

## TABLE OF CONTENTS

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### CHAPTER 2: THE ROLE AND IMPORTANCE OF LOGISTICS

	Page
<b>2.1 INTRODUCTION</b> . . . . .	2
2.1.1 Background and methodology of the chapter . . . . .	2
2.1.2 Logistics - a micro and a macro perspective . . . . .	3
2.1.3 Logistics - a growing area of company focus . . . . .	7
2.1.4 Logistics and supply chain management defined . . . . .	9
2.1.5 The main logistics activities . . . . .	17
2.1.6 Conclusion . . . . .	23
<b>2.2 THE DEVELOPMENT OF LOGISTICS MANAGEMENT</b> . . . . .	24
2.2.1 Introduction . . . . .	24
2.2.2 The historical development of logistics management . . . . .	25
2.2.3 The increasing focus on the role of logistics . . . . .	26
2.2.4 Current and continuing logistics trends . . . . .	31
2.2.5 Conclusion . . . . .	37
<b>2.3 THE MICRO-ECONOMIC ROLE OF LOGISTICS MANAGEMENT</b> . . . . .	38
2.3.1 Introduction . . . . .	38
2.3.2 Logistics and company finance and profitability . . . . .	39
2.3.3 Logistics and marketing . . . . .	48
2.3.4 Logistics and manufacturing . . . . .	55
2.3.5 Role of logistics relative to other key company functions. . . . .	60
2.3.6 Conclusion . . . . .	62
<b>2.4 CONCLUSION</b> . . . . .	63
<b>SOURCES OF REFERENCE</b> . . . . .	65

## CHAPTER 2: THE ROLE AND IMPORTANCE OF LOGISTICS

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### 2.1 INTRODUCTION

#### 2.1.1 Background and methodology of the chapter

Companies are today facing increasing levels of competitive pressure and difficulty with regard to maintaining and improving profitability. The management of these companies are being forced to seek and implement innovative strategies with which to advance their company's competitive advantage as well as their profitability.

These circumstances and the increasingly complex nature of logistics operations, are causing companies, such as those in the manufacturing sector, to focus on their core competencies, while others provide, for example, some or many of their logistics activities. Companies are also increasingly coming to realise the importance and role of logistics in their organisations and therefore the need for specialist input therein.

This chapter of the thesis will discuss, in more detail, important logistics concepts and definitions, some of which were introduced in the preceding chapter, and further introduces concepts and definitions relevant to logistics outsourcing in particular. The chapter also deals with important underlying concepts and definitions of logistics and supply chain management. The information in this chapter also focuses on the meaning, role and importance of logistics and deals with the increasing recognition of the role and importance of logistics and thus the development thereof and trends with regard thereto.

This information is of a predominantly descriptive nature and presents the relevant concepts and definitions mainly in an introductory manner but will be clear and in sufficient detail to provide a background to the subjects discussed

subsequently in this thesis and to contribute to the purpose thereof. This is key to the thesis in order to begin to clarify the aspects that will be researched, analysed and discussed.

The definitions and classifications discussed in this section have been compiled from a number of sources for the purposes of this thesis. While most definitions and descriptions are fairly brief and provide mainly a background to the subject material, the concepts of logistics, logistics management and supply chain have been defined and described in particular detail, as outsourcing will be in Chapter 3, in contribution to the main focus of this thesis.

### **2.1.2 Logistics - a micro and a macro perspective**

As was outlined in the preceding chapter, which provided an initial introduction to the role and importance of logistics, it is important to note the key role and impact of logistics in the company, on its sustainability, competitiveness and profitability, as well as in the economy of a country.

Furthermore, as companies find themselves under growing pressure from both customers and shareholders to seek ways in which to decrease their costs while at the same time increasing performance, they are forced to find ways in which they may improve the efficiency and effectiveness of their operations. These pressures are increasingly impacting the way in which companies, and their customers, view logistics activities. Logistics is thus playing more and more of an important role in company performance, in particular for companies seeking to increase their competitive advantage and corporate profitability.

*It can be said that companies with a competitive advantage enjoy a position of enduring superiority over competitors, in terms of customer preference, which may be achieved through logistics. The source of competitive advantage is in the ability of the organisation to differentiate itself, in the eyes of the customer,*

*from its competition, and to operate at a lower cost, and therefore a greater profit than its competitors. Competitive advantage stems from the many discrete activities a company performs in designing, producing, marketing, delivering, and supporting its products. (Porter, 1985; as quoted by Christopher, 1998).*

Companies are thus increasingly recognising the role and importance of logistics.

*Companies thus gain competitive advantage by performing such strategically important activities more efficiently than their competitors. (Porter, 1985; as quoted by Christopher, 1998). In so doing they may well find that they are engaging considerable resources in the performing of non-strategically important activities, and may consider outsourcing these to a company that specialises therein. The specialisation and expertise of such a contractor may well provide the company with further competitive advantage in this regard.*

In the same way that companies seek a competitive advantage over other companies, so too do countries seek to promote their exports by influencing the value of their currency, subsidising certain sectors of their economy, for example by promoting efficiencies in economically important activities such as those involved in the logistics arena. Improved and efficient logistics will make a country's products more attractive from a cost and customer service point of view in the global village. Furthermore, the impact of logistics on a country's land, labour and capital resources; gross national product; rate of inflation, interest rates, productivity, energy costs and availability; as well as employment and standards of living, is also key to the increased focus on logistics and supply chain management in many companies and countries.

**Logistics** is one of the major expenditures for businesses, thereby affecting and being affected by other economic activities. This is well demonstrated by the following figures for the US quoted by Stock and Lambert (2001): In 1999, US

industries spent an estimated \$554 billion on freight transportation; more than \$332 billion on warehousing, storage, and inventory carrying costs; and more than \$40 billion to administer, communicate, and manage the logistics process; the total expenditure on logistics therefore amounting to over \$900 billion. In 2001, US business logistics systems costs totalled \$970 billion, the equivalent of 10% of the US gross domestic product measured in nominal dollars. (Delaney, 2002, as quoted by Langley, Allen & Tyndall, 2002). World-wide, companies spent about \$3 trillion on logistics. (Bank of America; as quoted by Weaser, 2001).

**Logistics outsourcing** is also big business in the US. (Sopher, Lareau & Crum, 2002). In 2000, third-party logistics service providers (3PLs), for example, generated \$56.4 billion revenue in the US, up from \$46 billion in 1999, (Armstrong & Associates, 2001; as quoted by Sopher, et al. 2002), and in 2001 estimated total contract logistics market revenues were \$60.8 billion. (Armstrong & Associates, 2002; as quoted by Langley, et al. 2002). Logistics is also a huge consumer of land, labour and capital, particularly in industrialised countries where investment in logistics facilities runs into many billions, as can be seen from the above example.

As a significant component of gross domestic product (GDP), in the US 10.5% in 1996, logistics affects the rate of inflation, interest rates, productivity, energy costs and availability, and other aspects of the economy. However it has been reported that the average organisation in the US, for example, could improve its logistics productivity by 20% or more. (Stock & Lambert, 2001). Unchecked, logistics expenditure translates into higher prices for consumers, lower profits for businesses, or both, resulting in a lower standard of living for everyone. It is therefore crucial that South African businesses, as with those in all other countries, improve their logistics productivity. By improving the efficiency of logistics operations, logistics can make an important contribution to the economy as a whole.

Logistics also plays a key role in the economy in that it supports the movement and flow of many economic transactions. It is an important activity with regard to the facilitation of the sale of practically all goods and services. In order to identify with this role of logistics, consider the fact that if goods do not arrive on time, customers cannot buy them. If goods do not arrive in the correct place or condition, no sale can be made. All economic activity throughout the supply chain would suffer if the logistics function failed to fulfil this role. The logistics management function therefore plays an important role in a country's export effort, and particularly in a country such as South Africa where government has established an export-led growth strategy. If the application of the logistics management concept can tend to a reduction in total logistics costs, exports will be stimulated.

South African companies operate in a fiercely competitive environment as a result of the liberalisation of trade and accelerated technological advances. These challenges need to be turned to the advantage of companies by combining product, process and management technology in a holistic approach matched to each unique business situation. Companies in South Africa need to greatly enhance their ability to compete in the global environment and logistics management and innovative strategies have an important role to play in this regard.

As a significant element of GDP and GNP, as discussed in previous paragraphs, logistics also affects the rate of inflation, interest rates, productivity, energy costs and availability, and other aspects of the economy. (Stock & Lambert, 2001). In this regard, South Africa too needs to pay attention to those aspects and techniques that could slow down the rate of cost increases and even lead to a reduction therein. The socio-economic progress of South Africa also depends upon this and it is essential to focus on this arrest in cost increases in order to maintain and improve the standard of living of the population. Also of particular relevance to South Africa is the fact that logistics is of a capital-intensive nature

and that labour also represents a major percentage of the total costs. It is also important to note that capital is expensive and scarce, while labour is also expensive and can sometimes be an unreliable production factor. Furthermore, logistics management is usually accompanied by the investment of large capital amounts in mechanisation, often to reduce labour requirements. In South Africa every effort should be made however to utilise labour, even though intensive and expensive training schemes may be needed to make this labour more effective. A fine balance will have to be struck between the use of labour and capital in the overall logistics management system.

The above discussions of the micro and macro roles of logistics management are provided to indicate the far-reaching effects and role of logistics in both the economy of companies as well as countries. However, the rest of this thesis will focus mainly on the micro-economic role of logistics as this is the focus thereof. The following sections of this chapter will outline the factors resulting in a growing focus on logistics, clarify the meaning and understanding of the terms logistics management, as well as logistics, supply chain and supply chain management, and discuss in some detail the implications of logistics for a company.

### **2.1.3 Logistics - a growing area of company focus**

*The recognition of the role and importance of logistics and the management thereof in a company, for example with regard to **outsourcing decisions**, is not a recent trend but has been receiving growing attention, particularly over the last thirty years.*

Several factors, including the pressures alluded to in Section 2.1.2, have contributed to the growing focus on logistics management. According to Stock and Lambert (2001) and Davis and Drumm (1999) the factors underlying the recognition of the importance of logistics management include the following:

- Advances in technological and quantitative techniques
- Significant opportunities presented by e-commerce potential
- Development of the systems approach and total cost analysis concept
- Recognition of the role of logistics in a company's customer service programme
- Erosion of companies' profits because of their failure to examine functional areas where cost savings might be realised
- Profit leverage resulting from increased logistics efficiency
- General economic conditions since the 1950s
- Recognition of the role of logistics in creating competitive advantage in the marketplace, particularly in the face of domestic and foreign competition, saturated markets, government regulation
- Consolidation of companies thus increasing the importance of sound logistics practices and continued strategic planning as companies are reorganised and product lines are combined
- Markets, and logistics policies and practices of suppliers of consumer products, being driven by the large retailers
- Distributors stocking less with respect to industrial products, and depending more on their suppliers' stocks than in the past
- Customer requirements for value-added services continuing to drive costs up
- Increasing interest in third-party providers that handle all or part of a company's logistics function, particularly with increased penetration into major trade areas
- Inventories continuing to be at high levels irrespective of improved forecasting, inventory and make-to-order software available.
- Gaps in logistics support left by enterprise resource planning (ERP) systems, resulting in the need for additional bolt-on systems in the near future
- Customer service activities continuing to be centralised and consolidated
- Increased focus on computer technology and distribution software.



