineering and maintenance. Their customers are the various departments within the organisation that require such services. Incidentally, it is not uncommon for an internal service to start marketing its services outside the parent organisation and become a service business itself. Farner, Luthans and Sommer (2001:1) mention that various models have been proposed that revolve around the concept of customers existing within the boundaries of the organisations. This basic principle of internal customer service posits that every department in an organisation exists to serve someone, whether that is the external customer or another department. The organisation consists of an interdependent chain of individuals and functional units, each taking inputs from one

another and turning them out into external customer service. The basic assumption is that if everybody strives to provide their "internal customer" with better service, then the end customer will receive higher quality service. Farner,Luthans and Sommer (2001:3) adds that the basic tenet of internal service is that each department either receives work from, or processes work for another department, as the process management approach emphasises. Because of this, individual units or departments need to view themselves as both customers and suppliers. They receive inputs from another department (their supplier), add value, and send the output of their work to another department (their customer). Processes can be improved, and thus quality improved, if each department treats the people who receive the outputs from their work as "customers".
Many authors have defined the concept "customer service" but in this study, these definitions are selected.

According to Stock and Lambert (2001:97), customer service can be defined as a process which takes place between buyer, seller and the 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 benefit to the supply chain in a cost-effective way.

Coyle, Bardi and Langley (2003:96) define the concept customer service referring to the levels of involvement of customer service (activity, performance measures and philosophy).

a. Customer service as an activity. This level treats customer service as a particular task that a firm must accomplish to satisfy the customer's needs. Order processing, billing and invoicing, product terms and claims handling are all typical examples of this level of customer service. Customer service departments, which basically handle customer problems and complaints, also represent this level of customer service.

b. Customer service as performance measures. This level emphasises customer service in terms of specific performance measures, such as the percentage of orders delivered on time and completed and the number of orders processed within acceptable time limits. Although this level enhances this first one, a firm must look beyond the performance measures themselves to ensure that its service efforts achieve actual customer satisfaction.

c. Customer service as a philosophy. This level elevates customer service to a firm-wide commitment to providing customer satisfaction through superior customer service. This

view of customer service is entirely consistent with many firms' contemporary emphasis on quality and quality management. Rather than narrowly viewing customer service as an activity or as a set of performance measures, this interpretation involves a dedication to customer service that pervades the entire firm and all of its activities.

Doctker (in Ballou 2004:93), considering customer service in terms of a fulfilment process, define it as '… the entire process of filling the customer's order. This process includes the receipt of the order (either manual or electronic), managing the payment, picking and packing the goods, shipping the package, delivering the package, providing to the customer for the end user and handling the possible return of the goods.'

Finally, Emerson and Grimm (in Collins, Henchion and O'Reilly 2001:2) distinguish between marketing and logistics customer service, both of which are required to meet customer expectations. They describe logistics customer service activities as providing 'place, time and form utility, by ensuring that the product is at the right place, at the time the customer wants it and in an undamaged condition.' Its activities are restricted to those that take place during the individual order cycle, from order placement to order delivery. Marketing customer services, on the other hand, are those outside the context of the order cycle. They 'facilitate possession utility by creating awareness of the product, offering a mechanism such as price, by which the buyer-seller exchange can take place, and often offering follow-up service and warranty on the product.'

3.2.2 Importance of customer service

Many business organisations spend much money researching how to meet customers' needs. This situation translates the role that service management plays in the future of any business. Chase, Roth et al., Voss and Johnston (in Verma 2000:1) add that ' as the post-industrial economy evolves, the service sector continues to increase in importance, both in terms of its contribution to the gross domestic product (GDP) of all advanced economies and in terms of the percentage of workforce employed in services. Accordingly, the last decade has witnessed an increased emphasis on teaching and research on service management issues by schools and professional organisations.

Dodds (2003:49) notes that customer service is the set of activities that increase the value customers receive when they buy by constantly and consistently giving them what they want. This conceptualisation of customer service goes beyond the traditional way we think about customer service. It covers activities that do not directly involve customers at all. Manufacturing, purchasing and quality control may never 'talk' to the end user of products yet they are vital in meeting customers' needs. Delivering an expensive product that doesn't work and delivering it late, affects customer service just as much as a rude

salesperson. The entire organisation must pull together to provide excellent customer service.

Customer service is the most important component of the logistics system. Not only do customer service decisions have a direct impact on the firm's customers and employees, but they also determine how the rest of the logistics mix will be structured (Gourdin 2001:57). Bloomberg, Lemay and Hanna (2002:65) are of the opinion that customer service defines the effectiveness of integrated logistics in the channel of distribution.

A 98 percent in-stock level means that the desired product is available to the customer when required 98 percent of the time. This also means that the firm accepts a 2 percent stock out level. Integrated logistics activities determine stock availability, which may, in turn, determine whether the firm loses a customer or loses a sale, two major factors in customer service cost. To increase availability of the product from 95 percent to 98 percent and improve customer service levels, a manufacturer may choose air transportation over trucks. For distances over 500 miles, air is usually faster than roads in getting the product onto the shelves. Shorter transit time means lower inventory levels.

Tseng, Qinhai and Su (1999:1) sum up the importance of service by underlining the fact that the growing importance of the service sector in almost every economy in the world has created a significant amount of interest in service operations. In practice, many services sectors have sought and made use of various enhancement programs to improve their operations and performance in an attempt to hold competitive success. As most researchers recognise, service operations link with customers. The customers as participants act in the service operations system driven by the goal of sufficing his / her added values. This is one of the distinctive features of service production and consumption.

3.2.3 Types of customer support / service

With regard to customer support or service, Coyle, Bardi and Langley (2003:95) state that 'a fundamental point to recognise is that customer service is a concept whose importance reaches far beyond the logistics areas. Customer service frequently affects every area of the firm by attempting to satisfaction through the provision of aid or service to the customer '. Examples of the various forms that customer service may take include the following:

a. Revamping a billing procedure to accommodate a customer's request
b. Providing financial and credit terms
c. Guaranteeing delivery within specific time periods

d. Providing prompt and congenial sales representatives
e. Extending the option to sell on consignment
f. Providing material to aid in a customer's sales presentation
g. Installing the product
h. Maintaining satisfactory repair parts inventories.

3.2.4 Elements of customer service

It has to be mentioned that customer service has always been considered as a fundamental ingredient in marketing strategy. The four Ps- product, price, promotion and place, are elements that build the philosophy of an excellent customer service and impact on buyer's behaviour. That's the reason why knowing the elements of customer service and the rational management of those elements are necessities for all organisations. Coyle, Bardi and Langley (2003:97-99) have identified four dimensions affecting the cost centres of both buyer and seller firms. These traditional dimensions will be discussed in order to provide solid information on elements of customer service.

a. Time. The time factor is usually order cycle time, particularly from the perspective of the seller looking at customer service. On the other hand, the buyer usually refers to the time dimension as the lead time, or replenishment time. Regardless of the perspective or the terminology, several basis components or variables affect the factor.

Successful logistics operations today have a high degree of control over most, if not all, of the basis elements of lead time, including order processing, order preparation and order shipment. By effectively managing activities such as these, thus, ensuring that order cycles will be of reasonable length and consistent duration, seller firms have improved the customer service levels that they provide to buyers.

Modifying all the elements that contribute to lead time may be too costly. The firm may therefore make modification in one area and permit the others to operate at existing levels. For example, investing in automated materials-handling equipment may be financially unwise for the firm. To compensate for its higher manual order-processing time, the firm could switch from fax to internet-enabled order transmittal and use motor transportation instead of rail. This would permit the firm to reduce lead time without increasing its capital investment in automated materials-handling equipment.

b. Dependability. To some customers, dependability can be more important than lead time. The customer can minimise its inventory level if the lead time is fixed. That is, a customer that knows with 100 percent assurance that lead time is ten days could adjust its inventory levels to correspond to the average demand (usage) during the ten days and

would have no need for safety stock to guard against stockouts resulting from fluctuating lead times.

(1) Cycle time. Lead time dependability, then, directly affects the customer's inventory level and stockout costs. Providing a dependability lead time reduces some of the uncertainty a customer faces. A seller, who can assure the customer of a given level of lead time, plus some tolerance, distinctly differentiates its product from that of its competitor. The seller that provides a dependable lead time permits the buyer to minimise the total cost of inventory, stockouts, order processing and production scheduling.

(2) Safe delivery. An order's safe delivery is the ultimate goal of any logistics system.
As was noted earlier, the logistics function is the culmination of the selling function.
If goods arrive damaged or are lost, the customer cannot use the goods as intended.
A shipment containing damaged goods aggravates several customer cost centres in inventory, production and marketing. Receiving a damaged shipment deprives the customer of items for sale or production. This may increase stockout costs in the form of foregone profits or production. To guard against these costs, the customer must increase inventory levels. Thus, unsafe delivery causes the buyer to incur higher inventory carrying costs or to forego profits or production. This situation would be unacceptable for a company interested in minimising or eliminating inventories through some form of just-in-time program.

(3) Correct orders. Finally, dependability embraces the correct filling of orders.
A customer who has been anxiously awaiting the arrival of an urgent need shipment may discover upon receiving the shipment that the seller made an error in filling the order. The customer who has not received what was requested may face potential lost sales or production. An improperly filled order forces the customer to re-order, if the customer who is not angry enough to buy from another supplier. If a customer who is an intermediary in the marketing channel experiences a stockout, the stockout cost (lost sales) also directly affects the seller.

c. Communications. Two logistics activities vital to order filling are the communication of customer order information to the order-filling area and the actual process of picking out of inventory the items ordered. In the order information stage, the use of EDI of internet-enabled communications can reduce errors in transferring order information from the order to the warehouse receipt. The seller should simplify product identification such as product codes in order to reduce order picker errors.

However, customer contact can be as important as accurate, electronic flow of information between buyers and sellers. Communication with customers is vital to monitor customer service levels relating to dependability. Customer communication is

essential to the design of logistics service levels. The communication channel must be constantly open and readily accessible to all customers, for this is the seller's link to the major external constraints that customers impose upon logistics. Without customer contact, the logistics manager is unable to provide the most efficient and economical service; in other words, the logistics manager would be playing the ball game without full knowing the rules.

d. Convenience. Convenience is another way of saying that the logistics service level must be flexible. From the logistics operations standpoint, having one or a few standard service levels that apply to all customers would be ideal but this assumes that all customers' logistics requirements are homogeneous. In reality, this is not the situation. For example, one customer may require the seller to palletise and ship all palletisation; still others may request special delivery times. Basically, logistics requirements differ with regard to packaging, the mode and carrier the customer requires, routing and delivery times. Convenience recognises customers' different requirements. A seller can usually group customer requirements by such factories as customer size, market area and the product line the customer is purchasing. This grouping, or market segmentation, enables the logistics manager to recognise customer service requirements and to attempt to fulfil those demands as economically as possible.

3.2.5 Service quality

Leonard and Sasser (in Ching-Chow Yang 2003:1) note that from the beginning of the 1980s, quality awareness and customer consciousness have been growing steadily. Wang and Po Lo (2002:3), respectively, Associate Professor and Head of Department of Management Sciences, City University of Hong Kong, Hong Kong, China, explicit the notion of quality by underlining the fact that in marketing and economics, quality often has been viewed as dependent on the level of product attributes. In operations management, quality is defined as having two primarily dimensions, fitness of use (it refers to whether the product or service does what it is supposed to do and possess features that meet the needs of customers) and reliability (it represents to what extent the product is free from deficiencies). Farner, Luthans and Sommer (2001:3) mention that the hyper-competitive business environment of the new millennium has forced organisations to increase their emphasis on service quality. Because of this, a wealth of practical applications has emerged on the many facets associated with managing service quality. Consider, for example, the past issues of this journal and the quality literature as a whole on such topics as benchmarking, re-engineering, and total quality management (TQM). One point of debate within this literature concerns defining the customers that quality programs are supposed to be serving.

3.2.5.1 Importance of service quality

Parasuraman et al. (in Bebko 2001:2) mention that quality is an issue of vital importance to marketers in the delivery services. But the delivery of quality to the consumer has been an especially difficult proposition. The unique characteristics of services (intangibility, variability, inseparability and perishability) have created problems in the delivery of quality to the consumer. The research that resulted in the SERVQUAL methodology was a giant stride in defining the concept of quality in services. SERVQUAL methodology defines service quality as the level of discrepancy between consumer expectations or desires and their perceptions of what they received. The following five dimensions are used by consumers as they evaluate service quality:

a. Tangibles (the appearance of physical facilities, equipment, personnel and communications material).
b. Reliability (the ability to perform the promise service dependably and accurately).
c. Responsiveness (the willingness to help customers and provide prompt service).
d. Assurance (the knowledge and courtesy of employees and their ability to convey trust and confidence).
e. Empathy (the carrying of individualised attention the firm provides its customers).

Based on customer feedback systems, Wirtz and Tomlin (2000:1-2) back up Bebko's research by adding that the key objective of a good customer feedback system is to learn from customer feedback in an institutionalised, continuous manner. As service quality is only one of several important drivers of overall customer satisfaction, the scope of the system needs to reflect this. One way of modelling this is Arthur D. Little's framework that distinguishes between four key factors of overall satisfaction, normally:

(1) Product quality or the tangibles delivered to customers;
(2) Service quality;
(3) Image or brand; and
(4) Price.

Managerially, it makes sense to separate these four factors, as they are typically shaped by different parts of the organisation, need different management approaches for improvement, and have different time horizons of management. Product quality is often the responsibility of production and procurement managers, and of distribution channels. Service quality is typically the responsibility of process owners and branch managers (in many matrix organisations). Price is set by product managers, or by planning and finance departments. Image or brand is driven, in general, by the way the entire organisation projects itself and, in particular, by marketing managers who determine brand positioning, and by corporate communications managers who manage the corporate image.

Deming (in Yang 2003:1-2) points out that businesses would like to provide "good" service quality to their customers. The problem lies in the means of evaluating the service quality they provide: service quality aims to confirm the requirements of customers, to meet their expectations and to satisfy them. At this subject, Yang (2003:2) concludes by stating that 'to understand the performance of service quality, firms first examine whether the service provided will meet with customers' requirements and expectations. Therefore, firms should focus on the following issues:

a. Knowing customers' requirements, especially those quality attributes considered to be important by customers.

b. Fulfilling customers' requirements on quality attributes as much as possible, especially those that are considered important by customers;

c. Investigating where the service performed is satisfactory to customers and where it is not; and

d. Taking appropriate action to correct or improve service in cases where quality is poor.'

3.2.5.2 Methods for measuring service quality

It has to be mentioned that literature indicates the existence of many different methods for measuring service quality, some more complex than others and this according to authors or researchers consider quality from customers' perspective than management perspective. Yang (2003:2-3) has identified five methods for measuring service quality. These methods will be briefly discussed in order to provide solid information on service quality.

3.2.5.2.1 SERVQUAL

According to Smith (in Yang 2003:2), SERVQUAL is based on the 'gap model' of service quality, which defines quality as a function of the 'gap' between customers' expectations of a service and their perceptions of the actual service delivered. Because SERVQUAL uses a complicated questionnaire to measure perceived service quality, it is used by scholars more frequently than business practitioners. Parasuraman et al. (in Tan and Pawitra 2001:2-3) explains the following five gaps that can result in unsuccessful service delivery:

a. Gap between customer expectation and management perception. This may result from a lack of understanding of what customers expect from a particular service.

b. Gap between management's perception and service quality specifications. This gap results when there is a discrepancy between what management perceives to be the customers' expectations and the actual established service quality specifications.

c. Gap between service quality specifications and service delivery. Even when guidelines or specifications exist for performing excellent service, its delivery may not be up to standard due to poor employee performance, resulting in this gap.

d. Gap between service delivery and external communication. Customer expectations are established by promises made by a service provider's promotional messages. This gap measures the consistency between the quality image portrayed in promotional activities and the actual quality services offered.

e. Gap between perceived service and delivered service. This gap results when one or more of the previous gap occurs.

3.2.5.2.2 Customer surveys

Many authors or researchers on service quality are of the view that customer surveys are used by most business organisations in order to measure service quality. Yang (2003:2) adds that surveys can be conducted by brief questionnaire, telephone, or mail. Of these, mail survey is still the best method. It can contain more questions, and can thus enable more information to be obtained. Different situations in different dimensions of quality attributes can be explored to obtain a better understanding of needs to be improved.

3.2.5.2.3 Customer interviews

Vichas (in Yang 2003:3) notes that customer surveys by telephone or mail have deficiencies in obtaining the 'real voices' of customers. For example, it is not possible to take account of a customer's body language, and it might be difficult to interpret voice intonation. Yang (2003:3), therefore adds that customer interviews overcome such weaknesses. Focus group, customer seminars, and individual interviews are frequently used as methods of customer interview continue arguing.

3.2.5.2.4 Internal audits

According to Yang (2003:3), the above methods provide evidence of the subjective judgement of customers. However, many of these methods lack objective numerical measurements, and many of them are deficient as practical tools of objective quality assessment. Therefore, many companies establish a 'service standard' or 'quality standard' of the quality attributes that they consider being important, and they use such established standards or performance levels to conduct their quality measurements and internal audits.

3.2.5.2.5 Customer value workshops

In 1998, Bennington and Cummane introduced a hybrid methodology called a "customer value workshop" (CVW) that combines the Kawakita Jira methods, mental weighting methods, and technological interfaces. Bennington and Cummane (in Yang 2003:3) underline that the CVW method provides for significant involvement by all participants. Such processes are more structured than focus groups, and the methodology can also overcome some weaknesses associated with focus groups.

3.2.6 Customer service expectations and satisfaction

Customer service management, because of the present market complexity related to customer's maintenance and sales increase, remains a serious concern of this time. A poor customer service management will grind business organisations to a halt. Understanding customer expectations and satisfying them is of great necessity because without knowing the real motives that push to a purchasing behaviour, it will be difficult to meet customers' requirements.

3.2.6.1 Customer expectations

Today, the business environment is characterised by changing customer expectations, technological and product advances, legislative and political developments and economic and competitive conditions which contribute to an increasing emphasis on service quality for all organisations- in both the services and manufacturing sectors.
Managing service quality necessitates an integrated approach from operations, marketing, human resource and other key managers or areas of business (Dale 1999:195).

According to Bowersox, Closs and Cooper (2002:79), it is clear that when customers transact business with a supplier they have numerous expectations, many of which revolve around the supplier's basic logistical service platform, that is, they have expectations regarding availability, operational performance and service reliability. Frequently, they have in place formal programs to monitor suppliers' performance with respect to each of these dimensions' logistical performances. Johnston and Clark (2001:83) add that organisations need to understand expectations, understand the competition and need to manage expectations. Indeed, it may be appropriate to try to rein in customers' expectations in order to keep them at the right level that can be met or just exceeded by service delivery. This is a challenge for service operations managers.

Finally, Hoffman and Bateson (2002:313-314) have identified three types of customer expectations. These types of customer expectations will be briefly analysed in order to provide a basic background on customer expectations.

a. Predicted service is a probability expectation that reflects the level of service customers believe is likely to occur. For example, bank customers tend to conduct their banking business at the same location. Customers become accustomed to dealing with the same bank personnel and begin to anticipate certain performance levels.

b. Desired service is an ideal expectation that reflects what customers actually want compared with predicted service, which is what is likely to occur. Hence, in most instances, desired service reflects a higher expectation than predicted service.

c. Adequate service is a minimum tolerance expectation and reflects the level of service the customer is willing to accept. Adequate service is based on experiences or norms that develop over time.

Customers' expectations will be influenced by many things (Johnston and Clark 2001:86). Key parameters influencing customers' expectations are shown by the following figure:

Figure 3.2: Expectations- Key influences

Source: Johnston, R and Clark, G. 2001. Service operations management. 86

It is imperious to be noted that apart from the above- mentioned parameters, there are also service quality factors that motivate a customer to purchase as well. Related to that, Johnston and Clark (2001:88) mention that service quality factors are attributes of service about which customers may have expectations and which need to be delivered at some specific level. Here is the graphical representation of those variables which influence customers' purchasing decisions.

Figure 3.3: Service quality and its factors

Source: Johnston, R and Clark, G. 2001. Service operations management.98

3.2.6.2 Customer satisfaction

According to Johnston and Clark (2001:78), satisfaction is the result of a customer's assessment of a service based on a comparison of its service delivery with its prior expectations.

The research done by Yasin and Yavas (1999:1) witnesses that in an area of intense competitive pressure, service organisations ranging from hospitals to financial institutions to restaurants face considerable pressures and challenges not only to meet, but also to exceed customer expectations. Today's sophisticated and discerning customers demand the highest levels of service efficiency, quality, and flexibility and dependability.
Many service organisations recognise that attaining customer satisfaction through delivery of quality services is a key to their survival and they are well aware that having a loyal base of satisfied customers increases sales, reduces costs, improves bottom lines and builds markets shares. Yet, while manufacturing organisations have long been willing to develop the philosophies, techniques and concepts needed to enhance the effectiveness of their systems, most service organisations have lagged behind.

