KEY FACTORS REQUIRED TO BE CLASSIFIED AS A WORLD-CLASS SUPPLIER FROM A SOUTH AFRICAN AUTOMOTIVE INDUSTRY PERSPECTIVE

G.T. COOK
8505950

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SUPERVISOR: Prof. Gideon S. Horn

Port Elizabeth
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DECLARATION

I hereby declare that the dissertation is my own, original work and that it has never been previously submitted completely or partially by me or any other individual to another university for obtaining a degree. Furthermore, all sources used or quoted in this study have been indicated by means of complete references.

_____________________     ________________
GAVIN TREVOR COOK      DATE
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ABSTRACT

Over and above the fact that South African automotive business firms do not have the advantages of a major domestic market and are far removed from the major world markets, they face the challenges of operating in a tough and ever-changing environment. This environment is characterised by a global recession, aggressive global competition, high inflation and more demanding customers. To overcome these obstacles and to ensure their continuous success and existence, these domestic firms need to create a competitive advantage. The establishment of such a competitive advantage is dependent on a number of factors which mainly include sourcing from a world-class supplier base in terms of price, quality and service delivery.

The main objective and central theme of this study is to determine the factors that are required by a supplier in the South African automotive industry to be classified as a world-class supplier. In support of the main objective, it was necessary to source the reasons why a firm would find it important to trade with a world-class supplier base, and to determine whether the current levels of supplier performance as experienced by buying firms in the Eastern Cape automotive industry, could be regarded as world-class. Furthermore, the study set out to determine the consequences to customer firms of inferior supplier performance, as well as the actions currently taken and support programmes in place to bring suppliers in line with world-class standards.

As a starting point to the study, a literature review was undertaken which revealed the definite interdependence between a business firm and the environment in which it operates. The review underlined the need for environmental scanning as a means to proactively manage the impact of environmental changes on a firm. Porter’s value chain and business process re-engineering, as discussed in the study, are also perceived as means to manage environmental changes. The literature study further revealed some of the latest business trends followed by automotive business firms, as well as the expected supplier buy-in to ensure success.
A statistical analysis on the quantitative data gathered, grouped specific items (questions) that relate to the study’s main objective with three respective individual supplier performance areas. A confirmatory factor analysis which focused on the three factors, namely quality, pricing and service delivery was carried out to assess the validity of the questions used for gathering the research data. The Cronbach Alphas determined for the three factors portrayed the reliability of the research instrument as acceptable.

The empirical study revealed a few main factors that automotive business firms strongly perceive as being key to the establishment of a world-class supplier base. These factors are: a culture of continuous improvement; consistently meeting delivery deadlines by being able to respond to customer schedule changes; quoting fair prices and having respect for business ethics; as well as the consistent application of a quality policy which leads to conformance to specifications and subsequent high levels of product reliability.

The empirical study also identified the following benefits enjoyed by customer business firms when trading with a world-class supplier base: Firms are able to be more flexible to customer schedule changes; they receive products that meet specifications; and they are able to operate at lower costs.

The empirical findings with regard to the current level of supplier performance in the Eastern Cape Province automotive industry highlighted mainly three problem areas. These are late deliveries; the inability of suppliers to respond to customer schedule changes; as well as a lack of continuous improvement.

Late deliveries which lead to production stoppages, with its resultant high costs, as well as the receipt of below-par quality products, were revealed as the main consequences when dealing with suppliers whose performance are not world-class.
The main actions taken and programmes or incentives offered by automotive business firms to bring inferior suppliers more in line with world-class performance, include the rewarding of good suppliers by granting them more business; applying formal supplier performance evaluations; and having regular supplier audits.
CHAPTER 1

INTRODUCTION, PROBLEM STATEMENT AND DEMARCATION OF THE STUDY

1.1 INTRODUCTION

Over and above the fact that South African automotive business firms do not have the advantages of a major domestic market and are far removed from the major world markets, they also face other challenges in a tough and ever-changing environment. These challenges include a global recession; aggressive global competition; customers demanding new and improved products with the latest technologies at shorter time intervals; as well as improved product quality and service delivery levels at more acceptable prices. To withstand the challenges and be competitive, firms should be able to deliver better value and quality (effectiveness) to their customers at lower cost (efficiency) than their competitors. The establishment of such a competitive advantage is dependent on a number of factors which mainly include sourcing from a world-class supplier base in terms of price, quality and service delivery.

Therefore, in their quest to become world-class firms, Original Equipment Manufacturers (OEMs) and component manufacturers operating in the South African automotive industry, should realise, similar to other manufacturing firms in the 21st century, that they need to meet the above-mentioned (Mangan, Lalwani & Butcher, 2008:37). The success of these firms in terms of being effective and efficient, however, depends to a great extent on the price, quality and service they receive from their supplier base (Leenders & Fearon, 1997:261). Being manufacturers, procurement forms an imperative component of the general planning functions of OEMs and component manufacturers. Their overall business policy in terms of what products they will add, or what changes they intend to bring to their existing product range, depends on whether they are able to procure the required supplies at competitive prices, at the right place and time, and with the required quality and quantity specifications. Selecting the “wrong” supplier could have severe implications for both the manufacturer and the entire supply chain in which it operates.
Supplier problems could, for example, lead to out of stock situations and consequent production stoppages, which in turn could lead to the non-availability of completed goods to the customer-base and, ultimately, cancelled orders. All these problems negatively affect the profitability and survival of the firm and the supply chain of which it is part of (Hugo, Badenhorst-Weiss & Van Rooyen, 2002:132).

On the positive side, suppliers are often a source of new production processes and product technologies (Van Weele, 2002:95). In many industries, including the automotive industry, development takes place at such a pace that even large firms are unable to generate all the investments needed to keep up with technological developments in every area. This leads to suppliers assisting the manufacturing firm’s research and development programmes. Partnerships are established in this way, particularly in strategic and high risk supply situations. The concept “partnership sourcing” refers to such situations where manufacturers and their suppliers work together as a team in an effort to drive down total cost, improve quality, and speed up product delivery in a more effective and efficient manner than the same people working as adversaries (Saunders, 1997:251). Both parties in fact develop sensitivity to each other’s needs.

In these partnerships, the development of suppliers into world-class partners often require and involve taking remedial action to correct possible shortcomings that they might experience. The necessary adjustments are then made to bring their performance to more acceptable levels. This equips manufacturers who deal with these world-class partners to compete internationally, especially with regard to the much needed higher quality and higher volume requirements of international customers. The selection of the right supplier, whose performance in terms of quality, quantity, time, place and price is consistently acceptable, is, therefore, one of the most critical aspects of a successful supply chain. Consequently, world-class manufacturing firms in all industries, including the automotive industry, are currently scrutinising the selection and qualification of their supplier base more critically than before.
A comprehensive literature review indicated that very little research has been done on the requirements for the establishment of a world-class supplier base in the automotive industry and that limited data is available on the topic. In order to address this gap in the literature and data, it was decided to investigate the topic of world-class supply and the factors that indicate world-class supplier performance.

1.2 PROBLEM STATEMENT AND RESEARCH OBJECTIVES

Whether a world-class supplier base does exist in the South African automotive industry, as well as the factors that indicate whether a supplier is of world-class standard, constitute the research problem of this study. Therefore, based on the research problem, the main objective of this study is defined as follows: To identify the key factors a supplier needs to adhere to in order to be classified a world-class supplier from the South African automotive industry perspective.

1.2.1 Sub-objectives of the study

In identifying the key factors required to be classified a world-class supplier from the South African automotive industry perspective, the study portrays what expectations OEMs and automotive component manufacturers have of their supplier base in order for them to become world-class businesses. Some of the aspects to be investigated in this regard include the current levels of supplier performance as experienced by automotive business firms in the Eastern Cape Province, possible reasons for possible inferior supplier performance, as well as proposed corrective actions. Therefore, in support of the main objective of the study, the following sub-objectives have been identified:

a) To source the reasons why a firm will find it important to trade with a world-class supplier base in the Eastern Cape automotive industry.
b) To determine whether the current levels of supplier performance as experienced by buying firms in the Eastern Cape automotive industry, could be regarded as world-class.

c) To highlight the consequences to customer firms if supplier performance is not of world-class standard.

d) To identify the actions currently taken, as well as support programmes available to suppliers, in an effort to bring them in line with world-class standards.

1.3 SCOPE/DELIMITATION OF THE STUDY

The study focuses on the specific factors which are perceived as being important in establishing a world-class supplier base for automotive business firms. As was mentioned earlier, the empirical study included two Eastern Cape-based motor assemblers, namely Volkswagen and General Motors, the Automotive Industrial Development Centre (AIDC), as well as first-tier automotive component manufacturers in the Province. The study therefore excludes automotive business firms that are situated in other provinces, as well as service oriented business firms in the automotive industry. As various factors could be considered in establishing a world-class supplier base for the automotive industry, the researcher focuses mainly on the elements affecting price, quality and customer service delivery of manufacturing firms.

The main reasons for this delimitation are as follows:

- The South African automotive industry is concentrated in three regions in the country, with the Eastern Cape Province being the second most important behind the Gauteng Province (AIDC, 2005:13). It is home to three OEMs, namely Volkswagen in Uitenhage, General Motors in Port Elizabeth and Mercedes Benz in East London, as well as almost 30,0% of the country’s automotive component industry.
• A meaningful number of automotive business firms acting as first-tier suppliers to the above-mentioned motor assemblers are situated in the Eastern Cape Province. These automotive business firms each have their own supplier base and could provide valuable input to the study.

• The business firms in the Eastern Cape automotive industry are operative over the entire spectrum of the industry. This includes the metal, plastic, electrical, rubber, trim, as well as chemical industries, which could impact positively on the comprehensiveness of the study.

• By focusing on Eastern Cape based automotive business firms only, close proximity made it easier for the researcher to obtain data by paying multiple visits to the business firms which formed part of the study target group.

• The Automotive Industry Development Centre (AIDC) was included because of its involvement in developing suppliers for the automotive industry.

1.4 SIGNIFICANCE OF THE RESEARCH

As was mentioned in the problem statement and research objectives, the study specifies the importance of the key factors that constitute a world-class supplier. The benefits of having a world-class supplier base with regard to automotive business firms’ overall competitiveness are also highlighted. These benefit areas include aspects such as price, quality, delivery time and general business dealings. As a dual purpose, the results of the study will also act as a guide to suppliers in setting themselves up to gain world-class recognition. Local suppliers will benefit from the research outcomes in that they could use them as a mirror to view their current performance levels and make the necessary adjustments should the need exists. The research output could also act as motivation to attract foreign investment into South Africa and increase exports from the country, as it will highlight the conditions of local automotive business firms before engaging in contractual dealings with their supplier bases.
1.5 CHAPTER OUTLINE

The dissertation comprises seven chapters. Chapter 1 is the introductory chapter and outlines the research problem and objectives, the reasons for the study, the demarcation of the study, as well as its significance.

Chapter 2 outlines the interdependence of the environment in which a business firm operates, highlights some of the more recent and important environmental changes that have an impact on firms in all industries including the automotive industry, and discusses the importance of environmental scanning.

Chapter 3 gives an overview of Porter’s value chain, with the purpose of giving the reader a better understanding why automotive business firms, including automotive assemblers, have to change their current business processes internally and/or externally to become world-class. This is followed by a discussion of the role of the purchasing function in the context of Porter’s value chain, as well as the potential contribution of the overall procurement activity. The chapter concludes with a discussion of the broader supply function in which its objectives are highlighted, as well as an elaboration of business process re-engineering as a response to environmental changes.

The latest trends followed globally by business firms with regard to manufacturing are discussed in Chapter 4. The chapter covers topics such as supply chain management, lean manufacturing, outsourcing, just-in-time production, and total quality management. This is followed by an investigation into the possible ways of how suppliers, who follow these trends, should respond.

A general overview of the research methodology used in this study, as well as the construction of the questionnaire and population sample make-up, is given in Chapter 5. Chapter 6 presents the findings of the empirical study to the reader. These findings are integrated with the literature study, while responses to the questionnaire are discussed
in relation to the research objectives. In Chapter 7, the researcher concludes on the findings of the research study. Recommendations regarding possible improvements with regard to supplier performance are made, and the researcher highlights some areas for future research that relate to the topic researched in this study.

1.6 CONCLUDING REMARKS

Having outlined the research problem and study objectives to be achieved in the study in this introductory chapter, environmental changes, environmental scanning and the challenges of globalisation, will be discussed in the next chapter.
CHAPTER 2

THE BUSINESS ENVIRONMENT, CHANGES AND ENVIRONMENTAL SCANNING

2.1 INTRODUCTION

Business firms are dependent on both the internal and external environment in which they operate to provide labour, materials, technology, finance, information and capital as inputs for their production processes (Worthington & Britton, 2006:4). These resources are then processed and transformed into products and services, which in turn are either required by other businesses as inputs in their production processes, or as final goods for consumption by the community of that same environment. Figure 2.1 illustrates this interdependence between inputs and outputs.

Figure 2.1: The business firm as a sub-system of the business environment

Changes in the environment in which they operate, could cause changes in the conditions under which business firms operate: from a situation of stability to one of instability; from predictability to unpredictability; and from the known to the unknown (Worthington & Britton, 2006:13). Changes in the external environment over which business firms have limited or no control, for example, could impact either positively or negatively on their operations and future success. These changes could develop into either business opportunities or threats. Failure to respond to the challenges or
opportunities that result from these changes could signal their demise or a significant fall in potential performance. This is why continuous environmental scanning has become a compulsory business activity. Businesses need to scan the environment in which they operate to become aware of environmental changes that could possibly affect their operations (Choo, 2001).

The aim of this chapter is to take a closer look at how environmental changes create the need for a world-class supplier base. The following aspects will be covered:

- The composition of the business environment
- Changes in the South African business environment
- The need for environmental scanning

2.2 COMPOSITION OF THE BUSINESS ENVIRONMENT

The general business environment, in which firms operate, generally consists of the following three distinct environmental segments (Cronje, Du Toit, Mol & Van Reenen, 1997:56-60):

- The micro environment

The micro environment consists of the business itself, its objectives and the organisational resources required to achieve its overall goals. Management decisions made in this environment are normally formatted into strategies, which directly impact on the market environment in terms of its price and supply strategies. Management has direct control over the micro environment.
The market environment

Variables within the market environment are interdependent and include consumers, competitors, intermediaries that form the distribution channel for the firm’s product(s), as well as its supplier base. The buying power and behaviour of consumers, for example, determine the nature, number and actions of competitors.