Companies are becoming more aware of, and interested in, logistics management.

In summary, the recognition of the cost and service impact of logistics is an important step for companies. The development and expansion of global competition and the increasingly international growth of companies, with increasing foreign sourcing of raw materials, components and labour, further impacts on the recognition of the importance of logistics. Domestic competition and saturated markets in particular have led to the need for companies to become more competitive and thus effective and efficient in all their operations, with logistics being no exception. Many discussions on logistics in fact refer to the competitive advantage which logistics efficiencies provide for a company. Companies that successfully implement innovative strategies to better manage their logistics requirements, for example, are better equipped to increase their competitive advantage and corporate profitability and to become market leaders.

#### **2.1.4 Logistics and supply chain management defined**

The term logistics is used to describe the entire process of materials and products moving into, through and/or out of a company. Logistics thus includes any activity involved in the management of inventory at rest (awaiting production into finished goods or distribution at the final point of sale) or in motion (during transportation). Logistics management is the management of these logistics activities. The definition of logistics management provided in the introduction to this thesis, is that provided by various definitions compiled over the years by the Council for Logistics Management in the US. In repetition thereof, *logistics management can thus be defined as that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of raw materials, in-process inventory, finished goods, services and related information from the point-of-origin to the point-of-consumption (including inbound, outbound, internal and external flows) in such a way as to meet customers'*

*requirements cost-effectively and ensure that current and future profitability are maximised.*

Logistics, and the management thereof, therefore has a key impact on the daily lives of people as well as the economic state and development of countries. Consumers of manufactured products and other goods, world-wide, are dependent on logistics and the various activities involved therein, ensuring that the products and services they require are available when, where and how they want them. Competitive advantage, as was mentioned previously, can thus be gained by a company that finds ways of performing strategically important activities, for example logistics, or ensuring that these activities are performed, more efficiently than its competitors. Effective logistics management can provide a major source of competitive advantage to a company.

Competitive advantage is thus a key output of the logistics management process. These outputs, as identified by Stock and Lambert (2001) as well as the inputs of the logistics management process also can be summarised as follows:

Outputs of the logistics management process, are thus:

- Competitive advantage for the organisation resulting from a marketing orientation and operational efficiencies and effectiveness
- Time and place utility
- Efficient movement to customer
- Proprietary asset of the organisation

Inputs to the process, with respect to services or products (raw materials, in-process inventory, and finished goods), acquired from various suppliers, include:

- Natural resources (land, facilities and equipment)
- Human resources
- Financial resources
- Information resources

Identifying and managing the important role and impact of logistics in the company is thus of utmost importance. Furthermore, as was outlined in the preceding definition of logistics management, it is also a key component of the supply chain process. The management and execution of logistics activities in a company is therefore not independent of the other organisations, management structures and activities within the particular supply chain of which it is a part.

It is thus appropriate at this stage to define the term *supply chain* which can be described as *the network of connected and interdependent organisations that are mutually and co-operatively working together and involved, through upstream and downstream linkages, in the different processes and activities to control, manage and improve the flow of materials and information (from suppliers to end users) that produce value in the form of products and services in the hands of the customer.* (Christopher, 1998). The supply chain thus involves the network of organisations that performs the activities that enable the physical flows and storage of materials and the system flows of related information. The supply chain for a particular product or service is thus the collection of all components or activities associated with the creation and ultimate delivery of that product or service. *Supply chain management is therefore the managing of both the flow of materials and the relationships among the channel intermediaries from the point of origin of raw materials through to the final customer.* (Christopher, 1998).

Supply chain management also involves the integration of business processes, from end-user through to original suppliers that provide products, services and information that add value for customers. (Lambert, Stock & Ellram, 1998). Stock and Lambert (2001) develop this concept further by asserting that supply chain management implementation involves identifying supply chain members with whom it is critical to link, what processes must be linked with each key member, and what type of integration applies to each process link, with the objective of maximising competitiveness and profitability for the company as well as the whole supply chain network including the end customer.

Consequently, **supply chain process integration and re-engineering initiatives** should be aimed at boosting **total process efficiency and effectiveness across members of the extended supply chain.**

It is important to note that supply chain management can also be termed demand chain management to reflect the fact that the chain should be driven by the market and not the suppliers; in other words it should be a pull system rather than a push system. Supply chain can also be termed supply network, since there is normally a number of suppliers and customers, and suppliers to suppliers and customers to customers, to be included in the total system.

Therefore a logistics supply chain develops when there is a multiplication of exchanges between a number of individuals or organisations, of goods and services that some parties have and others need, mostly between producers and consumers. The use of the term supply chain may vary from organisation to organisation, but it will always impact on the profitability and competitive advantage of an organisation.

*Therefore, while logistics is concerned with seeking to create a single plan for the flow of products and related information through a business, supply chain management builds upon this plan and framework, seeking to achieve linkage and co-ordination between processes of other entities in the chain or network (suppliers and customers) and the company itself.* Supply chain management thus moves the company away from the traditional arms-length, sometimes adversarial, relationships between buyers and sellers, to the managing of upstream and downstream relationships with suppliers of materials and/or products and providers of services, and customers, in order to deliver superior customer value at less cost to the supply chain as a whole. The focus of supply chain management should therefore be on the management of relationships in order to achieve a more profitable outcome for all parties in the chain.

Companies which are able to improve their supply chain management thus typically reflect a holistic approach, viewing the supply chain from end to end and ensuring improvement of the whole, in revenue, cost and asset utilisation.

The concept of integrated logistics management is key to the success of a particular supply chain, where *integrated logistics management is the administration of the various logistics activities as an integrated system, moving inventory through a constant and consecutive chain/network of value-added steps, with it arriving when needed in the proper quantity and form, at the customer.* The basis of the integrated logistics management concept is *total cost analysis which is minimising the total cost of transportation, warehousing, inventory, order processing and information systems, and lot quantity cost, while achieving a desired customer service level, i.e. at a given level of customer service, management should minimise total logistics costs rather than attempting to minimise the cost of individual activities.* (Gattorna & Walters, 1996; Stock & Lambert, 2001).

If companies have not adopted an integrative approach, logistics can be a fragmented and unco-ordinated set of activities spread throughout the organisation with individual functions, budgets, priorities and measurements. A non-integrative approach to logistics costs leads to attempts to reduce specific costs within the logistics function which may not be optimal for the system as a whole and may lead to greater total costs. Total costs do not respond to cost-cutting methods aimed at warehouse, transportation or inventory costs, and attempts to reduce the cost of individual activities may lead to increased total costs.

Therefore failure to co-ordinate any activities of demand creation and physical supply, or undue emphasis on any one activity or function, may well upset the equilibrium of forces of efficient distribution.



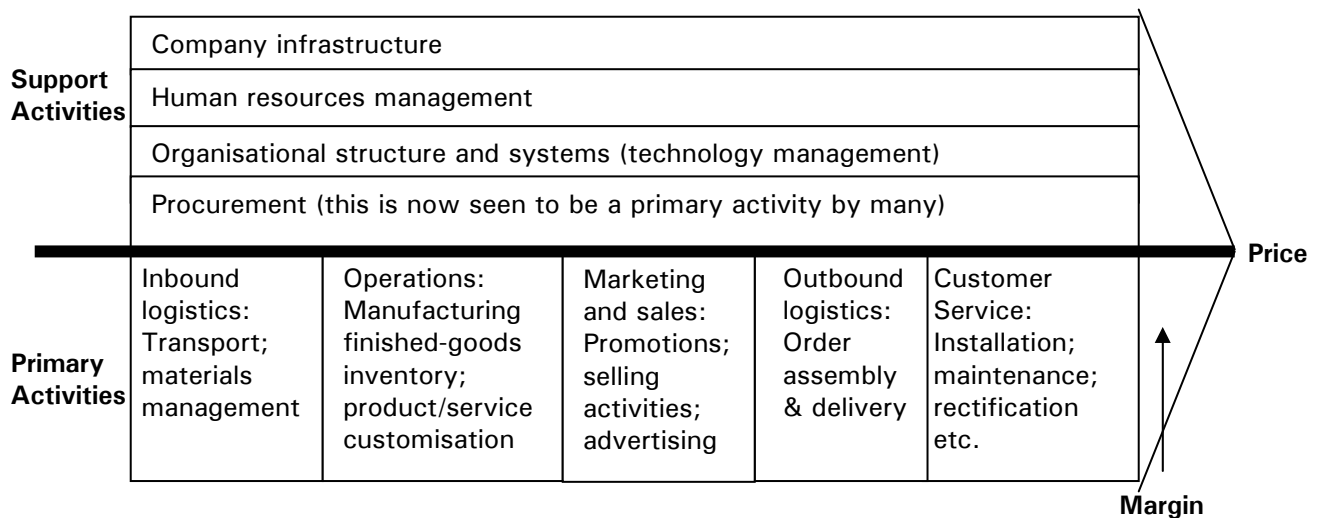
Stock and Lambert (2001) thus state that *the overall logistics objective is therefore to minimise the total costs given the customer service objective where total costs = transportation costs + warehousing costs + order processing and information costs + lot quantity costs + inventory carrying costs*; where:

- *The cost of customer service levels also refers to the cost of lost sales, i.e. the cost associated with alternative customer service levels. Management must minimise the total of the other cost components, for a desired level of customer service.*
- *Transportation costs are the costs associated with the transportation function and can be identified in total and by segments, i.e. inbound/outbound, and by vendor/customer/mode/carrier/product/channel.*
- *Warehousing costs are all the expenses that can decrease or increase as a result of a change in the number of warehousing facilities. The number of warehouses used in the logistics system will also have an impact on the levels of inventory.*
- *Order processing and information costs are costs for order transmittal, order entry, order processing, related handling costs, and associated internal and external communication costs.*
- *Lot quantity costs are production or purchasing costs that will change due to a change in the logistics system. Production lot quantity costs are production preparation costs, capacity lost due to changeover, materials handling, etc. Purchasing lot quantity costs are the costs of buying various quantities.*
- *Inventory carrying costs are costs that vary with the level of inventory stored and include capital, inventory service, storage space, and inventory risk costs.*

Regarding supply chain integration, Christopher (1998) asserts that this implies *process integration both upstream and downstream*, where process integration is *collaboration of buyers and suppliers/providers, joint product development, common systems, and shared information*. He further indicates that in the future it will be the extent and quality of supply chain integration that will determine marketplace performance.

Also key to the understanding and success of a particular supply chain is the **value chain** concept. The business of a company is often described as a value chain in which all the activities undertaken to develop and market a product or service, yield value. (Gattorna & Walters, 1996; Chee & Harris, 1998). A company will be profitable as long as total revenues exceed the total costs incurred in creating and delivering the product or service. Companies should strive to understand their own value chain as well as those of their competitors, suppliers, and distribution providers in order to pursue improvement of the whole. The value chain shown in Figure 2.1 and described in Table 2.1 indicates total value comprising various activities as well as the link between the logistics and other organisational functions.

**Figure 2.1 A logistics view of the value chain of a manufacturing company**



Source: Porter, 1982; adapted by Gattorna & Walters, 1996; Chee & Harris, 1998.