To streamline and improve their service delivery system, service organisations have much to learn from their manufacturing counterparts in utilising, among others, such quality and process improvement tools as root cause analysis (RCA), benchmarking (BM), process reengineering (PR) and continuous improvement.

The following figure shows the relationship between expectations and satisfaction:

Figure 3.4: Relationship between expectations and satisfaction

Source: Johnston, R and Clark, G. 2001. Service operations management.78

3.3 CUSTOMER SERVICE RELATIONSHIPS

3.3.1 Definition of a Sales-Service relationship

The sane service management must prioritise customers' requirements. As it has been mentioned in the previous sections of this dissertation that the carelessness of customers' requirements can lead to the closing down of a company, a sane customer service management has to endeavour to maintain or increase customers' confidence in terms of service offered by the company: and consequently maintain or increase sales.

Tseng, Qinhai and Su (1999:2) add the fact that poor service experience of customers will reduce the potential customer base of an organisation and in turn have an adverse impact on the organisation's performance. A negative service experience of customers do not only force the existing customers to migrate to competitors but also, due to the effect of negative word of mouth, results in fruitless effort of the organisation to attract new customers.

A sensitive measure of how customers regard a product or service can be sales or market share. After all, if the relative value to a customer changes, sales and market share should be affected, although there may be an occasional delay caused by market and customer inertia. Sales levels can be strategically important. Increased sales can mean that the customer base has grown. An enlarge customer base, if we assume that new customers will develop loyalty, will mean future sales and profits. Increased share can provide the potential to gain SCAs in the form of economies of scale and experience curve effects. Conversely, decreased sales can mean decreases in customer bases and a loss of scale economies (AAKER: 2001:113).

For a better understanding of the impact of service management on the company's sales, the relationship between sales and service level is mathematically shown through the following graphical representation.

Figure 3.5: General relationship of sales to customer service

Source: Ballou, R H. 2004. Business logistics / Supply chain management.105.

Ballou (2004:106) gives an explanation to figure 3.5 noting three distinct stages of the curve: threshold, diminishing returns and decline. Each stage shows the equal increments of service improvements that do not always bring equal gains in sales. He clearly underlines these following marking points:

a. When no customer service exists between a buyer and a supplier, or when service is extremely poor, little or no sales are generated. Obviously, if a supplier offers no logistics, customer service and the buyer is not providing it, there is no way of overcoming the time and space gap between the two. No exchange and thus no sales, can take place.

b. As service is increased to that approximating the offering by competition, little sales gain can be expected. Assuming that price and quality are equal, the firm is not in effect,

and in business until its service level approximates that of the competition. This point is the threshold service level.

c. When a firm's service level reaches this threshold, further service improvement relative to competition can show good sales stimulation. Sales are captured from competing suppliers by creating a service differential. As the service is further improved, sales continue to increase, but at a slower rate. The region from the service level at threshold to the point of sales decline is referred to as one of diminishing returns. It is in this region that most of firms operate their supply chains.

Researches related to customer service have proven that sales increases are linked to customer service improvement. Based on that fact, business organisations have to formulate strategic actions in view of provoking sales increase.

3.3.2 Cost-Service relationship

Cost is a significant variable which directly or indirectly influences logistics key activities. Logistics customer service is a result of logistics activity level. Each level of service is associated with a given cost level. Ballou (2004:109-110) states that 'as activity levels are increased to meet higher customer service levels, costs increase at an increasing rate. This is a general phenomenon observed in most of economic activities as they are forced beyond their point of maximum efficiency.' Graphically, cost-service relationship can be represented as follows:

Figure 3.6: General cost- revenue trade-offs at varying levels of logistics customer service

Source: Ballou, R H. 2004. Business logistics / Supply chain management.110

Ballou continues arguing that the profit contribution curve results from the difference between revenue and costs at various service levels. Because there is a point on the profit contribution curve where profit is maximised, it is this ideal service level that is sought in planning the logistics system. This maximum profit point typically occurs between the extremes of low and high service levels.

3.4 CUSTOMER SERVICE IMPROVEMENT

It is a responsibility for organisations which look for a high sales level to regularly establish strategic planning regarding service in order to meet the market's needs. Gourdin (2001:50-51) has identified three vectors for improving customer service. These vectors will be briefly discussed in order to provide basic information on customer service improvement.

a. Understand customer needs

It is absolutely essential that management learn what services their customers most value and how much they are willing to pay for those amenities. Invariably, this sort of research will show that all customers do not seek the same things. This effort will, in turn, give managers the information needed to conduct an ABC analysis whereby customers can be

categorised, based on the profits they provide to the firm. Customer service strategies can then be developed to meet these specific needs.

b. Monitor service delivery

Because the uncontrollable variables discussed earlier can upset the best laid plans, managers must seek constant customer feedback in order to ensure that service deficiencies are quickly identified and corrected. Customer surveys and interviews can provide useful insights, as can personal experience. For example, managers may choose to put themselves into their customers' place by acting as a patron within their own organisation.

c. Train employees

Employees must understand what the firm's customer service strategies are so that they know what their role in implementing those plans is. Very often, the only interaction the customer has is with the front-line worker: the vehicle operator, order taker, or clerk. Therefore, for many customers, the company is represented by the lowest- ranking people in the entire organisation. It is crucial that these employees understand the critical role they play in providing customer satisfaction and receive the training necessary to carry out their tasks. Top management must also give these customer contact workers the freedom and authority to take whatever action they deem necessary to keep the customer happy.

Leaning on service operations improvement, Tseng, Qinhai and Su (1999:3-4) suggested three ways for improving customer operations. These ways will also be analysed in view of feeding this dissertation.

1. Customer-oriented management philosophy is the key to the competitive advantage of organisations. Kingman-Brundage et al. (in Tseng, Qinhai and Su 1999:3) state that customer-oriented management philosophy maintains the notion that management ought to consider customers when determining what improvements are needed. That is, the managerial actions should be taken from customers' view points. Arguments in favour of customer-oriented managing are persuasive. Maintaining customer satisfaction and sufficing customer value have been increasingly identified as an important and effective way for businesses to gain competitive advantage. Repeat business from satisfied customers generates long-term revenue that is a key to profitability.

2. The problems that erode the customer value and the improvement opportunity that enhances the customer value can be discovered through auditing the service experience of customers. The reason why customers experience a service operations system is that they consider it represents some value they are looking for. In the customers' eyes, service experience is perceived as the service product produced by the service operations system. Through experiencing the service operations system, customers make judgements about what they perceive and consequently have service value perception (positive or negative). For customers, their value perception is the direct function of their service experience. The service experience either adds or subs tracts value in customers' eyes, their satisfaction or dissatisfaction (if any) comes from their perception of what they experienced.

3. Service experience of customers is describable. One may argue that the psychology and behaviour of customers vary considerably and the service experience of customers with respect to a service operations system is customer-unique. Accordingly the service experience of customers is not describable or at least difficult to describe. Indeed, this logic falls in the fallacy of completeness and ignores the abstraction ability of humans. It is evident that when people behave in a certain environment or relationships created by the system shape all the customer-unique service experiences thus giving their common characteristics with to a service operations system. So, according to the service operations system (its operation processes, policies and regulations, physical environment and others) and the observed customer behaviour, we can get a description of the service experience of customers, the comprehensive abstraction of all the instances of the customer-unique service experience.

Improved service generally means lower inventory costs for the buyer, assuming that product quality and acquisition price remain unaffected by the improved service offering. Buyers are then motivated to shift their patronage to the supplier offering the best service (Ballou 2004:1006). According to Stock and Lambert (2001: 129), an effective customer service strategy must be based on an understanding of how customers define service. The customer service audit and surveys of customers are imperative. Once management has determined the firm's customers' view of service, it must select a customer service strategy that advances the firm's objectives for long-range profit and return on investment. The optimum customer service level is not always the lowest cost level but rather than the one that retains the 'right' or 'desired' customers.

3.5 PERFORMANCE MEASURES FOR CUSTOMER SERVICE AND IMPLEMENTATION OF CUSTOMER SERVICE STANDARDS

3.5.1 Performance measures for customer service

According to Coyle, Bardi and Langley (2003:102), the new supply chain environment for customer service has resulted in much more rigorous standards of performance. The performance measures are now stated from the point of view of the customer:

a) Orders received on time
b) Orders received complete
c) Orders received damage free
d) Orders filled accurately
e) Orders billed accurately.

The ontime delivery measure is even more demanding today because buyers often give appointment times for warehouse and / or store deliveries on the outbound side of logistics. For example, the move to just-in-time manufacturing has necessitated the establishment of sometimes very narrow delivery time 'windows' for vendors. Overall, marking deliveries on time is very much more difficult currently and will be even tougher in the future.

Another aspect of the supply chain environment is that the excellent companies are using multiple measures of customer service simultaneously. Using multiple measures makes it much more difficult to achieve high levels of customer service. For example, that a company was using only one of the following:

- 95 percent of orders delivered on time
- 93 percent of the filled completely
- 97 percent of orders delivered damage free.

Achieving one of these performance levels- for example, 95 percent of orders delivered on time- would be challenging but very possible by focusing upon the activities necessary to attain the required performance. But trying to achieve all three performance levels simultaneously for every order and to attain a 'perfect order' level like 95 percent would be difficult.

Hulbert, Capon and Piercy (2003:229-231) mention the three following strategic relationships which impact on a company's performance:

a. Customer service as offensive strategy

Some companies have used service superiority either as the main plank of their business strategy, or at least as a key element. British Airways, which had been a poorly managed state-owned airline, relied on superiority in customer service to achieve global impact and high profitability as the 'world's Favourite Airline.' Unfortunately, when the company subsequently entered a phase of cost-cutting and outsourcing, it lost that service edge, culminating in significant operating losses.

b. Customer service as defensive strategy

Realistically, most traditional manufacturing companies still do not see service as the core of their offensive strategy. Many of them may find it difficult to understand how firms compete this way, because they cling to the belief that product superiority is the only route to competitive success. Yet, even if companies are unprepared to use customer service as the cutting edge, they are starting to recognise the crucial role of customer service in defensive strategy. The growth of relationship marketing has encouraged more companies to explore the economics of relationships with their customers. Typically, it costs so much to acquire customers that it is irresponsible to lose them, at least when retention costs are relatively small.

c. Customer service as learning strategy

Although firms frequently ignore this benefit, customer service is a potential hot spot for listening to customers and learning more about their changing priorities. Because customer service is a critical point where customers meet the company (often for the first time if they have bought products through intermediaries), it is an amazingly productive source of lessons for managers about really drives customer value.

3.5.2 Implementation of customer service standards

According to Coyle, Bardi and Langley (2003:103), customer service standards can be implemented on the basis of these following points:

The first point is to be wary of adopting easily achievable performance standards; such standards may be too low to be of practical value. While setting and adhering to a meaningful standard should help to differentiate your firm from the competition, setting standards at unrealistically low levels will not help to establish a competitive advantage.

Second, some current management philosophies- such as an emphasis on total quality or on creation of the 'perfect order'- are very critical of any acceptable quality level set below 100 percent. This does not mean that a firm can achieve 100 percent performance at all times, for the use of 100 percent represents an attitude more than a measurement. From a practical viewpoint, however, establishing a desired quality level that is less than 100 percent will generally limit, rather than encourage, superior performance.

Third, the firm should develop customer service policies and standards through customer consultation. After adapting these standards, the firm should formally communicate them to customers. Certain firms prefer to keep silent about their customer service standards and avoid letting their customers know their exact policies and performance targets. The best approach, however, is to communicate these policies and standards to customers very openly.

Fourth, the firm should develop procedures to measure, monitor and control the customer service quality called for by the firm's performance measures and standards. Using techniques such as statistical process control (SPC), obtaining feed-back and taking corrective action are essential to success. When customer service standards are ineffective, the firm should not hesitate to amend or discontinue them as appropriate.

3.6 SUMMARY

Industries do not produce items for themselves but for the market's needs. According to Bowersox, Closs and Cooper (2002:91), the fundamental rationale for logistics is the need to accommodate customers, whether those customers are end users, intermediate or even internal. The marketing concept provides the foundation for customer accommodation with its fundamental focus on customer needs rather on products or services; the requirement to view and position products or service in a customer context, identification of market segments which differ in needs and commitment that volume is secondary to profit.

Spreng and Mackoy (in Sureshchandar, Rajendran and Anantharaman 2002:1-2) affirm that service quality and customer satisfaction are inarguably the two core concepts that are at the crux of the marketing theory and practice. Sureshchandar, Rajendran and Anantharaman (2002:2) add that the importance of these two concepts is further manifested by the cornucopia of the theoretical and empirical studies on that topic that have emanated over the past few years. Therefore, there is not even an iota of doubt concerning the importance of service quality and customer satisfaction as the ultimate goals of service providers.

Burgers, de Ruyter, Keen and Streukens (2000:2) are of the opinion that 'to serve the customer right and effectively, contact employees need to know what customers desire.' In the case of face-to-face encounters, people can create quality perceptions relating to physical characteristics of the contact employee and the environment where the service takes place. Interaction by telephone restricts the evaluation of the delivery to such an extent that consumers will have to base their perceptions solely on the interpersonal traits of the contact employee. Tseng, Qinhai and Su (1999:2) underline that poor service experience of customers will reduce the potential customer base of an organisation and in turn has an adverse impact on the organisation's performance. A negative service experience of customers do not only force the existing customers to migrate to competitors but also, due to the effect of negative word of mouth, results in fruitless effort of the organisation to attract new customers.

Dale (1999:195) also mentions that organisations need clearly defined service strategies with top management commitment and leadership. They need to understand their service encounters (both internal and external to the company) and potential failure points and to avoid service quality shortfalls or gaps. This can be achieved by researching both service personnel and customers, identifying key dimensions of service quality and developing appropriate service quality initiatives. Successful service strategies will include emphasis on products / services, delivery systems and procedures, technology and personnel- their skills and commitment to the organisation and its customers.

Product consumption depends upon the product availability, the product quality, the price, the word of mouth and so on. That's the reason why customer service management remains a death and life issue because the organisation's future depends on it and neglecting customers' needs will grind an organisation to a halt.

PART TWO: PRACTICAL FRAME

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

A sane inventory management is of great necessity in any business organisations. The future of business organisations depends upon how the top management defines and considers inventory in relationship with the company's objectives or service levels. Knowing factors that push to a purchasing behaviour and meeting customers' needs remain a crucial matter for the growth and survival in nowaday's competitive market.

Baki et al (2004:1) add that today's competitive marketing environment forces producers and customers to get closer to each other. This means organisations should give a great importance to customers' needs and listen to their voices, and suppliers and customers should be closer and closer to each other in order to produce goods or services based on the customer needs. Therefore, manufacturers and service producers need an effective planning and control system for a powerful coordination in between all stages of the organisations (processes, and other). The implementation and the use of an effective planning and control system in an organisation improve productivity and performance of distribution, while decreasing waiting times. The enterprise resource planning (ERP) systems are examples of the most strategic tools, which provide robust tools for planning, coordination and control of the processes in all organisations.

4.2 RESEARCH DESIGN

4.2.1 Problem statement

The basic purpose of inventory analysis in manufacturing and stock keeping services is to specify (1) when items should be ordered and (2) how big the order should be. Many firms are tending to enter into longer-term relationships with vendors to supply their needs for perhaps the entire year. This changes the 'when' and 'how many to order' to 'when' and 'how many to deliver' (Chase, Jacobs and Aquilano 2004:545).

The improvement of customer service has always been a main issue in manufacturing industries throughout the world. This pushes business organisations to endeavour to identify and prioritise all activities required in order to accommodate customers' logistics requirements. Bowersox, Closs and Cooper (2002:91) add that organisations build their

platform for accommodation on three levels of increasing commitment: The first of these is basic logistics customer service. To be competitive, a firm needs a basic service capability that balances availability, operational performance and reliability for all customers. The level of commitment to each dimension of service requires careful consideration of competitive performance and of a cost / benefit analysis. The highest level of commitment is perfect order performance, which requires zero defects in logistics operations. Such high-level commitment is generally reserved for a firm's key customers.

The main problem addressed in this dissertation could be stated as follows:

How can inventory management be a decisive factor to improve customer service in manufacturing industries logistics located in Gauteng Province (especially in Pretoria and Johannesburg)?

From the main problem, here are secondary problems:

a. Determination of the impact of product availability policies on the customer's level of expectation.

b. Determination or test of inventory management policies in connection with customers' needs in manufacturing industries.

c. Determination of the incidence of internal customer service on external customer service.

d. Measurement or test of the level of customers' satisfaction.

4.2.2 Research objectives

The main objectives of this research study are:

a. To determine whether product availability policies followed by manufacturing industries in Gauteng Province (especially in Pretoria and Johannesburg) enable them to meet customers' levels of expectation.

b. To determine if inventory management policies enable manufacturing industries in Gauteng Province (especially in Pretoria and Johannesburg) to respond to customers' needs.

c. To determine whether internal customer service impact on external customer service (satisfaction).

d. To measure or test the level of customers' satisfaction.

The approach followed in this research in order to reach objectives a, b, c and d above was to state a research statement or hypothesis, and then source and analyse (descriptive analysis and detailed quantitative analysis see points 4.3 and 4.4 of this chapter) the necessary data to prove the correctness or otherwise of the hypothesis. The only one hypothesis in question is:

The improvement of inventory management policies leads to customer service improvement.

4.2.3 Research approach

The approach of this study consists of combining research into primary and secondary data. Secondary data, that is, the literature phase of the research has essentially been provided in the previous chapters. The theoretical part or the literature of the study is represented by the debate of various parameters relative to inventory management and customer service management. This is of a vital importance in the sense that it provides a measured explanation concerning inventory management and customer service management in a business logistics environment where globalisation, technological innovation and changing societal expectations negatively or positively impact on the growth and survival of business organisations on one side and manufacturing industries logistics on the other.

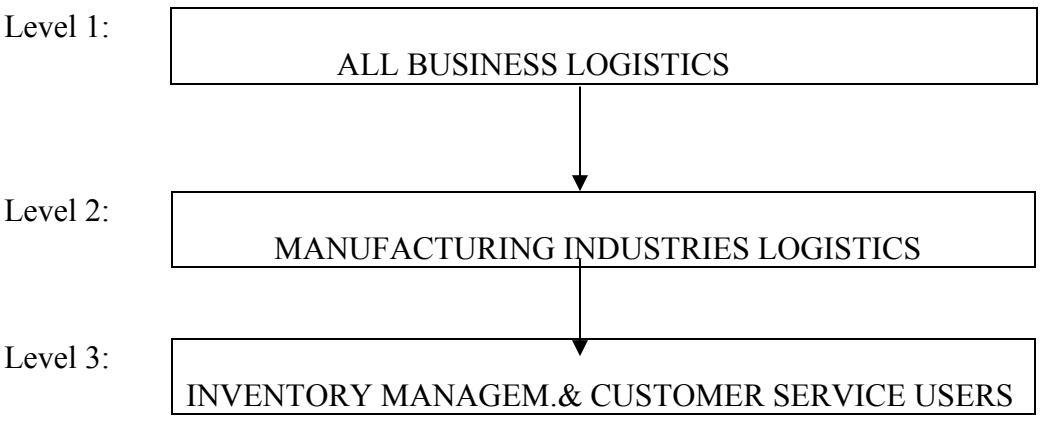
Primary data has also been analysed in the form of an empirical study. In this phase, manufacturing industries in Gauteng Province (especially in Pretoria and Johannesburg) were included in the study. In light of the above, it has to be indicated that the respondents in this population (manufacturing industries in Gauteng Province) were precisely those dealing with inventory management and customer service management. Employees or managers of business organisations that were approached were typically in manufacturing industries logistics according to sectors (Machinery & Equipment, Textiles, Chemicals and Food, Beverage & Agro industrial products).

The analysis of this research was conducted or done from both a descriptive and quantitative point of view in order to test the correctness of the only one hypothesis formulated earlier in the previous section (point 4.2.2) and to achieve the objectives of this dissertation in accordance with the primary data that has been obtained. Findings and future perspectives of both the primary and secondary phases of this study will finally be presented.

4.2.4 Design of the sample

The target population of the empirical study is manufacturing industries located in Gauteng Province (Pretoria and Johannesburg). In order to make the survey among inventory management and customer service users more practical, a sample of the abovementioned target population had to be taken. The sample method followed is illustrated in figure 4.1 below.

Figure 4.1: Sampling model



Source: own design / research

Level 1 represents survey respondents forming part of the entire business logistics that had to be narrowed down in view of targeting the Manufacturing Industries Logistics per se. Level 2 excludes a number of services industries or organisations such as bank, post, transportation organisations, health care companies, shops, and other in a manner to make the sample more valid as far as the manufacturing industries logistics are concerned. Level 3 focuses on inventory management and customer service users. This level is of a

great usefulness to the sample model in terms of validity and then enables this research study to attain its objectives as stated in the point 4.2.2 of this dissertation. In concrete terms, more emphasis was placed on level 3 responses made possible for the elaboration of the statements in the questionnaire.