The macro environment

This environment, which in turn influences the market environment and therefore the micro environment, is made up of the following sub-environments:

(i) The technological environment. This is the environment in which product innovation takes place and at times puts pressure on the business firm to engage in new product development or utilise new technology.

(ii) The economic environment. Economic variables register itself in the form of inflation, fluctuating exchange rates, economic upswings and recessions, as well as adjustments to monetary and fiscal policy, all of which influence business strategies, consumer behaviour and competitor strategies. All these also impact directly on the business firm, its consumer structures, and the consumers’ spending patterns.

(iii) The social environment. Constantly changing variables in this environment reflect the values, beliefs, cultures and ideas of consumers and in turn place certain demands on the business firm in terms of product types, product designs and customer expectations.

(iv) The political and legal environment. Political activities and legislation could have a profound affect on business strategies. For example, political
instability could result in internal conflict, which in turn could affect the smooth supply of production requirements or the currency value. Furthermore, new government legislation might prevent the use of certain materials, which might form an intricate part of a firm’s final product.

(v) The physical environment. This environment consists of natural resources such as mineral wealth, flora and fauna, as well as man-made infrastructure such as transportation networks which could also impact on business activity, especially on the availability and prices paid for production requirements.

(vi) The international environment. This is the environment in which international events such as September 9/11 and the war in Iraq, for example, have shown to affect business firms worldwide, including South African firms, in terms of business confidence, fluctuating exchange rates and higher inflation when oil prices soar.

The different interdependent environments, in which business firms operate as was explained above, are illustrated in Figure 2.2 below.
2.3 ENVIRONMENTAL CHANGES AFFECTING THE SOUTH AFRICAN AUTOMOTIVE INDUSTRY

Over and above the interdependence of the business environment as explained in the previous section, firms operating in the South African automotive industry are also challenged by the following specific environmental changes which influence their operations:

- **Less government protection.** Less government protection for South African business firms has led to a decrease in import duties, resulting in aggressive global competition entering the already limited local automotive market place (Hugo, Badenhorst-Weiss & van Biljon, 2004:326-328). This has put pressure on local firms to focus on attaining lower costs in order to remain competitive. Material costs, for example, which constitute up to 70.0% of a motor
assembler’s total production cost, have become such an important factor that pricing from the supplier base has to be thoroughly scrutinised and challenged.

- **Government legislation.** Government legislation on two areas in particular has had a major impact on the South African automotive industry. Firstly, the Broad Based Black Economic Empowerment (BBBEE) Act through which government is seeking to accelerate the inclusion of all South Africans into the mainstream economy, affects the selection of suppliers in the automotive industry (Hugo, Badenhorst-Weiss & Van Biljon, 2006:336). Secondly, government’s introduction of the Motor Industrial Development Programme (MIDP) has triggered the need for more competitive supplier pricing. The MIDP motivates exports by assemblers to counteract import duties when importing fully assembled derivatives. The MIDP has been revised and will be replaced by the recently announced Automotive Production and Development Programme (APDP), which is to be implemented by 2013 (Creamer, 2008).

- **Rapid technological innovation.** Rapid technological innovation is another challenge facing business firms in the automotive industry. While new technologies are giving birth to new products and improved production processes, they also create shorter product life cycles which place significant obligations on firms to constantly engage in new product development and engineering changes (Hugo et al, 2006:10). The better informed and demanding customers of today are also putting pressure on OEMs to offer new models more frequently than ever before and to adapt current models to new customer requirements and expectations. Business firms’ operations also enjoy the benefits of new technologies which provide a new medium for its selling, buying and distribution processes (Griffin & Ebert, 2002:298). On the other hand, new technologies could cause stock of existing inventories to become obsolete.
New information technology. Probably one of the biggest opportunities and challenges facing firms in the automotive industry is the utilisation of new information technology in the form of e-commerce, which impact directly on operational costs and the real-time working environment. Vogt, Piennaar and De Wit (2002:256) state that e-business has changed the way information moves between partners in a supply chain and that it continuously improves the performance of the supply chain. According to these authors, e-business has impacted on supply chains in the following ways:

- Improved customer service. Customer service levels have improved as business firms are able to respond faster to their clients’ requests.

- Efficient consumer response (ECR). This strategy allows distributors and suppliers to operate closely together to ensure better value to customers by focusing jointly on the efficiency and effectiveness of the total supply chain.

- Customer relationship management. E-business is an important tool used in transferring and sharing information. Through e-business, firms are able to learn more about their customers. By having an effective data base, firms could react to their customers’ needs in such a way that it improves interactive relationships.

- Supply chain partnerships. Joint ventures in partnerships are often dependent on the sharing of information by linking information systems. Examples include the sharing of information on stockholding and transportation equipment.

- Core competencies. There is a significant amount of outsourcing among business firms as they focus mainly on their core competencies. Business-to-business (B2B) exchanges which facilitate the conduct of
transactions on the Internet could be used to facilitate the outsourcing processes.

- Focused manufacturing. E-business is an essential tool for managing the flow of information, especially if production for the entire world markets is located in one or two countries. Fast and accurate communication between the production plant, its customers and third party logistics providers are of the utmost importance to ensure success.

Burt, Dobler and Starling (2003:181-183) highlight the following advantages and disadvantages for supply chain management when using e-commerce technology in managing supply chain activities.

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<td>- Business firms are able to share information on customer demand information.</td>
<td>- It is very difficult to quantify the costs and benefits of e-commerce.</td>
</tr>
<tr>
<td>- Supply chain members and functional areas are able to collaborate on new product designs.</td>
<td>- Educated supply staff required for e-commerce is difficult to recruit and retain.</td>
</tr>
<tr>
<td>- It speeds up the notification of product specification changes.</td>
<td>- The integration of databases, standards and software among supply chain members is at times not possible due to incompatibility.</td>
</tr>
<tr>
<td>- Business firms could share information on quality concerns.</td>
<td>- The business firm is exposed to various global issues such as fluctuating currencies and tariffs.</td>
</tr>
<tr>
<td>- It allows the business firm to compare potential suppliers on price, quality and delivery.</td>
<td>- Small supplier firms might be eliminated due to the high costs of entry into e-commerce driven supply chains.</td>
</tr>
<tr>
<td>- It fast tracks the exchange of information, thereby reducing costs and the possibilities of errors.</td>
<td>- The introduction of e-commerce in firms might find resistance amongst employees, customers and suppliers who prefer</td>
</tr>
</tbody>
</table>
range of choice as buyers are exposed to many different products and services from a wider variety of suppliers.
- Information on prospective suppliers and purchases could be more easily customised.
- Purchase order costs are reduced.
- It runs continuously (24 hours a day, 7 days a week).

conducting business using traditional methods.
- The possible loss of employment for supply management staff due to capital intensive production processes.

- *Changes in country’s financial environment.* In line with the turmoil in the global financial markets, the following changes have occurred in the South African financial environment since the beginning of 2008 (South African Reserve Bank, 2008:16-31):

- An increase in the Reserve Bank’s repurchase (repo) rate by a further 100 basis points from 11,00 per cent in December 2007 to 12,11 per cent in June 2008. The relatively higher lending rates have contributed to a decline in real economic activity, especially for new passenger car sales, with the latter having maintained its long-run inverse relationship with the prime lending rate.

- A sharp decline in the retail banking confidence level in the second quarter of 2008 (compared with the first quarter) which was attributed to high and rising inflation and higher interest rates. This reduced the demand for consumer credit.

- A drop in the level of business confidence in response to the slower growth in investment income and the deteriorating financial position of
consumers due to higher lending rates, as well as increases in food and fuel prices.

- Rising food and fuel prices had a dampening affect on household consumption expenditure in the first half of 2008 compared with the second half of 2007. The annual growth rate of real household consumption expenditure decelerated to 4.1 per cent in the first quarter of 2008, followed by a further deceleration to 3.2 per cent in the second quarter.

- In the second quarter of 2008 the overall Financial Services Index dropped to 70 index points, which is well below the average of 88 index points since the inception of the survey in 2002, and the lowest level of overall confidence since the fourth quarter of 2002.

- The total number of liquidations increased by 29 per cent in June 2008 compared with the year before. The increase confirms that the favourable financial conditions of recent years are probably at an end. Most liquidations were recorded in the finance, insurance, real-estate and business services industry.

- The high level of household indebtedness continues to be a source of vulnerability to the financial system in the event of an adverse shock to the repayment capacity of households.

Although official statistics is not available, it seems as though the negative figures outlined above, represent a trend for the whole of 2008.

- Globalisation. Another major driver of change in any industry, including the automotive industry, is globalisation, which is described as “the process by which the world economy is becoming a single interdependent system” (Griffin
This concept opens new markets for much needed requirements and at the same time acts as a seed from which more competition is born.

Countries specialise in manufacturing specific goods for which they have an abundance of resources and trade in these goods with other countries who lack these resources or who could not produce the same goods in a cost effective manner. At times exporting countries have an absolute advantage, which means that they are the only or one of very few countries being able to produce much needed requirements as a result of large natural resource deposits, for example, crude oil. In other situations countries have a comparative advantage, meaning that they specialise in the production of specific goods which they could produce more efficiently, resulting in lower total production cost (Mescon, Bovée & Thill, 2002:76).

Further justification for globalisation lies in factors such as the need for lower cost structures, outstanding quality, as well as more reliable services. As business firms are striving to become more competitive, they procure more and more from foreign sources which satisfy these needs (Hugo et al, 2006:9). These lower prices charged are the result of factors such as more effective and cost efficient production processes used by foreign suppliers; the use of more advanced production technology with greater capacity and better quality output; generally higher productivity rates; lower costs of raw material and capital equipment; lower labour rates; as well as high volume demand which results in reductions in production unit costs (Leenders, Johnson, Flynn & Fearon, 2006:372-374).

Changes in government policies also speed up the need for globalisation and are becoming a prerequisite for the survival of many business firms. According to Chopra and Meindl (2004:65), governments around the world have relaxed their trade restrictions, resulting in formerly protected businesses firms now
competing with competitors from around the world. Furthermore, policies that protected local firms are being replaced by policies that aggressively encourage both imports and exports. Countries are thus relaxing their import penalties which in turn open their borders to foreign businesses with the hope of expanding their own business into international markets. Examples of South African business firms that have entered the global arena successfully include South African Breweries, the Anglo American Corporation and Old Mutual (Hugo et al, 2004: 326), as well as OEMs operating in the country and various component manufacturers (Automotive Industry development Centre, 2005:13).

Burt et al (2003:366-367) highlight the following as common reasons for global sourcing:

- Superior quality. As a result of increasingly stringent quality specifications, purchasing managers in most industries look at global sources to fulfill their quality requirements.

- Better timelines. Business firms engage in global sourcing as a result of the limited production capacity of domestic suppliers. The resulting reduced order lead-times and increased variability might be more suitable than those offered by local suppliers.

- Lower cost. Due to factors such as lower labour costs, better equipment and improved processes, foreign sources are able to satisfy a domestic firm’s requirements at a lower cost than a domestic supplier. Sourcing from these foreign suppliers thus impact positively on the domestic firm’s own cost structure.

- More advanced technology. Many foreign suppliers are more advanced technologically than their local counterparts. By sourcing these
advanced technologies and incorporating it into its product-offering, the domestic business firm’s competitive advantage improves.

- Broader supply base. By broadening its supply base, the firm increases its opportunities to find better suppliers which enable it to decrease its number of contracted suppliers and pursue closer relationships when appropriate.

- Expanded customer base. Purchasing goods in foreign countries could result in the opening of markets in which the business could sell its products. This could happen naturally or as part of trade restrictions. An example will be situations where the purchase of foreign goods is a precondition of a sale of a major product such as aircraft (Leenders et al, 2006:373).

2.3.1 The challenges of globalisation

Over and above the need for environmental scanning, firms in the South African automotive industry, mainly because of the fact that the mother companies of local OEMs are located in foreign countries, need to be ready to face the challenges of globalisation. Although globalisation offers various benefits for those firms that participate globally, it also offers an abundance of challenges. Some of these challenges are briefly outlined in this section.

- Success in the global business environment is dependent on how well firms are managed. Christopher (2005:226) contends that the difference between success and failure in the global marketplace is determined by the way business firms manage and control their global pipelines. Business functions such as planning, organising, directing and controlling are more difficult when trading in distant foreign markets. The reality of globalisation is that it impacts directly on business success and
due consideration should therefore be given when formulating supply, production, marketing and distribution strategies.

- Although global business firms are exporting domestically produced products and have multiple manufacturing and assembling operations worldwide, they typically source their requirements from a multitude of suppliers situated in various countries. To ensure its survival and its competitiveness, many firms need to engage in global sourcing (Benton, 2007:165). This highlights the need for proper supply chain management, as failure in any link within the supply chain could result in a loss of business for every supply chain member.

- In their efforts to develop effective global supply chains, business firms are facing both controllable and uncontrollable elements which impact on the eventual supply chain format and success. Controllable elements include factors such as costs, inventory levels, lead-times, information and transportation (Hugo et al, 2004:330). Therefore, supply management should establish a trade-off between these controllable elements with the objective of creating a cost effective supply chain which is responsive and flexible towards the needs of all the chain members and final customers.

Due consideration should thus be given to globalisation as it could be viewed as a double-edged sword which offers both advantages and challenges to business firms. While acting as a pathway to new customer and supplier markets, it also creates a gateway through which foreign competition could enter the local market.

2.4 THE NEED FOR ENVIRONMENTAL SCANNING

Based on the interdependence of the different environments in which business firms operate, as well as changes that take place in the different environments on a
continuous basis, environmental scanning has become important for firms to keep abreast of these environmental changes. The concept ‘environmental scanning’ is defined as “the acquisition and use of information about events, trends, and relationships in an organization’s external environment, the knowledge of which will assist management in planning the organization’s future course of action” (Aquilar, 1967; Choo, 1993). Firms scan the environment in order to understand the external forces of change so that they might develop effective responses which secure or improve their position in the future. “They should, in order to avoid surprises, identify threats and opportunities, gain competitive advantage, and improve long-term and short-term planning” (Sutton, 1988). Therefore, to the extent that a firm's ability to adapt to its outside environment is dependent on knowing and interpreting the external changes that are taking place, environmental scanning constitutes a primary mode of organisational learning.