The value chain is thus:

- a dependent system joined by links (i.e. the relationship between performance of an activity and the performance cost of another);
- a way of reviewing the activities of an company which are necessary to provide the service or product; and
- the relationship or link between these activities or links in the chain.



**Table 2.1 The various company activities and functions in the value chain**

<b>Elements of the chain</b>	<b>Description</b>
<b>Support activities</b>	Activities necessary to enhance value and quality of the product or service (providing the infrastructure to carry out primary activities and including technological development, human resources, infrastructure and procurement)
Systems/technology	Activities that include designing the product, as well as the creation and improvement of the primary activity in the value chain
Human resources management	Activities that focus on the acquisition, maintenance and development of a well-trained employee corps
Company infrastructure	Activities creating the necessary organisational infrastructure such as finance, reporting, general and strategic management
Procurement	Activities that acquire the resources for input to primary activities such as the purchase of materials, comprising the acquisition and provision of input with a view to the transition process
<b>Primary activities</b>	Activities necessary to produce or provide the product or service (including internal/inbound logistics, business/operations, external/outbound logistics, marketing and sales, and service)
Inbound logistics	Activities relating to the flow of goods, services and information throughout the organisation – activities concerned with receiving, storing, handling of raw materials and components
Operations	Activities associated with the transition process from raw materials to the final product – activities concerned with assembly, testing, packing, maintenance
Outbound logistics	Activities relating to the distribution and supply of goods and provision of services to the market – activities concerned with packaging, warehousing, testing
Marketing and sales	Activities that connect the end-consumer with the product or service
Customer service	Activities that enhance the value of the product after sales, providing the consumer with a supportive service
Procurement	Although a support activity providing purchased input, as do human resources, technology and infrastructure, it is also increasingly recognised for its strategic and primary importance to a company
<b>Margin</b>	The excess that the customer is prepared to pay over the costs of the inputs and activities

Source: De Bruyn & Kruger, 1998.

Companies in a given industry sector, for example, generally have similar value chains, including activities such as procuring and transporting raw materials, designing products, building manufacturing facilities, developing co-operative agreements, and providing customer service. However, value chains also differ

between organisations, as each has a unique capability profile. As has already been mentioned, the value chain also does not exist in isolation and is connected to the value system of its suppliers, distributors, etc. Therefore, in addition to managing its own value chain, an organisation can obtain a competitive advantage by managing the linkages with its customers and suppliers.

Finally, it is also appropriate to define physical distribution in order to discern between this concept and that of logistics. *While physical distribution involves the movement of the finished product from the factory floor to the final user at the lowest possible cost, logistics is more market-oriented and takes the customer at their starting point and works backward to the producer.* Customer service is a key component of logistics management and is an important logistics activity. This and the other key logistics activities will be briefly outlined in Section 2.1.5.

### **2.1.5 The main logistics activities**

Certain major logistics activities can be identified with respect to the logistics operations and management in a company and its supply chain. (Lambert, et al.1998; Stock & Lambert, 2001). These logistics activities are as follows:

- Customer service
  - Traffic and transportation
  - Warehousing and storage
  - Plant and warehouse site selection
  - Inventory management
  - Order processing
  - Logistics communications
  - Procurement
  - Materials handling
  - Packaging
  - Demand forecasting
  - Parts and service support
  - Salvage and scrap disposal
  - Return goods handling
- } Reverse  
} logistics

In addition to those listed, are the freight forwarding and customs clearance activities that are key to most companies' operations.

A company, depending on the products and/or services that it supplies, may consider some, or all, of these logistics activities core to its business, or of a less strategic nature. Nevertheless all of these activities are important to most supply chains and the manufacturing sector, on which this thesis focuses, is no exception. However, with respect to their suitability in terms of **outsourcing**, only the following activities will receive specific attention in the thesis:- traffic and transportation; warehousing and storage; inventory management; order processing; procurement; packaging; parts and service support; salvage and scrap disposal; return goods handling; and freight forwarding and customs clearance. (Langley, Allen & Newton, 2000; Lynch, 2000; Murphy & Poist, 2000; Burns, Warren & Cook, 2001; Langley, et al. 2002; Lieb & Schwarz, 2002a; Lieb & Schwarz, 2002b).

The following definitions and discussions outline these activities in greater detail. These definitions and discussions only cover those activities, provided in the above list, that are particularly relevant in an outsourcing context.

(i) Traffic and transportation

*The traffic and transportation activity refers to managing the movement of products and includes activities such as selecting the method of shipment (air, rail, water, pipeline, or road, or a combination thereof), choosing the specific route also known as routing, complying with various local, provincial and national transportation regulations and being aware of both domestic and international shipping requirements. (Stock & Lambert, 2001).*

Transportation is the linkage activity in logistics and is often the single largest cost in the logistics process, an important component that must be managed effectively. A variety of options are available for the movement of products to their destinations.

(ii) Warehousing and storage

*Warehousing can be defined as that part of a company's logistics system that stores products (raw materials, parts, goods-in-process, finished goods) at and between point-of-origin and point-of-consumption, and provides information to management on the status, condition, and disposition of items being stored. Warehousing therefore supports the time and place utility of goods by allowing an item to be produced and held for later consumption. (Stock & Lambert, 2001).*

Warehousing is an integral part of every logistics system. It plays a vital role in providing a desired level of customer service at the lowest possible total cost. The warehousing activity is the link between the producer and the customer. Over the years, warehousing has developed from a relatively minor component of a company's logistics system to one of its most important activities.

(iii) Inventory management

*Inventory management involves trading off the level of inventory held to achieve high customer service levels, with the cost of holding inventory which includes capital tied up in inventory, variable storage costs, and obsolescence. (Stock & Lambert, 2001).*

A company might have half of its current assets tied up in inventory. Logistics is thus concerned with all inventory within the business, from raw materials, subassembly or bought-in components, to work-in-progress to finished goods.

(iv) Order processing

*Order processing includes the systems used by an organisation to receive orders from customers; check on the status of orders and communicate with customers regarding orders; as well as actually filling the order and making it available to the customer. Part of the order processing system therefore is the checking of inventory status, customer credit, invoicing, and accounts receivable. (Stock & Lambert, 2001).*

Order processing tends to be a key area for automation, with the order processing cycle providing a key area of customer interface with the organisation. It can therefore have a significant impact on customer perception of service, and consequently, customer satisfaction. As a result, organisations are increasingly implementing advanced order-processing methods to speed up the process and improve accuracy and efficiency.

(v) Procurement

*Procurement, or purchasing and supply management, is the purchase of materials and services from outside organisations to support the company's operations from production to marketing, sales and logistics. Procurement includes activities such as supplier/provider selection, negotiation of price, terms and quantities, and quality assessment. As organisations form longer-term relationships with fewer key suppliers/providers, procurement continues to grow in its importance and contribution to the organisation. (Stock & Lambert, 2001).*

The cost of purchased materials and supplies is a significant part of total costs of most organisations. The procurement function also provides the opportunity for leveraging the capabilities and competencies of suppliers through closer integration of the buyers' and suppliers' logistics processes. Procurement is therefore playing an increasingly critical role in creating and sustaining competitive advantage as part of an integrated logistics process. Leading organisations include these supply side issues in their strategic planning.

Manufacturing must also link into a strategy and plan for procurement. There needs to be unity within the business between marketing, distribution, production and procurement through the tasks of integrated logistics management.

The interface between logistics, manufacturing and other key company functions will be discussed in Section 2.3 of this thesis.

(vi) Packaging

*Packaging provides advertising, marketing, protection and storage for goods. (Stock & Lambert, 2001).*

Packaging performs two basic functions, viz. marketing and logistics. In a marketing sense the package acts as a form of promotion or advertising, attracting customers to and informing them about the product. From a logistics perspective, packaging serves two purposes: it must protect the product from damage while it is being stored or transported, and can also make it easier to store and move products by reducing handling and therefore materials handling costs.

(vii) Parts and service support

*Parts and service support, or after-sale service support, provides repairs, spares and parts to dealers, and ensures the collection of defective or malfunctioning products from customers, and responding quickly to demands for repairs. (Stock & Lambert, 2001).*

The parts and service support activity is very important to industrial customers for whom downtime, as a result of production stoppages or delays caused by awaiting repairs, can be extremely costly. Customer relationship management (CRM) and the use of company or outsourced call centres can play an important role in parts and service support for the company's customers.

(viii) Salvage, scrap disposal and return goods handling

*Salvage and scrap disposal together with return goods handling is often referred to as reverse logistics. It is an element increasingly receiving management attention, particularly as the concern for recycling and reusable packaging grows, and considering the complexity and high cost of return goods handling. (Stock & Lambert, 2001).*

With regard to salvage and scrap disposal, logistics is involved in the removal and disposal of waste materials left over from the production, distribution, or packaging processes. This could involve temporary storage followed by transportation to disposal, reuse, reprocessing, or recycling locations.

Returns may take place, for example, because of a problem with the performance of the product. Return goods handling is complex and expensive due to the movement of mostly small quantities of goods, from the customer to the company, the opposite movement to which its systems are best suited.

(ix) Forwarding and clearing

*Freight forwarders typically purchase transportation capacity from carriers in bulk and sell it to their network of shipping clients, earning a fee based on the spread between the purchased transportation cost and the price sold to a shipping client. A freight forwarder is a classic example of a non-asset based third-party logistics provider which thus by definition does not own the logistics assets and instead contracts out to execute client's logistics needs. (Sopher, et al. 2002).*

The cost advantage of using a freight forwarder is particularly compelling for a shipper aiming to initiate or accelerate international activity. (Burns, et al. 2001).

In summary, the logistics activities discussed in the preceding paragraphs are all involved in the flow of products from point-of-origin to point-of-consumption. Each of these activities plays an important role in determining whether a customer receives the right product at the right place in the right condition at the right cost and at the right time. Managing the various activities as an integrated system should lead to the maximisation of customer satisfaction, as well as to the lowest possible total cost. In this way logistics management can contribute significantly to, and has an important role in, overall company efficiency. Due to the nature and importance of these activities companies often, for example, decide to outsource part, some, or all of these activities to companies with a recognised expertise therein. However, the very nature and importance of these activities may also cause a company to decide to keep them in-house to ensure ongoing control and to personally ensure that service commitments to customers are met. Irrespective of the eventual decision whether or not to outsource logistics activities, the importance of these activities and their role in the company and its service provision must be thoroughly considered and understood by the company. Fully understanding this will better equip management to make strategic decisions, for example with respect to outsourcing.

### **2.1.6 Conclusion**

Logistics and the management thereof play a key role in, and have an important impact on, both the well-being of a company and the economy of a country. The objective of logistics is to consistently supply the correct quantity of the correct product to a customer, in the right condition and at the required place, time and price. The effectiveness and efficiency with which a company and its logistics function achieve this has a significant impact on the competitiveness and success of the company. The important role and impact of logistics thus warrants further discussion and will be elaborated upon in the following sections.





## **2.2 THE DEVELOPMENT OF LOGISTICS MANAGEMENT**

### **2.2.1 Introduction**

From the preceding discussion it may be noted that any movement of goods is largely dependent on logistics and supply chain processes and activities.

The concept of logistics and the management thereof is not a new one. The role of the distribution function (and more broadly logistics), together with the production function, has always been key to solving the economic problem. Society has always required the movement of materials and goods for their existence and particularly their development.