Numerically or quantitatively speaking, the sample table is represented in table 4.1 as follows:

Table 4.1: Sampling table

AREAS / SECTORS	JOHANNESBURG			PRETORIA		
	Population Sample	Planned Sample	Realised Sample	Population Sample	Planned Sample	Realised Sample
MACHINERY & EQUIPMENT	28	14	7	15	10	10
TEXTILES	56	27	10	9	5	4
FOOD,BEVERAGE & AGRO IND. PR.	47	24	7	14	7	3
CHEMICALS	19	8	4	6	3	2
TOTAL	150	73	28	44	25	19

From table 4.1, it is shown that the population sample was of 194 manufacturing industries of which 44 manufacturing industries for Pretoria and 150 manufacturing industries for Johannesburg. The planned sample was of 98 manufacturing industries in Gauteng Province (respectively 73 for Johannesburg and 25 for Pretoria). Considered to be a reasonable sample as validity was constructed or designed into the sample so that the questionnaire can be distributed among inventory and customer service managers constituting the target population of this study. Therefore, it has to be underlined that inventory management and customer service users exist in the manufacturing industries nowadays to make a reasonable qualitative and quantitative contribution to the survey. A total number of 47 (47.96 %) responses were realised from the sample drawn (mail questionnaire and personal interviews), that is, the realised sample was of 47 (47.96 %) manufacturing industries in Gauteng Province (respectively 28 for Johannesburg and 19 for Pretoria).

4.2.5 Methods of data collection

In order to gain a thorough sound base to the theoretical aspects, literature on inventory management, customer service, and customer service improvement were studied. And then, there are numerous researchers or authors who have written literature on inventory management and customer service management, but only new literatures have been selected in the purpose of feeding this dissertation.

Leedy and Ormrod (2001:196) are of the view that 'a survey research captures a fleeting moment in time, much as a camera takes a simple-frame photograph of an ongoing activity. By drawing conclusions from one transistor's collection of data, we may extrapolate about the state of affairs over a longer time period. At best, the extrapolation is a conjecture and sometimes a hasardous one at that, but it is our only way to generalise from what we see.'

The method used in order to collect data for the empirical phase of this study was that of a survey, utilising a structured instrument. A questionnaire (appendix & number) was developed in a manner to attain the research objectives of this dissertation. In order to add the number of questionnaire feed back, personal interviews have been conducted with managers of different manufacturing industries logistics situated in Pretoria and Johannesburg. Telephone interviews have been costly and also not practical because of a large number of questions or statements to be addressed.

The purpose of the questionnaire was to provide nutritive elements for analysis and testing of the hypothesis. The questionnaire was designed with structured and measurable statements in order to feed the practical part of this study. A total of twenty-four statements were selected with some open-ended statements. This helped to capture some perceptions on inventory management and customer service management.

4.2.6 Analyses of data

Two following approaches were used in this study in order to analyse data:

a. descriptive analysis per dimension of data for the purpose of measuring, inter alia, frequency of occurrence; and,

b. quantitative analysis of dimension relationships constituting the basis for testing the only one hypothesis formulated in this study.

The validity of a measurement instrument is the extent to which the instrument measures what it is supposed to measure (Leedy and Ormrod 2001: 24). Validity takes two natures namely, external and internal validity. External validity refers to the findings' ability to be generalised throughout the manufacturing industries logistics and internal validity refers to the questionnaire ability to measure the fact it is intended to measure.

Related to the research study, the survey questionnaire was developed under the inspiration of Leedy and Ormrod's research methodology and the University of Pretoria's guidelines for creating questionnaires (C S Steenekamp: 'Praktiese riglyne vir vraelyskonstruksie'). After the survey questionnaire was conceived and approved by a research consultant and statistician on one side and the supervisor of this dissertation on the other, discussions were held with logistics managers (Immediate Electrical Power & Distribution, Accutech Weighing Service (Pty) and Vector Logistics Solutions) in the purpose of testing its practicability (among manufacturing industries logistics). A certain number of the statements were especially conceived in order to test the hypothesis of this study. The content of the questionnaire was evaluated for non ambiguity, relevance, validity and interpretation.

The form and the contents of the questionnaire was finalised only after the questionnaire had been pre-tested. Apart from the questionnaire, a certain number of personal interviews were also conducted with managers of manufacturing industries logistics in view of getting sufficient information for the materialisation of this research study.

The procedure followed for descriptive analysis consisted of measuring the occurrence frequency of data in the purpose of examining the problem studied, that is, the valid presentation of data analysis and its interpretation in order to clearly perceive how respondents react to the issue.

As far as quantitative analysis is concerned, the procedure followed was Fisher's Exact test for a (2x2) contingency table and as literature witnesses that Fisher's Exact test for a (2x2) contingency table is used in cases where n is small or where the expected frequencies under Ho are not at least 5. This procedure is of a vital usefulness in the sense that it analyses non-continuous data when describing the behaviour of the dependent variable. By utilising Fisher's Exact test, it can be known which of the variables are influenced significantly. Consequently, the independent variables explain the dependent variables.

4.3 SUMMARY

The aim of this chapter was to present the research methodology followed in order to attain the objectives of this dissertation. In light of the above, it is of great importance to mention that more emphasis was placed on inventory management and customer service users. The approach used in this study consisted of combining research into primary and secondary data. A questionnaire was developed (under the inspiration of Leedy and Ormrod's research methodology and the University of Pretoria's guidelines for creating questionnaires) in order to collect data for empirical phase. This enabled to capture some perceptions on inventory management and customer service management. The data analysis of this study was conducted from both a descriptive and quantitative standpoint for the purpose of testing the correctness of the only one hypothesis formulated earlier in this dissertation.

CHAPTER 5: RESEARCH FINDINGS

5.1 INTRODUCTION

In this section, the research results of this dissertation are presented. It is of great importance to underline that the data analysis of this research will be done from both a descriptive and quantitative standpoint for the purpose of testing the correctness of the only one hypothesis formulated earlier in the previous chapter (section 4.2.2) and achieving the research objectives. In light of the above, descriptive analysis, in this study, will consist of measuring the occurrence frequency of data in the purpose of examining the problem researched, that is, the valid presentation of data analysis and its interpretation in order to clearly perceive how respondents react to the issue. As far as quantitative analysis is concerned, Fisher's Exact test will be used in order to know which of the variables will be influenced significantly. Consequently, the independent variables will explain the dependent variables.

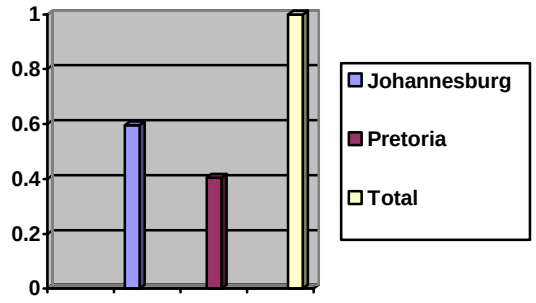
5.2 DESCRIPTIVE ANALYSIS PER DIMENSION OF DATA

5.2.1 Analysis of respondents

5.2.1.1 According to activity area (v2)

Figure 5.1 shows the breakdown of the 47 respondents within manufacturing industries located in Gauteng Province. Two main activity areas or regions have been chosen in Gauteng Province namely, Pretoria and Johannesburg. The city of Vereeninging has not been taken into account because of a feeble number of manufacturing industries situated in that area. As far as responses are concerned for the two main activity areas in this research study, it is shown that responses in Johannesburg are higher than that of Pretoria. This could be explained by the simple fact that Johannesburg has more manufacturing industries than Pretoria. The distribution of percentage according to activity area is 59.57 % for Johannesburg and 40.43 % for Pretoria. Graphically, the situation is represented as follows:

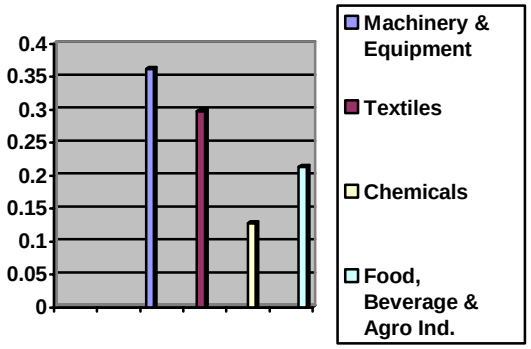
Figure 5.1: Analysis of respondents in manufacturing industries according to activity area.



5.2.1.2 According to business sector (v3)

Figure 5.2 is a graphical representation of the respondents in manufacturing industries referring to business sectors. In this study, it has to be mentioned that four business sectors were chosen amongst manufacturing industries logistics namely, Machinery & Equipment sector, Textiles sector, Chemicals sector and Food, Beverage and Agro industrial products sector. The abovementioned figure shows that three business sectors are represented somewhat higher than the last sector namely, Machinery & Equipment (36.17 %), Textiles (29.79 %), Food, Beverage & Agro industrial products (21.28 %) and Chemicals (12.77 %). This could be justified by the fact that the Department of Trade & Industry of South Africa (TISA) that stocks information for manufacturing industries in South Africa has not been able to provide more information in the chemicals sector than in others. Here below is the graph of the situation:

Figure 5.2: Analysis of respondents in manufacturing industries based on business sector.



5.2.1.3 According to position in the company (v4)

Table 5.1 makes the autopsy of 16 categories of respondents dealing with inventory management and customer service management within manufacturing industries logistics basing on their positions in the four business sectors chosen in this dissertation. As far as responses (to questionnaire) are concerned, three categories of respondents' positions are represented somewhat higher than others namely, Operations-Director (10.8 % of the sample), Operations & Commercial Manager (17.39 % of the sample) and Supply Chain Manager (10.87 % of the sample). The rest of the categories of respondents' positions in manufacturing industries logistics are represented evenly as indicated by the above-mentioned table.

Table 5.1: Analysis of respondents positions dealing with inventory and customer service management.

Respondents positions	Frequency	Percent	Cumulative percent
Director – Commercial	2	4.35	4.35
General Manager	2	4.35	8.70

Managing Member	3	6.52	15.22
Operations- Director	5	10.87	26.09
Stock & Marketing Manager	1	2.17	28.26
Engineer. Member	1	2.17	30.43
Technical- Member	1	2.17	32.61
Production & Sale Manager	4	8.70	41.30
Engineering & Commerc. Member	2	4.35	45.65
Procurement & Marketing Manager	1	2.17	47.83
Managing Director	4	8.70	56.52
Operations & Commerc. Manager	8	17.39	73.91
Supply Chain Manager	5	10.87	84.78
Technical & Marketing Director	3	6.52	91.30
Technical Manager	3	6.52	97.83
Sole Proprietor	1	2.17	100.00

5.2.1.4 According to products manufactured and offered to the market

5.2.1.4.1 Group A (v5)

Table 5.2 illustrates the autopsy or x- ray of the respondents in manufacturing industries logistics basing on products (Group A) manufactured and offered to the market. It is

clearly indicated that agricultural chemicals & related products are more manufactured and offered to the market by manufacturing industries situated in Gauteng Province than others (14.89 % of the sample). This could be explained by the fact that agriculture is a priority for the economical independence of a country. The rest of the products are represented evenly as indicated by the above-mentioned table.

Table 5.2: Products (Group A) manufactured and offered by manufacturing industries to the market

Manufactured products (Group A)	Frequency	Percent	Cumulative percent
Chemicals	7	14.89	14.89
Painting	1	2.13	17.02
Maize Meal	3	6.38	23.40
Canned Foods	2	4.26	27.66
Milk	3	6.38	34.04
Coffee	1	2.13	36.17
Tea	1	2.13	38.30
Textiles Products	1	2.13	40.43
Curtains	3	6.38	46.81
Blankets	1	2.13	48.94
Tent Cloth & Related components	1	2.13	51.06
Men, Women & Children Clothing's	3	6.38	57.45
Towels	3	6.38	63.83
Sport Wear	1	2.13	65.96
Knitted Products	1	2.13	68.09

Components Turbo	1	2.13	70.21
Agricultural Mach.	1	2.13	72.34
Equipment Airline	1	2.13	74.47
Machinery Quality Assurance	1	2.13	76.60
Steel Wool Machin.	1	2.13	78.72
Blow Moulding Machinery	1	2.13	80.85
Glass Product Machinery	1	2.13	82.98
Equipment Data Communication	1	2.13	85.11
Equipment Audio Visual	2	2.13	89.36
Equipment of Measurement	1	2.13	91.49
Electrical Equipments	1	2.13	93.62
Compressors	1	2..13	95.74
Air Conditioning Equipment	1	2.13	97.87
Welding Machinery	1	2.13	100.00

5.2.1.4.2 Group B (v6)

Table 5.3 shows the responses of users in manufacturing industries logistics referring to products (Group B) manufactured and offered to the market.

Table 5.3: Products (Group B) manufactured and offered by manufacturing industries to the market.

Manufactured Products (Group B)	Frequency	Percent	Cumulative percent
Milk	1	10.00	10.00
Juice	2	20.00	30.00
Coffee	1	10.00	40.00
Carpets	2	20.00	60.00
Baby wear	1	10.00	70.00
Face Cloth	1	10.00	80.00
Cable Laying	1	10.00	90.00
Equipment of Measurement	1	10.00	100.00

The table displays that two products namely, juice (20 %) and carpet (20 %) are more manufactured and offered to the market by manufacturing industries than others. The above-mentioned table indicates the other products as well.

5.2.1.4.3 Group C (v7)

Table 5.4 illustrates the responses of users in manufacturing industries based on products (Group C) manufactured and offered to the market. It is clearly shown that two products are equal represented, 50.00% each.

Table 5.4: Products (Group C) manufactured and offered by manufacturing industries to the market

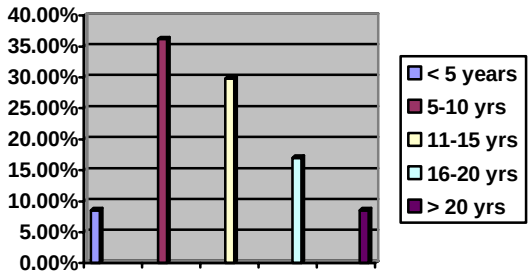
Manufactured Products (Group C)	Frequency	Percent	Cumulative Percent
Blankets	1	50.00	50.00
Kitchen Linen	1	50.00	100.00

5.2.2 Experience of respondents

5.2.2.1 Inventory management experience of respondents (v8)

Figure 5.3 is a graphical representation of the level of experience with inventory management amongst respondents. Respondents representing 8.51 % of the sample have less than five years experience dealing with inventory management. This means that less than five years exposure to inventory management could be considered as inexperienced. The > 20 years group of respondents only represents 8.51 % of the sample because of technological innovation affecting business logistics area in general and inventory management as well. In light of the above, employees having more than 20 years experience are accustomed to deal with inventories on a routine basis and push or compel manufacturing industries to renew or to readapt their competences in connection with today's changing environment requirements. The largest grouping (36.18 %) has five to ten years experience managing inventories. This latter amount of exposure to inventory management would be regarded as representing a relatively experienced group of the respondents. It is imperious to indicate that the respondents with five or more years experience represent 91.49 % of the sample and could be considered as sufficiently informed and experienced to provide measured and instructive responses.

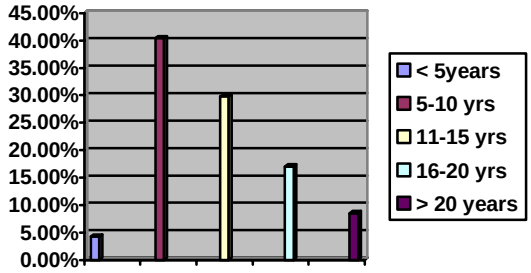
Figure 5.3: Respondents' exposure to inventory management.



5.2.2.2 Customer service (management) experience of respondents (v9)

Figure 5.4 is a graphical representation of the level of experience with customer service management amongst respondents. In light of above, it is clearly indicated that respondents representing 4.26 % of the sample have less than five years experience dealing with customer service. This translates that this category of respondents (less than five years) is exposured to customer service management and consequently could be regarded as not knowledgeable or less experienced. Therefore, the > 20 years category of respondents, being practically double than the first one (less than five years category), points out 8.51 % of the sample and this group of respondents is more experienced dealing with customers' issues. The largest category of respondents representing 40.42 % of the sample has five to ten years experience dealing with customers. It has to be noted that this group of respondents has already mastered customers' needs or requirements in terms of quality, quantity, items availability, delivery time, communication policy, and others.
In addition, it has to be underlined that the respondents with five to ten or more years experience, exposing 95.74 % of the sample could be regarded as sufficiently knowledgeable, mature or experienced to furnish balanced and informative responses.

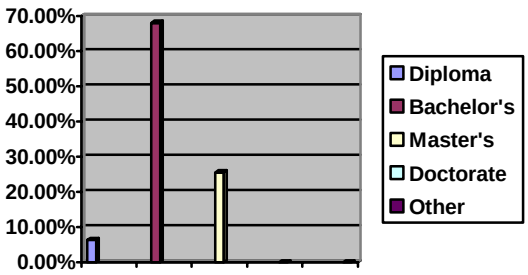
Figure 5.4: Respondents' exposure to customer service management.



5.2.3 Qualification amongst respondents (v10 &v11)

Figure 5.5 displays qualifications of respondents involved in inventory management and customer service management within manufacturing industries logistics situated in Gauteng Province.

Figure 5.5: Qualifications of respondents involved in inventory management and customer service management.



Looking at figure 5.5, 68.09 % of the respondents dealing with inventory management and customer management are holders of a bachelor's degree. This translates the fact that most of manufacturing industries trust bachelor's degree employees to be involved in inventory management and customer service management in the sense that those employees have the ability to understand business organisations'problems and provide or propose solutions (answers) to issues that the above-mentioned organisations are facing. It has to be added that even though, new bachelor's degree holders hired may require additional knowledge in order to link theories to practice, they do cost less to manufacturing industries in terms of time and money because of their easy adaptability to business environments.
25.53 % of the respondents involving in inventory management and customer service management possess a master's degree. This could be explained in two dimensions, first, some bachelor's degree employees are not satisfied with their academic level and fearing future challenges linked to technological changes or innovation, return to universities in order to get a higher degree (master's degree), and secondly, because of difficulties due to hiring which constrain other bachelor's degree holders go to master's degree with hope to be hired after ending their studies. 6.38 % of the respondents of the sample dealing with inventories and customer service management within manufacturing industries are of diploma level. It is also noticed that no doctorate degree and other qualifications holders are employed in manufacturing industries because doctorate (and other qualifications) could either cost a lot or complicate or create difficulties in the classification structure of manufacturing industries.

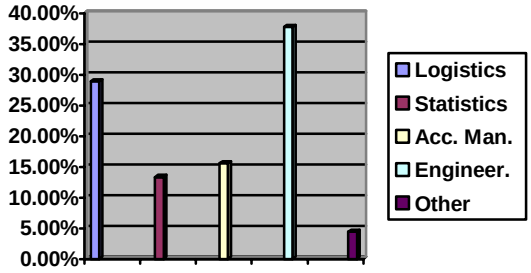
In addition, the respondents with bachelor's degrees and master's degrees expose 93.62 % of the sample and could be regarded as sufficiently fitted or competent to respond to customers' needs.

5.2.4 Degree held by respondents

5.2.4.1 Involved in inventory management (v12)

Figure 5.6 illustrates degrees held by respondents involved in inventory management within manufacturing industries logistics.

Figure 5.6: Degree held by respondents dealing with inventory management.



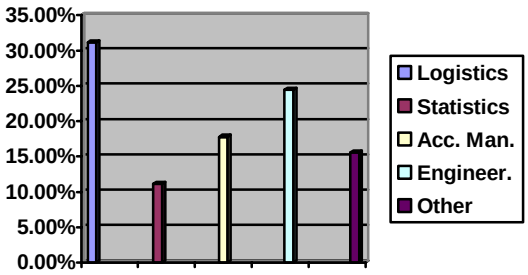
Looking at figure 5.6, it is clearly indicated that 37.78 % of respondents dealing with inventory management are from the engineering area. This could be explained in so far as technological innovations related to manufacturing industries logistics constrain engineers nowadays to interest in or to enlarge their view to some business logistics key areas in order to effectively and efficiently manage organisations operations from one hand and to another hand to extend business organisations'market share and cause business organisations'growth and survival. It is also exposed that 28.89 % of respondents are from the logistics management area. This group of respondents is the second in terms of extent after engineering area in the sense that logistics management include inventory management, customer service management, transport management, purchasing management, and others. 4.44 % represent the respondents dealing with inventory management but having other degrees such as marketing management, consumer science and economics. This category, because of its economical and managerial background, understands and solves inventory management problems. The

rest of the degrees held by respondents are represented evenly as the above-mentioned figure displays.