Environmental scanning includes both looking at information (viewing) and looking for information (searching). It could range from a casual conversation at the lunch table or a chance observation of an angry customer, to a formal market research programme or a scenario planning exercise. Information derived from environmental scanning is increasingly being used to drive the strategic planning process by both private and public sector firms in most developed countries. It should be noted, however, that the practice of scanning by itself is insufficient to assure performance – scanning should be aligned with strategy, and scanning information should be effectively utilised in the strategic planning process.

Business firms which over the years have engaged in environmental scanning, have become proactive in responding to changes in the environment. This has helped them to be more successful and remain in existence. Others, who did not respond to environmental changes, have not always been successful and some had to close their doors. During the last 50 years prior to 1970, for example, some 50 of the 100 largest business firms in the United States of America failed to scan their environments. “This had catastrophic results, as they did not adapt to the changes accordingly and in time” (Du Toit, Erasmus & Strydom, 2007:119). Especially since the 1970s and 1980s, factors
such as supply shortages, inferior quality and price fluctuations have increasingly influenced the business environment and threaten the profitability and existence of business firms (Hugo et al, 2002:8-9). This has caused firms to show more interest in environmental scanning as well as the purchasing function than before in an effort to withstand the negative influence of threats such as supply shortages, inferior quality and price fluctuations on their profitability and existence.

The scope of environmental scanning in terms of its thoroughness and application rate depends on the nature of the environment in which a business firm operates. Choo, (2001) regards resource dependency, nature of the firm’s strategy, as well as the availability and quality of information, as additional factors that influence its scope. The more dynamic the environment and the more sensitive the firm is to change, the more comprehensive the scanning should be. Although the method of environmental scanning is guided by the importance of the environment to the firm and the required thoroughness, the following scanning methods are the most widely used (Du Toit et al, 2007:119):

- Relevant secondary or published information obtainable from sources such as financial journals, the Internet and the firm’s own data.
- The collection of primary information or special studies on particular aspects of the environment, either by the firm itself or outside consultants.
- A full-time scanning unit within the firm which researches a broad range of environmental variables affecting the firm’s operations.

According to Mahaffie (2008), environmental scanning is a tried and tested tool which business firms could utilise to study the full context in which they operate. The author is of the opinion that environmental scanning has undergone a metamorphosis over the past 20 years. Old approaches to environmental scanning were often too troublesome, narrow, weak and complex. It was non-continuous and limited to a small group of
people within the firm. He contends that environmental scanning has been elevated to a new level as a result of web and computer technology, as well as constant innovations in and improvements to scanning tools. Environmental scanning has rather become a continuous process and is viewed as a catalyst for new ideas. Table 2.1 highlights the characteristics of “old” and “new” approaches to environmental scanning.

Table 2.1: Characteristics of environmental scanning approaches

<table>
<thead>
<tr>
<th>The old approach</th>
<th>The new approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A formal separate cyclical process</td>
<td>• A continuous integrated activity</td>
</tr>
<tr>
<td>• An information and analytical process</td>
<td>• A shared social process</td>
</tr>
<tr>
<td>• Input to the strategic planning process</td>
<td>• Input to continuous strategy making</td>
</tr>
<tr>
<td>• Done by staff or supplier(s)</td>
<td>• Applied in an ongoing manner by staff across the firm</td>
</tr>
<tr>
<td>• Narrowly focused</td>
<td>• Exploratory, with a broad focus</td>
</tr>
</tbody>
</table>

Source: Mahaffie (2008)

Nieman and Bennett (2002:44-45) perceive the analysis of the environment as essential for the formulation of a firm’s total strategy. According to these authors, a strategy is a deliberate decision of a firm’s management to adapt to anticipated change in the macro and micro environment. The output of environmental scanning allows a firm thus to align its strategies as management are made aware of external powers, opportunities and threats, as well as the firm’s weaknesses and strengths.

2.4.1 Benefits of environmental scanning

While the main benefits of environmental scanning relate to economic and financial gain, research by Murphy and Ptaszynski as quoted by Choo (2001) has also revealed the following benefits:
• Improves a firm’s ability to react and implement change in response to external forces.
• Contributes to increased communication and discussion about future-oriented issues among line and staff personnel.
• Based on the improved communication, environmental scanning has a positive effect on the firm in areas such as greater employee involvement, shared vision, strategic planning and management, as well as future orientation.
• Provides a structured process which encourages participants to participate regularly in planning discussions.
• Enables a firm to develop a number of strategic options that allows it to cope with external change in a proactive manner.
• It has a positive influence on corporate performance and return on assets.

2.4.2 Sources of environmental change information

As environmental analysis is key to the formulation of a firm’s overall business strategy, it is essential that a formal step-by-step approach is applied. Nieman and Bennett (2002:45) suggest that the functional strategies of finance, production, purchasing and marketing be developed in a coordinated fashion. The authors highlight the following as information sources available, some of which are very relevant to business firms in South Africa:

• General media which covers articles on relevant environmental aspects.
• Research reports specifically compiled by and for the firm.
• Notable sources of economic data, for example South African statistics which is published by the Central Statistics Services, the South African Reserve Bank, the National Productivity Institute, the Development Bank of South Africa, the Human Science and Research Council (HRSRC), as well as institutes which are affiliated to the South African universities. Demographic, social and cultural data might be obtained from these institutions.
2.4.3 Environmental change-driven strategies

The output of environmental scanning allows a firm to determine if its current strategy is in line with the external forces of change or if there is a need for strategy re-alignment. The following are various types of strategies that could be adopted by business firms (Nieman & Bennett, 2002:46):

- **Maintenance strategy.** With this strategy the firm keeps to the strategy currently applied and thereby maintains its current profit position. It is assumed that the current strategy could withstand the impact of change.

- **Growth strategy.** This strategy highlights a need for expansion and relates to activities such as:
  - Joint ventures
  - Innovation by means of new products
  - Vertical integration
  - Market or product development with small changes.

- **Curtailing strategy.** The forces of change lead to the creation of a strategy which could result in:
  - Disinvestments (withdrawal)
  - Liquidation
  - Reorganisation

- **Combination strategy.** This strategy is utilised when the firm serves various markets. It is a combination of the above-mentioned strategies.

- **Specific activity strategy.** These types of strategies focus on specific areas such as finance, production and purchasing.
2.5 CONCLUDING REMARKS

The various changes in a business firm’s external environment highlighted in this chapter underline the need for continuous environmental scanning. These changes include new government legislation, rapid technological innovations, changes in the economic environment, as well as globalization. Thorough scanning of the environment and the development and implementation of well thought-out strategies to address the challenges, remain important remedies to ensure the long-term survival of the business firm. Scanning enables the firm to assess the impact of environmental changes on its operations and to re-align its current strategies and processes if the need exists. This is done through the application of business process re-engineering.

The next chapter addresses business process re-engineering as a prerequisite for the creation of a competitive advantage.
CHAPTER 3

THE CREATION OF A COMPETITIVE ADVANTAGE, THE ROLE OF PURCHASING, AND THE NEED FOR BUSINESS PROCESS RE-ENGINEERING

3.1 INTRODUCTION

As was indicated in Sections 2.2 to 2.4 of the previous chapter, the various changes in a business firm’s external environment create the need for the firm to undertake environmental scanning on a continuous basis. This enables the firm to assess whether environmental changes will impact on its operations and whether changes are required to address the impacts. If changes are required, the firm will normally respond by re-aligning its current strategies and processes through the application of business process re-engineering. Business process re-engineering is a management tool which enables a firm to re-align its current strategies and processes once the impact of environmental changes on its operations has been determined and a need for changes is realised. It allows the firm to either exploit opportunities or address the threats created by the environmental changes.

This chapter will address the process of and motivation for business process re-engineering utilised by business firms in response to environmental changes. The discussion will start by outlining Porter’s value chain as a means of building a competitive advantage, followed by an outline of purchasing and supply management’s role in realising a competitive advantage.

3.2 PORTER’S VALUE CHAIN

According to Porter (Christopher, 2005:13), the competitive advantage of a business firm could not be understood by viewing it as a single entity, as competitive advantage stems from “many discrete activities which a business firm performs in designing, producing, marketing, delivering and supporting its product.” The ways in which these
activities are carried out contribute to the business firm’s relative cost position and affect a basis for differentiation. A competitive advantage is gained when all these activities are performed in an integrated, coordinated manner and at a lower cost than that of the firm’s competitors.

Figure 3.1: Porter’s value chain

![Porter's value chain diagram](image)

Source: Christopher (2005:14)

Porter’s value chain as indicated in Figure 3.1 above consists of various business activities which need to be performed in a coordinated manner. These business activities are categorised into two sections, namely primary and secondary activities (Van Weele, 2005:9-10). The primary activities are departmentalised as follows in Table 3.1:
Table 3.1: Primary activities in Porter’s value chain

<table>
<thead>
<tr>
<th>Inbound logistics, which include:</th>
<th>Operation activities that relate to the transformation of inputs into outputs, which include:</th>
<th>Outbound logistics, which include:</th>
<th>Marketing and sales, which include:</th>
<th>Services related to the provision of services to enhance or maintain the value of the product, which include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving, storing and distribution of pre-production requirements</td>
<td>Assembling</td>
<td>Collecting, storing and physically distributing the manufactured products to customers</td>
<td>Advertising and sales</td>
<td>Installation and training</td>
</tr>
<tr>
<td>Materials handling, warehousing and inventory control</td>
<td>Machining</td>
<td>Finished goods warehousing and materials handling</td>
<td>Selection of the firm’s distribution channel</td>
<td>Parts supply and repairs</td>
</tr>
<tr>
<td>Vehicle scheduling</td>
<td>Packaging</td>
<td>Order processing and scheduling</td>
<td>Management of channel relations and pricing</td>
<td>Product adjustment</td>
</tr>
<tr>
<td>Returns to supplier</td>
<td>Equipment maintenance</td>
<td>Delivery vehicle operations</td>
<td></td>
<td>Support activities</td>
</tr>
</tbody>
</table>

- Receiving, storing and distribution of pre-production requirements
- Materials handling, warehousing and inventory control
- Vehicle scheduling
- Returns to supplier

Source: Van Weele (2005:9-10)
The secondary or support activities are, according to Porter, integrating functions that cut across the various primary activities within the firm and include the following:

- Procurement, which includes purchasing as an important sub-function, relates to the sourcing of inputs required in the value chain. These inputs include raw materials, supplies and other consumables. It also includes the purchase of capital assets such as machinery, laboratory equipment, office equipment and buildings.

- Technology development, which refers to the know-how, procedures and technology embodied in the production process or product design process.

- Human resources management. This involves the recruitment, hiring, training, development and compensating of manpower to carry out the primary and supporting activities.

- The firm’s infrastructural activities, which relate to management, planning, finance, accounting, legal, government affairs, quality management and facilities management which support the firm’s production processes.

The primary and support activities are thus interrelated and are seen as the basic units which create eventual customer value. By linking the activities, the value chain is established. The ways in which these activities are organised and linked become part of the business firm’s planning strategy. Activities external to the business firm also form part of the formula to secure a strong competitive advantage. Ensuring workable linkages and relationships between the internal and external activities becomes an important aspect of the business firm’s strategic management, as this involves the structuring of the value chain and the coordination of its parts (Saunders, 1997:100-102). The value chain, in essence, thus provides a framework to a business firm's management which enables management to identify how all the firm's activities should be channeled and coordinated, as well as the cost structures of these activities (Hugo, Van Rooyen & Badenhorst, 1997:16).
The following example explains how the execution of the various activities requires the use of resources: New product development, which normally forms part of engineering in a firm, is often the first link in the value chain. This function is responsible for product design and the creation of specifications. Demand for the product is created by marketing and sales which publish and stipulate the needs and wants that the product will satisfy. In addition to this responsibility, marketing conveys information on customer desires which is gathered through market research, through to product design. Operations, in turn, utilise these inputs to create the final product. Distribution then ensures that the product and customer are brought together, with service responding to the requests from customers after sales have been concluded. Support services such as human resources and procurement facilitate and support the objectives which these primary functions intend to realise (Chopra & Meindl, 2007:23).

The resources come at a cost and the value chain structure provides a basis on which these costs are made visible. The bottom line is that these activities need to be performed in such a way that the total value generated by the business firm is greater than the sum of the separate costs combined (Van Weele, 2005:11).

3.3 THE ROLE OF PURCHASING IN THE CONTEXT OF PORTER’S VALUE CHAIN

As was explained in the previous Section 3.2, the role of purchasing in Porter’s value chain is that of acquiring inputs used in the firm’s value chain, in the most efficient and effective manner. This includes both production and non-production input requirements. Lysons (2000:2-3) proclaims that purchasing not only represents the greatest area of expenditure in many business firms, but it also offers the greatest potential for major savings. As business firms outsource more and more, this area of expenditure also increases.

In order to bring the primary objectives and activities of the purchasing function into perspective, a closer look at a definition of purchasing should give a better insight and
understanding of the importance of this support activity. Everything that the firm could not provide by itself needs to be purchased from external suppliers. Therefore, the concept purchasing is defined as “the management of the firm’s external resources in such a manner that the supply of all goods, services and knowledge which are necessary for running, maintaining and managing a firm’s primary and support activities, are secured at the most favourable conditions” (Van Weele, 2005:13).

From the above-stated definition it could be concluded that the purchasing function has both an internal and external focus. Internally, it has to ensure the timely availability of user requirements in the most cost effective manner. Externally, it focuses on managing supplier relations with the goal of continuously improving purchasing processes within the business firm and between the business firm and its suppliers.

According to Van Weele (2005:15), purchasing management relates to supply chain management. The difference between the two is that supply chain management entails relationship management beyond first-tier suppliers. In other words, it includes buy-in and the management of second- and third-tier suppliers and beyond. Purchasing, on the other hand, focuses mainly on a firm’s first-tier or immediate supplier.

The role of a purchasing department in most automotive firms has become very important in recent years, one reason being the fact that it is responsible for spending a large percentage of the operating budget. Other reasons why the purchasing function has become more important, are discussed in the following paragraphs.

3.3.1 Reasons for the increasing importance of the purchasing function

The enabling of smooth operations within the firm is dependent on the existence of an effective and efficient purchasing function. Business firms have over time been confronted by an abundance of challenges which have impacted directly on the purchasing function. This has resulted in its elevation within the
organisational structure. Hugo et al (2002: 8-9) highlight the following as reasons for the increasing importance of the purchasing function:

- **Inflation**

  In South Africa, the buying power of the rand has diminished since the 1970s to a level that buyers are now compelled to critically look at prices and price tendencies to achieve the most value for the business firm. Therefore, applying the purchasing function in a proactive manner becomes a necessity to protect the business firms from price increases.