The economic problem however is related to the fact that individuals and society have unlimited needs and wants which must be fulfilled or remain unfulfilled with the limited number of resources at their disposal. The optimum solution of the economic problem is thus the process of obtaining maximum want satisfaction from the available resources. (Begg, Fischer & Dornbusch, 1984). Logistics systems, and the management and improvement thereof, have a key role to play in this solution - increasing customer satisfaction and/or decreasing costs to ensure improved want satisfaction with the available resources. A reduction in the costs of distribution, for example, in relation to other things, increases flexibility for example in the location of industry, the exploitation of natural resources, and the achievement of industrial efficiency. With the development of the logistics function, it is therefore important to note its expansion from an operational (albeit important) activity where the concern of management was focused on mainly on costs, to a strategic function responsible (to a large degree) for the management of resources required to achieve specific levels of customer satisfaction. (Gattorna & Walters, 1996). This development of the logistics function will be considered in more detail in the following sections.

### 2.2.2 The historical development of logistics management

As has been alluded to in the introduction to this section, distribution (and more broadly logistics) has always been **key to satisfying the needs** of individuals and society. Lynch (2000), for example, quotes Ackerman (2000) who suggests that one of the first business logistics arrangements is described in the Bible, in *Genesis* Chapter 41. This is an account of the seven years of plenty during which the people in the land of Egypt accumulated crops for the predicted seven years of famine. The grains and other fruits of their labours were taken to storehouses for safekeeping – the grain was placed in storehouses for later re-distribution during the time of need. Lynch goes on to point out that in Europe, a number of logistics service providers can trace their origins back to the Middle Ages with the first commercial warehouse operations having been built in Venice, Italy in the 14<sup>th</sup> century. Merchants from all across Europe used these as collection and distribution points.

As an area of study, logistics in the US started to receive attention in the early 1900s, with an investigation into the distribution of farm products, as a manner of supporting organisational business strategy, and in its role of providing time and place utility. The Report of the Industrial Commission on the *Distribution of Farm Products* was thus the first text to deal with the costs and factors affecting the distribution of farm products and in 1916 a text titled *An Approach to Business Problems* discussed the strategic aspects of logistics, while a further text *The Marketing of Farm Products* introduced the concepts of marketing utilities and channels of distribution. (Stock & Lambert, 2001). In the 1920s, the term logistics was defined in a way similar to the definition used today.

In the US in the 1930s, Al Capone managed the logistics activities associated with his movement (smuggling) of liquor from Canada to Chicago by **outsourcing** these, in an effort to keep his associates out of harm's way. Since most shipments were subject to hijacking and other unpleasantness, Capone

minimised his risk through strategic alliances with fledgling ambitious and aggressive service providers. Another example of the historical development of logistics in the US commenced in 1971 when Frederick W. Smith used a \$4 000 000 inheritance and over \$90 000 000 in other capital to acquire a Little Rock, Arkansas, used aircraft business. It was Smith's intention to provide an overnight delivery service. In 1973, Federal Express, with 389 employees and 14 Dassault Falcon planes, began operations at the Memphis International Airport. By 2000, it employed 150 000 people located around the world and had a fleet of 648 aircraft and 64 000 vehicles. (Lynch, 2000).

With these few brief historical highlights as a background to the development of logistics management, the *increasing focus on the role of logistics in business* will be investigated. This is particularly significant if the *increasing importance of strategic decisions in logistics management*, such as the **outsourcing of aspects of logistics activities**, is to be understood.

### **2.2.3 The increasing focus on the role of logistics**

As has already been pointed out, logistics activity is actually thousands of years' old, dating back to the earliest form of organised trade. However, due to many societal and economic developments worldwide, the role of logistics in companies and economies, is receiving increasing attention.

A significant impact with respect to the increasing focus on the role of logistics was the contribution which logistics made to the victory of the Allies in World War II, at which time it began to receive increased recognition and emphasis. In the 1950s, with the development of the new corporate philosophy of marketing, logistics came to be associated to an even greater degree with the customer service and cost components of a company's marketing efforts. Companies began to emphasise customer satisfaction at a profit with customer service later becoming the cornerstone of logistics management. Also in the 1950s an

important study of the economics of air freight added a further dimension to the field of logistics. The study introduced the concept of total cost analysis, air freight being the highest cost form of transportation. However, air freight, when used instead of other modes of transportation, could result in lower inventory and warehousing costs as the company distributed them directly to its customers. This text which essentially introduced the concept of total cost analysis to the area of logistics, thus increasing the focus on the important role of logistics, was titled *The Role of Air Freight in Physical Distribution*. (Stock & Lambert, 2001).

Lambert, et al. (1998) further discuss in some detail how the first dedicated logistics texts began to appear in the early 1960s, which was also the first time that Peter Drucker, a noted business expert and author, stated that logistics was one of the last real frontiers of opportunity for organisations wishing to improve their corporate efficiency. Also in the early 1960s, Edward Smykay, Donald Bowersox, and Frank Mossman wrote one of the first texts on logistics management. The book examined logistics from a company-wide perspective and discussed the total cost concept. In 1963 the National Council of Physical Distribution Management (now the Council for Logistics Management – CLM), was formed to develop the theory and understanding of the distribution process, promote the art and science of managing distribution systems and to foster professional dialogue and development in the field. During the remainder of the 1960s, on into the 1970s, and still, a multitude of textbooks, and conferences were devoted to the subject of logistics management.

Deregulation of the transport sector in the US in the late 1970s and early 1980s gave organisations more shipping options, increasing competition within and between transportation modes. As a result, carriers became more creative, flexible, customer-oriented, and competitive in order to succeed. The trend in industry moved from businesses undertaking the many different aspects of running their organisation, to their **focusing on their core businesses and**

**outsourcing** activities such as transport. This was made possible because of the competition between the different transport providers and the solutions provided by logistics and technological providers. The added benefit to the end user of innovative and additional service elements, as provided by logistics companies, became well recognised. (Lambert, et al. 1998).

During the 1970s and 1980s, many companies also found it increasingly difficult to maintain traditional profit levels and growth rates because of increasing domestic and foreign competition, saturated markets, government regulation, and other factors. Accordingly Stock and Lambert (2001) point out that an organisation can pursue one or more of three basic strategies in a profit-squeeze situation. First, it can attempt to generate additional sales volume through increased marketing efforts. However, this may be very difficult and costly as incremental sales increases in saturated or highly competitive markets are hard to achieve while in low-growth markets, the rate of growth may be less than the company needs to generate additional sales. Even in high-growth market situations, a company may be unable to achieve desired sales increases because of resource problems, competition, and other market conditions. A second way to improve profitability may be to increase the price of the company's product. Again, such increases may not be possible given market conditions and depending on demand elasticity, price increases may not have the desired impact on sales. Furthermore, companies hesitate to increase prices unless higher costs of materials, production, or labour make those increases unavoidable. Therefore, a third strategy, that of reducing the organisation's costs of doing business, has been the one most companies have pursued. As companies have looked inward attempting to identify areas for cost savings and/or productivity increases, most have found logistics to be an area with the most potential for significant cost savings. Already during the 1970s therefore, the notion was proposed that the problems of sub-optimal performance might be overcome if sub-optimal performance in one, or even two, of the distribution activities be accepted (even introduced) and that the economies obtained from the other activities would

lower the overall costs of the distribution function. This is what happened and once the behavioural issues and problems had been overcome, stronger and much more effective distribution functions became available. (Gattorna & Walters, 1996).

At the same time there has also been a proliferation of products and services, with manufacturers beginning to offer their standard product in an increasing number of colours and patterns, often merely to increase the shelf-space they could command in a retail outlet. Often, however, each different product line had to be handled separately in the company's distribution system resulting in various problem areas and the need to analyse, evaluate and assess the causes and institute correction. Furthermore, it was variously estimated that in the 1970s physical distribution costs (as a percentage of sales) could vary between less than 10%, to in excess of 40% of sales revenue. (Gattorna & Walters, 1996). By this time physical distribution managers were also becoming very much part of the organisational structure of many companies.

By the 1990s many organisations were also evaluating their business processes to determine whether there was a better way of performing them, with logistics presenting a major functional area where re-engineering efforts have resulted in significant improvements. The supply chain management approach has also been recognised as an important concept, its development and implementation being initiated in many industries. The significance for the development and increasing focus on the role of logistics is the notion that multiple organisations and functional areas can integrate their efforts to optimise their individual and combined performance, leading to the development of a systems approach throughout the entire channel of distribution. (Stock & Lambert, 2001).

Globalisation and technological advancements have also made the marketplace increasingly competitive, and the role of logistics in the success of the company more crucial. It has furthermore become inadequate to merely provide products

to the customer, the company must offer value in many forms, and an increasing number of companies are looking to logistics to provide this value to the customers. As a result of the fact that buyers prefer to do business with sellers that provide excellent logistics service, many more companies are using logistics to differentiate themselves from competitors. Logistics managers can also no longer afford to work without considering all components of the system and taking into account how any changes will affect the overall cost of the company's distribution function. The fact is that logistics decisions and policies can influence the company's total sales as well as the cost of its operations.

Information technology and communications have been an important element in the distribution process and increasing awareness of the role and contribution of logistics. Computer technology and distribution software have thus further increased the interest of businesses in logistics management. The development of computer technology has allowed executives to manage and implement logistics management much more effectively and efficiently than ever before. Companies can improve their cost efficiency because of the speed and accuracy of the computer; they can use sophisticated techniques to manage and control activities such as production scheduling, inventory control, and order processing. (Stock & Lambert, 2001).

Such advances, and the resulting impact on the company's marketing, production, and financial activities, together with many other factors such as those discussed above, have been instrumental in creating top management awareness of logistics. In turn, top management has elevated the priority of logistics investment in systems and communications. (Delaney, 1999). In many companies and countries this is ongoing, as is the increasing focus on the role of logistics in general.



#### 2.2.4 Current and continuing logistics trends

From the above discussions and outline of the developments leading to the increasing focus by businesses on the importance of logistics, it is clear that companies need to recognise the role and importance of logistics management. They need to use logistics as a competitive weapon to secure and maintain customer loyalty. *Companies must aim to be increasingly responsive and flexible, committed to their customers, aware of their results, working closely with their suppliers and providers, embracing technology, and committed to developing and maintaining strategic direction. Logistics management will continue to be a key element of such aims and direction.*

According to Davis and Drumm (1999) the first step in achieving significant improvement in both cost and service is a thorough review of logistics policies, practices and systems, particularly where they result in **unsatisfactory performance levels**. Customer service performance, for example, needs to be accurately measured and the results compared to what the customer wants and what world-class competitors are giving. Transportation and warehousing costs and practices should also be evaluated in terms of their competitiveness and their impact on customer service performance. Furthermore, inventory management and planning, key elements in controlling costs and meeting service goals, must be structured to assure good service and low cost.

A critical review of logistics policies, practices and systems is therefore an important way to determine what management needs to do to achieve high customer satisfaction and acceptable cost levels. Excellence in logistics is an important competitive capability and it is becoming increasingly difficult for companies to catch up with world-class logistics competitors. Some companies are giving excellent service and are still reducing the cost of providing it. (Davis & Drumm, 1999).