5.2.4.2 Involved in customer service management (v13)

Figure 5.7 illustrates degrees held by respondents involved in customer service management within manufacturing industries logistics.

Figure 5.7: Degree possessed by respondents dealing with customer service management



Looking at figure 5.7, 31.11 % of respondents involved in customer service management are from the logistics management area. This could be understood in the sense that customer service management is one of the logistics management key activities. This group of respondents is well fitted to dealing with customers' issues. It is also shown that 24.44 % of respondents dealing with customer service issues are from the engineering area. Complexity of business environment requires or pushes engineers in manufacturing industries logistics to be directly or indirectly involved in customer service management in order to enlarge manufacturing industries logistics' market share. The rest of the degrees held by respondents dealing with customer service management are represented evenly as the above-mentioned figure indicates.

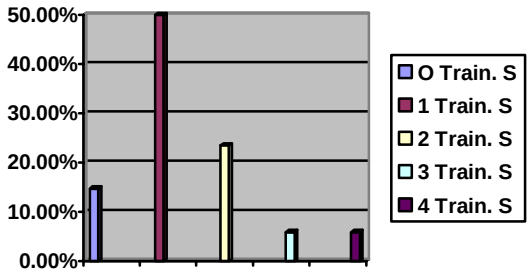
5.2.5 Training sessions had by respondents

5.2.5.1 Inventory management training sessions had amongst respondents (v14)

Figure 5.8 displays the number of training sessions had by respondents managing inventories within manufacturing industries logistics. Respondents representing 50.00 %

of the sample have had one training session. This group of respondents, being the largest of the sample (half of the sample), has positively satisfied the manufacturing industries' requirements after a training session (that is, they have been at the level with their task to hold inventories). Therefore, this group is followed by that of representing 23.53 % of the sample having also answered to the manufacturing industries' requirements in view of managing inventories (after two training sessions). The third category is that of respondents pointing out 14.71 % that have had no training session in order to deal with inventories. The rest of the respondents are represented as displays in the above-mentioned figure.

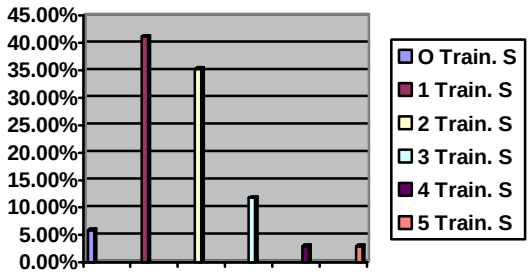
Figure 5.8: Inventory management training sessions had by respondents.



5.2.5.2 Customer service management training sessions amongst respondents (v15)

Figure 5.9 shows the number of training sessions had by respondents dealing with customer service management within manufacturing industries logistics.41.18 % of respondents involved in customer service management have had one training session. This translates that this group of respondents answered to the manufacturing industries requirements in order to manage customers' issues. Respondents representing 35.29 % of the sample have had two training sessions in view of managing customers' problems. 11.76 % of the respondents dealing with customer service management have had three training sessions in order to respond to manufacturing industries requirements. The rest of the respondents are represented as indicates the below figure.

Figure 5.9: Customer service management training sessions had by respondents.



The point 5.2 was aimed at descriptive analysis per dimension of data. The next discussion, point 5.3, will focus on the potential relationships between dimensions of data by means of quantitative analysis.

5.3 QUANTITATIVE ANALYSIS OF DIMENSION RELATIONSHIPS

5.3.1 Introduction

In this section, the search for a relationship between two or more variables is established. The Chi-Square test was not valid for this research study because the sample size was small (47 manufacturing industries logistics). Fisher's Exact test was valid only for 30 percent of the results of this research study and the remaining 70 percent of the results were reported. It has to be indicated (according to literature) that Fisher's Exact test (P test of significance) for a (2 x 2) contingency table is used in cases where n is small or where the expected frequencies under Ho are not at least 5.

In this research, the 0.05 level of significance table will be used or employed. Thus, if p-value > 0.05, it means that the P value is below that necessary for achieving the 0.05 level of significance. If a p-value of P > 0.05, it indicates that there is no statistical significant difference between the two variables. Otherwise, if p-value < 0.05, the null hypothesis (Ho), shows that there is no relationship between the two variables, the population can be rejected and the alternative hypothesis Ha shows there is a relationship between the two variables in the population, can be accepted.

5.3.2 Relationships between dimensions of data

5.3.2.1 Use of a managerial procedure to respond to the channel members' inventory need (v16) versus interdepartmental relationships (v35).

The table 5.5 shows the relationship existing between the use of a managerial procedure to respond to the channel members' inventory needs through the distribution channel and interdepartmental relationships within manufacturing industries logistics.

Table 5.5: Use of a managerial procedure to respond to channel members' inventory needs and interdepartmental relationships

v 16	v 35			
Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1	11 10.435 23.91 91.67 27.5	1 1.3043 2.17 8.33 20	0 0.2609 0 0 0	12 26.09
2	28 27.826 60.87 87.5 70	4 3.4783 8.7 12.5 80	0 0.6957 0 0 0	32 69.56
3	1 1.7391 2.17 50 2.5	0 0.2174 0 0 0	1 0.0435 2.17 50 100	2 4.35
Total	40 86.96	5 10.87	1 2.17	46 100

Frequency missing = 1

From a column percentage point of view, the above table indicates that 86.96 % of the respondents mentioned that collaboration amongst departments within manufacturing industries logistics may lead to external customers' satisfaction. 10.87 % of the respondents mentioned that mutual support amongst departments within manufacturing industries logistics may lead to external customers' satisfaction and 2.17 % of the respondents mentioned that communication amongst departments within manufacturing industries logistics may lead to external customers' satisfaction. From a row percentage viewpoint, the above table shows that 26.09 % of the respondents definitely agreed they

use a managerial procedure in order to respond to the channel members' inventory needs through the distribution channel. 69.56 % of the respondents agreed they use a managerial procedure to respond to the channel members' inventory needs through the distribution channel. 4.35 % of the respondents had a neutral opinion on this statement.

It has to be reported in conclusion that, of the 86.97 % of the respondents using collaboration:

a. 27.50 % of the respondents definitely agreed they use a managerial procedure to respond to the channel members' inventory through the distribution channel.
b. 70.00 % of the respondents agreed they use a managerial procedure to respond to the channel members' inventory needs through the distribution channel.
c. 2.50 % of the respondents was of neutral point of view about this statement.

5.3.2.2 Use of a managerial tool to coordinate inventory requirements (v21) versus interdepartmental relationships (v35).

The table 5.6 displays the relationship between the use of a managerial tool in view of coordinating inventory requirements across multiple locations or stages in the supply chain and the interdepartmental relationships.

Table 5.6: Use of a managerial tool to coordinate inventory requirements and interdepartmental relationships

v 21	v 35			
Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1	3 4.3478 6.52 60 7.5	2 0.5435 4.35 40 40	0 0.1087 0 0 0	5 10.87
2	31 29.565 67.39 91.18 77.5	3 3.6957 6.52 8.82 60	0 0.7391 0 0 0	34 73.91
3	6	0	1	7

	6.087	0.7609	0.1522	
	13.04	0	2.17	15.22
	85.71	0	14.29	
	15	0	100	
Total	40	5	1	46
	86.96	10.87	2.17	100

Frequency missing = 1

In terms of column percentage, 86.96 % of the respondents mentioned that collaboration amongst departments may lead to external customer's satisfaction. 10.87 % of the respondents underlined that mutual support amongst departments may satisfy external customer's needs and 2.17 % of the respondents pointed out that communication may satisfy customer's wants. In terms of row percentage, the abovementioned table shows that 10.87 % of the respondents definitely agreed they use a managerial tool to coordinate inventory requirements across multiple locations or stages in the supply chain. 73.91 % of the respondents agreed they use a managerial tool in order to coordinate inventory requirements across multiple locations or stages in the supply chain.

In conclusion, of the 86.96 % of the respondents mentioning collaboration amongst departments within manufacturing industries logistics:

a. 7.50 % of the respondents definitely agreed they use a managerial tool to coordinate inventory requirements across multiple locations or stages in the supply chain.
b. 77.50 % of the respondents agreed they use a managerial tool to coordinate inventory requirements across multiple locations or stages in the supply chain.
c. 15.00 % of the respondents had a neutral position concerning this assertion.

5.3.2.3 Use of a managerial system to coordinate inventory requirements and respond to the channel members' needs (vv24) versus interdepartmental relationships (v35).

The table 5.7 sets out the relationship existing between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through distribution channel and the interdepartmental relationships.

Table 5.7: Use of a managerial system to coordinate inventory requirements and interdepartmental relationships

vv 24	v 35
Frequency Expected	

Percent Row Pct Col Pct	1	2	3	Total
1 - 2	36	4	0	40
	34.783	4.3478	0.8696	
	78.26	8.7	0	86.96
	90	10	0	
	90	80	0	
3	4	1	1	6
	5.2174	0.6522	0.1304	
	8.7	2.17	2.17	13.04
	66.67	16.67	16.67	
	10	20	100	
Total	40	5	1	46
	86.96	10.87	2.17	100

Frequency missing = 1

From a column percentage standpoint, 86.96 % of the respondents were of the view that collaboration amongst departments may lead to external customers' satisfaction. 10.87 % of the respondents underlined that mutual support amongst departments may satisfy external customer's needs and 2.17 % of the respondents mentioned that communication may lead to external customers' satisfaction. In terms of row percentage, the abovementioned table indicates that 86.96 % of the respondents which some definitely agreed and the others agreed that they use a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs through distribution channel. The rest of the respondents representing 13.06 % had a neutral opinion about this issue.

Of the 86.96 % of the respondents using collaboration amongst departments within manufacturing industries logistics, there are:

a. 90.00 % of the respondents which some definitely agreed and the others agreed they use a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs through distribution channel.
b. 10.00 % of the respondents was neutral about this statement.

5.3.2.4 Use of a managerial approach to face inefficiency reduction (v29) versus interdepartmental relationships (v35).

The table 5.8 shows the relationship that exists between the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process and the interdepartmental relationships within manufacturing industries logistics.

Table 5.8: Use of a managerial approach to face to inefficiency reduction and interdepartmental relationships

v 29 v 35

Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1	4 4.3478 8.7 80 10	1 0.5435 2.17 20 20	0 0.1087 0 0 0	5 10.87
2	34 33.043 73.91 89.47 85	4 4.1304 8.7 10.53 80	0 0.8261 0 0 0	38 82.61
3	2 2.6087 4.35 66.67 5	0 0.3261 0 0 0	1 0.0652 2.17 33.33 100	3 6.52
Total	40 86.96	5 10.87	1 2.17	46 100

Frequency missing = 1

From a column percentage standpoint, the above table mentions that 86.96 % of the respondents pointed out that collaboration amongst departments may satisfy external customers' needs. 10.87 % of the respondents were of the opinion that mutual support may lead to external customers' satisfaction and the rest of sample (2.17 % of the respondents) reported that communication may satisfy external customers' needs. From a row percentage viewpoint, it is clearly shown that 10.87 % of the respondents definitely agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process. 82.61 % of the respondents (majority) agreed that they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process and 6.52 % of the respondents were of neutral opinion about this matter.

The above table also indicates, of the 86.96 % of the respondents using collaboration amongst departments within manufacturing industries logistics:

a. 10.00 % of the respondents definitely agreed using a managerial approach in order to face up to inefficiency reduction and unproductive time during the production process.
b. 85.00 % of the respondents agreed they use a managerial approach in order to face up to inefficiency reduction and unproductive time during the production process.
c. 5.00 % of the respondents had a neutral position concerning this statement.

5.3.2.5 Workers category (vv32) versus interdepartmental relationships (v35).

The table 5.9 displays the relationship between workers category and the interdepartmental relationships within manufacturing industries logistics.

Table 5.9: Workers category and interdepartmental relationships

vv 32	v 35			
Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1	11	0	0	11
	9.5652	1.1957	0.2391	
	23.91	0	0	23.91
	100	0	0	
	27.5	0	0	
2	25	4	0	29
	25.217	3.1522	0.6304	
	54.35	8.7	0	63.04
	86.21	13.79	0	
	62.5	80	0	
3 - 6	4	1	1	6
	5.2174	0.6522	0.1304	
	8.7	2.17	2.17	13.04
	66.67	16.67	16.67	
	10	20	100	
Total	40	5	1	46
	86.96	10.87	2.17	100

Frequency missing = 1

In terms of column percentage, 86.96 % of the respondents were of the opinion that collaboration amongst departments within manufacturing industries logistics may satisfy external customers' needs. 10.87 % of the respondents mentioned that mutual support may lead to external customers' satisfaction. Only 2.17 % of the respondents responded

that communication may lead to external customers' satisfaction. Based upon row percentage, 23.91 % of the sample reported that product quality management unit was directly involved in stock problem-solving and in the increase of product quality. The majority of the sample (or respondents), representing 63.04 % noted that stock or inventory managers, were directly involved in stock problem-solving and in the increase of product quality. And the rest of the sample (13.04 %) mentioned that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

Of the 86.96 % of the respondents applying the collaboration philosophy amongst departments within manufacturing industries logistics:

a. 27.5 % of the respondents mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality.
b. 62.50 % of the respondents noted that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality.
c. 10.00 % of the respondents reported that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

5.3.2.6 Use of a managerial procedure to assemble final product (vv33) versus interdepartmental relationships (v35).

The table 5.10 illustrates the relationship between the use of a managerial in order to assemble the final product in the quantities required during future time horizons and the interdepartmental relationships within manufacturing industries logistics.

Table 5.10: Use of a managerial procedure to assemble final product and interdepartmental relationships

vv 33	v 35			
Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1	5	1	0	6
	5.2174	0.6522	0.1304	
	10.87	2.17	0	13.04
	83.33	16.67	0	
	12.5	20	0	

2 - 3	35	4	1	40
	34.783	4.3478	0.8696	
	76.09	8.7	2.17	86.96
	87.5	10	2.5	
	87.5	80	100	
Total	40	5	1	46
	86.96	10.87	2.17	100

Frequency missing = 1

Based upon the column percentage, 86.96 % of the respondents mentioned that collaboration amongst departments within manufacturing industries logistics may lead to external customers' satisfaction. 10.87 % of the sample were of the view that mutual support may satisfy external customers' desires and 2.17 % of the sample underlined that communication may lead to customers' satisfaction. Considering row percentage, it has to be pointed out that 13.04 % of the respondents (sample) definitely agreed they use a managerial procedure in order to assemble the final product in the quantities required during future time horizons. The largest group of respondents (representing 86.96 %) which some agreed the use of a managerial procedure to assemble the final product in the quantities required during future time horizons and the others respondents had a neutral view about this matter.

In conclusion, of the 86.96 % of the respondents using collaboration philosophy amongst departments within manufacturing industries logistics:

a. 12.50 % of the respondents definitely agreed they use a managerial procedure to assemble the final product in the quantities required during future time horizons and,
b. the majority of the sample, representing 87.50 % of the respondents, which some agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons and the others were neutral regarding this concern.

5.3.2.7 Use of a managerial model to review inventory ordering (vv34) versus interdepartmental relationships (v35).

The table 5.11 displays the relationship existing between the use of a managerial model to review inventory ordering and the interdepartmental relationships within manufacturing industries logistics.

Table 5.11: Use of a managerial model to review inventory ordering and interdepartmental relationships

vv 34 v 35

Frequency Expected Percent Row Pct Col Pct	1	2	3	Total
1 -	4	1	0	5
	4.3478	0.5435	0.1087	
	8.7	2.17	0	10.87
	80	20	0	
	10	20	0	
2 - 3	36	4	1	41
	35.652	4.4565	0.8913	
	78.26	8.7	2.17	89.13
	87.8	9.76	2.44	
	90	80	100	
Total	40	5	1	46
	86.96	10.87	2.17	100

Frequency missing = 1

Considering the column percentage, 86.96 % of the respondents noted that collaboration amongst departments within manufacturing industries logistics may satisfy external customers' wants.10.87 % of the respondents mentioned mutual support may lead to external customers' satisfaction and the rest of the respondents (representing 2.17 %) indicated that communication may satisfy external customers' desires. In terms of row percentage, 10.87 % of the respondents definitely agreed they use a managerial model to review inventory ordering. 89.13 % of the respondents which some agreed using a managerial model inventory ordering and the others had a neutral position about that.

Of the 86.96 % (majority) of the respondents using collaboration amongst departments within manufacturing industries logistics:

a. 10.00 % of the respondents (or sample) definitely agreed they use a managerial model to review inventory ordering and;
b. 90.00 % of the respondents (majority of the respondents) which some agreed using a managerial model to review inventory ordering and the others were neutral about this statement.

5.3.2.8 Use of a managerial procedure to respond to the channel members' inventory needs (v16) versus customers' complaints (vv37).

The table 5.12 sets out the relationship between the use of a managerial procedure to respond to channel members' inventory needs and the customers' complaints related to service quality within manufacturing industries logistics.

Table 5.12: Use of a managerial procedure to respond to channel members' inventory and customers' complaints

v 16	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	8 8.1702 17.02 66.67 25	4 3.8298 8.51 33.33 26.67	12 25.53
2	22 22.468 46.81 66.67 68.75	11 10.532 23.4 33.33 73.33	33 70.21
3	2 1.3617 4.26 100 6.25	0 0.6383 0 0 0	2 4.26
Total	32 68.09	15 31.91	47 100

From a column percentage point of view, the above table indicates that 68.09 % of the respondents which some disagreed that customers complain about service quality within manufacturing industries logistics and the others were neutral on this issue. The rest of the respondents, representing 31.91 % definitely disagreed that customers complain about service quality within manufacturing industries logistics. From a row percentage standpoint, the abovementioned table shows that 25.53 % of the respondents definitely agreed they use a managerial procedure to respond to channel members' inventory needs through the distribution channel. 70.21 % of the respondents agreed they use a managerial procedure to respondents to channel members' inventory needs through the distribution channel and the rest of respondents had a neutral position about this matter.

The above-mentioned table indicates in conclusion that, of the 68.09 % of the respondents which some disagreed that customers complain within manufacturing

industries logistics about service quality and the others had a neutral position about this assertion:

a. 25.00 % of the respondents definitely agreed using a managerial procedure to respond to channel members' inventory needs through the distribution channel.
b. 68.75 % of the respondents agreed they use a managerial procedure to respond to channel members' inventory needs through the distribution channel.
c. 6.25 % of the respondents was of neutral point of view concerning this matter.

5.3.2.9 Use of a managerial tool to coordinate inventory requirements (v21) versus customers' complaints (vv37).

The table 5.13 indicates the relationship between the use of a managerial tool to coordinate inventory requirements across multiple locations and customers' complaints about service quality.

Table 5.13: Use of a managerial tool to coordinate inventory requirements and customers' complaints

v 21	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	3 3.4043 6.38 60 9.38	2 1.5957 4.26 40 13.33	5 10.64
2	26 23.83 55.32 74.29 81.25	9 11.17 19.15 25.71 60	35 74.47
3	3 4.766 6.38 42.86 9.37	4 2.234 8.51 57.14 26.67	7 14.89
Total	32 68.09	15 31.91	47 100

Based upon the column percentage, it has to be noted that the largest category of the respondents, representing 68.09 % of the sample, which some disagreed that customers within manufacturing industries logistics complain about service quality and the others had a neutral position about this matter. 31.91 % of the respondents definitely disagreed customers within manufacturing industries logistics complain about service quality. From a row percentage viewpoint, 10.64 % of the respondents definitely agreed they use a managerial tool to coordinate inventory requirements across multiple locations. The majority of the respondents (74.47 %) agreed using a managerial tool in order to coordinate inventory requirements across multiple locations and the rest of the respondents (14.89 %) were neutral about this concern.

It is clear to conclude that of the 68.09 % of the respondents which some disagreed customers within manufacturing industries logistics complain about service quality and the others had a neutral opinion regarding this statement:

a. 9.38 % of the respondents definitely agreed they use a managerial tool in view of coordinating inventory requirements across multiple locations.
b. 81.25 % of the respondents agreed they use a managerial tool to coordinate inventory requirements across multiple locations.
c. 9.37 % of the respondents had a neutral position concerning this issue.

5.3.2.10 Use of a managerial system to coordinate inventory requirements and responds to the channel members needs (vv24) versus customers' complaints (vv37).

The table 5.14 shows the relationship that exists between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs through distribution channel and customers' complaints about service quality.

Table 5.14: Use of a managerial system to coordinate inventory requirements and customers' complaints

vv 24		vv 37		
	Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1- 2		29	12	41
		27.915	13.085	
		61.7	25.53	87.23

	70.73 90.63	29.27 80	
3	3 4.0851 6.38 50 9.37	3 1.9149 6.38 50 20	6 12.77
Total	32 68.09	15 31.91	47 100

Of the 68.09 % of the respondents which some disagreed that customers within manufacturing industries logistics complain about service quality and the others were of a neutral point of view about this concern, it has to be reported that:

a. 90.63 % of the respondents which some definitely agreed and the others agreed they use a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs.
b. 9.37 % of the respondents had a neutral position regarding this matter.