- **Competition**

  Business firms are facing a continuous increase in competition, especially global competition. To maintain or increase market share, purchases at the lowest possible prices with on-time delivery have become an important area of focus.

- **Shortage of requirements**

  In some instances business firms are faced with shortages of requirements as supply becomes more limited or when the growth in demand totally outgrows the growth in supply. As this is detrimental to continuous operations, business firms have either to look at alternative supply sources or substitute products.

- **International sourcing**

  Due to factors such as the non-availability of inputs, economic fluctuations, inferior quality and high customer expectations, business firms are engaging more and more in foreign sourcing. However, the
fluctuating values of monetary units become an important factor when making payment for deliveries from these sources. The choice of foreign suppliers thus becomes an important factor in terms of protecting business firms from negative exchange rates.

- Price control

As a result of price increases, government authorities have intervened by propagating some price controls. Price control has forced businesses to revisit their cost structures in order to remain competitive.

- Supply risks

The incidences of boycotts, strikes and other uncertainties increase the possibility of supply risks. In the 1980s, in particular, the choice of foreign suppliers by South African firms became a critical factor. However, after the 1994 elections and with the removal of sanctions and boycotts, new suppliers have appeared.

- Technological revolution

The fierce battle regarding technological innovation among business firms has led to a decrease in the life cycle of products. These business firms are now introducing new products at shorter time intervals which enhance the possibility of product obsolescence. Over-stocking and long-term contract commitments could greatly disadvantage the business firm. Proper planning thus becomes a necessity.
• Stringent quality specifications and control

The demand for higher quality products results in new designs with specifications much higher than before and at much tighter tolerances. The selection of suppliers capable of complying with these inherent quality features becomes an important consideration to ensure the delivery of so-called “to-spec” requirements.

• Development costs

The high costs of new product development have necessitated purchasing’s presence in the development phase, especially with regard to material input and functional suitability. Early supplier involvement during new product development is becoming standard practice in proactive business firms, with shorter development cycles and lower development costs being the underlying objectives.

• Inventory costs

Due to the hike in inventory costs, inventory carrying costs, interest rates and transport costs in particular, business firms have to find a balance between the dangers of too low and the cost of too high inventory levels.

3.3.2 Activities of the purchasing function

Individual business functions could be perceived as a group of related activities that, if performed correctly, will ensure its success. Therefore, the purchasing function could be viewed as a series of activities that will ensure a continuous flow of requirements into the firm. According to Hugo et al (2002:7), these activities include:
• Determination of the business firm’s input requirements in terms of the qualities and quantities required.

• Continuous searching for and locating of suppliers.

• Selecting, evaluating and negotiating with suppliers in terms of prices and other relevant purchasing conditions.

• Placement of orders and following up to ensure timely delivery.

• Receiving and inspection of goods as per specification and contractual obligations.

• Holding and controlling the inventory of the business firm to ensure consistent availability and to prevent unnecessary overstocking.

• Salvaging materials and disposing of redundant stock in the most practical manner.

• Carrying out purchasing research to improve purchasing efficiency.

3.4 THE SUPPLY FUNCTION

Before the discussion in this section is continued, it is important for the reader to note the difference in meaning between the concepts “purchasing management” and “supply management”. This difference is defined as follows by Hugo et al (2006:6): Purchasing management relates to “the process of buying, learning the need, locating and selecting the supplier, negotiating price and other pertinent terms, and following up to ensure delivery”. Supply management, on the other hand, involves “the identification, access, positioning and management of the resources that the firm needs to attain of its
requirements”. Purchasing management activities thus relate more to the general daily operational activities of a buyer, whereas the scope of supply management activities is much broader. Supply management activities are cross-functional and inter-organisational in nature as it involves issues such as new product development and supplier relationship management.

As a result of factors such as increases in material costs during the late 1980s, Japanese influences on Western manufacturing industries such as Kanban, quality circles, just-in-time (JIT) and Kaizen, as well as the growing recognition of the potential role that purchasing could play in making business firms more profitable, purchasing and supply managers began to see the need for two types of human resources in their firms. Firstly, there is a group of people responsible for the operational and tactical activities of purchasing and materials management. This group, called material coordinators, is responsible for order placement, ensuring continuous production and ensuring minimum inventories. The second group, namely supply managers, will be involved in developing the broader strategic aspects of the purchasing function. Their responsibilities include new product development, supplier selection, cost management, developing supplier partnerships and strategic alliances, and ensuring and managing long-term agreements with selected suppliers (Burt et al, 2003:26-27).

An added responsibility of this group in proactive business firms revolves around their participation in strategic business planning processes. This forms an important input equal to the marketing, conversion and finance strategies. When properly integrated, this becomes the strategic plan of the overall business as indicated in Figure 3.2.
3.4.1 Objectives of supply management

In addition to the primary objective of obtaining the right materials at the right quality, quantity, time and price, as well as from the right supplier, supply management needs to achieve an additional nine secondary objectives to render their inputs as fulfilled. These objectives are in line with the study’s objectives of identifying factors required to establish a world-class supplier base. The nine secondary objectives include in brief the following (Leenders et al, 2006:29-30):

- Improve the firm’s competitive position

The firm’s competitive position is enhanced when supply management, through its efforts, secures lowest total costs, provides access to new technologies, ensures fast response times, creates access to high quality products and services, arranges flexible delivery arrangements and engineering assistance, as well as assisting in product design through the use of external suppliers. Supply management is in a unique position as it could identify these opportunities in the supply chain, which eventually result in better costumer value and the overall success of the business firm.
• Provide an uninterrupted flow of materials, supplies and services

Business firms need a continuous supply of their input requirements in the correct quantity and at the specified quality levels to ensure the continuous availability of final products to their customers. If this is not achieved by those responsible in supply management, the result will be lost production, lower sales and lower profits, as well as a loss of customer goodwill.

• Keep inventory investment and loss at a minimum

When inventory is held, certain costs are incurred, such as insurance, interest lost or payable, materials handling, theft and obsolescence. This might amount up to 50,0 % of the annual inventory value. Supply management should therefore find a compromise between the disadvantages of having inventory at levels that are too low, and the cost of holding too high levels of inventories.

• Maintain and improve quality

Supply management should, through proper control measures at both the business firm’s premises and its supplier’s operations, ensure that requirements of the required quality levels are produced and delivered. The costs to correct incorrect quality could be huge and impact negatively on expected profits. Continuous improvement in supplier quality has also become a prerequisite for competing globally.

• Find and develop “best-in-class” suppliers

The selection of suppliers who are both responsive and responsible is part of the equation for a successful supply management function. Supplier-base decisions should be linked to the firm’s strategy. Locating or developing suppliers, analysing their capabilities, selecting the appropriate suppliers and working with them to obtain continuous improvement, has become a necessity for supply management.
Standardise, where possible, the items bought and the processes used to procure them.

Standardisation is the process of agreeing on a common specification or process. This results in a lower cost structure, better material availability, supply base reduction, lower inventory range, reduced training costs and more consistent quality and service levels. Supply management process standardisation could result in benefits such as shortened cycle times and lower transaction costs.

Purchasing required items and services at lowest cost of ownership

Obtaining goods and services at the lowest total cost of ownership is not limited to paying the lowest price only, but also includes factors such as quality levels and after-sales warranty, which could have a greater cost impact on the business firm than the original price.

Achieve harmonious, productive internal relationships

It is essential for supply management to maintain a healthy understanding with other departments of the firm. To accomplish its own objectives and to ensure that other sections, such as operations and marketing achieve their own objectives requires healthy coordination and cooperation.

Accomplish supply objectives at the lowest possible cost

Costs incurred to operate the supply function include salaries, communication expenses, supplies, travelling costs, computer costs and various overheads. Supply managers should strive to improve the purchasing and supply processes, methods and procedures in an effort to achieve the supply objectives as efficiently and effectively as possible.
The above-stated nine objectives indicate that the focus of supply management is based on the long-term survival, competitiveness and profitability of the firm. This is evident in the objectives relating to ensuring an uninterrupted materials flow, high product quality and lowest cost of ownership.

3.5 BUSINESS PROCESS RE-ENGINEERING IN RESPONSE TO ENVIRONMENTAL TURBULENCE

As was stated in the introductory paragraphs of this chapter as well as in Chapter 2, environmental changes have a direct impact on the operations of business firms. If left unchallenged, it could lead to the downfall of even the strongest enterprises. Every business firm consists of processes, which in turn consist of activities that it needs to perform in order to conclude its operations. These processes could add value and create satisfied customers if performed well, or they might become too costly and disappoint customers if they are done in a way not fitting a given situation (Griffen & Ebert, 2002:455). The two authors further argue that while current processes might have been tested over years and served business firms well over time, changes in the external environment might warrant them obsolete and valueless, thus calling for adjustments.

According to Christopher (1998:229), organisational structures are often rigid and do not have the ability to change at the rate at which the environment is changing. He contends that as markets, technologies and competitive forces change at ever-increasing rates, the need for organisational change increases. Organisational change should manifest itself in the re-engineering of business processes, which could be defined as “the re-thinking and radical re-design of business processes to achieve performance improvements in terms of cost, quality, service and speed.” This effort should be driven by a desire to improve operations with the goal of increasing customer value at the lowest cost (Griffin & Ebert, 2002:455-457).
Therefore, for the business firm to determine the effect(s) of changes in the external environment, a benchmark study is required. A benchmark is the identification of a standard against which the business could compare its processes. If the comparison yields a small or insignificant difference in processes, the business firm could apply continuous improvement to ensure that the process is in line with expectations. On the other hand, should the difference be significant, an exercise of business process re-engineering is required. This process is illustrated in Figure 3.3.

Figure 3.3 The process of environmental scanning and benchmarking leading to business process re-engineering

Source: Van Bilon (1999:78)
Lysons (2000:16) contends that the forces of change are both external and internal to business firms. External forces, for example competition, put pressure on firms to adapt current strategies or implement new approaches. On the other hand, forces within a business firm might be the result of changing environmental conditions, for example, a declining competitive advantage or rising production costs. This motivates the need for new corporate strategies, hence the need for both internal and external process re-engineering.

3.5.1 Re-engineering of internal business processes

The functional management approach which addresses problems/challenges in an isolated, departmentalised manner, has been replaced by an approach based on cross-functional process management (Hugo et al, 2004:69). The stimuli for this new approach are the pressures of global competition, the need to reduce costs, and to make better use of resources. The argument against the functional approach is that it creates boundaries, limits innovation, and leads to conflict and piecemeal business improvements rather than optimal solutions. Figure 3.4 portrays this type of organisational structure as hierarchical and vertically organised. Bureaucracy and long communication channels act as obstacles for quick decision making and strategy implementation.

Figure 3.4: The traditional, functional organisational structure

Business managers currently realise that the way to overcome these obstacles is through a cross-functional management approach, called cross-functional integration. This approach is built on the premise that a process is managed by a cross-functional management team instead of by one individual business function (Van Biljon, 1999:80).

Advantages of cross-functional management include (Hugo et al, 2004:69-70):

- Response systems are developed to react quicker to changes in demand.
- Increased synergy and creativity as a result of the application of a broad range of skills and expertise.
- Better understanding of the business firm in terms of the problems it is experiencing, its activities, linkages, processes and solutions.
- As a result of wider participating, team members acquire more skills and have a better understanding regarding other disciplines.
- Less conflict is experienced and consensus is reached more easily.
- Elimination of duplication in efforts leads to a removal of waste.

It is important to note that cross-functional integration gives rise to the creation of cross-functional teams which are given either part-time or full-time assignments for specified durations. This approach results in a functional buy-in for decisions taken by the cross-functional teams. Various supply management-related activities exist that, if approached on a team basis, will result in better achievement of the goals intended. These include activities such as material requirements review, supplier selection, as well as the development of sourcing strategies (Burt et al, 2003:30).

3.5.2 Re-engineering of external business processes

Business firms have come to realise that success is not only based on how well they have changed and mastered their internal processes, but also on how their external business partners, that is, suppliers and distribution networks, buy into their efforts in meeting and exceeding customer expectations. According to Hugo et al (2004:70), a
team effort is required to overcome the impact that environmental turbulences have on the business firm. Team members include the business firm, upstream suppliers and downstream customers.

The vehicle to achieve this buy-in is through cross-firm integration in which business firms work together in partnership fashion. These businesses view themselves as one unit, all part of an extended enterprise. This partnership implies that there is a new and revitalised focus on customer value creation amongst the same business firms that previously had adversarial relationships. The aim of this extended enterprise is to break down boundaries that exist between individual businesses and to create end-to-end processes that result in innovative products of higher quality levels, at shorter intervals and at prices more affordable than before (Christopher, 1998:272-275). According to Burt et al (2003:116), cross-firm integration provides a forum where cross-firm teams jointly discuss new ways to reduce process costs, improve service to customers, and enhance time-to-market, all of which will result in expanded market share for all participants.

Van Biljon (1999:81), in his thesis on supplier network re-engineering, contends that downsizing of the business firm through the outsourcing of non-core activities and the use of strong collaboration with other business firms, leads to the establishment of the virtual firm. A virtual firm could be defined as “a temporary network of independent firms, linked by information technology, to share skills and costs in pursuit of a common goal” (Lysons & Gillingham, 2003:30). The activity of outsourcing is mainly performed based on reasons for cost containment and the exploitation of lean principles. According to Worthington and Britton (2006:254), virtual firms, when managed properly, could simultaneously increase efficiency, flexibility and responsiveness to ever-changing market conditions. Other benefits include minimised overhead, training and support costs, as well as reaping the benefits of specialisation of other business firms, without having to develop these specialities on their own. They further contend that as information technology enables communication and information sharing across
geographical boundaries, it also assumes many coordinating and management roles normally carried out by managers and committees in large firms.

The main characteristics of virtual firms are summarised as follows by Lyson and Gillingham (2003:145):

- Cooperation facilitated by the use of telecommunications.
- Cooperation based on trust as confidential information in terms of forecasts, designs and cost structures needs to be shared.
- Cooperation based on equality and shared vision. The members of the virtual firm recognise their dependence on one another although their firms differ in size. They share a common sense of identity and purpose which is based on a vision of the eventual goals of the firm and the manner in which to achieve it.
- Cooperation based on core competencies. To gain the best competitive position, firms need to do an analysis on what they could do better than their competitors. This will result in the firm identifying its core competencies.