**World-class organisations** are, and will continue to be, characterised by flexibility, responsiveness, customer focus, use of information technology and continuous improvement, where *world-class implies an international reputation for overall effectiveness*.

According to Gattorna and Walters (1996), the use of **information technology** is also a key trend and offers the following key attributes and contribution to creating competitive advantage:

- Accurate and reliable information input for decision-making
- The ability to respond rapidly
- Greater knowledge and therefore understanding of the marketplace
- A means of differentiating the business to reinforce its competitive advantage

It should be noted however that information technology is a means to an end; it is not an end in itself. It provides a company with the capability to maintain flexibility, responsiveness, customer focus, and continuous improvement.

**Continuous improvement**, particularly in the field of logistics, is key to a world-class, and indeed a leading-edge, organisation. (Gattorna & Walters, 1996). Therefore, to achieve continuous improvement there are certain supporting concepts a company should implement:

- Best practice and benchmarking
- Outsourcing where such an action will add extra value to the organisation
- Empowerment of employees
- Corporate strategies to expand the company's knowledge asset base
- An incentive-led innovation policy

For long-term success, continuous improvement is the key to differentiation and therefore to achieving sustainable competitive advantage. Successful organisations respond faster, more effectively and efficiently than competitors, doing so on a global basis. Furthermore, to ensure success continues, the world

class organisation must monitor its marketplace and competitors, and constantly be aware of processes that could enhance its position through the process of best practice and benchmarking.

With regard to the important concepts of **best practice and benchmarking**, Gattorna and Walters (1996) provide the following introduction: *Best practice is widely considered to be about doing things in the most effective manner, usually focusing upon a specific and key activity or operation such as customer service. Best practice is identified by searching for companies who, in similar situations excel, and then analysing the reasons for that success in terms of activities, functions and processes conducted within the business. In order to assess best practice, some form of measurement criteria needs to be applied. It is here where benchmarking is useful. Benchmarking provides insight into businesses, their processes and performance and identifies gaps between best practice and the current operating environment. Therefore benchmarking provides an insight into how best practice companies achieve superior performance as well as their objectives.*

**Performance measurement** is thus key to benchmarking. In order to effectively manage a supply chain, it is necessary to benchmark and measure operations, making it possible to determine effectiveness and remove operational constraints. Significant productivity benefits and operational improvements can therefore be realised by implementing high quality performance measuring systems. Measurement of performance and success in key areas, is also crucial to determining progress towards achieving strategy. An important measure of supply chain performance, for example, is the extent to which the company's end-user markets are being satisfied. This would include measures such as product availability and adequacy of customer service. It is also important for the company to focus on future success by setting objectives and measuring performance from a financial, customer, internal and learning/growth perspective. Apart from quantitative data for performance indicators, qualitative data or

feedback also forms an essential part of the complete performance picture. Both types of information need to be available and properly integrated for successful performance measurement. A balanced view of the organisation is one that includes a combination of traditional measures of historical financial success or failure, as well as indicators of areas that must change and improve in order to deliver future success. In the end, the best measures will always be that combination that are important to the customer and bottom-line.

To continue the discussion of best practice and benchmarking, these are thus practices which offer organisations the opportunity to identify and replicate the practices and methodologies of successful world-class companies. It is important for companies therefore to also *continuously seek best practice in logistics* which may or may not, for example, include **outsourcing certain logistics activities**.

Well-implemented best-practice activities should enable a company to copy successful companies while benchmarking ensures that the high levels of performance that are implemented are maintained and updated. However it must also be realised that context is key and practices overseas must be evaluated from a South African perspective. In the context of this thesis, therefore, the outsourcing practices in South Africa will also be considered relative to various best practices in logistics outsourcing currently implemented in the US.

While world-class is a key concept and status for companies to strive for, **leading-edge companies** go one step further and not only seek an international reputation for overall effectiveness in terms of flexibility, responsiveness, customer focus and continuous improvement but also a competitive edge and position of enduring superiority over competitors, in terms of customer preference. Leading-edge companies will therefore have, for example, a superior level of logistics competency and use logistics as a competitive weapon to secure and maintain customer loyalty. They are more responsive, flexible,

committed to their customers, and aware of their results; work more closely with their suppliers, are more likely to embrace technology, and are more involved in their company's strategic direction.

Therefore, leading-edge companies:

- Use logistical competency to gain and maintain competitive superiority
- Add value to the products and services they market, supporting this goal by operating a cost-effective logistics system
- Leverage their assets by forming strategic alliances with service providers. These alliances help companies achieve preferred-provider status with key customers.

*Companies implementing innovative methods, systems and technologies to better manage their logistics activities and the integration thereof, are thus often referred to as leading-edge companies or organisations.* Logistics management has the potential to assist the organisation in the achievement of both a **value advantage and a cost/productivity advantage**. (Christopher, 1998; Gattorna & Walters, 1996).

These various trends, developments, and important concepts and strategies, together with reductions in trade barriers and economic integration, have also encouraged an increase in **world trade**. Companies seek to take advantage of these trends by entering new markets or looking to participate in global markets. **Globalisation** can be seen as a positive force for change that has the potential to raise living standards and drive economies forward. It also brings positive benefits for consumers, in particular, helping to increase choice, drive down prices, improve services and create new jobs and opportunities. With the effects of globalisation being felt in the majority of markets, companies need to adopt a global perspective, identifying competitors, new products and opportunities. The trend towards global organisation of both manufacturing and marketing is also

highlighting the critical importance of logistics and supply chain management as the keys to profitability. (Chee & Harris, 1998).

The **complexity** of the logistics task is furthermore increasing exponentially, influenced by factors such as increased **ranges of products**, shorter product life **cycles**, marketplace **growth** and the number of supply/market **channels**. The main objective in managing the global logistics system is to meet customer service levels at the lowest cost. All the different logistics aspects need to be co-ordinated, and companies need to look carefully at both savings opportunities and the additional costs which may be incurred when making adjustments in parts of the logistics system. (Chee & Harris, 1998).

In summary therefore of the current and future scenario for companies, and the development of logistics management, companies should be continuously seeking ways in which they may improve their operations. The concepts discussed above and other supporting strategies available to a company, such as the decision to outsource, where such an action will add value to the organisation, can increase the cost-effectiveness and efficiency of a company's operations. Management should set objectives for the supply chain and individual members, and measure actual performance against planned performance. Evaluation measures should be developed over time and be used to identify problem areas. Measures of performance with respect to value created for customers and the profitability of the supply chain and its members should receive particular attention. When management evaluates the supply chain structure it must also compare the company's ability to perform the activities internally with another member's ability to perform these activities. It is also important to remember that for the supply chain, the goal is, by means of integrated logistics management, to improve overall efficiency, which may be achieved by means of various logistics management and strategic options, such as the practice of outsourcing which will be dealt with in greater detail in Chapter 3.

### 2.2.5 Conclusion

For logistics and supply chain management the goal will continue to be improvement in overall efficiency by means of integrated logistics management and sound logistics decisions. The various logistics activities, and the integrative management thereof, will play an ongoing and important role in determining whether a customer receives the right product, at the right place, in the right condition, at the right cost, and at the right time. Managing the various activities as an integrated system must lead not only to the maximisation of customer satisfaction, but also to the lowest possible total cost. In this way logistics management can contribute significantly to overall company efficiency, competitive advantage and profitability.

Effective logistics management can therefore provide a major source of competitive advantage. Many of the discussions of logistics and supply chain management and the associated processes and activities refer to the competitive advantage which efficiencies therein provide for a company.

Another important area for increased efficiencies will continue to be the trend toward the **outsourcing of logistics requirements**, which holds the potential to optimise the role of logistics in a company. This in turn may lead to many improvements and other possibilities for a company as it is freed up to refocus on its core competencies. *It may increase customer service levels, reduce capital requirements, increase profitability, reduce supply chain costs due to economies of scale, simplify industrial relations, help companies keep up to date with world-wide technological trends, and introduce innovative ideas and concepts.*

Logistics decisions therefore are, and will continue to be, key to corporate profit and performance and indeed in the growth of a country's economy and competitiveness.

The role of logistics in a company's overall strategy is key, as are the strategies within the logistics function itself. It is therefore most important to consider, in further detail, the micro-economic role of logistics or otherwise stated, the role and importance of logistics in the company. The following sections will discuss in more detail this role of logistics and the management thereof.

## **2.3 THE MICRO-ECONOMIC ROLE OF LOGISTICS MANAGEMENT**

### **2.3.1 Introduction**

As was already discussed in Chapter 1, and the preceding sections of this chapter, logistics can play a key role in the competitive advantage of a company, notably by enabling the company to find ways in which to perform strategically important activities, or ensure that these activities are performed, more efficiently than its competitors. As was mentioned, for example, in Sections 2.1.2 to 2.1.5 of this chapter, the recognition of the cost and service impact of logistics is an important step for companies. Managing the various important logistics activities as an integrated system should lead to the maximisation of customer service as well as lowest possible cost. Companies that successfully implement innovative strategies to better manage their logistics requirements will be better equipped to increase their competitive advantage and corporate profitability and to become market leaders.

An efficient and effective logistics system should form the basis of a company's overall customer service and marketing strategy. The impacts of the system, in turn, on the finance, marketing, manufacturing, and other functions of the company such as human resources and information technology, must also be considered and planned for.



It is also important to consider that logistics is a complex framework of relationships between manufacturer and consumer, employer and employee, manager and shareholder, and members of the business and the community in which the business operates. Having a supply chain view of these relationships, and the operations involved, represents a great opportunity for suppliers, manufacturers, and retailers to improve productivity and efficiency, and therefore revenues and profits. The key for trading partners is to understand what constitutes their supply chain, i.e. all the activities involved in supplying a product to the end customer.

Logistics management therefore has a key role in a supply chain, and in particular in the member companies, for example in contributing to their **customer satisfaction** and **total cost reduction**, as well as company profitability.

As logistics management affects company **profitability**, it also impacts the **shareholder value** of a company. This is particularly significant as companies are increasingly being driven by the goal of enhancing shareholder value, a key measure of corporate performance.

Logistics performance and its connection with company profitability, shareholder value, customer satisfaction, and the extensive use of resources, also has a significant impact on the economy of a country; however only the impact of logistics from a micro-economic point of view on company profitability and performance, and other company functions, will be considered in more detail in the following discussions of Section 2.3.

### **2.3.2 Logistics and company finance and profitability**

Every aspect of a business has an influence on the profitability of a company, be it positive or negative. It is therefore essential to consider, understand and evaluate the importance of the functions of each department within the company

and their influence on its profitability. The logistics department, for example, plays a key role in the company in terms of delivering the product to the target market, providing customer satisfaction, and ensuring that the costs thereof are minimised to ensure that the company is competitive and profitable.

**Profitability** is a key concept for any company. For each possible output level, a company needs to know how much it will cost to produce and distribute this output as well as how much revenue will be earned by selling it. For each output level, these costs depend on technology that determines how many inputs are needed to provide this output, and on input prices that determine what a company will have to pay for these inputs. The revenue obtained from selling output depends on the demand for the company's output in the market. This demand determines the price for which any given output quantity can be sold and thus the revenue that the company will earn. It is therefore the interaction of costs and revenues that determines how much output companies will wish to supply. Profits then are the excess of revenues over costs. Furthermore as companies have the objective to make as much profit as possible, it is important that they examine how revenues and costs change with the level of output produced and sold, in order to make decisions that will maximise their profits. (Begg, et al. 1984). Therefore, *a company's revenue is the amount it earns by selling goods or services in a given period such as a year; its costs are the expenses incurred in producing and distributing goods or services during the period; profits are the excess of revenues over costs, and profitability is the yielding of profit or gain.* (Begg, et al. 1984).