Fisher's Exact test

Cell (1, 1) Frequency (F)	29
Left- sided Pr < = F	0.9275
Right –sided Pr > F	0.2826
Table Probability (P)	0.2102
Two –sided Pr < = P	0.3670

Sample Size = 47

As indicated in the above table, the P test of significance as reflected in the value of p > 0.05, leads to the conclusion that there is no statistical significant relationship between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through distribution channel and the customers' complaints related to service quality (P: P= 0.3670 > 0.05).

5.3.2.11 Use of a managerial approach to face inefficiency reduction (v29) versus customers' complaints (vv37).

The table 5.15 displays the relationship between the use of a managerial approach in order to face up to inefficiency reduction and unproductive time during the production process and the customers' complaints regarding service quality.

Table 5.15: Use of a managerial approach to face to inefficiency and customers' complaints

v 29	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	4	1	5
	3.4043	1.5957	
	8.51	2.13	10.64
	80	20	
	12.5	6.67	
2	25	14	39
	26.553	12.447	
	53.19	29.79	82.98
	64.1	35.9	
	78.13	93.33	
3	3	0	3
	2.0426	0.9574	
	6.38	0	6.38
	100	0	
	9.37	0	
Total	32	15	47
	68.09	31.91	100

From a column percentage point of view, the above-mentioned table indicates that 68.09 % of the respondents which some disagreed customers within manufacturing industries logistics complain concerning service quality and the others were of neutral view about this statement. The rest of the respondents, representing 31.91 %, definitely disagreed customers within manufacturing industries logistics complain about service quality. Based upon row percentage, 10.64 % of the respondents definitely agreed using a managerial approach in view of facing up to inefficiency reduction and unproductive time during the production process. The majority of the respondents, representing 82.98 %, agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process and the remaining group of respondents (6.38 %) had a neutral position about this assertion.

It is of great importance to note that, of the 68.09 % of the respondents which some disagreed customers within manufacturing industries logistics complain regarding service quality and the others were of a neutral point of view about this matter:

a. 12.50 % of the respondents definitely agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process.
b. 78.13 % of the respondents agreed using a managerial approach in order to face up to inefficiency reduction and unproductive time during the production process.
c. 9.37 % of the remaining respondents was neutral about this point.

5.3.2.12 Workers category (vv32) versus customers' complaints (vv37).

The table 5.16 illustrates the relationship between the category of workers directly involved in stock problem-solving and in the increase of product quality and the customers' complaints related to service quality.

Table 5.16: Workers category and customers' complaints

vv 32	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	5	6	11
	7.4894	3.5106	
	10.64	12.77	23.4
	45.45	54.55	
	15.63	40	
2	23	6	29
	19.745	9.2553	
	48.94	12.77	61.7
	79.31	20.69	
	71.88	40	
3 - 6	4	3	7
	4.766	2.234	
	8.51	6.38	14.89
	57.14	42.86	
	12.5	20	
Total	32	15	47
	68.09	31.91	100

Based upon the column percentage, it is clearly shown that 68.09 % of the respondents which some disagreed customers within manufacturing industries logistics complain about service quality and the others were neutral concerning that. 31.91 % of the respondents definitely disagreed that customers complain about service quality. In terms of row percentage, the above table sets out that 23.40 % of the respondents mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality. 61.70 % of the respondents indicated that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality. And the rest of the respondents (14.89 %) noted that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

It is imperious to be underlined in conclusion that, of the 68.09 % of the respondents which some disagreed that customers within manufacturing industries logistics complain about service quality and the others were neutral about this statement:

a. 15.63 % of the respondents that mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality.
b. 71.88 % of the respondents noted that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality and,
c. 12.49 % of the remaining respondents reported that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

5.3.2.13 Use of a managerial procedure to assemble the final product (vv33) versus customers' complaints (vv37).

The table 5.17 shows the relationship between the use of a managerial procedure in order to assemble the final product in the quantities required during future time horizons and the customers' complaints about service quality.

Table 5.17: Use of a managerial procedure to assemble the final product and customers' complaints

vv 33	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	4	2	6

	4.0851	1.9149	
	8.51	4.26	12.77
	66.67	33.33	
	12.5	13.33	
2 - 3	28	13	41
	27.915	13.085	
	59.57	27.66	87.23
	68.29	31.71	
	87.5	86.67	
Total	32	15	47
	68.09	31.91	100

Of the 68.09 % of the respondents which some disagreed that customers within manufacturing industries logistics complain about service quality and in the increase of product quality and the others were neutral, it has to be underlined that:

a. 12.50 % of the respondents definitely agreed they use a managerial procedure to assemble the final product in the quantities required during future time horizons and,
b. 87.50 % of the remaining respondents which some agreed they use a managerial procedure in order to assemble the final product in the quantities required during future time horizons and the others had a neutral opinion about this concern.

Fisher's Exact test

Cell (1, 1) Frequency (F)	4
Left- sided Pr <= F	0.6334
Right- sided Pr >= F	
Table Probability (P)	0.71 74
Two- sided Pr <= P	1.0000

Sample Size = 47

In the above table the test of significance of the P as reflected by the value $p > 0.05$, leads to the conclusion that there is no significant statistical relationship between the two variables: the use of a managerial procedure to assemble the final product in the quantities required during future time horizons and the customers' complaints about service quality (P: $p = 1.0000 > 0.05$).

5.3.2.14 Use of a managerial model to review inventory ordering (vv34) versus customers' complaints (vv37).

The table 5.18 sets out the relationship between the use of a managerial model to review inventory ordering within manufacturing industries logistics and the customers' complaints regarding to service quality.

Table 5.18: Use of a managerial model to review inventory ordering and customers' complaints

vv 34	vv 37		
Frequency Expected Percent Row Pct Col Pct	3 - 4	5	Total
1	1	5	6
	4.0851	1.9149	
	2.13	10.64	12.77
	16.67	83.33	
	3.13	33.33	
2 - 3	31	10	41
	27.915	13.085	
	65.96	21.28	87.23
	75.61	24.39	
	96.87	66.67	
Total	32	15	47
	68.09	31.91	100

In conclusion, of the 68.09 % of the respondents which some disagreed that customers within manufacturing industries logistics complain about service quality and the others were of a neutral position about this statement, it has to be indicated that:

a. 3.13 % of the respondents definitely agreed using a managerial model to review inventory ordering and,
b. 96.87 % of the remaining respondents which some agreed using a managerial model to review inventory ordering and the others had a neutral point of view about this issue.

Fisher's Exact test

Cell (1, 1)	Frequency	(F)	1
Left- sided	Pr <=	F	0.0094
Right- sided	Pr >=	F	0.9995

Table Probability	(P)	0.0089
Two- sided	Pr <= P	0.0094

Sample Size = 47

As indicated in the above table, the P test of significance as reflected in the value of $p < 0.05$, leads to the conclusion that there is a significant statistical relationship between the use of a managerial model to review inventory ordering (vv36) and the customers' complaints about the service quality (vv39) [P: $p = 0.0094 < 0.05$].

5.3.2.15 Use of a managerial procedure to respond to channel members' inventory (v16) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.19 clearly shows the relationship that exists between the use of a managerial procedure to respond to channel members' inventory needs through the distribution channel and service / product to customers at the right time and in the right conditions.

Table 5.19: Use of a managerial procedure to respond to channel members' inventory and product / service at the right time and in the right conditions

v 16	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 1.2766 4.26 16.67 40	10 10.723 21.28 83.33 23.81	12 25.53
2	3 3.5106 6.38 9.09 60	30 29.489 63.83 90.91 71.43	33 70.21
3	0 0.2128 0 0 0	2 1.7872 4.26 100 4.76	2 4.26
Total	5 10.64	42 89.36	47 100

From a column percentage standpoint, it is indicated that 10.64 % of the respondents definitely agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions and the rest of the respondents, being the biggest group of the respondents (89.36 %), agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. Considering row percentage, the above table sets out that 25.53 % of the respondents definitely agreed they use a managerial procedure to respond to channel members' inventory needs through the distribution channel and the remaining group of respondents (4.76 %) did not give their position concerning this matter (neutral).

Of the 89.36 % of the respondents which agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions, it is of great importance to underline that:

a. 23.81 % of the respondents definitely agreed they use a managerial procedure to respond to channel members' inventory needs through the distribution channel.
b. 71.43 % of the respondents agreed they use a managerial procedure to respondents to channel members' inventory needs through the distribution channel.
c. 4.26 % of the respondents was of a neutral position about this statement.

5.3.2.16 Use of a managerial tool to coordinate inventory requirements (v21) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.20 displays the relationship existing between the use of a managerial tool in view of coordinating inventory requirements across multiple locations and the service / product to customers at the right time and in the right conditions.

Table 5.20: Use of a managerial tool to coordinate inventory requirements and service / product at the right time and in the right conditions

v 21	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 0.5319 4.26 40 40	3 4.4681 6.38 60 7.14	5 10.64

2	3	32	35
	3.7234	31.277	
	6.38	68.09	74.47
	8.57	91.43	
	60	76.19	
3	0	7	7
	0.7447	6.2553	
	0	14.89	14.89
	0	100	
	0	16.67	
Total	5	42	47
	10.64	89.36	100

Based upon the column percentage, it is clearly shown that 10.64 % of the respondents definitely agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions and 89.36 % of the respondents agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. According to row percentage, the above table indicates that 10.64 % of the respondents definitely agreed they use a managerial tool in view of coordinating requirements across multiple locations. 74.47 % of the respondents agreed they use a managerial tool to coordinate inventory requirements across multiple locations and the rest of the percentage (14.89 %) is attributed to respondents that did not show their position about this issue.

In conclusion, of the 89.36 % of the respondents that agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions, it has to be mentioned that:

a. 7.14 % of the respondents definitely agreed they use a managerial tool to coordinate inventory requirements across multiple locations.
b. 76.19 % of the respondents agreed using a managerial tool to coordinate inventory requirements across multiple locations.
c. 16.67 % of the remaining respondents was attributed to neutral respondents concerning this point.

5.3.2.17 Use of a managerial system to coordinate inventory requirements and respond to the channel members' needs (vv24) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.21 indicates the relationship that exists between the use of a managerial system in order to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel and the service / product to customers at the right time and in the right conditions.

Table 5.21: Use of a managerial system to coordinate inventory requirements and respond to the channel members' needs and service / product at the right time and in the right conditions

vv 24	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1 - 2	4 4.3617 8.51 9.76 80	37 36.638 78.72 90.24 88.1	41 87.23
3	1 0.6383 2.13 16.67 20	5 5.3617 10.64 83.33 11.9	6 12.77
Total	5 10.64	42 89.36	47 100

Therefore, of the 89.36 % of the respondents that agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions, it has to be mentioned that:

a. 88.10 % of the respondents which some definitely agreed and the others agreed they use a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel.
b. 11.90 % of the respondents did not manifest their point of view about this statement.

Fisher's Exact test

Cell (1, 1) Frequency (F)	4
Left- sided Pr <= F	0.5115
Right- sided Pr >= F	0.8847

Table Probability (P)	0.3961
Two- sided Pr <= P	0.5115

Sample Size = 47

In the above table in terms of the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel and the service / product at the right time and in the right conditions, the P test of significance as reflected by the value $p > 0.05$, leads to the conclusion that there is no statistical significance between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel and the availability of service / product to customers within manufacturing industries logistics at the right time and in the right conditions (P: $p = 0.5115 > 0.05$).

5.3.2.18 Use of a managerial approach to face to inefficiency reduction (v29) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.22 mentions the relationship between the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process and the service / product to customers at the right time and in the right conditions.

Table 5.22: Use of a managerial approach to face to inefficiency reduction and service / product at the right time and in the right conditions

v 29	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 0.5319 4.26 40 40	3 4.4681 6.38 60 7.14	5 10.64
2	3 4.1489 6.38 7.69 60	36 34.851 76.6 92.31 85.71	39 82.98
3	0 0.3191	3 2.6809	3

	0	6.38	6.38
	0	100	
	0	7.14	
Total	5	42	47
	10.64	89.36	100

From a column percentage standpoint, it is shown that 10.64 % of the respondents definitely agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. 89.36 % of the respondents within manufacturing industries logistics agreed that customers receive service / product at the right time and in the right conditions. According to row percentage, the above table indicates that 10.64 % of the respondents definitely agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process. 82.98 % of the respondents, being the majority of the sample, agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process. And the remaining percentage of respondents (6.38 %) did not show their opinion about this matter.

Concluding that, of the 89.36 % of the respondents which agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions, it has to be underlined that:

a. 7.14 % of the respondents definitely agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process.
b. 85.71 % of the respondents agreed using a managerial approach in order to face up to inefficiency reduction and unproductive time during the production process.
c. the rest of the respondents, representing 7.14 %, had a neutral view about this issue.

5.3.2.19 Workers category versus (vv32) service / product to customers at the right time and in the right conditions (v38).

The table 5.23 sets out the relationship existing between the workers category directly involved in stock problem-solving and in the increase of product quality and the service / product to customers at the right time and in the right conditions.

Table 5.23: Workers category and service / product at the right time and in the right conditions

vv 32	v 38
Frequency	

Expected Percent Row Pct Col Pct	1	2	Total
1	2	9	11
	1.1702	9.8298	
	4.26	19.15	23.4
	18.18	81.82	
	40	21.43	
2	1	28	29
	3.0851	25.915	
	2.13	59.57	61.7
	3.45	96.55	
	20	66.67	
3 - 6	2	5	7
	0.7447	6.2553	
	4.26	10.64	14.89
	28.57	71.43	
	40	11.9	
Total	5	42	47
	10.64	89.36	100

Based upon the column percentage, the above table shows that 10.64 % of the respondents definitely agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. The majority of the respondents (89.36 %) agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. In terms of row percentage, it has to be underlined that 23.40 % of the respondents within manufacturing industries logistics mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality. 61.70 % of the respondents pointed out that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality. The rest of the respondents (14.89 % of the sample) reported that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

In conclusion, of the 89.36 % of the respondents which agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions:

a. 21.43 % of the respondents indicated / mentioned that product quality management unit was directly involved in stock problem- solving and in the increase of product quality.
b. 66.67 % of the respondents reported that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality.

c. the remaining percentage of the respondents, representing 11.90 %, underlined that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

5.3.2.20 Use of a managerial procedure to assemble the final product (vv33) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.24 shows the relationship between the use of a managerial procedure to assemble the final product in the quantities required during future time horizons and the availability of service / product to customers at the right time and in the right conditions.

Table 5.24: Use of a managerial procedure to assemble final product and service / product at the right time and in the right conditions

vv 33	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	1 0.6383 2.13 16.67 20	5 5.3617 10.64 83.33 11.9	6 12.77
2 - 3	4 4.3617 8.51 9.76 80	37 36.638 78.72 90.24 88.1	41 87.23
Total	5 10.64	42 89.36	47 100

It has to be mentioned in conclusion that of the 89.36 % of the respondents which agreed that customers within manufacturing industries logistics receive service / product at the right time and in the right conditions, there are:

a. 11.90 % of the respondents that definitely agreed they use a managerial procedure to assemble the final product in the quantities required during future time horizons.
b. the largest sample, representing 88.10 % of the respondents, which some agreed using a managerial procedure to assemble the final product in the quantities required during

future time horizons and the others did not manifest their point of view concerning this assertion.

Fisher's Exact test

Cell (1, 1)	Frequency	(F)	1
Left- sided Pr < =		F	0.8847
Right- sided	Pr > =	F	0.5115
Table Probability		(P)	0.3961
Two- sided Pr	< =	P	0.5115

Sample Size = 47

The P test of significance as reflected by the value $p > 0.05$, leads to the conclusion that there is no significant relationship between the use of a managerial procedure to assemble the final product in the quantities required during future time horizons and the availability of service / product to customers at the right time and in the right conditions (P: $p = 0.5115 > 0.05$).

5.3.2.21 Use of a managerial model to review inventory ordering (vv34) versus service / product to customers at the right time and in the right conditions (v38).

The table 5.25 indicates the relationship existing between the use of a managerial model to review inventory ordering and the availability of service / product to customers at the right time and in the right conditions.

Table 5.25: Use of a managerial model to review inventory ordering and service / product at the right time and in the right time

vv 34	v 38		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 0.6383 4.26 33.33 40	4 5.3617 8.51 66.67 9.52	6 12.77

2 - 3	3	38	41
	4.3617	36.638	
	6.38	80.85	87.23
	7.32	92.68	
	60	90.48	
Total	5	42	47
	10.64	89.36	100

It has to be reported that, of the 89.36 % of the respondents which agreed that customers within manufacturing industries logistics receive the service / product at the right time and in the right conditions:

a. 9.52 % of the respondents definitely agreed using a managerial model to review inventory ordering.
b. 90.48 % of the remaining respondents which some agreed using a managerial model to review inventory ordering and the others were of a neutral opinion about this concern.

Fisher's Exact test

Cell (1, 1) Frequency (F)	2
Left- sided Pr <= F	0.9889
Right- sided Pr >= F	0.1153
Table Probability (P)	0.1042
Two-sided Pr <= P	0.1153

Sample Size = 47

The P test of significance as reflected by the value $p > 0.05$, leads to the conclusion that there is no statistical significance between the two variables: the use of a managerial model to review inventory ordering and the service / product to customers at the right time and in the right conditions (P: $p = 0.1153 > 0.05$).

5.3.2.22 Use of a managerial procedure to respond to channel members' inventory (v16) versus extension of market shares (v39).

The table 5.26 shows the relationship that exists between the use of a managerial procedure to respond to channel members' inventory needs through the distribution channel and the extension of market shares within manufacturing industries logistics.

Table 5.26: Use of a managerial procedure to respond to channel members' inventory and extension of market shares

v 16	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	6 2.8085 12.77 50 54.55	6 9.1915 12.77 50 16.67	12 25.53
2	5 7.7234 10.64 15.15 45.45	28 25.277 59.57 84.85 77.78	33 70.21
3	0 0.4681 0 0 0	2 1.5319 4.26 100 5.55	2 4.26
Total	11 23.4	36 76.6	47 100

From a column percentage point of view, the above table indicates that 23.40 % of the respondents definitely agreed that service delivery extends market shares within manufacturing industries logistics and 76.60 % of the respondents agreed that service delivery extends market shares within manufacturing industries logistics. According to row percentage, the above table also shows that 25.53 % of the respondents or sample definitely agreed they use a managerial procedure to respond to channel members' inventory needs through the distribution channel. 70.21 % of the sample agreed using a managerial procedure to respond the channel members' inventory needs through the distribution channel. The rest of the sample, representing 4.26 % of the sample, did not give their point of view about this concern.

In conclusion, of the 76.60 % of the respondents which agreed that service delivery extends market shares within manufacturing industries logistics, there are:

a. 16.67 % of the respondents definitely agreed using a managerial procedure to respond to channel members' inventory needs through the distribution channel.

b. 77.78 % of the sample, being the biggest percentage of respondents, agreed using a managerial procedure to respond to channel members' inventory needs through the distribution channel.
c. the remaining percentage of the respondents (5.55 %) was of neutral position regarding this assertion.

5.3.2.23 Use of a managerial tool to coordinate inventory requirements (v21) versus extension of market shares (v39).

The table 5.27 displays the relationship existing between the use of a managerial tool in view of coordinating inventory requirements across multiple locations and the extension of market shares within manufacturing industries logistics.

Table 5.27: Use of a managerial tool to coordinate inventory requirements and extension of market shares

v 21	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	1 1.1702 2.13 20 9.09	4 3.8298 8.51 80 11.11	5 10.64
2	9 8.1915 19.15 25.71 81.82	26 26.809 55.32 74.29 72.22	35 74.47
3	1 1.6383 2.13 14.29 9.09	6 5.3617 12.77 85.71 16.67	7 14.89
Total	11 23.4	36 76.6	47 100

Considering the column percentage, the above table reports that 23.40 % of the respondents definitely agreed that service delivery extends market shares within manufacturing industries logistics. 76.60 % of the sample, the largest of the respondents,

agreed that service delivery extends market shares within manufacturing industries logistics. Basing upon row percentage, it is shown that 10.64 % of the respondents definitely agreed they use a managerial tool in order to coordinate inventory requirements across multiple locations. 74.47 % of the sample agreed using a managerial tool to coordinate inventory requirements across multiple locations. And the remaining percentage of respondents (14.89 %) did not show their opinion about this point.

In conclusion, of the 76.60 % of the respondents which agreed that service delivery extends market shares within manufacturing industries logistics, it has to be mentioned that:

a. 11.11 % of the respondents definitely agreed using a managerial tool in view of coordinating inventory requirements across multiple locations.
b. the majority of the sample, representing 72.22 %, agreed they use a managerial tool to coordinate inventory requirements across multiple locations.
c. 16.67 % of the respondents was of a neutral position about this assertion.