3.5.2.1 Advantages of cross-organisational integration

Through cross-organisational integration, individual business firms in a particular supply chain work together as a cohesive unit in ensuring maximum value to the customer. Through this approach the supply chain is able to respond immediately to the challenges that confront it. The following advantages are the result of such an approach (Hugo et al, 2004:71):

- As information sharing is a common requirement in cross-organisational integration, it creates an opportunity to react quickly to various changes in
the market place regarding demand and the business environment in general.

- Wasteful activities and duplication that exist in supplier-customer processes are identified earlier and could be effectively eliminated.

- It results in lower operational costs for all supply chain partners.

- It improves the competitiveness of the supply chain and its members.

- Through focusing on mutual benefits, conflicting business and supply chain objectives are balanced at an optimum.

3.6 CONCLUDING REMARKS

To remain successful in a turbulent, competitive business environment, business firms should ensure that their primary and supporting activities are performed in such a manner that the value they create are much bigger than the costs they incur. Porter’s value chain regards this as fundamental in creating a competitive advantage. Purchasing has a major impact on cost structures, especially in those firms where material costs are the biggest cost element of the firms’ total cost structure. By procuring requirements in the most effective way and at the most economical prices, the purchasing function impacts directly on the business firm’s competitive advantage.

The next chapter examines new trends followed by firms as a response to changing business environmental conditions. These trends have a direct impact on the purchasing and supply function as it influences the levels of material held and the rate of materials flow.
CHAPTER 4

INTERNATIONAL TRENDS FOLLOWED BY BUSINESS FIRMS IN RESPONSE TO CHANGING ENVIRONMENTAL CONDITIONS

4.1 INTRODUCTION

The number of environmental variables facing business firms in the 21st century is much greater than those experienced in previous years. These variables manifest themselves either in the form of threats or opportunities, or a combination of both. It was indicated in Section 2.3.6, for example, that while globalisation, opens new markets for a business firm’s final product, it also creates a pathway for foreign competition to access the local market. Similarly, while new technologies allow a business firm to offer new designs with better performance levels, the product life cycles of products are shortened. In order to overcome the negative impact of these variables, business firms have to revaluate current business strategies to determine their effectiveness with regard to current situations.

This chapter focuses on the following modern business strategies, also referred to as international trends, that are applied by business firms in an effort to be effective and efficient: Supply Chain Management, Lean manufacturing, Outsourcing, Total Quality Management (TQM), and Just-in-time (JIT) manufacturing. It should be noted that a natural interdependence exists among these business strategies. In a Just-in-time manufacturing environment, for example, TQM is a necessity as incoming material should be defect free. Motivation for the use of these strategies will be highlighted, as well as their characteristics and benefits. The impact that these strategies have on the purchasing function will be discussed, as well as the responses that the business firms applying it, expect from their supplier base.
4.2 SUPPLY CHAIN MANAGEMENT: AN INTEGRATED APPROACH TO BUSINESS

The success of businesses depends largely on the way it satisfies its customer requirements and on how their own supplier base responds in making this a reality (Leenders, Fearon, Flynn & Johnson, 2002: 93). The ability of a business firm to manage these two external links through its internal firm as one cohesive unit, will to a large extent determine the effectiveness of the supply chain in which it operates. As was indicated in Section 2.2, the supply chain concept is rooted in the belief that one chain member’s output is another member’s input and that coordination amongst member firms will benefit the chain as a whole (Mescon et al, 2002:246-7) (see Figure 4.1). Members of supply chains thus no longer view themselves as competing independently, but rather as part of one supply chain competing against other supply chains.

Figure 4.1: Simplified supply chain perspective showing three core links

![Supply Chain Diagram]

Source: Leenders, Flynn and Johnson (2006:295)

4.2.1 Supply chain defined

A supply chain could be defined as “a group of business firms that are engaged in different processes to provide different products and services required to make final products” (Burt et al, 2003:7). It normally starts with business firms that extract raw materials from mother earth and ends with the final customer receiving the good or service he or she required. It typically consists of various tier suppliers and principal firms, with distributors and retailers in between (refer to Figure 4.2).
The supply chain, although consisting of fragmented groups with unique operations, is viewed as a whole. According to the above-mentioned authors, collaboration amongst chain members and the synchronisation of their operations result in lower cost structures, improved competitiveness and higher profitability for all members. A willingness to co-operate should exist amongst supply chain members to make the entire chain successful. According to Christopher (1998:16), the focus should be on value adding and cost reduction and not on profit improvement efforts at the expense of other chain members.

Figure 4.2: The supply chain

Source: Researcher's own construction

4.2.2 Supply chain management

The supply chain management concept has its origin in the subject Logistics which is primarily concerned with the management of the internal materials flow and its related information. Supply chain management, while acknowledging the importance of cross-functional collaboration and integration, emphasises cross-organisational integration as a further necessity for a successful business equation.

The following two definitions portray the boundaries and operations for both logistics management and supply chain management:
“Logistics is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and related information) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfillment of orders” (Christopher, 1998:4).

“Supply chain management is the systematic, strategic coordination of the traditional business functions within a particular firm and across businesses within the supply chain, for the purpose of improving the long-term performance of the individual businesses and the supply chain as a whole (Burt et al, 2003:622).
Figure 4.3  Achieving an integrated supply chain

Source: Christopher (2005:19)
4.2.3 The evolution of supply chain management

Figure 4.3 depicts the evolution of supply integration which progressed over four stages into the current form of supply chain. Christopher (2005:18) describes the four stages as follows:

Stage 1: Baseline

This stage is characterised by various functions working in isolation and is driven by functional objectives instead of overall business firm objectives. Inter-departmental communication is either limited or non-existent. For example, purchasing might be pushing for low inventory levels with the goal of limiting carrying costs, while production, on the other hand, is calling for high pre-production stock levels in order to prevent stoppages.

Stage 2: Functional integration

In this stage, a limited amount of integration between adjacent functions exists and responsibility for some activities is centralised. Very limited information sharing amongst certain functions takes place and none amongst others. Purchasing, materials control and expeditors, for example, work closely with one another and/or report to the same authority.

Stage 3: Internal integration

This stage is characterised by all the functions within the firm working together towards the overall goals and objectives of the business firm. The sharing and flow of information is organisation-wide.
Stage 4: External integration

This stage is characterised by total internal functional integration and external integration with upstream suppliers, downstream distribution channel members and final customers, while information sharing is inter-organisational.

Not all business firms have progressed to stage 4 (external integration-stage) and business approaches in the first three stages are fundamentally different in comparison to stage 4. Relationships based on trust and co-operation between buying and supplying firms have replaced the traditional arms-length and conflicting relationships.

4.2.4 Factors contributing to the growth in prominence of supply chain management

Arnold and Chapman (2004:7) mention the following factors that contributed towards the growth in prominence of supply chain management:

- More and more business firms are focusing on their core business activity and are outsourcing more work to suppliers. Their dependency on suppliers has thus increased. This highlights the need for more responsible, responsive and trustworthy suppliers and partners.

- With the relaxation of trade barriers, business firms are currently faced with more local and global competition that are pressurising existing businesses to find new ways to remain successful.

- The advent of new technologies is giving rise to new products at shorter time intervals. Product life cycles are thus shrinking. Business firms are forced to come up with new offerings more often, which in turn call for a closer relationship between supply channel members.

- Changes caused by JIT supply requests since the 1980s have and are still
evolving and forcing business firms to apply new approaches to inter-firm relationships.

- The advances and growth in the field of information technology have made information sharing across functions and firms in real time, a reality. This in itself is a fundamental requirement for proper inter-firm integration.

### 4.2.5 Principles of supply chain management

According to Hugo et al (2002:30-31), the supply chain process and its application are driven by certain principles which include:

- **Creation of customer value**

  Customers are attracted to the supply chain that offers them the most value. This value could either be tangible or intangible benefits derived from purchasing the chain’s final product. According to Christopher (1998:7), when a product or service could not be distinguished in some way from that of its competitors, there is a strong likelihood that it will be viewed as a commodity and that the “cheapest” supplier will be given the sale. It is thus important that all role players in a specific chain view their inputs as necessary to create the best customer value in terms of product quality, product cost optimisation, customer satisfaction and timeliness of transformation (production).

- **Total cost of ownership**

  The concept of total cost of ownership refers to the sum of all the costs incurred by a customer over the lifespan of a product purchased. It is also known as life cycle costs which look at the total costs of a product performing its intended function over its lifespan (Leenders et al,
2006:429). The concept is used to describe all costs associated with the acquisition, use and maintenance of a product or service. A properly applied supply chain approach will ensure a competitive advantage by optimising the total chain cost that will then be passed on to the ultimate customer.

- Process integration

Although the operational activities of principal firms, upstream suppliers and downstream distributors differ as a result of the nature of their output, a process of total integration of all the internal functions and across firms making up the chain is a necessity. Functionalisation on its own is not enough. Inter-firm relationship management based on a high level of information sharing and trust is underlined. This will lead to a better understanding of what the ultimate customer expects in terms of product performance, quality, price and delivery.

- Reduction of cycle time

As a result of ever-changing customer demand and increased competition, business firms should be more responsive than ever before. Technology and innovation have also caused shorter product life cycles which put pressure on business firms to introduce new products at shorter intervals. Furthermore, customer demand for shorter lead times, just-in-time supply, and ever changing production schedules created a need for a more responsive supply chain. The resulting shorter reaction time leads to a competitive advantage for the total supply chain.
4.2.6 Characteristics of supply chain management

The following basic summary of the main characteristics of effective and efficient supply chain management provides further insight into the nature of this management philosophy (Hugo et al, 2006:59):

- Supply chain management is a business philosophy which stresses long-term cooperation between participants of the supply chain. A partnership between members, based on trust, results in joint planning, the exchange of information, and the sharing of risks, benefits and rewards.

- Multiple layers of business firms strive as a team to optimise the shared supply chain processes with their focus on the strategic objectives of the chain's principal firm. Team efforts occur across businesses and functional boundaries.

- Participating business firms could belong to more than one chain. The supply network of any particular business is a partial involvement at any particular moment in time and is likely to change over time.

- Suppliers, principal firms and customer integration are a “loose” affiliation, linked at interfaces and bound together by mutual advantages. Management’s task is to keep the focus on value creation for the customer, irrespective of whether these links and interfaces change.

- Not all links and interfaces in the supply chain are of equal importance. Their level of importance will rather depend on their potential impact on the relevant supply chain process(es).
• Information is shared across the breadth of the supply chain. Access to data is open on an inter-firm basis. There is thus openness in the sharing of information which is of the utmost importance in creating a competitive supply chain.

• In order to achieve the necessary levels of planning and coordination, it is essential that corporate philosophies are compatible. The top management of member firms should be committed to the supply chain philosophy and should understand the benefits and risks inherent in the implementation of this approach.

• The shared vision regarding customer value and compatible corporate philosophies are essential in achieving the required integration in all the elements of management for all supply chain participants.

4.2.7 The need to manage supply chains

With the focus on their own operations and immediate supplier base, many business firms have paid little attention to managing their total supply chains (Kruger, De Wit & Ramdass, 2005:298). This limited business approach is still current practice in many firms today and results in higher total costs for all chain members and an uncompetitive supply chain. The following factors highlight the need for managing the full supply chain of which individual business firms are part (Kruger et al, 2005:298-301):
• Improvement of operations

The pressures of competition are forcing business firms to adopt new innovative practices such as Lean manufacturing and Total Quality Management in order to improve their operations and to become more competitive. Such practices are not possible for the business firm that wants to operate in isolation. Success is only possible if other supply chain participants, including suppliers, buy into these practices and are managed accordingly.

• Outsourcing to more suppliers

With business firms concentrating more on their core competencies, decisions previously supporting the production of none-core requirements in-house, are increasingly being reversed. This leads to a bigger dependence on suppliers whose actions, if not well managed, could have negative consequences for the buying firm in terms of quality, pricing and delivery.

• Increasing transport costs

The costs of transporting the business firm’s goods are constantly increasing due to various factors. The three main contributions to this high cost in South Africa are the ever-increasing price of fuel, the volatility of the rand and rising insurance costs. This leads to increased total costs for business firms and the entire supply chain. An uncompetitive supply chain could thus result if these issues are not given the necessary attention.
• Pressure from the business firm’s competitors

To remain competitive, business firms need to keep up with their competitors in industry. For example, there could be a greater need for them to launch new products at shorter intervals. The information technology and cellular telephone industries are typical examples. New product development requires early supply management and early supplier involvement to assist with the identification of better and more economical materials.

• The influence of globalisation

Easy access to world markets has lengthened supply chains considerably. This creates a greater need for proper coordination amongst members in the supply chain. Business firms purchase their requirements from those suppliers that could either meet their needs in the shortest time span or at the lowest cost and highest quality.

• E-commerce

Business firms are buying their requirements and selling their final products more and more on-line. Almost all transactions are electronically done. This advent has made supply chains more manageable as transactions are done in real time with less paperwork.

• Management of inventories

Business failure or success is partially dependent on how well a business’s inventories are handled. For this reason the levels of inventory
should be kept as practically low as possible throughout the supply chain. However, insufficient inventory levels create shortages that in turn will lead to production stoppages or non-delivery to customers. Unnecessarily high inventory levels will on the other hand increase the costs of carrying them, ultimately increase the total costs of the business and supply chain.

4.3 LEAN MANUFACTURING

The philosophy of lean manufacturing is rooted in lean thinking, which is regarded as an antidote for various forms of waste, especially within manufacturing environments. The focus of lean thinking is on improving processes in order to maximise value and eliminate waste. Waste or “muda” as it is known in Japanese, refers to any human activity which absorbs resources but creates no value (Womack & Jones, 2003:15).

In their book, “Lean Thinking”, Womack and Jones (2003:15) refer to the following forms of waste present in manufacturing as identified by Toyota executive, Taiichi Ohno: mistakes that require rectification; the production of items no one wants, resulting in inventories and completed goods piling up; processing steps which are not actually required; movement of employees and transport of goods from one place to another without any purpose; groups of people in a downstream activity standing idle and waiting on an upstream activity which has not been delivered on time; as well as goods and services which do not meet the needs of the customer. These forms of waste are typical in mass production systems and cost business firms money and time.