Since logistics costs can account for such a large proportion of **total costs** in the business it is critical that they be carefully managed. However, the true costs of logistics are not always fully understood. (Christopher, 1998). According to Nell (2001) it is critical that companies understand that the logistics industry is as much a cost management industry as a sales and utilisation industry. He further asserts that one of the most basic and fundamental aspects of business

is a good knowledge of the costs thereof. For most business operators it is common sense to know their costs, selling price and subsequent profit or loss. However, this is more straightforward if the company is selling a product it has bought, while for manufacturers it is more complicated with additional calculations like cost of raw material, cost of manufacturing, cost of transport, and cost of warehousing to name but a few aspects.

In this regard, unprecedented opportunities exist today for companies to adopt radically new business designs that maximise customer utility and profits. However too often supply chain network design projects focus solely on detailed modelling of internal operating costs where great care is taken to capture the functional costs of manufacturing, warehousing, transportation, and inventory and then, using powerful computer-based optimisation tools, to identify the least-cost network. The typical design objective is to ascertain the optimal number and geographical placement of internal company facilities and to specify distribution flows subject to simplified customer-service constraints. Although this approach has provided significant operational benefits to companies in the past, it falls short of creating optimal value. The most innovative and profitable companies are therefore replacing traditional linear supply chains with value nets or the concept of supply networks. *Value networks are therefore integrated networks that simultaneously connect customer needs to component sources, product assembly, rapid delivery options and support services.* (Bovet & Frenzler, 1999). By taking this approach to network design, companies can provide customers with tailored products and solutions, delivered quickly and cost competitively. This, in turn, translates into **higher profits and enhanced shareholder value**. Sinclair (2002) adds that supply chain success stories should increase shareholder value and the larger the company, the larger the savings from an efficient supply chain which has a substantial impact on shareholder investment as it maximises return on funds employed through reducing operating costs.

By the same measure, however, lower profits and share failure can result from supply chain problems, and the more problems experienced the greater the impact. Ineffective management of supply chains thus destroys significant shareholder value. Supply chain problems such as those that cause production and shipping delays decrease the value of company shares by 20%. Furthermore, significant losses occur irrespective of which link in the supply chain (supplier, manufacturer, or customer) is responsible for the problem and companies that experience supply chain problems caused by supplier or customers still lose about 9 to 12% of their market value. (Sinclair, 2002).

In summary, developing an effective supply chain, benefits the bottom-line and shareholder value of a company. This concept of the bottom-line: became the driving force of the late 20<sup>th</sup> century due to the turbulent business environment as was discussed in Section 2.2 of this chapter, and which produced an even greater awareness amongst managers of the financial dimension of decision-making. This 'bottom-line driving force' came to, perhaps erroneously, determine the direction of a company and in some cases this led to a limiting and potentially dangerous, focus on the short-term with the result that investment in brand, research and development, and capacity were, and are, often curtailed if there is no prospect of an immediate pay-back. Just as powerful an influence on decision making and management horizons is cash flow. Strong positive cash flow has become as much a desired goal of management as profit. Another financial dimension to decision-making, is resource utilisation and specifically the use of fixed and working capital. A pressure in most organisations is therefore to improve the productivity of capital. (Christopher, 1998).

For an organisation to grow, management also needs to **attract capital** from existing and potential shareholders. The better the performance of that company's share price, the easier it is to raise capital and share performance is closely related to both a company's revenue growth and its return on assets (ROA). Flood (1999) thus asserts that *ROA is a better measure than profit*

*margin in evaluating performance relative to the investment that has been made.*

Thus the ability to generate more revenue from the capital invested in the business has to be evaluated, in addition to profit margin, in order to assess overall performance. There are numerous benefits for logistics management from quantifying the estimated **financial impact of supply chain improvements**, including the following:

- Understanding the risks involved in various scenarios related to the implementation of logistics initiatives
- Focusing on the right measures for example ROA
- Communicating effectively with the company's financial management
- Forecasting economic value added (EVA) improvement and thus corresponding share price
- Quantifying the value contributed by the logistics function, which is also useful as a basis for logistics management compensation programmes
- Accelerating the swiftness of making decisions
- Shifting the focus from cost reduction to value generation

Companies therefore also need an effective means to quantify the **future value of logistics changes** as this will greatly contribute to their ability to make the right decisions. Furthermore, providers of supply chain solutions need to focus on maximising the return on investment for their clients. It is vital that companies understand the concept of an effective and optimised supply chain. (Gillingham, 2002).

**Supply chain improvements** can have a profound impact on financial results. Flood (1999) in discussing the contribution of logistics to the bottom-line and the quantification of the financial impact of supply chain improvements, points out that logistics managers are furthermore concerned about the financial impact of logistics activities due to the **pressure** that these managers receive from the following sources:

- Customers who want to order the company's products via the Internet; have them delivered within a tight timeframe; and have them customised to their liking and returnable if they do not like them
- Suppliers who want to send their materials JIT; integrate with the systems of the company; and institute a consignment programme
- Executive management who expect the company's logistics function to streamline processes; expand internationally; pursue **outsourcing** of some activities; evaluate supply chain management software; while at the same time reducing logistics costs.

While these are just some of the responsibilities of logistics management, each of them has an impact on financial value. In addition, there is the pressure from shareholders regarding share performance.

The role of logistics in the financial performance of a company also necessitates more active involvement by **senior management** in the performance of their company's supply chain. Sinclair (2002) asserts that avoiding or reducing the probability of supply chain problems will prevent shareholder destruction, which is the flipside of shareholder creation. It is also important therefore that senior management understands the company's core business to make informed decisions as to, for example, which of the associated logistics activities it is suited to undertake in-house and which should be outsourced, and how this should be done. It is, however, important to note that should the company choose to outsource its logistics activities, it will still require management to ensure the distribution of its products in the most profitable way.

There are also other areas in logistics management to which senior management can look in terms of improving corporate profit performance. In an uncertain economic environment, for example, senior management will be particularly interested in **asset management and cash flow management**. The most common strategies used to improve cash flow and return on assets are the reduction of

accounts receivable, and the reduction of the investment in inventory. When management decides on a reduction in accounts receivable and/or inventories, its objective is to improve cash flow and reduce the company's investment in assets. However, simply reducing the level of inventory can significantly increase the cost of logistics if current inventories have been set at a level that allows the company to achieve least total cost logistics for a desired level of customer service. The unconsidered reduction of accounts receivable and/or inventories, in the absence of technological change or changes in the logistics system, can have a devastating effect on corporate profit performance. In the same way, company policy to reduce inventory levels and thereby investment in inventory, in the absence of a system change, may increase transportation costs and/or production set-up costs as the logistics system tries to achieve the specified customer service levels with lower inventories. (Christopher, 1998).

The unconsidered policy to reduce expenses, by excluding the use of premium transportation or increasing production set-ups, to achieve the desired customer service levels with less inventory, can have further disastrous effects. In this case, customer service levels would be decreased, and a decrease in market share might result. In either set of circumstances, the increased cost of transportation and/or production, or the cost of lost sales, could far exceed the savings in inventory carrying costs. Christopher (1998) goes on to assert, however, that if management concentrates rather on systems changes that improve logistics efficiency and/or effectiveness, it may be able to satisfy all of the company's objectives. For example, by replacing an outdated order processing and information system, a company may be able to achieve:

- increased customer service levels
- lower inventories
- quicker collections
- fewer split shipments of orders
- decreased transportation costs due to freight consolidation
- lower warehousing costs

- improved forecasting accuracy and production planning
- improvement in cash flow and return on assets.

If an advanced order transmittal, order entry, and processing system, for example, would allow a company to reduce its annual out-of-pocket costs for transportation, warehousing, and inventory by a lot more than the annual cost of such a system, the cost would be more than recovered. In addition, if such a system made it possible to reduce accounts receivable and inventories, the company would enjoy improvements in both cash management and return on assets. Improvements in return on assets and cash flow received, through increased productivity, have an additional benefit in that they do not force other channel members to react in a way that would have a negative impact on channel efficiency. The primary benefit to the manufacturer, for example, is that the cost savings associated with a reduction in accounts receivable or inventory is not offset by the costs of reduced service levels or increased transportation costs. This is a key illustration of the important role that logistics, and improvements in the efficiency and effectiveness thereof, can play in the financial performance of a company.

As has already been alluded to, it is therefore **critical for senior management to be aware of the financial impact of logistics decisions**, or rather *the role which logistics plays in impacting the bottom-line of a company*. Financial management is naturally concerned with the efficient use of the company's capital. The design and operation of the logistics system requires many trade-offs between commitment of capital, reduction of operating costs, and improvement of delivery service. These conflicts can be reconciled by a policy with respect to the value or availability of capital in the logistics system. This policy is often expressed in the form of a capital cost or required return on capital investment. It is important that management recognise that capital in the logistics system does cost money, although the cost does not appear on any expense statement other than the implied opportunity cost of capital. A well-designed logistics



system thus makes a major direct contribution to the financial control of the company. If the system is under stable control, management can be confident that sudden unexpected surges in requirements for capital will not occur. The techniques used to design and manage the system can also be used to predict future capital requirements to support demand projections. Reasonable prediction of logistics system **capital requirements** is a key element in the **cash forecast**, the key **financial planning** instrument. Finally, a well-designed **logistics control system** is adaptable to changes in circumstances, including changes in capital availability. It is also important to note, that full implementation of integrated logistics is based on total cost analysis, and the true potential will not be reached until the required cost information is made available to decision-makers. The future potential of the integrated logistics management concept thus depends on the ability to obtain the necessary accounting information. The **availability of logistics cost information** should be a primary concern of management. Developing logistics cost information for decision-making and control is a most critical task. (Stock & Lambert, 2001).

Integrated effort, cost reduction and customer satisfaction are key in the role of logistics in **company profitability**.

In summary, it is important for senior management to keep in mind therefore that various impacts and implications of logistics management on the finances and profitability of a company, as discussed in the preceding paragraphs, will also lead to an impact on shareholder value of a company. Logistics performance has a strong link to, and role in, shareholder value. This connection between logistics performance and shareholder value is not only the impact that logistics service can have upon net operating income (profit) but also the impact on capital efficiency (asset turn). Many companies have come to realise the effect that lengthy supply chains and highly capital intensive logistics facilities can have on the creation of shareholder value. As a result these companies have focused on finding ways in which pipelines can be shortened and, as a result, working

capital requirements reduced. At the same time they have looked again at their fixed capital deployment of distribution facilities and vehicle fleets and in many cases have removed these assets from the balance sheet through the use of third party logistics service providers. (Christopher, 1998).

As has already been alluded to, an important strategy for cost reduction is the option for a company to **focus on its core competence** and outsource many of its logistics activities. **Outsourcing**, for example, enables a company to distribute its products in the most competitive manner, by avoiding all unnecessary costs that may be incurred by undertaking certain distribution activities itself. Logistics does, however, play a more varied role than this, in terms of possible cost reduction for a company – as has been discussed in the preceding paragraphs, while outsourcing will be discussed in further detail in Chapter 3.