5.3.2.24 Use of a managerial system to coordinate inventory requirements and respond to the channel members' needs (vv24) versus the extension of market shares (v39).

The table 5.28 illustrates the relationship between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through distribution channel and the extension of market shares within manufacturing industries logistics.

Table 5.28: Use of a managerial system to coordinate inventory requirements and respond to the channel members'needs and extension of market shares

vv 24	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1 - 2	9 9.5957 19.15 21.95 81.82	32 31.404 68.09 78.05 88.89	41 87.23
3	2 1.4043	4 4.5957	6

	4.26	8.51	12.77
	33.33	66.67	
	18.18	11.11	
Total	11	36	47
	23.4	76.6	100

Therefore, of the 76.60 % of the respondents which agreed that service delivery extends market shares within manufacturing industries logistics, there are:

a. 88.89 % of the respondents which some definitely agreed and the others agreed they use a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs through distribution channel.
b. the remaining percentage of the respondents, representing 11.11 %, had a neutral point of view about this concern.

Fisher's Exact test

Cell (1, 1)	Frequency (F)	9
Left-sided	Pr < = F	0.4324
Right-sided	Pr > = F	0.8693
Table Probability	(P)	0.3017
Two- sided	Pr <= P	0.6138

Sample Size = 47

The P test of significance as reflected by the value $p > 0.05$, leads to the conclusion that there is no statistical significance between the two variables: the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through distribution channel and the extension of market shares within manufacturing industries logistics (P: $p = 0.6138 > 0.05$).

5.3.2.25 Use of a managerial approach to face up to inefficiency reduction (v29) versus extension of market shares (v39).

The table 5.29 illustrates the relationship that exists between the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process and the extension of the market shares within manufacturing industries logistics.

Table 5.29: Use of a managerial approach to face to inefficiency reduction and extension of market shares

v 29	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	1 1.1702 2.13 20 9.09	4 3.8298 8.51 80 11.11	5 10.64
2	10 9.1277 21.28 25.64 90.91	29 29.872 61.7 74.36 80.56	39 82.98
3	0 0.7021 0 0 0	3 2.2979 6.38 100 8.33	3 6.38
Total	11 23.4	36 76.6	47 100

From a column percentage point of point, the above table reports that 23.40 % of the respondents definitely agreed that service delivery extends market shares within manufacturing industries logistics. 76.60 % of the respondents agreed that service delivery extends market shares within manufacturing industries logistics. From a row percentage standpoint, it has to be noted that 10.64 % of the respondents definitely agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process. 82.98 % of the respondents agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process. And the rest of the respondents, representing 6.38 %, were neutral concerning this statement.

Of the 76.60 % of the respondents which agreed that service delivery extends market shares within manufacturing industries logistics:

a. 11.11 % of the respondents definitely agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process.

b. 80.56 % of the respondents agreed they use a managerial approach to face up to inefficiency reduction and unproductive time during the production process.
c. the remaining percentage of the respondents (8.33 %) had a neutral view about this issue.

5.3.2.26 Workers category (vv32) versus extension of market shares (v39).

The table 5.30 shows the relationship between workers category directly involved in stock problem-solving and in the increase of product quality and the extension of market shares within manufacturing industries logistics.

Table 5.30: Workers category and extension of market shares

vv 32	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 2.5745 4.26 18.18 18.18	9 8.4255 19.15 81.82 25	11 23.4
2	7 6.7872 14.89 24.14 63.64	22 22.213 46.81 75.86 61.11	29 61.7
3 - 6	2 1.6383 4.26 28.57 18.18	5 5.3617 10.64 71.43 13.89	7 14.89
Total	11 23.4	36 76.6	47 100

From a column percentage viewpoint, the above table indicates that 23.40 % of the respondents definitely agreed that service delivery extends market shares within manufacturing industries logistics. 76.60 % of the respondents agreed that service delivery extends markets shares within manufacturing industries logistics. In terms of row percentage, the above table sets out that 23.40 % of the sample mentioned that product quality management unit was directly involved in stock problem-solving and in

the increase of product quality. 61.70 % of the respondents reported that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality. The rest of the respondents underlined that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

Of the 76.60 % of the respondents that agreed that service delivery extends market shares within manufacturing industries logistics, there are:

a. 25.00 % of the respondents mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality.
b. 61.11 % of the respondents / sample reported that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality.
c. 13.89 % of the respondents noted that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

5.3.2.27 Use of a managerial procedure to assemble final product (vv33) versus extension of market shares (v39).

The table 5.31 illustrates the relationship that exits between the use of a managerial procedure in order to assemble the final product in the quantities required during future horizons and the extension of market shares within manufacturing industries logistics.

Table 5.31: Use of a managerial procedeure to assemble final product and extension of market shares

vv 33		v 39		
	Frequency Expected Percent Row Pct Col Pct	1	2	Total
	1	2 1.4043 4.26 33.33 18.18	4 4.5957 8.51 66.67 11.11	6 12.77
	2 - 3	9 9.5957 19.15 21.95	32 31.404 68.09 78.05	41 87.23

	81.82	88.89	
Total	11	36	47
	23.4	76.6	100

The above-mentioned table shows that, of the 76.60 % of the respondents that agreed that service delivery extends market shares within manufacturing industries logistics:

a. 11.11 % of the respondents definitely agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons.
b. the majority of the sample 88.89 % of the remaining respondents, which some agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons and the others were of a neutral point of view about this statement

Fisher's Exact test

Cell (1, 1) Frequency (F)	2
Left- sided Pr <= F	0.8693
Right- sided Pr >= F	0.4324
Table Probability (P)	0.3017
Two- sided Pr <= P	0.6138

Sample Size = 47

As indicated in the above table, the P test of significance as reflected in the value of $p > 0.05$, leads to the conclusion that there is no statistical significant relationship between the use of a managerial procedure to assemble the final product in the quantities required during future time horizons and the extension of market shares within manufacturing industries logistics (P: $p = 0.6138 > 0.05$).

5.3.2.28 Use of a managerial model to review inventory ordering (vv34) versus extension of market shares (v39).

The table 5.32 indicates the relationship existing between the use of a managerial model to review inventory ordering and the extension of market shares within manufacturing industries logistics.

Table 5.32: Use of a managerial model to review inventory ordering and extension of market shares

vv 34	v 39		
Frequency Expected Percent Row Pct Col Pct	1	2	Total
1	2 1.4043 4.26 33.33 18.18	4 4.5957 8.51 66.67 11.11	6 12.77
2 - 3	9 9.5957 19.15 21.95 81.82	32 31.404 68.09 78.05 88.89	41 87.23
Total	11 23.4	36 76.6	47 100

It has to be reported that, of the 76.60 % of the respondents that agreed that service delivery extends market shares within manufacturing industries logistics, there are:

a. 11.11 % of the respondents definitely agreed using a managerial model to review inventory ordering.
b. the remaining percentage of the respondents, being the largest of the sample and representing 88.89 %, which some agreed using a managerial model to review inventory ordering and the others had a neutral opinion about this concern.

Fisher's Exact test

Cell (1, 1) Frequency (F)	2
Left- sided Pr <= F	0.8693
Right- sided Pr >= F	0.4324
Table Probability (P)	0.3017
Two- sided Pr <= P	0.6138

Sample Size = 47

The P test of significance as reflected by the value $p > 0.05$, leads to the conclusion that there is no significant relationship between the two variables: the use of a managerial

model to review inventory ordering and extension of market shares within manufacturing industries logistics (P: p = 0.6138 > 0.05).

5.3.2.29 Use of a managerial procedure to respond to channel members' inventory (v16) versus a strategic policy to meet customers' requirements (vv40).

The table 5.33 sets out the relationship between the use of a managerial procedure to respond to channel members' inventory needs through the distribution channel and a strategic policy in order to meet customers' requirements within manufacturing industries logistics.

Table 5.33: Use of a managerial procedure to respond to channel members' inventory and a strategic policy to meet customers'requirements

v 16	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1	0 1.3043 0 0 0	9 8.3478 19.57 75 28.13	3 2.3478 6.52 25 33.33	12 26.09
2	5 3.4783 10.87 15.63 100	22 22.261 47.83 68.75 68.75	5 6.2609 10.87 15.63 55.56	32 69.57
3	0 0.2174 0 0 0	1 1.3913 2.17 50 3.13	1 0.3913 2.13 50 11.11	2 4.35
Total	5 10.87	32 69.57	9 19.57	46 100

Frequency missing = 1

From a column percentage point of view, the above table shows that 10.87 % of the respondents mentioned right product, right time and right conditions as an effective policy in order to meet customers' requirements within manufacturing industries logistics. The second group of respondents, representing 69.57 % of the sample,

emphasised on the fact that customers' needs and satisfaction as a powerful philosophy to respond to customers' requirements. And 19.57 % of the respondents pointed out strategies such as 'sales increase companies' strength, more customers, more money, attitude, business sense and management support', not be neglected for meeting customers' requirements or needs. In terms of row percentage, the above table also reports that 26.06 % of the respondents definitely agreed the use of a managerial procedure to respond to channel members' inventory needs through the distribution channel. 69.57 % of the respondents agreed using a managerial procedure to respond to channel members' inventory needs through the distribution channel. Only 4.35 % of the respondents were of neutral standpoint about this matter.

It has to be indicated that, of the 69.57 % of the respondents that emphasised on customers' needs and satisfaction as philosophy to meet customers' requirements within manufacturing industries logistics:

a. 28.13 % of the respondents definitely agreed the use of a managerial procedure to respond to channel members' inventory needs through the distribution channel.
b. 68.75 % of the respondents agreed using a managerial procedure to respond to channel members' inventory needs through the distribution channel.
c .the remaining percentage of the respondents (3.13 %) was neutral about this assertion.

5.3.2.30 Use of a managerial tool to coordinate inventory requirements (v21) versus a strategic policy to meet customers' requirements (vv40).

The table 5.34 illustrates the relationship between the use of a managerial tool to coordinate inventory requirements across multiple locations and a strategic policy in order to meet customers' requirements within manufacturing industries logistics.

Table 5.34: Use of a managerial tool to coordinate inventory requirements and a strategic policy to meet customers' requirements

v 21	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1	0	3	2	5
	0.5435	3.4783	0.9783	
	0	6.52	4.35	10.87
	0	60	40	

	0	9.38	22.22	
2	4	24	6	34
	3.6957	23.652	6.6522	
	8.7	52.17	13.04	73.91
	11.76	70.59	17.65	
	80	75	66.67	
3	1	5	1	7
	0.7609	4.8696	1.3696	
	2.17	10.87	2.17	15.22
	14.29	71.43	14.29	
	20	15.63	11.11	
Total	5	32	9	46
	10.87	69.57	19.57	100

Frequency missing = 1

From a column percentage point of view, the table shows that 10.87 % of the respondents pointed out right product, right time and right conditions as a right strategy / policy in order to meet customers' requirements within manufacturing industries logistics. 69.57 % of the respondents mentioned customers' needs and satisfaction as manufacturing industries logistics philosophy to meet customers' requirements. And 19.57 % of the respondents noted other strategies such as 'sales increase companies' strength, more customers, more money, attitude, business sense and management support' to meet customers' requirements. From a row percentage viewpoint, 10.87 % of the respondents definitely agreed using a managerial tool in view of coordinating inventory requirements across multiple locations. The largest group of the respondents, representing 73.91 %, agreed using a managerial tool to coordinate inventory requirements across multiple locations. 15.22 % of the respondents did not manifest their position about this concern (neutral).

In conclusion, of the 69.57 % of the respondents that mentioned customers' needs and satisfaction as right policy to respond to customers' requirements, there are:

a. 9.38 % of the respondents definitely agreed the use a managerial tool in view of coordinating inventory requirements across multiple locations.
b. 75.00 % of the respondents agreed using a managerial tool to coordinate inventory requirements across multiple locations.
c. 15.62 % of the remaining respondents had a neutral position concerning this issue.

5.3.2.31 Use of a managerial system to coordinate inventory requirements and respond to channel members' needs (vv24) versus a strategic policy to meet customers' requirements (vv40).

The table 5.35 shows the relationship existing between the use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel and a strategic policy to meet customers' requirements.

Table 5.35: Use of a managerial system to coordinate inventory requirements and respond to channel members' needs and a strategic policy to meet customers' requirements

vv 24	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1 - 2	4	29	7	40
	4.3478	27.826	7.8261	
	8.7	63.04	15.22	86.96
	10	72.5	17.5	
	80	90.63	77.78	
3	1	3	2	6
	0.6522	4.1739	1.1739	
	2.17	6.52	4.35	13.04
	16.67	50	33.33	
	20	9.38	22.22	
Total	5	32	9	46
	10.87	69.57	19.57	100

Frequency missing = 1

From a column percentage standpoint, 10.87 % of the respondents reported right product, right time and right conditions to be a favourable strategy to meet customers' requirements within manufacturing industries logistics. The majority of the respondents (69.57 %) were of the opinion that customers' needs and satisfaction as philosophy lead manufacturing industries logistics to efficiently and effectively meet customers' requirements. 19.57 % of the respondents were of the view that other strategic policies such as 'sales increase companies' strength, more customers, more money, attitude, business sense and management support' are unnegligible within manufacturing industries logistics to respond to customers' requirements. From a row percentage viewpoint, the above table indicates that 86.96 % of the respondents which some definitely agreed and the others agreed using a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel. 13.04 % of the remaining respondents were neutral about this statement.

In conclusion, of the 69.57 % of the respondents that mentioned that customers' needs and satisfaction was a right strategy to effectively and efficiently respond to customers' requirements:

a. the largest percentage of the respondents (90.63 %) which some definitely agreed and the others agreed using a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel.
b. 9.37 % of the respondents was neutral about this matter.

5.3.2.32 Use of a managerial approach to face to inefficiency reduction (v29) versus a strategic policy to meet customers' requirements (vv40).

The table 5.36 indicates the relationship existing between the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process and a strategic policy to meet customers' requirements within manufacturing industries logistics.

Table 5.36: Use of a managerial approach to face to inefficiency reduction and a strategic policy to meet customers' requirements

v 29	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1	1 0.5435 2.17 20 20	3 3.4783 6.52 60 9.38	1 0.9783 2.17 20 11.11	5 10.87
2	3 4.1304 6.52 7.89 60	29 26.435 63.04 76.32 90.63	6 7.4348 13.04 15.79 66.67	38 82.61
3	1 0.3261 2.17 33.33 20	0 2.087 0 0 0	2 0.587 4.35 66.67 22.22	3 6.52
Total	5	32	9	46

	10.87	69.57	19.57	100

Frequency missing = 1

From a column percentage point of view, the above table reports that 10.87 % of the respondents mentioned right product, right time and right conditions as powerful policy to meet customers' requirements within manufacturing industries logistics. 69.57 % of the respondents pointed out customers' needs and satisfaction as a philosophy leads manufacturing industries logistics to meet customers' requirements. The remaining percentage of respondents (19.57 %) emphasised on other policies such as 'sales increase companies' strength, more customers, more money, attitude, business sense and management support' not negligible within manufacturing industries logistics in order to meet customers' requirements. In terms of row percentage, the above table shows that 10.87 % of the respondents definitely agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process. 82.61 % of the respondents, being the majority of the sample, agreed the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process. And the rest of the respondents, representing 6.52 %, were neutral concerning this assertion.

In conclusion, of the 69.57 % of the respondents that mentioned customers' needs and satisfaction as a strategic policy to meet customers' requirements:

a. 9.38 % of the respondents definitely agreed the use of a managerial approach to face up to inefficiency reduction and unproductive time during the production process.
b. 90.62 % of the respondents agreed using a managerial approach to face up to inefficiency reduction and unproductive time during the production process.

5.3.2.33 Workers category (vv32) versus a strategy to meet customers' requirements (vv40).

The table 5.37 sets out the relationship that exists between the workers category directly involved in stock problem-solving and in the increase of product quality and a strategic policy to respond to customers' requirements.

Table 5.37: Workers category and a strategic policy to meet customers' requirements

vv 32		vv40
	Frequency Expected Percent	

Row Pct Col Pct	1	2	3 - 8	Total
1	1	8	2	11
	1.1957	7.6522	2.1522	
	2.17	17.39	4.35	23.91
	9.09	72.73	18.18	
	20	25	22.22	
2	3	21	4	28
	3.0435	19.478	5.4783	
	6.52	45.65	8.7	60.87
	10.71	75	14.29	
	60	65.63	44.44	
3 - 6	1	3	3	7
	0.7609	4.8696	1.3696	
	2.17	6.52	6.52	15.22
	14.29	42.86	42.86	
	20	9.37	33.33	
Total	5	32	9	46
	10.87	69.57	19.57	100

Frequency missing = 1

Considering the column percentage, the above table points out that 10.87 % of the respondents reported right product, right time and right conditions as a strategic policy in order to respond to customers' requirements. The largest percentage of respondents (69.57 %) mentioned customers' needs and satisfaction as an effective policy within manufacturing industries logistics to respond to customers' requirements. 19.57 % of the respondents indicated other strategic policies such as 'sales increase companies' strength, more customers, more money, attitude, business sense and management support' effective and not negligible to respond to customers' requirements or needs. From a row percentage standpoint, the above table also shows that 23.91 % of the respondents mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality. 60.87 % of the respondents noted that inventory managers were directly involved in stock problem-solving and in the increase of product quality. The rest of the respondents, representing 15.22 %, reported that engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

Of the 69.57 % of the respondents that reported customers' needs and satisfaction as an effective strategy in order to respond to customers' requirements, there are:

a. 25.00 % of the respondents mentioned that product quality management unit was directly involved in stock problem-solving and in the increase of product quality.
b. 65.53 % of the respondents indicated that inventory managers were directly involved in stock problem-solving and in the increase of product quality.

c. 9.37 % of the respondents noted engineering team, parts managers, manufacturing team and store men were directly involved in stock problem-solving and in the increase of product quality.

5.3.2.34 Use of a managerial procedure to assemble final product (vv33) versus a strategy to respond to customers' requirements (vv40).

The table 5.38 shows the relationship existing between the use of a managerial procedure in order to assemble the final product in the quantities required during future time horizons and a strategic policy within manufacturing industries logistics in view of effectively responding to customers' requirements.

Table 5.38: Workers category and a strategic policy to meet customers' requirements

vv 33	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1	2	4	0	6
	0.6522	4.1739	1.1739	
	4.35	8.7	0	13.04
	33.33	66.67	0	
	40	12.5	0	
2 - 3	3	28	9	40
	4.3478	27.826	7.8261	
	6.52	60.87	19.57	86.96
	7.5	70	22.5	
	60	87.5	100	
Total	5	32	9	46
	10.87	69.57	19.57	100

Frequency missing = 1

From a column percentage viewpoint, the above table indicates that 10.87 % of the respondents pointed out right product, right time and right conditions as an effective policy to respond to customers' requirements within manufacturing industries logistics. 69.57 % of the respondents mentioned customers' needs and satisfaction as an incontestable strategy to respond to customers' requirements. The remaining respondents (19.57 %) underlined other policies such as 'sales increase companies' strength, more customers, more money, business sense and management support' necessary in order to respond to customers' requirements. From a row percentage point of view, the above table reports that 13.04 % of the respondents definitely agreed using a managerial

procedure to assemble the final product in the quantities required during future time horizons and 86.96 % of the respondents which some agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons and the others did not show their point of view about this statement.

In conclusion, of the 69.57 % of the respondents that mentioned customers' needs and satisfaction as an effective policy to respond to customers' requirements:

a. 12.50 % of the respondents definitely agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons.
b. the largest percentage of the respondents (87.50 %) which some agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons and the others were of a neutral view regarding this matter.

5.3.2.35 Use of a managerial model to review inventory ordering (vv34) versus a strategic policy to respond to customers' requirements (vv40).

The table 5.39 illustrates the relationship existing between the use of a managerial model to review inventory ordering and a strategic policy to respond to customers' requirements.

Table 5.39: Use of a managerial model to review inventory ordering and a strategic policy to respond to customers' requirements

vv 34	vv 40			
Frequency Expected Percent Row Pct Col Pct	1	2	3 - 8	Total
1	1 0.6522 2.17 16.67 20	4 4.1739 8.7 66.67 12.5	1 1.1739 2.17 16.67 11.11	6 13.04
2 - 3	4 4.3478 8.7 10 80	28 27.826 60.87 70 87.5	8 7.8261 17.39 20 88.89	40 86.96
Total	5 10.87	32 69.57	9 19.57	46 100

Frequency missing = 1

From a column percentage standpoint, 10.87 % of the respondents indicated right product, right time and right conditions as an imperative policy to respond to customers 'requirements. 69.57 % of the respondents mentioned customers' needs and satisfaction as an incontestable strategy to respond to customers' requirements within manufacturing industries logistics. 19.57 % of the respondents pointed out other strategies to respond to customers' requirements within manufacturing industries logistics (sales increase companies' strength, more customers, more money, business sense and management support). From a row percentage point of view, it has to be noted that 13.04 % of the respondents definitely agreed using a managerial model to review inventory ordering. 86.96 % of the respondents which some agreed using a managerial model to review inventory ordering and the others were of neutral position concerning this assertion.