Unnecessary movement, for example, makes the work more tiresome (harder) and takes up space, while defects require the creation of non-productive remedial systems and costly disposal of rejects. Stock of finished products, semi-finished goods and raw materials, on the other hand, create no added value. They rather
increase total costs due to the investment required to handle them. These are but a few examples of unnecessary costs incurred by business firms whose systems and procedures allow for these wasteful activities.

The goals of lean thinking are primarily focused on customer needs, to build what is sold (thus the pull system), to supply what has been used, to simplify the flow of both material and production, as well as the creation of a flexible response to production (Hugo et al, 2004:351).

The objectives of seeking maximum efficiency and the utilisation of traditional manufacturing systems are no longer sufficient in the modern business world which is characterised by ever-increasing competition offering a greater product range, as well as more demanding customers. Business firms need to adapt to these changes by applying new processes and technologies that will enable them to offer new and better products at lower cost structures, while at the same time enhancing customer satisfaction. Besides competitive forces in the market place, those operating in the manufacturing environment are confronted by an abundance of variables inherent to their own procedures and methods. These include short-notice customer demand changes, inadequate supplier capacities, workforce issues with respect to availability and skills levels, as well as limitations regarding their own capacities. A lean manufacturing approach focuses on the elimination of the problems created by these variables. Hugo et al (2004:357) state that more and more business firms are adopting the lean management approach to ensure successful supply chain management implementation.

Figuratively speaking, the world has grown smaller in the last 50 years with the increased speed of transportation and communication (Leenders et al, 2006:371). Although this makes source selection easier, it also creates an entry path for foreign competition into the local market. To many South African firms, this is an unpleasant reality as they are confronted with established world-class competitor firms with embedded continuous improvement programmes. This
puts added pressure on business firms to improve continuously on all aspects of their business.

Saunders (1997:16) states that lean production is seen as a successor to mass production as typified by the high-volume car assembly line developed by Henry Ford I. The difference between the two manufacturing scenarios, however, is that the same volume output is achieved with half the number of workers, equipment and material used, while at the same time producing at better quality levels, as well as offering a larger model range with more frequent product launches. Krafcik in (Saunders, 1997:69-70) compares the lean approach with the older style, which he calls the “buffered” approach. This approach offers low risks and safe conditions, but less opportunity for high rewards. The lean approach, on the other hand, offers more risk, but greater opportunity for higher rewards. It relies on things being right the first time as there is no built-in buffer or protection to cover uncertainties.

Lean manufacturing in essence refers to the most effective (therefore the least expensive) operation of all manufacturing processes (Hugo et al, 2006:57-58). It stresses coordination and integration with member activities in the supply chain and has the elimination of all forms of waste as a major objective. According to Gattorna (1999:339-340), the challenge of synchronous lean manufacturing is to move raw material smoothly and quickly through a manufacturing process, with the finished product as per the demand schedule, while eliminating all forms of waste. The author further highlights the following as objectives to realise the above:

• Maximise throughput. This refers to the rate at which the process generates money through sales.
• Minimise inventory. It relates to minimising the money tied up in materials held by the business firm.

• Minimise operating expenses. The money spent by the process in turning inventory into throughput.

4.3.1 Benefits of lean manufacturing

According to Trilogiq (2006:17), a foreign based firm advising and supporting domestic manufacturing firms committed to lean manufacturing, the benefits of lean manufacturing could be expressed in industrial, commercial and financial terms:

• Financial benefits

  - Reduction of circulating assets (stock and in-process materials). This relates to a reduction of capital used, increase in cash-on-hand and improved return on investment.

  - Work on productivity and profitability: relates to improving the bottom line by reducing production costs.

• Industrial benefits

  - Lower investment for the same level of production
  - Increased production at constant investment
  - Ecological production, more compact plants
  - Improved quality
• Commercial benefits

- Production in phase with customer demand
- Reduction in delivery times
- Greater customer satisfaction

Other benefits include greater flexibility, reduced waste, quicker response to customer demand, shorter throughput times and lower supervision costs (Lysons & Gillingham, 2003:143).

4.3.2 Features of lean manufacturing

The success achieved by lean business firms is dependent on unique features and practices which differ significantly from those of traditional mass production firms. Van Weele (2005:143) outlines the following as the unique features of lean manufacturing:

• A high level of teamwork among line workers trained with skills to perform different tasks within their working groups. These tasks include manufacturing and non-manufacturing tasks such as quality checks, machine repairs, material ordering and housekeeping.

• A basic, but comprehensive information display system that is easy to grasp and that will ensure that every worker could respond easily to problems and understand the overall situation in the plant.

• Total commitment from every worker to quality improvement. They are encouraged to improve the effectiveness of their work with their supervisors, ensuring the realisation of ideas or suggestions. In addition to the above, the following are principles found by Jones in (Saunders, 1997:70) to be characteristic of lean production firms:
• Workforce organised in teams with the maximum number of tasks and responsibilities being given to those actually adding value to the product on the production line.

• A strong reciprocal sense of obligation between the firm and its employees to ensure commitments to responsibilities.

4.3.3 Lean Supply

In order to realise lean manufacturing, lean supply should be part of the recipe as it is one of the aids used to eliminate waste – any activity that does not add value, but rather increases costs. According to Hugo et al (2004:160), inventory should be eliminated as it is regarded as superfluous (unnecessary) – a key characteristic of the Japanese JIT System.

Stevenson (2007:688) perceives inventories as buffers that cover up recurring problems that are never resolved. Effective inventory management as part of proper logistics management remains one of the few remaining options by which business firms could cut costs as it results in minimising inventory, which in turn, results in less space being used and more savings made on other costs such as insurance, opportunity costs, obsolescence and materials handling (Kruger et al, 2005:472).

Bryan Nelson, Managing Director of QAD South Africa (Stevenson, 2007:691) states that as a response to uncertainty in customer demand, variations in product mixes, high inventory carrying costs and growing variability in customer order patterns, automotive suppliers are re-examining their manufacturing practices. They are applying lean strategies that result in the optimisation of inventories and streamlining of manufacturing processes. This make them more cost competitive and
improves their customer responsiveness. It could thus be concluded that lean supply is a source of competitive advantage.

4.3.4 Features of lean supply

The features of lean supply impact directly on supply management and on inventory management in particular. Hugo et al (2004:160-161) highlight the following features:

- **The relationship as a quasi-firm**

  In a lean supply environment, purchasing has the responsibility of keeping together a complex organizational network consisting of the business firm, as well as a network of customers and suppliers who need to work harmoniously to eliminate costs. By working in a collaborative manner, the business firm and its suppliers focus on addressing the problems associated with inventory costs and as a result minimise the cost in the overall supply chain.

- **Cost transparency**

  Customers and suppliers operating in a lean environment, unlike in other business approaches, share confidential information with one another in order to create a more cost effective and responsive supply chain. Customers inform suppliers about their internal processes and forecasts, while suppliers in turn release information regarding their cost structures. This sharing results in the elimination of duplication and unnecessary costs, as well as a reduction of inventories in the total supply pipeline.
• Research and technology

With lean supply, the quest for new technology is a shared responsibility between customers and suppliers. It results in a shared research environment aimed at finding new technologies in fields such as Electronic Data Interchange (EDI) and transportation which become easier to identify and to apply. This results in cost reductions in the entire supply chain.

• Relationship assessment

A lean supply scenario emphasises a relationship that is jointly managed. Supplier evaluation by customer firms is non-existent as it requires already limited resources and time and does not add value. Customers and their suppliers develop joint approaches to assess the relationship itself. From an inventory management perspective this means that the management of inventory in the relationship should be evaluated rather than the inventory performance of any one of the partners.

4.3.5 The three phases of lean development

Research efforts by the University of Bath and Warwick on the “people” implications of lean firms have identified three phases of lean development and its associated production and human resources approaches (Lysons & Gillingham, 2003:143-4). These include:
Phase 1: Leanness as transition

The focus of this phase is on the efforts made by the business firm to become lean. This includes the delayering and downsizing, outsourcing and sub-contracting of none-core activities.

Phase 2: Leanness as an outcome

This phase relates to the creation of structural flexibility following the above-stated phase. Approaches used to realise this include business process re-engineering and the introduction of lean production to drive out various forms of waste.

Phase 3: Leanness as a process

This phase focuses attention on attributes that the business firm could use to respond to environmentally produced changes. It relates to the application of TQM and JIT specifically. These business practices are both discussed, as part of new trends followed by business firms in response to changes in the business environment, later in this chapter.

Lean firms increasingly buy more and make less. Outsourcing of non-core or non-strategic requirements and services are thus highlighted (Burt et al, 2003:307). The same authors refer to the following three categories as justification to produce core requirements or services in-house:

- Items which are critical to the success of a product, including customer perceptions of important attributes.
• Items that require specialised design and manufacturing skills or equipment where the number of capable and reliable suppliers are extremely limited.

• Items that fit well into the business firm’s core competencies or within those the firm should develop to fulfill future plans.

Components or sub-systems that fall into the above-stated categories should be considered for in-house production. Figure 4.4 illustrates the analytical procedure used for making the eventual decision and is self-explanatory.

Figure 4.4: Analysing strategic outsourcing decisions

Source: Burt, Dobler and Starling, (2003:308)
In order to identify the core competencies of the business, a thorough investigation into its strengths and weaknesses should be carried out. This includes areas such as design skills, people skills, production skills and equipment. Once this investigation has been completed, a critical analysis of the environment in which the firm operates should be done before the decision to produce in-house is made. Issues for this analysis include the level of competition, state regulatory climate, as well as changing customer and supply market characteristics. Finally, the question as to what business the firm really wants to be in, should be answered (Burt et al, 2003:304-5).

4.4 OUTSOURCING, AN INTEGRAL ELEMENT OF LEAN MANUFACTURING

Outsourcing by both manufacturing and service industries is increasing rapidly. According to Christopher (1998:116), most modern firms outsource up to 50,0% or more of their total costs. This creates a much bigger dependence on reliant suppliers than in previous years; therefore, it becomes important that their efficiency and effectiveness be in line with that of the principal firm in the supply chain and that they too, continuously improve. The same principle applies to distributors or intermediaries further downstream.

Although reduced cost is seen as a major advantage, outsourcing also provides the opportunity to achieve innovation as highly specialised supplier and distributor firms are used. Many of these firms are at the forefront of technological advances within their specific industries. As a result of lower overheads, labour costs and higher productivity, they manage to produce at lower unit costs. Other advantages of outsourcing include lower staff requirements, more flexibility and less investment in production and assembly operations (Burt et al, 2003:304).

Traditionally, most large business firms favoured the “to make” option which led to backward integration and ownership of manufacturing and sub-assembly
operations. Outside purchases were confined to raw materials which were processed in-house. The new approach focuses on buying from outside suppliers as factors such as corporate strengths, closeness to the customer, increased emphasis on productivity and competitiveness are considered (Leenders et al, 2006:476).

Van Weele (2005:119-120) notes that although changes in the business environment act as stimulus for outsourcing, new management concepts such as business process re-engineering, benchmarking, organisational restructuring and lean management have also resulted in business firms committing to this trend.

According to Van Biljon in (Hugo et al, 2002:52), “value adding” is one of the six basic principles of successful supply chain strategy. He contends that the determination of value starts with the customer and that outsourcing results in the avoidance of waste and the optimisation of value. Having a component manufactured or a service rendered more economically by an outside supplier could thus be seen as an example where the final customer could gain by paying less for the same or better value.

4.4.1 Outsourcing defined

Definitions on outsourcing highlight one common fact, namely a transfer of activities previously carried out internally, to outside suppliers. This is also evident in the definition given by Axelsson and Wynstra in Van Weele (2005:120): “the decision and subsequent transfer process by which activities that constitute a function, that earlier had been carried out within the firm, are instead purchased from an external supplier.”
These outsourced activities are usually none-core to the business firm as core activities (technologies) are kept in-house. Component parts, for example, are purchased from external sources, but assembly of the final product is performed internally (Kruger et al, 2005:310). This is typical for the automotive industry.

4.4.2 Advantages of outsourcing

Van Weele (2005:121-122) classifies the advantages of outsourcing either as tactical or strategic. Reduction of control and operating costs, freeing up internal resources such as labour and machinery, receipt of a cash infusion, improving performance and being able to manage functions that are out of control, are examples of tactical reasons. Strategic reasons include improving a firm’s focus, gaining access to world-class capabilities and resources which are not available internally, improving customer satisfaction, and sharing of risks.

4.4.3 Disadvantages of outsourcing

Although the intention of outsourcing is based on the benefits to be gained, it carries certain disadvantages and risks such as the following (Vogt, Pienaar & De Wit, 2002:37; Burt et al, 2003:321-323; Leenders et al, 2002:303):

- Adverse employee relations
- Change in management – selected supplier might manage the outsourced activity totally differently and / or less effectively than the business firm
- Loss of confidentiality – information on parts, components and processes once thought secretive is automatically shared
- Exposure to supplier risks – financial strength, loss of commitment to outsourcing, slow implementation and so on
- Difficulty to quantify economics

4.4.4 Critical success factors of outsourcing

If one considers the risks that outsourcing presents, it becomes clear that short sightedness on the side of the business firm could have catastrophic consequences. Proper thought and consideration of its total impact on the success of the business firm is thus important. The Outsourcing Institute in (Van Weele, 2005:134) considers the following factors as critical to outsourcing to render it successful. Note that the last four factors relate to the supplier with whom the activity will be outsourced:

- Understanding the goals and objectives of the firm

The motivation to outsource has its foundation in the firm’s overall business strategy. Once decided upon, the business firm should not reconsider the decision when going through an economic recession.
• A strategic vision and plan

An outsourcing decision should not be based on solving operational problems. The activity to be outsourced should be thoroughly investigated with the associated risks, benefits and resistance evaluated prior to the eventual decision taken.

• Senior executive support and involvement

It is essential that top management buy into the outsourcing decision and give the necessary support as it will involve complex decision making, as well as financial and long-term commitment from the business firm.

• Careful attention to personnel issues

How work is carried out and the routines of people involved, will be affected by outsourcing as affected jobs might change, their need disappear or new tasks might arise. It could thus put the workers' jobs at risk as they might no longer be required or be redeployed. It therefore becomes imperative that staff are well informed and well prepared in terms of management’s expectations in advance.

• Selecting the right supplier

Selection of suppliers for the outsourced activities should be based on a consistent set of criteria that relates to their technical and
managerial capabilities and also to the extent to which future visions, strategies and cultural aspects at different levels of the business firm are shared.