### **2.3.3 Logistics and marketing**

As has been noted, logistics not only plays a key role in company profitability and therefore the financial function of the company, but plays a key role and has an important impact on other critical company functions. As was previously mentioned, the logistics department plays a key role in the company in terms of delivering the product to the **target market**, providing customer satisfaction, and ensuring that the costs thereof are minimised to ensure that the company is competitive and profitable. *Logistics can be a source of competitive advantage for a company in the same way that a good product, promotion, and pricing strategy are.* Distribution can be used as the primary reason why the target market will purchase the product, and can be designed as a unique offering that will not easily be duplicated by competition.

One of the key elements of a successful business is **customer satisfaction**. No business can survive without a strong customer base, and it is therefore essential to supply a quality product as well as provide a quality service to the

customer. A combination of quality products and quality service along with assisting the customer to be competitive in their own market, is the key to a strong customer base. The basis of a strong customer base is therefore customer satisfaction. It is essential that each internal department of the company contribute positively to fulfil the needs of the customer and add value to the customer's business. *The logistics department plays an extremely important role in customer satisfaction. They hold the key to a major part of quality service for the customer, including elements such as order placement and processing, and the delivery of the product on time, in good order and at the correct destination.* **Positive, detailed and adequate interaction** between the customer and logistics department normally creates a strong relationship between the two parties. By taking care of unwanted situations and problems, and ensuring smooth deliveries, the logistics department can provide the customer with the best possible service at all times. On-time delivery, short lead times, product delivered in good condition, and effective handling of problems, therefore, are key to a company attempting to increase customer satisfaction and sales. Today companies are confronted with shorter product life cycles, increasing product lines, shifting distribution chains, and changing technology. Effective logistics management is now an essential ingredient of competitive success. Companies that view logistics as an offensive marketing weapon will make logistics an integral part of their business strategy. (Stock & Lambert, 2001).

Many companies are recognising the important role that logistics, and the management thereof play, and indeed the importance thereof in the strategic decision-making process. In a broader sense, therefore, logistics should also play an important role in determining the **overall company response to market opportunities**, for example, decisions to expand globally. Although it is beyond the scope of this thesis to investigate the reasons as to why companies extend operations internationally, suffice to say that the **ability to compete on a global basis** is becoming an essential consideration for many companies and

globalisation of industrial activity has become a major issue in business. Key to both the growth of the company and of the economy therefore is the move to international and global marketing of products of companies and indeed countries. However, this has major implications for supply chain management and is impossible to accomplish without considering the role that logistics will play therein. *Global logistics must therefore be defined as the design and management of a system that controls the flow of materials and products into and out of global companies.* (Chee & Harris, 1998).

As markets become increasingly competitive, therefore, the direction adopted by supply chain managers should be in response to the characteristics of global competition, particularly the move towards standardised yet customised product and service offerings, shortening product lifecycles, **outsourcing** and offshore manufacturing, and the convergence between marketing and manufacturing strategy. It is important to note that international marketing takes the activities of the company beyond exporting by becoming more directly involved in the local marketing environment. The implications for supply chain management is that the exporting company manufactures and distributes from its domestic base but also may require both manufacturing and logistics facilities operating in foreign territories. All distribution decisions, with regard to warehousing, transportation, inventory control and order processing, also need to be consistent with the product, promotional and pricing strategies for the global market. The task of co-ordinating all these activities in the global market place is complex as there are many factors that could impact on the flow of materials and products. However, logistics has become a potential source of competitive advantage for companies in the global market place. Effective management of logistics can save the company time, costs, and increase its reliability in the global market place. Particularly important with regard to the role of global logistics in a company's expansion strategies, and in addition to the preceding discussions, are considerations of structure and control, customer service management,

**outsourcing** and **partnerships**, logistics **information**, global transportation and global inventory control. (Chee & Harris, 1998).

At the same time international marketing decisions will have the following further important impacts as identified by Stock and Lambert (2001), on the logistics function:

- There will be an increasing number of logistics executives who will have international responsibility and authority
- There will be expansion of the number and size of foreign trade zones
- There will be reduction in the amount and increased standardisation of international paperwork and documentation, especially the bill of lading
- There will be an increasing utilisation of foreign warehousing owned and controlled by the exporting company
- There will be an increasing number of smaller companies engaging in exporting with larger companies utilising licensing, joint venture, or direct ownership in place of exporting to foreign markets
- Domestically, there will be a trend toward foreign ownership of logistics service companies, for example, public warehousing and transportation carriers
- There will be increasing vertical integration of the channel of distribution, including channel members from several different countries (especially in the acquisition of foreign sources of supply for certain raw materials).

The global marketer also needs to make decisions on distribution density, channel length, channel alignment and logistics. In selecting the various alternative channels available, the company's final choice will be determined by channel costs, coverage, control, continuity, communication, product characteristics, company objectives, competition, distribution culture, and customer characteristics. Once the logistics system has been designed, the global marketer needs to select appropriate and reliable intermediaries, evaluate their performance, motivate them to deliver results and control their activities to

ensure that they implement the company's marketing strategy. The main objective of logistics management, with global marketing, is as always to meet customer needs at the lowest possible cost and improve the logistical system, thereby gaining a competitive advantage for the company.

Whether to compete internationally is therefore a strategic decision that will fundamentally affect the company, including its operations and its management. Nevertheless as global trade increases, with fewer barriers to trade, newly emerging economies, technological change, and production efficiencies resulting in over-capacity in virtually every industry sector, there is greater competitive pressure than ever before. In order to remain competitive in this new global environment, companies will have to continually seek ways in which costs can be lowered and service enhanced, meaning that the role of logistics and supply chain efficiency and effectiveness will be more critical than ever. When investigating any market opportunity, therefore, consideration of the logistics implications allows better decision-making with regard to how the opportunity may best be approached.

Apart from global marketing opportunities and the implications of this new global environment, Gattorna and Walters (1996) identify the following important factors in the external environment facing the marketing and logistics functions in any company:

- Rapidly changing economic circumstances leading to few growth markets and high levels of unemployment
- Market fragmentation whereby a polarisation between upmarket (high quality and high price) and downmarket (low quality and low price) is putting pressure on organisations, with neither of these forms of differentiation, to search for exclusive market niches and develop specialist delivery systems
- Increasing competitive intensity as market growth opportunities decline

Companies and their marketing and logistics functions therefore continue to operate together with all other business functions and activities in a dynamic environment both internally and externally with respect to the organisation itself.

Companies are also increasingly assessing the validity of the make or buy option, in both production and logistics activities. When deciding on company strategies, it is therefore important that management **understand their markets** as well as the behaviour of production and logistics costs. This will provide the company with a competitive benefit as well as facilitating strategic decision-making. It will also assist in ensuring that the structure and strategy most likely to provide long-term profitability will be identified.

In order to effect the successful integration, therefore, of logistics into the **marketing strategy**, the manufacturer should regard the logistics system as an extension of its own marketing department. This must function in such a way that mutual advantages for both manufacturer and intermediaries are achieved. (Van der Walt, Strydom, Marx & Jooste, 1996).

Stock and Lambert (2001) point out that marketing policy and tactics have an important controlling influence on the design and operations of a logistics system. The marketing objective is to allocate resources to the marketing mix to maximise the long-term profitability of an organisation. The logistics objective is to minimise total costs. Marketing requirements establish the servicing limits within which the system must work and marketing tactics impose loads and demands on the physical distribution element of the logistics system that in turn affects its total cost. Marketing management has a huge impact on the design and operating costs of the logistics system. For a customer to be satisfied, marketing and logistics must work together. The overall service must include both physical service factors (logistics) and intangible service factors (marketing). Customer service is a result of overall supply chain management, and marketing

and logistics must work together at all interfaces between the links in the chain, to ensure this.

Marketing can, in particular, have short term impacts on the logistics system where service is measured by the speed with which an item can be provided to a customer; by the reliability with which service is achieved; and by the immediate availability of an item. The wider the product line, the more complex the interaction between marketing and logistics, especially in the areas of manufacturing, order processing, inventory control and transportation. Promotions and special sales can also create specific problems for logistics, similar to those of product line expansions, such as planning, control, rapid response to demand, disposal of surpluses, and the generally limited sales life of these items.

Logistics considerations also have important implications on both the pricing method and pricing structure that a company chooses. For example, in establishing pricing schedules, marketing should give explicit consideration to the characteristics of the distribution system by linking quantity discount schedules to aspects such as full case, full-palletload, or full-truckload quantities. A distribution warehouse that must break down full cases and palletloads to fill smaller orders will not operate as efficiently as a warehouse where the greater portion of its flow-through is in full cases or pallets. Where prices are quoted in terms of the delivered costs, then the economies of full- and less-than-full transport loads should be considered in the pricing decision. Finally, product design also involves important logistics considerations. Products, for example, are often designed with no reference to the impact on the physical distribution thereof. Introducing new items usually causes unexpected physical distribution costs and the marketing value of new product lines must be weighed against the resulting increases in inventory cost, scheduling and organisational complexity, and quality assurance requirements.



In summary then of the logistics-marketing interface, the four P's of the marketing mix, namely product, price, promotion, place, require that for a company to be successful, any marketing effort must integrate the ideas of having the right product at the right price, publicised with the proper promotion, and available in the right place. Logistics plays a critical role particularly in support of getting the product to the right place as a product or service provides customer satisfaction only if it is available to the customer when and where it is needed. (Lambert, et al. 1998).

#### **2.3.4 Logistics and manufacturing**

Logistics management also has a significant impact on other principal management functions within an organisation. Apart from marketing and financial management, these include manufacturing and product engineering.

*The manufacturing function is basically concerned with economy of manufacturing, of conversion of materials, supplies, and energy into finished products and components at as low a unit cost as is feasible.* The more time allowed to manufacturing to plan its activities, combine rounds of like materials or items and assign machines and staff, the more economical the operation, since machines and manpower can then be utilised to capacity. Thus, manufacturing management usually prefers as long a lead-time as possible in planning replenishment or order-filling operations. The manufacturing function characteristically also prefers to have runs as long as possible for making individual products, thus delivering products to the logistics system in relatively large unit quantities. Although these facets of manufacturing are changing with the introduction of more flexible manufacturing systems, they still serve to illustrate the important influence of the manufacturing function and the logistics system on one another. The manufacturing function usually seeks uniformity in the total level or rate of production and simplicity in the mix of products being run. However, *the manufacturing function cannot operate in isolation from the*

*company's market* and **the logistics system is the means for linking the manufacturing function to the market**, and guiding the necessary adjustments to fluctuations in market demand. The systems designed for communicating demand, ordering replenishment, and planning and controlling production, will determine how well the company is able to balance manufacturing and logistics interests. (Stock & Lambert, 2001)

*Other aspects of this interrelationship between the search for manufacturing economy and logistics effectiveness include plant location, control of production levels, and production system design.*

The logistics system can also create **unnecessary difficulties for manufacturing** if components thereof are not managed as an integrated whole. Manufacturing must be prepared, for example, to meet large occasional replenishment orders for items from the various field warehouses and must carry stocks, hold open production capacity, or insist on a long manufacturing lead time to fulfil orders. If, however, the unit-by-unit demand at the several warehouses could be made known to manufacturing and accumulated, the manufacturing function could anticipate when the warehouses would be needing re-supply and could then plan production of the item in a more orderly fashion. Integrated reporting of demand, utilising the methods of controlling inventory in a multi-echelon environment such as distribution requirements planning (DRP), is one technique for co-ordinating physical-distribution requirements with manufacturing efficiency.