In conclusion, it has to be mentioned that of the 69.57 % of the respondents that reported customers' needs and satisfaction as an effective and incontestable policy to respond to customers' requirements:

a. 12.50 % of the respondents definitely agreed they use a managerial model to review inventory ordering.
b. the majority of the sample, representing 87.50 % of the respondents, which some agreed using a managerial model to review inventory ordering and the others had a neutral opinion about this matter.

5.4 DISCUSSION ON THE RESEARCH FINDINGS

5.4.1 Determining of the impact of product availability policies on customers' level of expectation.

A mean of 84 % of the respondents within manufacturing industries logistics use a managerial approach to face up to inefficiency reduction and unproductive time during the production process.

Six categories of workers within manufacturing industries logistics were identified in connection with customers' levels of satisfaction. This brings out the mean of 65.54 % of the respondents which mentioned that stock or inventory managers were directly involved in stock problem-solving and in the increase of product quality.

A mean of 87.90 % of the respondents of which some agreed using a managerial procedure to assemble the final product in the quantities required during future time horizons and the others had a neutral view about this concern. It has to be indicated that no statistical relationships existing between the variables: use of a managerial procedure to assemble the final product in the quantities required during future time horizons, the customers' complaints about the service quality, the availability of service / product to customers at the right time and in the right conditions and the extension of the market shares within manufacturing industries logistics.

This research objective relates to determining whether product availability policies followed by manufacturing industries in Gauteng Province enable them to meet customers' levels of expectation. The analysis of this objective also provide a clear mention of the high use of product availability policies within manufacturing industries logistics in order to effectively and efficiently meet customers' levels of expectation (the more product availability policies are used, the more customers' levels of expectation is met) and inventory managers were directly involved in stock problem-solving and in the increase of product quality.

5.4.2 Determining inventory management policies in connection with customers' needs.

A mean of 71.34 % of the respondents within manufacturing industries logistics use a managerial procedure to respond to channel members' inventory needs through the distribution channel.

A mean of 76.43 % of the respondents within manufacturing industries logistics use a managerial tool in view of coordinating inventory requirements across multiple locations.

A mean of 89.65 % of the respondents which some definitely agreed and the others agreed using a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel. It is of great importance to mention that there is no statistical relationships between the variables: use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through distribution channel, the availability of service / product to customers at the right time and in the right conditions, customers' complaints about the service quality and the extension of market shares within manufacturing industries logistics.

A mean of 90.75 % of the respondents which some definitely agreed and the others agreed using a managerial model to review inventory ordering within manufacturing

industries logistics. It has to be noted that apart from the statistical relationship existing between the use of a managerial model to review inventory ordering and customers' complaints about service quality, there are no statistical significances existing between the variables: use of a managerial model to review inventory ordering, service / product to customers at the right time and in the right conditions and extension of market shares within manufacturing industries logistics.

This research objective relates to determining if inventory management policies enable manufacturing industries in Gauteng Province to respond to customer's needs. The analysis of this objective also provide a clear indication that the more manufacturing industries logistics use inventory management policies, the more customers' needs are met.

5.4.3 Determining of the incidence of internal customer service on external customer service.

Three categories of interdepartmental relationships were identified within manufacturing industries logistics in the Gauteng Province. This brings out the mean of 86.97 % of the respondents within manufacturing industries logistics that mentioned using collaboration amongst departments as an effective philosophy to meet external customers' satisfaction.

This research objective relates to determining whether internal customer service impact on external customer service within manufacturing industries logistics. A trend became clear when relationships amongst departments within manufacturing industries logistics were categorised. Collaboration amongst departments within manufacturing industries logistics was highly mentioned or scored than other categories. From this, it could be deduced that interdepartmental relationships within manufacturing industries logistics in Gauteng Province affect external customers.

5.4.4 Testing of the level of customers' satisfaction

A mean of 68.09 % of the respondents of which some disagreed customers within manufacturing industries logistics complain about service quality and the others were of a neutral opinion about this statement. Apart from the statistical significance existing between the use of a managerial model to review inventory ordering and the customers' complaints about the service quality, there are no statistical relationships between the variables: use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel, use of a managerial procedure to assemble the final product in the quantities required during time horizons and customers' complaints about the service quality.

A mean of 89.36 % of the respondents agreed customers within manufacturing industries logistics receive service / product at the right time and in the right conditions. No statistical relationships exist between the variables: use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel member's needs through distribution channel, use of a managerial procedure to assemble the final product in the quantities required during future time horizons, use of a managerial model to review inventory ordering and the service / product to customers at the right time and in the right conditions.

A mean of 76.60 % of the respondents of which some agreed that service delivery extends market shares within manufacturing industries logistics and the others were of a neutral position about this concern. It has to be added that no significant relationships exist between the variables: use of a managerial system to coordinate inventory requirements across multiple locations and respond to the channel members' needs through the distribution channel, use of a managerial procedure to assemble the final product in the quantities required during future time horizons, use of a managerial model to review inventory ordering and the extension of market shares within manufacturing industries logistics.

Seven categories of strategic policies were identified within manufacturing industries logistics in order to meet customers' requirements or needs. This brings out the mean of 69.57 % of the respondents which pointed out customers' needs and satisfaction as an effective and incontestable policy to meet customers' requirements within manufacturing industries logistics.

This research objective relates to the testing of the level of customers' satisfaction within manufacturing industries logistics. The following conclusive evidences were found:

1. Customers within manufacturing industries logistics do not complain about service quality;
2. Customers receive service / product at the right time and in the right conditions;
3. Customers' needs and satisfaction is an effective and incontestable strategy / policy to meet customers' requirements.

5.5 SUMMARY

Products are manufactured to be sold or consumed at the market. Literature witnesses nowadays that the customer is the focal point of all decisions and actions in any business organisations. The relationship product-customer is of great importance in business environment. That's why, manufacturing industries logistics has to arrest inventory

management policies in order to face to customers' needs or requirements and extend market shares.

It has to be reminded that the aim of this chapter was to present the results of this research study. The realised sample was of 47 (47.96 %) manufacturing industries located in Gauteng Province (respectively 28 for Johannesburg and 19 for Pretoria). The data was collected from December 2004 until March 2005. Because of the smallness of the sample of this research study, Chi-Square test was not valid. Fisher's Exact test was valid only for 30 percent of the results of this research study and the remaining 70 percent of the results were reported. It is considered that all four research objectives as stated in section 4.2.2 were conclusively achieved and the only one hypothesis of this research study confirmed based on both descriptive and quantitative analysis.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The customer, as literature witnesses, is a focal point of all decisions and actions in business organisations. Products are manufactured by manufacturing industries and offered to the marketplace for the purpose of being consumed by customers. That's the reason why, effective and efficient inventory management is of vital importance in today's complex and competitive environment in order to face up to customers' needs or requirements.

The research done by Han and Damrongwongsiri (2005:1) at Atlanta University in the United States of America witnesses that 'traditional concepts and methods for business management were focused on the optimisation of the internal activities in an organisation. These methods face a limit on the degree of improving the performance of the entire business system. In the present complex and competitive global marketplaces, effective information sharing and efficient distribution and allocation of inventory are necessary features to be considered and established in order to streamline operations and coordinate activity throughout the supply chain. The necessity to increase allocation efficiency and decrease operational costs are forcing supply chain parties continuously to investigate alternative approaches to improve their entire organisations.'

Routroy and Kodali (2005:2) add that ' in today's environment, every supply chain wants not only to maximise the system wide cost, but also keep minimum inventory along the supply chain while maximising service level requirements of the customers. This is because of the new innovative technology has made the product life cycle became short and increased the demand variability. The excess inventory in the supply chain will block the cash flow and indeed gives an adversely effect on the enterprise.'

The 21st century realities constrain business organisations to respond to meet customers' needs or requirements (means of extending market shares) through a sane inventory management strategy. It has to be noted that during this research study, the necessity of a sane inventory management strategy in order to meet customers' requirements within manufacturing industries logistics were discussed. This study revealed various perceptions on this subject but has also identified a range of trends and recommendations on inventory management on one side and customer service management on the other side. The aim of this last chapter is to review the research objectives and research

approach followed and to summarise the highlight of the research in terms of findings and recommendations.

6.1.1 Review of research objectives and approach.

The objectives of the research study, as depicted in chapter one (para 1.3) were:

a. To determine whether product availability policies followed by manufacturing industries in Gauteng Province (Pretoria and Johannesburg) enable them to meet customers' levels of expectation.

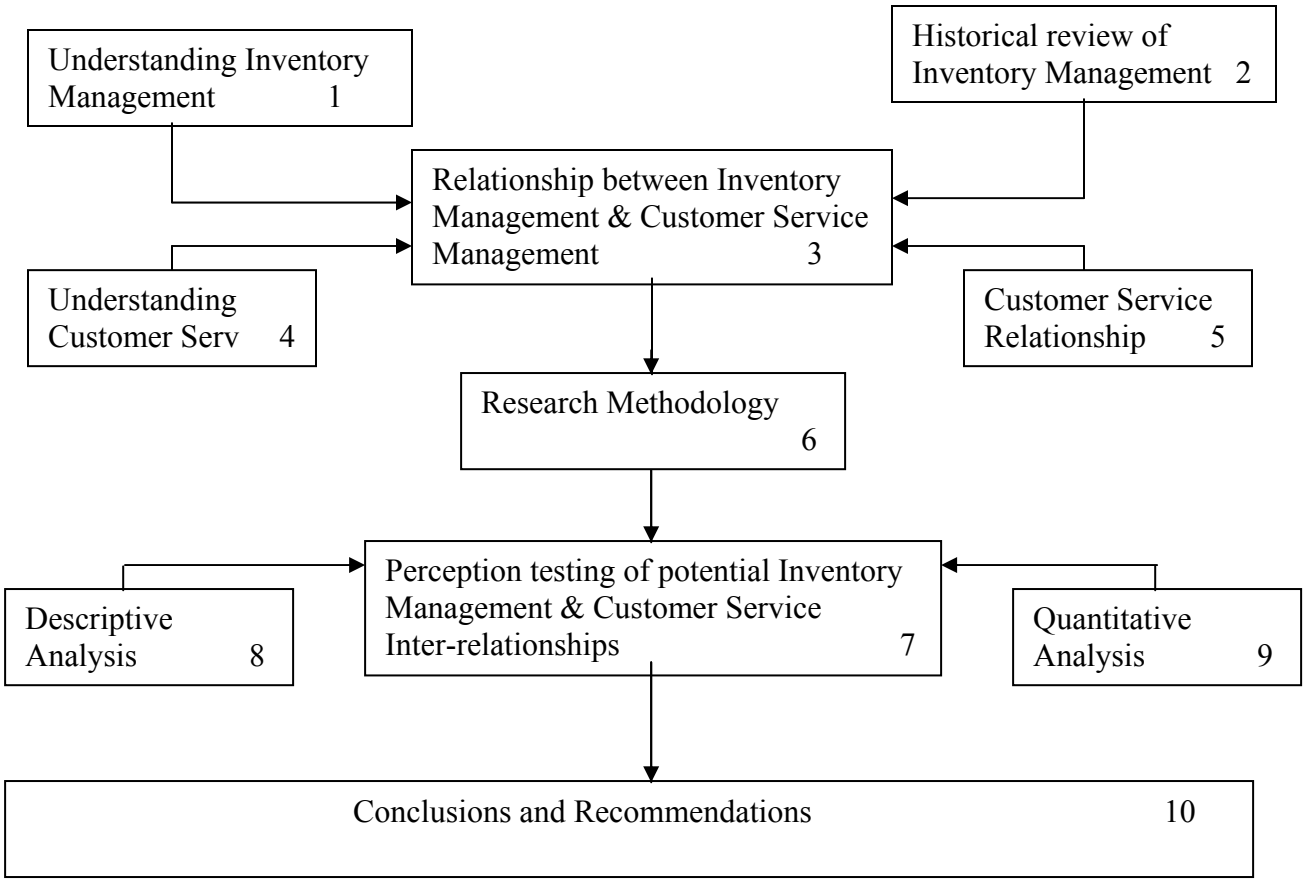
b. To determine if inventory management policies enable manufacturing industries in Gauteng Province (Pretoria and Johannesburg) to respond to customers' needs.

c. To determine whether internal customer service impact on external customer service (satisfaction).

d. To measure or test the level of customers' satisfaction.

Figure 6.1 below reflects the logic followed in order to achieve the above research study objectives. The cornerstones of the logic applied during the study were: the literature phase, the empirical phase, followed by conclusions and recommendations.

Figure 6.1: Logic of research study approach.



The theory of the relationship between inventory management and customer service management (box number 3 above) was thoroughly discussed in the literature phase. This debate was supported by:

a. Understanding inventory management;
b. Historical review of inventory management;
c. Understanding customer service; and
d. Customer service relationships.

After defining the research methodology (box number 6, figure 6.1 above), the theoretical phase and particularly the inventory management and customer service management theory provided a wealth of information and knowledge from which perceptions held by

manufacturing industries users (box number 7, figure 6.1 above), could be tested in the form of a survey. Survey results were analysed in descriptive and quantitative terms, and together constituted the empirical phase of the research study. And finally, conclusions on the study were supported or followed by recommendations (box number 10, figure 6.1 above) to complete and end the research.

6.1.2 Highlights of the theoretical and empirical phases of the study.

The highlights of the research study are:

a. Theoretical study

- An insight into the history and development of inventory management;
- An increased understanding of inventory management;
- An explanation of how inventory models are classified;
- Symptoms of poor inventory management;
- A deeper insight into just-in-time inventory management;
- Inventory management policies;
- Inventory management systems;
- An explanation of how to improve inventory management;
- An increased understanding of customer service;
- A discussion about customers' expectations and satisfaction;
- An establishment of customer service relationships;
- A discussion of how to measure performance of customer service and how to implement customer service standards; and
- A debate about service quality.

b. Empirical study

It has to be noted that in this phase, the theory of inventory management and customer service management was tested in a survey done within manufacturing industries logistics located in Gauteng Province. The theory of the theoretical phase was, therefore, applied empirical phase of the study. Highlights were:

- Respondents clearly mentioned the use of product availability policies within manufacturing industries logistics in Gauteng Province (quantitative analysis);
- Collaboration amongst departments were mentioned as an effective philosophy to meet external customers' satisfaction (quantitative analysis);

- Customers do not complain about service quality (quantitative analysis);
- Customers receive service / product at the right time and in the right conditions (quantitative analysis);
- Complying with customers' needs and satisfaction is an effective and incontestable strategy / policy to meet customers' requirements (quantitative analysis);
- Respondents gave strong recognition to inventory management policies (quantitative analysis);

6.2 CONCLUSION

In this section, the research findings will be briefly shown in order to support the aim of this dissertation in accordance with the research objectives. The research objectives of this study provided clear mention of:

a. The use of product availability policies within manufacturing industries logistics in order to effectively and efficiently meet customers' levels of expectation: the more product availability policies that are used, the more customers' level of expectation is met. Inventory managers were directly involved in stock problem-solving and in the increase of product quality.

b. The use of inventory management policies within manufacturing industries logistics in view of responding to customers' needs: the more manufacturing industries in Gauteng Province use inventory management policies, the more customers' needs are met.

c. The interdepartmental relationships within manufacturing industries logistics in Gauteng Province affect external customers. A mean of 86.97 % of the respondents within manufacturing industries logistics mentioned using collaboration amongst departments as an effective approach or philosophy to meet external customers' satisfaction.

d. The following conclusive evidences:

- Customers within manufacturing industries logistics in Gauteng Province do not complain about service quality;
- Customers within manufacturing industries logistics in Gauteng Province receive product / service at the right time and in the right conditions;
- Complying with customers' needs and satisfaction is an effective and incontestable strategy / policy to meet customers' requirements.

Inventory in the supply chain increases the product availability and reduces the cost by exploiting any economies of scale that may exist during both production and distribution. Inventory is a major source of cost and it has a huge impact on customer responsiveness (Routroy and Kodali 2005:1). The research findings of this study confirm that inventory management has an impact on customer service management within manufacturing industries logistics situated in Gauteng Province.

6.3 RECOMMENDATIONS

6.3.1 Implementation of a periodical customer service survey.

Because of the changing-business environment, a periodical customer survey has to be implemented within manufacturing industries logistics in the purpose of responding to customers' needs or requirements. This customer survey is to be attached to customers' slips or receipts at the products' delivery times on one side and will enable manufacturing industries logistics to know what customers are expecting from them and how to satisfy them to the other side.

6.3.2 Intensification of the use of the enterprise resource planning.

Today's complex and competitive marketplaces constrain manufacturers and customers to get closer. Enterprise resource planning provides powerful tools for planning, coordination and control of the processes in organisations. That's the reason why, the intensification of the use of the Enterprise resource planning (ERP) systems within manufacturing industries logistics located in Gauteng Province remain a must. Because through ERP, manufacturing industries logistics will easily, effectively and successfully face customers' requirements.

6.4 SUMMARY

As all the organisations are concerned with inventory management, a particular emphasis has to be put on it. A sane inventory management implies the coordination of strategic functions (production, finance, and marketing) of the organisation in the purpose of reaching objectives. The achievement of any organisation's objectives is linked to the relationship of functional goals. Routroy and Kodali (2005: 1) note that 'inventory in the supply chain increases the product availability and reduces the cost by exploiting any

economies of scale that exist during both production and distribution. Inventory is a major source of cost and it has a huge impact on customer responsiveness.

From this study, it is clear that inventory management impacts on customer service management. This means that an effective inventory management leads to high level of customer satisfaction.

APPENDIX

RESEARCH QUESTIONNAIRE

This questionnaire aims to determine inventory management parameters that are impacting to customer service improvement amongst manufacturing industries in Gauteng
Province.

Note: This questionnaire will be treated confidential and no information will be divulged to any third party.

PART A

Number V1 [ ][ ][ ] 1-3

1. Activity area :---------- V2 [ ][ ] 4-5

2. Business sector :

Textiles		V3 [ ] 6
Machinery & Equipment		
Food,Beverages& Agro-Ind.		
Chemicals		

3. Position of the respondent in the company :---------- V4 [ ] 7

4. Main products or services : ---------- V5 [ ][ ] 8-9
---------- V6 [ ][ ]
---------- V7 [ ][ ]

PART B

Please answer the following questions :

5. How many years do you deal with inventory management? --- V8 [ ][ ] 14-15

6. How many years do you deal with customer service management? --- V9 [ ][ ] 16-17

7. What is your highest qualification (inventory manager)? :

Diploma	
Bachelor's degree	
Master's degree	

[ ] 18

Doctorate degree	
Other (describe)	

V10 ☐

:

8. What is your highest qualification (customer service manager)? :

Diploma	
Bachelor's degree	
Master's degree	
Doctorate degree	
Other (describe)	

V11 ☐ 19

9. If you have a degree, in which of the following (inventory manager)? :

Logistics management	
Statistics	
Management accounting	
Engineering	
Other (describe)	

V12 ☐ 20

10. If you have a degree, in which of the following (customer service manager)? :

Logistics management	
Statistics	
Management accounting	
Engineering	
Other (describe)	

V13 ☐ 21

11.How many training sessions did you have to enable you to deal with inventory management? : ---------- V14 ☐☐ 22-23

12. How many training sessions did you have to enable you to deal with customer service management? : ---------- V15 ☐☐ 24-25

13. You use any managerial procedure that enables your company to respond to your channel members inventory needs through distribution channel.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V16 ☐ 26

* If you agree, which one or name it, please : ---------- V17 ☐☐ 27-28

---------- ☐☐ 29-

V18 30

* If you disagree, how does your company face to the above-

mentioned issue? : ---------- V19 31-32

---------- V20 33-34

14.Your company bases on a managerial tool in view of coordinating inventory requirements across multiple locations or stages in the supply chain.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V21 35

* If you agree, name it, please : ---------- V22 36-37

V23 38-39

15.Your company uses any managerial system that coordinates inventory requirements across multiple locations and respond to the channel members' needs through distribution channel.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V24 40

* If you agree, which one? : ---------- V25 41-42

V26 43-44

* If you disagree, why? (short answer) : ---------- V27 45-46

V28 47-48

16.Your company uses any managerial approach to face up to inefficiency reduction on one side and unproductive time during the production process on the other side.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V29 49

* If you agree, name it, please: ----------
- V30 50-51

V31 52-53

17. With regard to your company, which category of workers is

directly involved in stock problem-solving and in the increase of product quality? V32 [ ][ ] 54-55

18.Your company uses any managerial procedure in order to assemble the final product in the quantities required during future time horizons.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V33 [ ] 56

19.Your company uses any managerial model to review your inventory ordering.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V34 [ ] 57

20. What (kind of) relationship amongst your departments do you think can be suitable or appropriate in relation with your external customers' satisfaction? V35 [ ][ ] 58-59

(Very short answer) : ---------- V36 [ ][ ] 60-61

21. Your customers complain about your service quality.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V37 [ ] 62

22. Your customers receive your service or product at the right time and in the right condition (faultless item).

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V38 [ ] 63

23. Your service delivery extends your market shares.

Agree Definitely	Agree	Neutral	Disagree	Disagree Definitely

V39 [ ] 64

24. What do you think can be helpful for the employees of your company in order to respond to your customers' requirements or needs?