- A properly structured contract

The contract negotiated with the supplier selected for the outsourced activity should be fair to both parties. A win-win situation should exist and it should spell out the procedures to be followed, and the overall goals of the relationship. The expected performance of the supplier should be defined into a set of measurable performance indicators which are comparable over time.

- Open communication with the individual groups involved

The establishment of a communication structure that permits frequent interaction on a regular basis among different levels of the business firm is a necessity to ensure that outsourcing of the selected activity progresses smoothly. Reporting schedules should be agreed upon by both sides. Jointly agreed-upon training programmes should be drawn up where a need exists. This will create an awareness of the new environment and expose staff to new operations.
• Ongoing management of the relationship

It is important that proper contract management is carried out by those in procurement as this is vital to the success of the outsourcing agreement. A deviation from the contract could result in widespread ramifications in the form of production stoppages or additional investments to remedy the situation.

4.4.5 Make or buy

The decision to make or buy relates closely to the decision of insourcing and outsourcing and needs thorough consideration when choosing the right option (Hugo et al, 2006:98). The following circumstances will generally dictate if a business firm will either make their own requirements in-house or purchase them from outside suppliers (Leenders et al, 2006:477-8; Hugo et al, 2006:98-99):

Circumstances favouring buying include:

• When the business has a strong purchasing corps that purchase efficiently
• When better investment opportunities exist
• When staff lack knowledge and skills
• When buying is the cheapest option
• When suppliers have built a reputation (branded products)
• When a capable supplier is in close proximity
Circumstances favouring making in-house include:

- When it is cheaper to make
- When no or only a few reliable suppliers exist
- If the business’ quality requirements are so stringent that suppliers could not meet them
- When there is a greater assurance of supply or a closer coordination of supply with demand
- To make use of idle equipment and labour
- To avoid sole source dependency
- When it ensures a steady running of the business’s own operations, leaving the suppliers to bear the burden of demand fluctuations

4.5 TOTAL QUALITY MANAGEMENT (TQM)

TQM is a management approach where the emphasis shifts from quality in the production process only, to quality in all areas of a business enterprise. “Special attention is paid to areas interfacing with the customer” (Vogt et al, 2005: 86). TQM puts the responsibility for customer satisfaction in the hands of every employee in the business firm who, with an attitude directed at continuous improvement, should strive to provide fault-free products and services first time, every time. Customers, in the context of TQM, refer to all departments within the business firm, the firm as a whole from an outside supplier perspective, as well as the firm’s ultimate customers. TQM differs from the traditional view of quality which focuses mainly on the final product produced or service rendered by the business firms. It considers the quality of every element of the process that is used to produce and deliver the final product or service (Stevenson, 2007:416).
Total Quality Management (TQM) is a philosophy that acts as a guide used by business firms in their endeavour to realise the goals of achieving customer satisfaction, continuous improvement and overall success. Kruger et al (2005:204) state that this is made possible by a scientific analysis of the business processes used by the business firm, based on observed and recorded data which result in the continual approach to correct and prevent errors through the participation of all employees. According to the same authors (2005:242), TQM has been seen as a source of competitive advantage since the mid-1980s. They observe an increase in market share, cost reductions and product / service improvements as its benefits.

With reference to the above paragraph Wisner and Stanley (Hugo et al, 2006:130), make reference to the following as some of the main elements on which the internal quality process should focus:

- Responsiveness to customer needs
- Quality of delivered products and services
- Meeting customer expectations
- Flexibility in meeting customers changing needs
- Delivering information on time to internal suppliers and customers
- Delivering products and services on time
- Delivering reliable information
- Explaining product / service delivery problems
- Improving communication

Changes in the business environment have had various implications for different areas of management and in particular how quality should be managed inside a business firm and within the total supply chain. Hugo et al (2004:164) contend that world-class performance is the expected norm for all members of a supply chain as customers in the global marketplace will accept
nothing less. Integration of all members’ quality activities is stressed, thus meaning that quality becomes a shared responsibility.

In the content of supply chain management, the responsibility for TQM is further extended to suppliers of the business firm. This is confirmed by Hugo et al (1997:105), who state that TQM in supply chain management originates with the customer (internal or external), becomes part of the internal department philosophy and is then carried over to the supplier in the form of a request with affirming specifications. The quality philosophy and systems of the business firm and its supplier base are thus seen as an extension of each other which needs to integrate to ensure customer satisfaction and supply chain success.

Without top management buy-in, the whole TQM effort is destined for failure. Top management creates the vision for TQM and has to display a genuine interest and give the necessary support in order to realise the firm’s vision (Leenders et al, 2006:131). The core values set by top management define the culture of the business firm in terms of its attitude towards quality. These core values include principles such as customer-driven quality, continuous improvement, employee participation and fast response (Arnold & Chapman, 2004:431).

The application of TQM leads to long-term advantages, which result from continuous improvements to systems, programmes, products and people (Stock & Lambert, 2001:284). Continuous improvement, or Kaizen as it is known in Japanese, could be described as an ongoing process of setting high goals for various activities and the creation of methodologies for achieving it. Successful implementation of the continuous improvement process requires that employee teams work together, apply new technologies, measure quality and install controlling factors affecting it. Reviewing current work standards and practices and considering how and to what extent to improve them, acts
as the point of departure (Kruger et al, 2005:136-7). The same authors highlight the following ways of implementing Kaizen activities:

- Change the operations used by workers with the goal of making their jobs safe, more productive and efficient, as well as less exhausting.
- Improve equipment such as fool proof devices.
- Improve procedures that will result in better end results.

4.5.1 How quality is perceived by the user

Customers do not have an interest in why products are defective, but are concerned and agitated if they are defective. To the users, quality depends on their expectations of the products’ performance. Products which have been well conceived, designed, manufactured or assembled, priced and serviced, create quality which is satisfactory, but those which exceed customer expectations are regarded as superb quality (Arnold & Chapman, 2004:430-431). The same authors refer to the following as the dimensions of quality:

Performance - Refers to the primary characteristics and functions of the product or service. Its three sub-dimensions are reliability which refers to the consistency of performance, durability which relates to its ability to function under stressful conditions, as well as frequent use and maintainability which means being able to return the product to an operational condition after failure.

Features - These are secondary characteristics (little extras), such as a remote-control of a video cassette recorder.
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformance</td>
<td>Refers to the manufacturer’s responsibility to produce the product to specification.</td>
</tr>
<tr>
<td>Warranty</td>
<td>Is the promise of the business firm to back up its products with a guarantee of customer satisfaction.</td>
</tr>
<tr>
<td>Service</td>
<td>Covers issues such as availability, speed of service and courtesy and is usually intangible.</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>Relates to the pleasing of the senses, for example the finish of the product.</td>
</tr>
<tr>
<td>Perceived quality</td>
<td>Covers the customer’s total level of satisfaction with the business firm, not only its product.</td>
</tr>
<tr>
<td>Price</td>
<td>This is the value customers obtain which they pay for and could be more than the product itself. All the dimensions listed above are elements of value.</td>
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### 4.5.2 Factors that have contributed to the development of TQM

During the 1980s the importance of TQM was elevated to new heights as a response by business firms to compete with one another on the basis of quality. This was further stimulated by changes in the business environment, coupled with quality philosophies of various quality experts (Burt et al, 2003:127).

Lysons and Gillingham (2003:208) refer to the following factors that have given rise and recognition to the use of TQM as a management system:

- Competing on an international scale (global competition) in terms of sales, profits, jobs and funds in the private and government sectors has led
business firms to the concept of world-class manufacturing. By improving customer satisfaction through manufacturing, a competitive advantage is achieved.

- Just-in-time (JIT) and other strategies emphasising the philosophy of zero defects, which propagates that it is more economical to design and build quality into the product than to use inspection only.

- Japanese quality procedures which include Kaizen (continuous improvement) and Poka-Yoke (foolproof-systems) and a quality-based culture implemented in European manufacturing units, for example, Toyota and Nissan.

- Quality philosophies of internationally respected experts.

Table 4.1 below gives a summary of the impact that TQM has on purchasing and supply management (Hugo et al, 2006:131-132):

Table 4.1: Summary of the impact of TQM

| Customer focus | Purchasing operates in a typical environment in which both internal and external customers exist. Customers internal to the business firm demand timely processing of requests for requirements delivered at even better quality levels at the required time by external suppliers. Customers external to business firm (end users of the firm’s product) demand their suppliers to be reliable in terms of specified product quality, availability and response times. The way in which the purchasing function is performed could thus impact on both customer types satisfaction levels. |
Structured relationships

Relationships with internal and external customers and suppliers which are structured and where in collaboration exists will ensure that quality objectives are achieved. This type of relationship creates an awareness of the needs of the parties concerned and results in the required quality response.

Performance measurement

With continuous improvement being the cornerstone of TQM, performance measurement of both the purchasing function and the supplier base become a necessity to ensure that efforts to maintain or improve quality are on course. Supplier performance measurement becomes thus an integral part of relationship management. User departments, on the other hand, measure purchasing's performance with the goal of identifying any potential areas for improvement. Feedback on performance evaluation becomes than the foundation for determining the level and nature of improvement required.

Employee involvement

Every one employed in the supply chain should be quality conscious and actively involved in ensuring that their efforts result in customer satisfaction of the highest level. This includes all employees from all disciplines.

Involvement in teamwork

Purchasing and supply management should be part of quality management teams as they are aware of the range of customer requirements which they, as part of a team, could prioritise in order of importance.

4.6 JUST-IN-TIME (JIT) MANUFACTURING

The activities in the just-in-time (JIT) system are geared towards providing the business enterprise with raw materials and other production inputs just before they are needed in the production process (Vogt et al, 2005: 85). This definition implies that JIT coordinates purchasing with the internal manufacturing process, and manufacturing with consumer demand. It also implies a dependency on short,
reliable lead times, short set-up times for machinery, high quality standards and reliable suppliers (Hugo et al, 1997:53). Vogt et al (2002:79-80) summarises the main characteristics of the JIT system as short and consistent lead times; shorter production runs; lower inventory levels; as well as long-term involvement with suppliers.

In a JIT manufacturing environment, products are processed and moved in small batches only when required. This means that the production of finished (final) goods takes place only on receipt of a customer order and that semi-finished products or sub-assemblies are produced just-in-time for the assembly of the final product. Material and components purchased from outside suppliers are delivered to the business firm only when actual production is about to start (Kruger et al, 2005:298). The reasoning behind this Japanese philosophy is that through its application, various forms of waste are eliminated. Waste in this case refers to anything other than the minimum equipment, parts, space, material and workers' time needed to create value to the business firm’s product. “Having the right parts and quantities ready at the actual time and place required, producing the product or service required by the customer at the required quality levels and the time specified by the customer, and selling it at an affordable price, constitute value to the customer” (Arnold & Chapman, 2004:398).

According to Stevenson (2007:688), the holding of inventories is seen as a waste as it acts as “a buffer that covers up inefficiencies or recurring problems that never get resolved”. In the presence of inventory, problems are hidden or made less serious. These problems register themselves in the form of machine breakdowns, unacceptable quality, as well as unreliable suppliers and scheduling. The author further contends that once the causes of problems are identified and eliminated, the need to carry inventory (waste) is erased. Figure 4.5 depicts this fact.
JIT is thus more than a material management system - it is a management philosophy, perfected by the Japanese, which impacts on several management fields (Hugo et al, 1997:53). Productivity and quality management are particularly influenced. Quality of purchased items or in-house production should always be to predetermined specifications as no back-up stock is carried. This will indeed lead to a loss of productivity or sales if a quality deviation materialises. Within the production process, engineers strive to design the processes used to manufacture the business firm’s product with the intention of achieving shorter cycle times and lower set-up costs, thereby increasing productivity (Leenders et al, 2002:228).

As JIT systems work on a demand-pull basis, supply chain integration becomes a necessity. This means that information flow systems, collaborative networks and pipeline visibility become the prerequisites for its implementation (Hugo et al, 2004:112). Synchronisation of supply chain member operations is hereby made possible, which results in less waste, reduced cost, better time management, improved competitiveness and increased profitability for the total chain (Burt et al, 2003:7).

4.6.1 The Kanban-JIT information system

JIT systems work via the use of a Kanban (information) system. Kanban, meaning “card” or “visible sign”, is an information system that has been
perfected by Toyota in Japan in their application of JIT. It drives frequent deliveries of small quantities of production requirements to meet immediate demand and acts as an aid to effectively control the flow of material. It is a pull system that allows a downstream work centre to call for a small fixed quantity of replenishment supplies from an upstream point. As this quantity is issued, the system authorises the supplier upstream to produce a replacement quantity (Saunders, 1997:215). This system is very responsive and prevents the buildup of inventory.

4.6.2 Characteristics of the Kanban system

Hugo et al (2004:159-160) highlight the Kanban system’s most important characteristics as follows:

- Standard containers are used to move materials, sub-components and products through the plant. Kanbans (information cards) are attached to each of these containers.

- Every production process or workstation has a storage area where full and empty containers might be stored.

- Only on authorisation of the relevant Kanban could production or movement take place.

According to Stock and Lambert (2001:294), it is possible to combine JIT systems with systems that plan and control material flows into, within and out of manufacturing, such as JIT II, Materials Requirement Planning (MRP) and Distribution Resource Planning (DRP). In JIT II, the JIT concept is applied to the purchasing function by having a representative of the supplier located on the premises of the business firm. This approach, introduced by global audio equipment manufacturer, Bose Corporation,
improves mutual understanding between buyer and supplier, reduces waste and redundancy of efforts, improves supplier responsiveness and creates a positive working environment. DRP manages finished product inventory in distribution, while MRP manages incoming and in-house made production requirements and in-process inventory.

4.6.3 Quality principles behind JIT

The application of JIT demands high quality by all members in a supply chain as no buffer stock exists. A few interrelated principles exist to ensure that each step in the production process of the business firm, as well as that of suppliers, adheres to them. Leenders et al (2002:228-229) describe these principles as follows:

- Responsibility for quality lies with the producer, not the quality control department. This means that each workstation is responsible for the quality of its output, as well as suppliers external to the business firm. A culture of continuous improvement exists to improve quality further.

- Quality is not inspected into the product but rather built into it by those who produce it. They (workers) possess the authority to stop the production line if quality deviations arise.