The manufacturing function, on the other hand, may cause unnecessary physical-distribution problems through not conforming to schedules or delivery promises or requiring excessive lead-time. Manufacturing management may not realise that its performance is unreliable, or even how important reliable performance is to the operation. It may also not realise that its search for manufacturing

efficiency imposes additional logistics cost or that its lead-time requirements are unnecessarily long.

Sometimes plant and physical-distribution system managers cause unnecessary logistics problems by focusing attention on the wrong level of detail. Key production planning and control decisions are often concerned with managing the availability and use of common tools of machine and/or employee time. The lead-time to adjust total capacity can be long because of the need to hire employees, conform to labour contracts, arrange subcontracts, or procure raw materials. However, within available capacity, the lead time for making one item or another may be quite short. Unless the distinctions are recognised among lead times for production capability changes, raw material procurement, and item specification within available capacity, unnecessarily long lead-times may be set.

Production system design also influences the logistics system. If the production system is laid out in a rigid production line system, inflexibility in the use of equipment and the desire to maintain a uniform load over each line may create service delays or accumulation of unwanted stocks. Modern production systems that employ tools such as flexible manufacturing systems, robotics, automated materials handling equipment, quick set-up and change-over methods, and modern planning and control systems such as manufacturing resource planning and JIT inventory systems provide ways of obtaining greater flexibility without excess set-up cost or old standby capacity.

The product engineer needs the support of the logistics information system when considering a new substitute design of an end product or component. Product engineering requires an effective system of parts identification so that as a new item is engineered, the design can be adapted to use existing parts or materials as far as possible. Once a decision is reached, positive steps are needed to ensure that new designs are incorporated into the desired manufacturing lot or work order of an item. The ordering, inventory control and materials planning systems need to be responsive to the design changes. Modern logistics

information systems generally provide both these information access and planning control capabilities and aid in the integration of product engineering and logistics activities.

*The extension of computer techniques and automation into the manufacturing system fortunately provide the opportunity for simultaneously meeting the goals of manufacturing efficiency and logistics effectiveness.* **Sophisticated information systems** such as electronic data interchange (EDI) support companies within a particular supply chain seeking to reduce operating costs and overall lead times. The master production schedule (MPS) is another attempt to combine the interests of all participants in the supply chain, and in particular those in the production and logistics functions of a company, and to encourage their involvement and commitment to a single document or plan which essentially is concerned with meeting inventory volumes and location requirements within the capacity constraints of the value chain of the company. The MPS thus provides a vehicle to integrate a number of parties into the planning and decision-making process with the result being a superior plan which, when executed, results in superior customer service. (Greenhalgh, 1994; as quoted by Gattorna & Walters, 1996).

However, the introduction of new manufacturing strategies also results in further **challenges for the logistics-manufacturing interface**, but if correctly understood, implemented and managed can lead to further efficiencies in both manufacturing and logistics. JIT is an inventory management strategy that attempts to minimise inventories through the elimination of safety stock. This, for example, has profound effects on logistics systems as products must be delivered at the precise moment, or as near to it as possible, that the organisation needs them. JIT thus requires close co-ordination of demand needs among functional areas such as logistics, manufacturing and marketing, and with other channel members such as carriers and suppliers. Quick response (QR) is another important strategy and exists between manufacturers and retailers to improve inventory

management and efficiency while speeding inventory flows. QR also has had a major impact on logistics operations. Rather than storing products, distribution centres are now charged with moving products which frequently entails cross-docking and therefore no warehousing or storage of the products. The consumer packaged goods sector, especially the grocery industry, has implemented an adaptation of QR called efficient consumer response (ECR) which entails the direct linking of the consumer household, the retail store, the distributor, and the supplier and naturally also has significant logistics implications. (Stock & Lambert, 2001). With the postponement strategy, the final product or offer is not created until the last possible moment. The problem with this strategy is that it can lead to a significant increase in, for example, transport costs. However, according to Christopher (1998), if information on actual end user requirements can be rapidly transmitted upstream and shared between supply chain partners and if, through flexible manufacturing and postponement, the final product can be made on demand, then a significant competitive advantage would accrue. Often the final assembly or finishing of the product may be performed by another partner in the supply chain.

Many logistics service providers are now acting as value-adding parties in an extended, often global supply chain. While the unit costs of manufacturing under a postponement strategy may be higher than under the traditional mass production model, the overall cost-benefit will often be considerable as inventory holding costs fall, obsolescence reduces and customer service improves.

In summary therefore, the relationship and interdependencies between the logistics and manufacturing functions also have important implications for outsourcing decisions or the decision by the manufacturing company to retain certain activities in-house due to the need to exert total control over them.

### 2.3.5 The role of logistics with regard to other key company functions

As has been frequently discussed in previous sections, *effective logistics can provide a major source of competitive advantage to a company, ensuring that it is able to continuously respond more effectively and efficiently than competitors, to customer requirements world-wide.* The various functions within a company are increasingly dependent on logistics management in that, as the importance and role of logistics is recognised, the impact which these functions have on the logistics function and vice versa must receive more focused attention.

It can be said that *logistics system design and management affect many management functions.* These functions may be grouped and named in many different ways in individual companies, but the functions that are affected certainly include **finance and accounting, marketing, and manufacturing.** Responsibilities for logistics activities such as warehouse management, production and inventory control, or transportation may be scattered among several of these major functions. For example, raw material stock control may be the responsibility of purchasing or manufacturing, or a separate materials management group (or split among the three); production planning and control may be the responsibility of manufacturing; and field distribution of inventories and warehouses may be managed by the marketing organisation. Information systems and data processing for production planning and inventory control may be a financial organisation responsibility, or it may be handled by a separate information systems function. Transportation may be the responsibility of manufacturing, marketing, purchasing, or a separate department; the choice often depends on whether the bulk of the transportation expense is incurred in the supply or distribution system, i.e. whether it is inbound or outbound transportation.

There is in business today, however, a growing tendency to recognise that the efficiency of an individual activity or function examined in isolation may be quite different from the effectiveness of the activity or function as part of the total logistics process. As has been mentioned previously, the total cost concept of logistics management requires that compromises must be found among all the functions to obtain a total system operation that achieves a better cost-effectiveness balance. For example, low cost per ton shipped may be a very expensive target for the system as a whole if the traffic function achieves this target by sacrificing speed and particularly reliability of service, or if the mode of transportation chosen makes special packaging necessary.

*The impact of logistics on ancillary functions such as packaging, product design, or manufacturing engineering is also important.* Today for example, more attention is being given to design that yields a product that is easy to pack, store, and ship or that can be tailored by superficial or field modifications to individual customer needs. There must also, of necessity, be close co-operation between the product designer and the logistics system manager to achieve an effective integration of product and logistics system design. Logistics will be affected by the standardisation of components, fragility, packaging, and adjustment of products. There are also important links and relationships between logistics management and purchasing, materials management, transport, production planning, packaging, warehousing, inventory control and information technology.

*All of these links with, and the impact of, logistics management emphasise the growing role and importance of logistics in the company and the requirement for these interrelationships to be considered in detail by any logistician or logistics manager of an organisation, for example, with respect to **strategic decisions and initiatives such as outsourcing.***

### **2.3.6 Conclusion**

For the various reasons discussed in the preceding sections, logistics should have high visibility in companies. Increasingly recognition is being given to the contribution that logistics activities, and the management thereof, can make towards the successful and efficient functioning of an organisation. Logistics is a definite asset to a company. An efficient and economic logistics system is therefore similar to a tangible asset on a company's books. It cannot be readily duplicated by the company's competitors. If a company can provide its customers with products quickly and at low cost, it can gain market share advantages over its competitors. It might be able to sell its product at a lower cost as a result of logistics efficiencies, or provide a higher level of customer service, thereby creating goodwill. Although companies do not identify this asset in their balance sheets, it theoretically could be shown as an intangible asset, a category that includes items such as patents, copyrights, and trademarks. (Christopher, 1998; Stock & Lambert, 2001). Logistics practitioners have a major opportunity to reduce their companies' logistics costs while improving customer service. However, research shows that few logistics organisations are achieving significant improvement, with the resulting gap between the world-class performers and their competitors growing. (Davis & Drumm, 1999).

As part of the company's marketing effort, logistics also plays a key role in satisfying its customers and achieving profit for the company as a whole. Effective logistics management improves the marketing effort of the company, which can create advantage in the market place, by providing efficient movement of products to customers, and time and place utility to products. Logistics must also work closely with manufacturing as it supplies required materials and services to the production function, manages the flow of work-in-progress within the organisation, and ensures that the manufactured items are stored, shipped, and received on time. (Stock & Lambert, 2001).



Furthermore, with the development and increasingly important role and recognition of logistics, the distribution function no longer comprises a small number of activities and functions that were seen as individual in their nature and owned by departmental managers. (Gattorna & Walters, 1996). Logistics management increasingly involves the co-ordination of the activities of traditional distribution together with liaising with purchasing, materials planning, packaging, information technology and even research and development. In addition, logistics managers are becoming increasingly involved in supply markets and in customers' logistics issues. Within the business, logistics management is also becoming involved in financial issues and in strategic planning.

In summary, it is important to note that for many industries, logistics is the largest single expenditure in the cost of products sold and is a major critical success factor impacting on productivity, profitability, shareholder volume and competitive advantage. Furthermore, successful and efficient functioning of the logistics system and indeed improved productivity and profitability, is important if people are to maintain their existing living standards against a background of increasing pressures from steadily increasing populations and inflation rates. This macro-economic role of logistics was also briefly outlined in Section 2.1.

## **2.4 CONCLUSION**

Bearing in mind the increasing pressures on companies to increase turnover and/or decrease costs, as previously discussed, the growing role which logistics can play in making these achievements reality, is receiving increasing attention. Companies are particularly interested in the strategy of reducing a company's costs of doing business. As companies have thus looked inward attempting to identify areas for cost savings and/or productivity increases, most have found logistics to be an area with the most potential for significant cost savings.

These various factors, and others such as growing global competition, that are increasing companies' focus on the role of logistics, and current and continuing trends therein, are making management more and more aware of the fact that logistics decisions, policies and strategies can influence a company's total sales as well as the cost of its operations. It is therefore necessary to understand the development and importance of such strategies that may influence corporate profit and performance and therefore the competitiveness of a country's products and its economy.

Furthermore, as the logistics of a company improves, the nation's efficiency will improve, and this can ultimately result in positive effects on prices paid for goods and services, national debt, currency valuation, international competition, availability of investment capital and economic growth which will result in a higher level of employment and standards of living. However, although the macro-economic role of logistics is significant as has been touched on in previous sections, this thesis focuses on the micro-economic role of logistics and the use of outsourcing with regard thereto. Nevertheless, efficiencies gained, by such strategic implementations as logistics outsourcing, will have a positive impact on the role of logistics in the economy of the country as well. The strategic concept of outsourcing will be dealt with in substantial detail in Chapter 3.

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