(Very short answer) : ---------- V40 [ ][ ] 65-66

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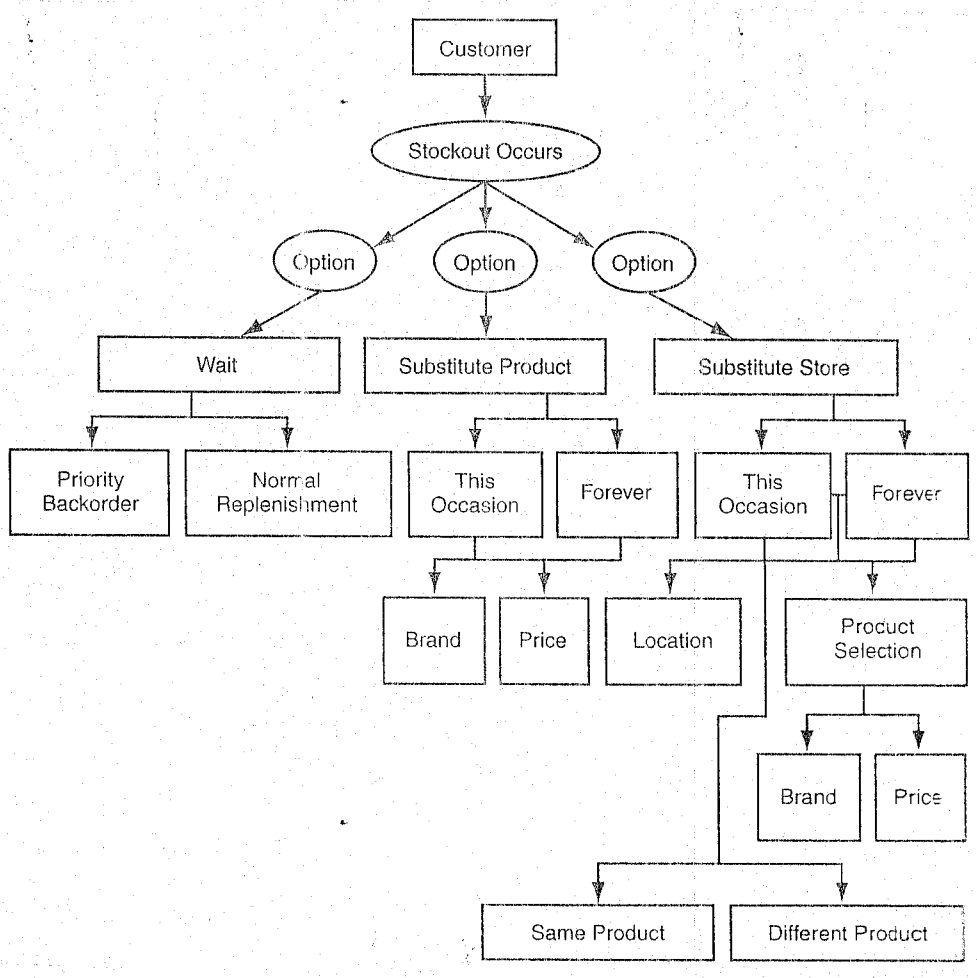
Figure 2.1 : Customer decisions regarding a stockout .



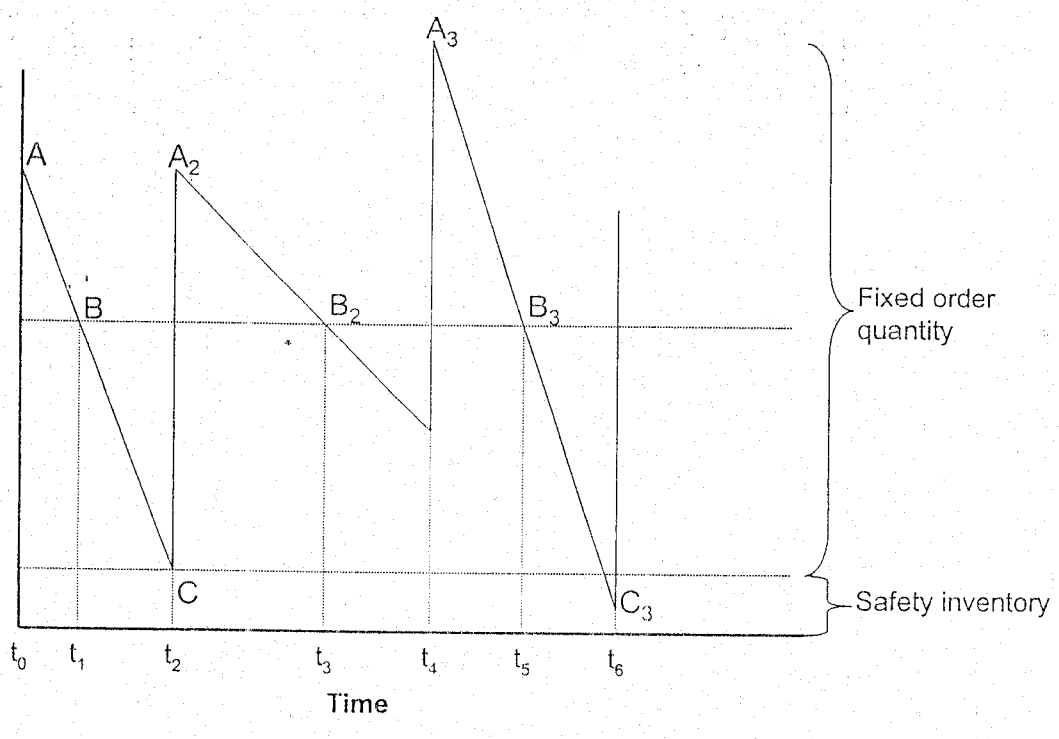
Source : Bloomberg D J , Lemay S. and Hanna J B. 2002 . Logistics:137

e. Buffer interface. Inventory can buffer key interfaces, creating time and place utility. Key interfaces include (1) supplier and purchasing, (2) purchasing and production, (3) production and marketing, (4) marketing and distribution, (5) distribution and intermediary, and (6) intermediary and customer. Having inventory at these interfaces helps ensure that demand is met and stock outs are minimised.

2.2.2.2 Importance of inventory

According to Hugo, Badenhorst-Weiss and Van Rooyen (2002:194-195) the basic characteristic of the system is that whenever stocks are replenished, the same fixed quantity is ordered (the economic order quantity) every time. This can graphically be represented by the following figure:

Figure 2.2 : Fixed order quantity system



Source : Hugo. W M J, Badenhorst-Weiss .J A and Van Rooyen. D C. 2002 . Purchasing and Supply Management :195

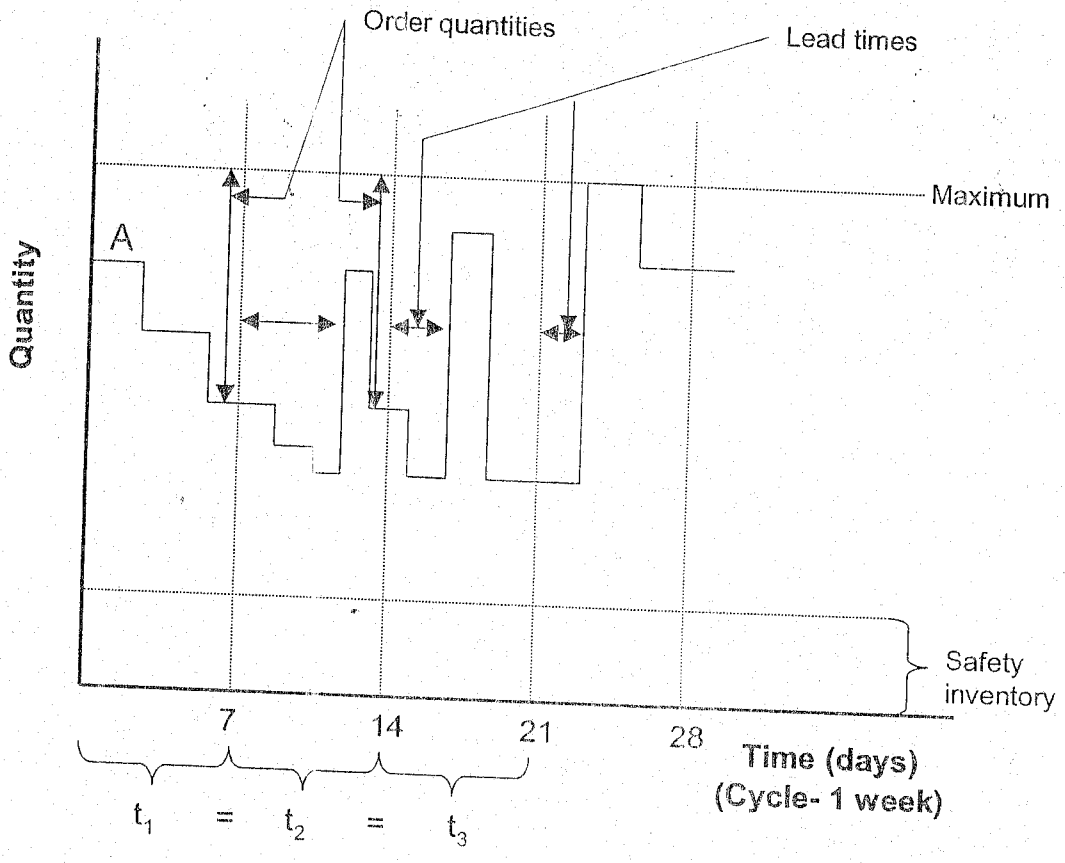
Inventory is issued from an existing inventory level (A) and depleted over a period of time up to t1, when the re-order level (B) is reached and further depleted over the period to t2, when the safety-inventory level (C) is reached. No safety inventory is issued, because the ordered fixed quantity is received at time t2, and inventory is replenished to level A2. The process repeats itself and a fixed quantity is ordered whenever the re-ordering level (B2; B3) is reached.

insufficient inventory could very well be available)
-The system is fairly simple to control and the EOQ is ordered on every occasion.

b. Cyclical ordering system

According to Hugo, Badenhorst-Weiss and Van Rooyen (2002:195-196) the cyclical ordering system's most prominent characteristic is that the level of all inventory items are received at fixed, predetermined times to determine whether sufficient inventory is available. The review cycles vary according to the nature of the inventory, but longer review cycles require higher maximum (as well as average) inventory levels. Shorter review cycle however mean more orders and higher replenishment costs.

Figure 2.3 : Cyclical ordering system



Source : Hugo. W M J, Badenhorst-Weiss. J A and Van Rooyen. DC. 2002 . Purchasing and Supply Management : 196

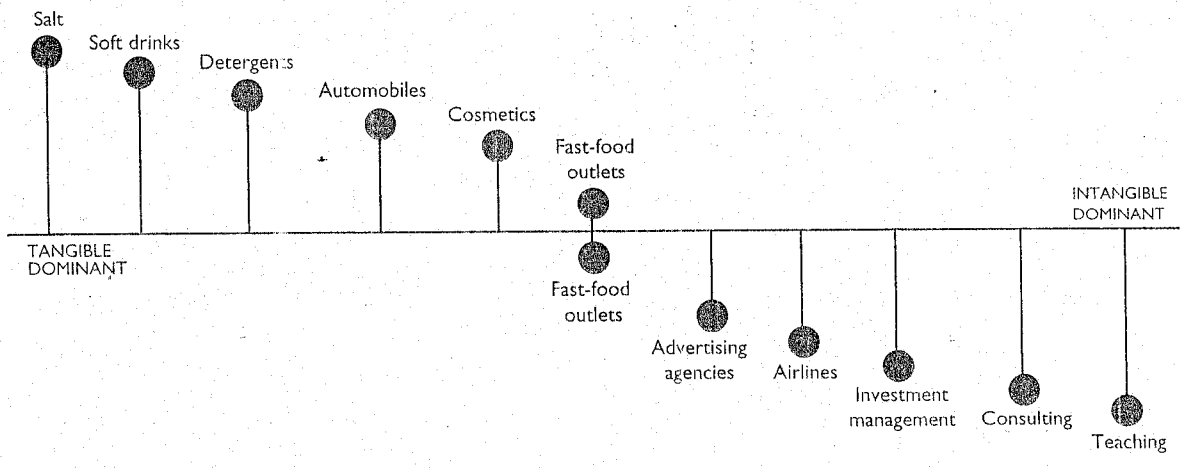
CHAPTER 3: CUSTOMER SERVICE

3.1 INTRODUCTION

Manufacturing industries purchase raw materials from suppliers, transform them into finished goods in order to be sold to customers. Customers' needs or markets' needs in general have always been a great worry for organisations either of the public or private sector. Customer service is one of the most important key activities of business logistics in the sense that it allows to determine in concrete terms customers' needs and wants for logistics in order to be positively met or answered.

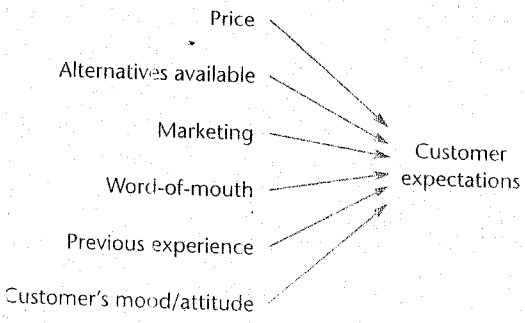
Leaning on service marketing, Hoffman and Bateson (2002:4-5) establish fundamental differences between goods and services summarised by a scale of market entities.
That explanation is shaped by the following figure:

Figure 3.1: Scale of market entities



Source: Lynn Shostack (in Hoffman and Bateson 2002). Essentials of service marketing: Concepts, Strategies & Cases. 5

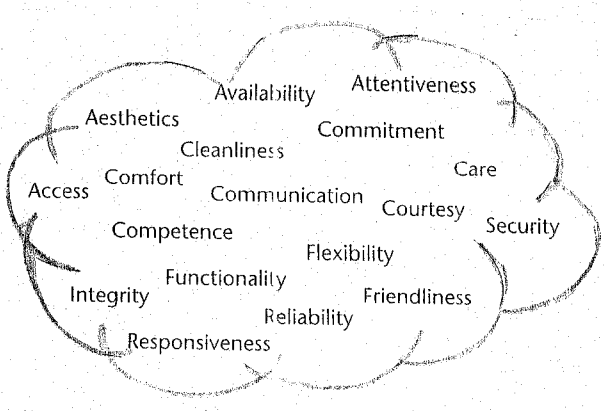
Hoffman and Bateson (2002:5) explain that figure 3.1 displays a range of products based on their tangibility. Pure goods are tangible dominant, whereas pure services are



Source: Johnston, R and Clark, G. 2001. Service operations management. 86

It is imperious to be noted that apart from the above- mentioned parameters, there are also service quality factors that motivate a customer to purchase as well. Related to that, Johnston and Clark (2001:88) mention that service quality factors are attributes of service about which customers may have expectations and which need to be delivered at some specific level. Here is the graphical representation of those variables which influence customers' purchasing decisions.

Figure 3.3: Service quality and its factors



Source: Johnston, R and Clark, G. 2001. Service operations management.98

3.2.6.2 Customer satisfaction

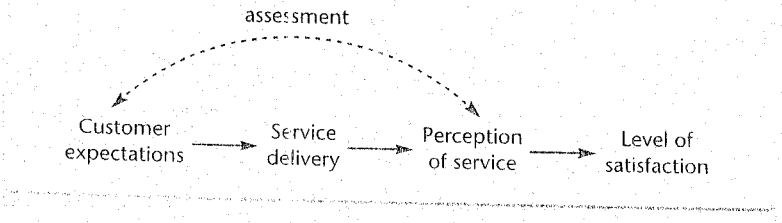
According to Johnston and Clark (2001:78), satisfaction is the result of a customer's assessment of a service based on a comparison of its service delivery with its prior expectations.

The research done by Yasin and Yavas (1999:1) witnesses that in an area of intense competitive pressure, service organisations ranging from hospitals to financial institutions to restaurants face considerable pressures and challenges not only to meet, but also to exceed customer expectations. Today's sophisticated and discerning customers demand the highest levels of service efficiency, quality, and flexibility and dependability.
Many service organisations recognise that attaining customer satisfaction through delivery of quality services is a key to their survival and they are well aware that having a loyal base of satisfied customers increases sales, reduces costs, improves bottom lines and builds markets shares. Yet, while manufacturing organisations have long been willing to develop the philosophies, techniques and concepts needed to enhance the effectiveness of their systems, most service organisations have lagged behind.

To streamline and improve their service delivery system, service organisations have much to learn from their manufacturing counterparts in utilising, among others, such quality and process improvement tools as root cause analysis (RCA), benchmarking (BM), process reengineering (PR) and continuous improvement.

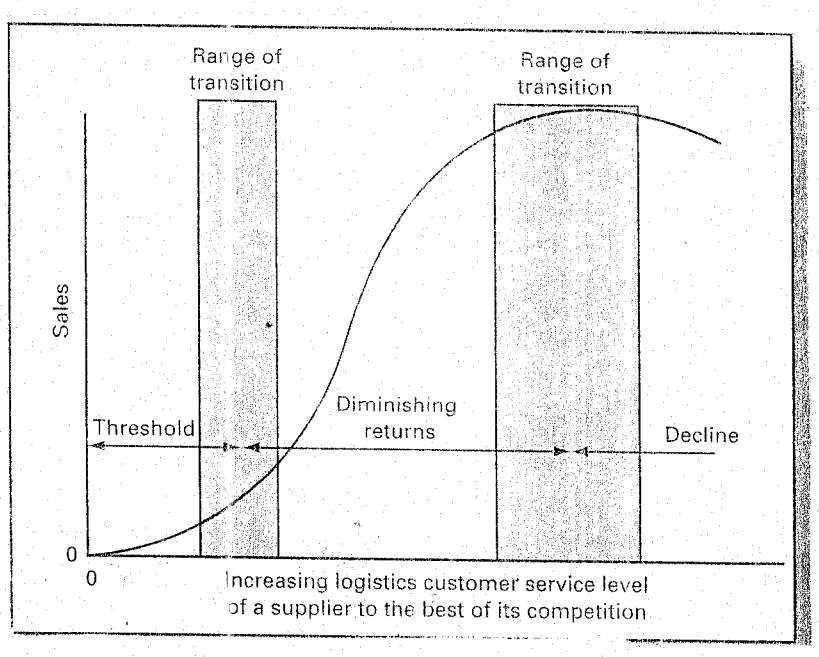
The following figure shows the relationship between expectations and satisfaction:

Figure 3.4: Relationship between expectations and satisfaction



Source: Johnston, R and Clark, G. 2001. Service operations management.78

3.3 CUSTOMER SERVICE RELATIONSHIPS



Source: Ballou, R H. 2004. Business logistics / Supply chain management.105.

Ballou (2004:106) gives an explanation to figure 3.5 noting three distinct stages of the curve: threshold, diminishing returns and decline. Each stage shows the equal increments of service improvements that do not always bring equal gains in sales. He clearly underlines these following marking points:

a. When no customer service exists between a buyer and a supplier, or when service is extremely poor, little or no sales are generated. Obviously, if a supplier offers no logistics, customer service and the buyer is not providing it, there is no way of overcoming the time and space gap between the two. No exchange and thus no sales, can take place.

b. As service is increased to that approximating the offering by competition, little sales gain can be expected. Assuming that price and quality are equal, the firm is not in effect, and in business until its service level approximates that of the competition. This point is the threshold service level.

c. When a firm's service level reaches this threshold, further service improvement relative to competition can show good sales stimulation. Sales are captured from competing suppliers by creating a service differential. As the service is further improved, sales continue to increase, but at a slower rate. The region from the service level at threshold to the point of sales decline is referred to as one of diminishing returns. It is in this region that most of firms operate their supply chains.

Researches related to customer service have proven that sales increases are linked to customer service improvement. Based on that fact, business organisations have to formulate strategic actions in view of provoking sales increase.

3.3.2 Cost-Service relationship

Cost is a significant variable which directly or indirectly influences logistics key activities. Logistics customer service is a result of logistics activity level. Each level of service is associated with a given cost level. Ballou (2004:109-110) states that 'as activity levels are increased to meet higher customer service levels, costs increase at an increasing rate. This is a general phenomenon observed in most of economic activities as they are forced beyond their point of maximum efficiency.' Graphically, cost-service relationship can be represented as follows:

Figure 3.6: General cost- revenue trade-offs at varying levels of logistics customer service