- Compliance to quality standards. Unacceptable quality is summarily rejected and thorough quality checks are performed on shop floors and at suppliers’ premises. Proof of how quality is measured and the results are properly documented and made available.
4.6.4 Advantages of JIT purchasing

The JIT concept could not be applied in isolation. JIT production is only possible if the concept is driven into every functional area within the business firm. In the context of the purchasing function it has a major impact on the quality and quantity of materials to be purchased (Van Weele, 2005:217). JIT however, creates various advantages for the purchasing function which include (Hugo et al, 2004:158-159):

- **Lower inventory levels**

  This is achieved due to the large number of small deliveries demanded by JIT. It results in a higher inventory turnover rate, which in turn leads to a healthier cash flow position as less capital is tied up.

- **Smaller buffer (safety) stocks**

  Short and reliable lead-times result in smaller buffer stocks being kept.

- **Adaptability of production schedules**

  With small, fixed-order quantities delivered at regular intervals, the business firm could adapt its production schedules much easier if compared with traditional manufacturing systems. Changes in production schedules due to factors such as machine breakdowns, absenteeism and adjusted customer orders could thus be accommodated.
• Quality improvement

Higher quality of purchased requirements (driven by continuous improvement) translates into improved quality of products produced.

• Cost savings

JIT encourages long-term, closer relationships with suppliers which have the potential to create cost reductions. Improved designs and suggestions regarding the use of less expensive substitute materials are typical examples.

4.6.5 JIT advantages and disadvantages to suppliers

The following is a lay-out of specific advantages and disadvantages that JIT has for suppliers of the business firm (Van Weele, 2005:218-129).

Advantages

• Suppliers are able to plan more accurately for future production and materials required as they are regularly informed about quantities to be delivered to the business firm.

• Through the use of electronic information systems, administrative savings are achieved as transaction documentation is electronically processed. The business firm’s production and materials planning system is connected with that of its supplier base.
• Regular communication between the supplier and the business firm on quality and cost improvements could lead to new product and process innovations.

• Long-term business is guaranteed to the supplier as JIT contracts cover long periods of time. Decisions regarding investments in new technology and equipment are made much easier than in traditional systems in which shorter term contracts are mostly set.

Disadvantages

• In some instances large business firms impose their demands ruthlessly on often much smaller suppliers who have to comply with it at the risk of losing their entire business.

• In their endeavour to supply on a just-in-time basis with zero defects, great effort and high initial costs should be incurred at the supplier's own expense.

4.6.6 The role of purchasing in successful JIT application

Successful application of JIT will result in requirements being delivered at the specified time, quality levels and in the correct quantities needed. The purchasing function plays an important role in realising the above. Lysons and Gillingham (2003:299) view the following as their (purchasing's) responsibilities in the light of the above:

• Close liaison with the design (engineering) function

Product performance should take precedence over design specifications. More tolerable specifications will enable suppliers
to keep to quality levels and to be more cost effective through being more innovative with regard to product quality and or function.

- Close liaison with suppliers

  This will ensure that they (suppliers) understand why on-time deliveries, at consistently high quality levels are of the utmost importance to the buying firm.

- Consideration of supplier proximity

  In order to increase the certainty of delivery, close attention should be given to the proximity of suppliers. With suppliers located close to the business firm, shorter lead times and / or JIT supply could result.

- Establish strong, long-term relationship with suppliers

  Such relationships are fundamental in creating a culture for cost reductions and where savings are shared. To make this a reality, the buyers should, through their efforts, ensure prompt payment of suppliers, minimise order changes, etcetera.

- Establishment of effective supplier certification programmes

  These certification programmes will result in suppliers taking the overall responsibility for quality assurance of purchased requirements, which should also eliminate the need for receiving inspection.
Evaluation of supplier performance

Regular evaluation of supplier performance will enable the business firm to track how well suppliers live up to expectations and highlight any shortcomings. Cooperation is given when the business firm expresses concerns and assistance is offered to overcome these shortcomings.

4.6.7 Buyer-supplier relationship in a JIT system

Proper buyer-supplier relationship management is important as this will ensure that the desired outcomes of JIT are achieved. The role of a buyer in a JIT environment is a combination of facilitator, negotiator, communicator and developer rather than that of an expeditor (Leenders et al, 2002:232).

Stevenson (2007:698-699) contends that the ultimate goal of the buyer is to certify the suppliers, as this will help them achieve the desired quality levels and that buyers use their own experiences in helping the suppliers convert to JIT-based production.

The author states that unlike in traditional systems, where price is regarded as a major factor and where multiple sourcing is used, JIT purchasing depends on good long-term supplier relationships, which will result in suppliers being more willing to commit resources to meet the expectations of the buying firm. Price often becomes secondary to other aspects of the relationship such as consistently high quality, flexibility, frequent small deliveries and quick response to problems.

In a JIT system, business firms use a much smaller number of first tier suppliers when compared with traditional systems. Figure 4.6 illustrates
the two different approaches. In traditional systems, suppliers have very little basis (motivation) for suggesting improvements. Business firms tend to play suppliers off against one another, resulting in the sharing of information becoming more risky than rewarding. In a JIT environment there is close cooperation between buyers and suppliers to solve problems, as well as close coordination and systems integration that smoothes operations (Leenders et al, 2002:232).

Figure 4.6: Number of first tier suppliers used in a JIT versus traditional system

Source: Stevenson (2007:700)

4.7 CONCLUDING REMARKS

The modern business strategies, also referred to as international trends discussed in this chapter, are supply chain management, lean manufacturing, outsourcing, total quality management and just-in-time manufacturing. All five are applied by business firms on a global scale in their quest to be efficient, effective and successful in an ever changing business environment. These strategies each have their own special focus area and share the following common characteristics: the customer as the focal point; a
continuous search to eliminate waste; a quest for better quality; continuous improvement; as well as cost reduction.

As business firms increasingly outsource requirements, there is a greater need for closer co-operation between a business firm and its supplier base. This therefore creates a bigger dependence on suppliers who are able to render a world-class performance that will ensure the success and continuous profitability of firms in the automotive industry. World-class suppliers are able to adapt their performances in line with the expectations of business firms who have adopted these new business strategies. On the other hand, a poorly performing supplier base will have severe consequences, resulting in the failure and eventual demise of the firm to which it supplies.

In order to realise more potential from its supplier base in the future, issues such as early supplier involvement, cost saving initiatives from suppliers and supplier development will therefore become more crucial. It could thus be concluded that the success of these strategies is practically dependent on how well the supplier base responds to meeting the needs of the business firm and the value a firm attaches to supplier relations.

The next chapter will outline the research methodology used, followed by the empirical study and findings of the study in later chapters.
CHAPTER 5

RESEARCH METHODOLOGY

5.1 INTRODUCTION

This chapter presents an overview of research methods in general and outlines the specific methodology that was followed for this particular research study. Issues covered in this chapter relate to the rationale for data collection, details of the research methodology applied, the questionnaire design and administration thereof, as well as an explanation of the actual response rate.

5.2 RATIONALE FOR THE DATA COLLECTION

According to Collis and Hussey (2003:1), the concept ‘research’ means different things to different people and no consensus exists in the literature on its definition. They further contend that from the many definitions available, there is agreement on the following characteristics of research:

- a process of enquiry and investigation
- being systematic and methodical
- it increases knowledge

An analysis of the above reveals that research should be conducted in a systematic way and that the use of appropriate data collection and analysis methods should result in valuable research outputs.

Leenders et al (2006:343-345) define research related to supply management, which is a central theme of this study, as “the systematic collection, classification and analysis of data as the basis for better supply decisions”. They state that the changing demands and increasing expectations of purchasing and supply in modern business create a need for supply managers to have a broader and deeper knowledge and skills set.
These authors argue that the rapidly-changing business environment, continuous innovations and productivity improvements, could best be managed if what might be possible is considered, comprehensive plans are developed, accomplishments and shortfalls are evaluated, and outcomes are reported. Accordingly, they contend that research skills are needed throughout the entire supply process, from need recognition through to supplier identification and the selection process, as well as the management of supplier relationships, concluding with the measurement of the results for each activity. These skills will enable the supply researcher to collect, analyse and synthesise information that will result in proper decision-making in the supply management process.

5.3 MOTIVATION FOR THE EMPIRICAL DATA COLLECTION METHOD USED

The nature of the topic researched in this study, dictated the use of both qualitative and quantitative research. As the achievement of the study’s objectives was mainly based on the use of the survey research method, a description of both qualitative and quantitative research is presented in the following paragraphs.

5.3.1 Qualitative research

According to Struwig and Stead (2001:11-13), qualitative research is not easily defined and cannot be described via the use of a single research method, because of the fact that various qualitative research methods exist. The subject fields within which it is used ranges from management sciences to sociology, psychology, education and history. Tesch, in Struwig and Stead (2001:13), views qualitative research as “any research in which qualitative data is used. It includes words, pictures, drawings, photographs, films and music, therefore, any information that is not expressed in numbers”.

Qualitative data collected for this study was mainly conducted through the archival method which, according to Jackson (2008:87), relates to the gathering of data that
exists before the time of the study. Sources utilised include textbooks by different authors, subject journals and various websites on the Internet.

5.3.2 Quantitative research

The following description of quantitative research and synopsis of its characteristics by Struwig and Stead (2001:4-6) justifies its use for this particular research study: They contend that “quantitative research is perceived as conclusive research involving a substantial representative sample size with structured data collection procedures”. The main reason for using quantitative research in this study was to determine the levels of consensus among respondent firms regarding a set of key factors required to be classified a world-class supplier in the South African automotive industry.

The characteristics, methodologies and different formats of quantitative research are explained in the following sections.

5.3.2.1 Characteristics of quantitative research

Quantitative research consists of various unique characteristics which distinguish it from qualitative research. These characteristics are as follows:

- Variables (constructs) and their measurement

In a quantitative research environment, variables are measured to achieve a study’s desired results. This measurement is done mainly through the use of questionnaires and/or structured information.
Causality

By using independent and dependent variables, quantitative research seeks to establish a causal (cause and effect) relationship. This relationship attempts to portray the current status quo of a particular situation and its causes.

Generalisation

The goal of quantitative research is to legitimately generalise the research findings to a much wider population than the representative sample used.

Replication

Unlike qualitative research where it is difficult to replicate the research findings, findings of quantitative research are replicable. Its replication offers an opportunity to determine the extent to which findings are also applicable in other contexts. Research biases can also be determined.

Individuals as focus

When quantitative research is administered, responses from individuals who make up the representative sample become the most important input of the empirical study. Their individual responses are aggregated and collectively form a measurement of the sample.

5.3.2.2 Quantitative research methodologies

According to Leedy and Ormrod (2005:179), observation studies, correlational research, developmental designs and survey research yield quantitative information that can be summarised through the application of statistical analysis. A brief description of the first three approaches as described by the authors, will be followed in the following
paragraphs by a more in-depth discussion on survey research, which is the method which was utilised for gathering the required data for this particular study.

- Observation studies

In a qualitative research environment, studies relate to a particular aspect of behaviour which a researcher qualifies in a particular way. The particular behaviour pattern is measured to determine its frequency, accuracy, intensity and maturity. Leedy and Ormrod (2005:180) contend that observational studies entail considerable advanced planning, attention to detail, a great deal of time, as well as support from research assistants.

- Correlational research

With reference to this type of research, researchers focus on gathering data with regard to two or more variables for a particular group of people or other appropriate units of study. Its purpose is to examine the degree to which differences or changes in one variable are related to those in one or more other variables.

- Developmental designs

According to Leedy and Ormrod (2005:181), developmental designs can either be used in cross-sectional studies or longitudinal studies and are mostly applied in developmental research, for example, child development. In cross-sectional studies, people from different age groups are sampled and compared, whereas longitudinal studies involve the study of characteristics for which data is gathered over long periods of time for a single group of people.
• Survey research

This approach was mainly used for this study. In survey research, a sample of a large population is studied. The purpose is then to generalise the study’s findings on the large population. It involves acquiring information from one or more groups of people through the use of structured questionnaires and tabulating their answers. The questions posed will normally relate to the sampled population’s characteristics, opinions, attitudes or previous experiences. The responses from willing participants are summarised in terms of percentage expressions, frequency counts or other statistical indices from which an assumption or judgment is made regarding the population. Survey research typically includes the use of face-to-face interviews, telephone interviews or written questionnaires. These are discussed in the following paragraphs.

• Face-to-face interviews

Face-to-face interviews, also known as personal interviews, are the most costly and time-consuming method of surveying. Jackson (2008:96-97) states that personal contact between a researcher and the respondent(s) has the advantage of giving a researcher insight into the respondent’s true opinions and beliefs as both verbal and body language can be recorded. Its relatively high response rate is the result of participants being able to devote more time to answering questions compared with answering them via telephone surveys.

Owing to its lack of anonymity, its high costs and the fact that it will have been too time consuming, face-to-face interviews were not used for this study.

• Telephone interviews

Leedy and Ormrod (2005:185) perceive telephone interviews to be less time-consuming and expensive than face-to-face interviews. It allows a researcher access to anyone that has a phone and has a response rate that is normally higher than in the case of
mailed questionnaires. With this type of survey method, however, the sample is biased as people without telephones are automatically excluded. With both face-to-face and telephone interviews, a researcher has the opportunity of seeking follow-up information.

The use of a telephone survey was not considered for this study as it was considered to be more time consuming and costly than mail surveys.

- **Structured questionnaires**

The use of a structured questionnaire through the mail survey method, mostly e-mail, is often utilised by researchers to gather information. Its use is motivated by the fact that it is relatively easy, cheap and fast to conduct, and is applied in cases where the respondents have a fixed e-mail address and facility. An important requirement is that the self-administered structured questionnaire should be clear and unambiguous as the researcher is not available to answer issues relating to it once the questionnaire is mailed. This method creates less sampling bias as most people have a mailing address. It also eliminates interviewer bias (Leedy & Ormrod, 2005:186). Answers provided via a mail survey tends to be more complete as the respondents have the time to properly formulate their responses without feeling pressurised. Another advantage relates to the issues of sensitive information. The respondents might be more willing to divulge personal information more freely on a written survey compared to divulging similar information over the telephone or face-to-face. Mail surveys also tend to be relatively less expensive than telephone or personal interviews.

With its advantages as explained above in mind, as well as the fact that most earmarked respondents have access to e-mail, it was decided to use a structured questionnaire for this study.
5.4 QUESTIONNAIRE DESIGN

Jackson (2008:91) considers the careful planning of the survey instrument as a prerequisite to ensure that the data collected is both reliable and valid. The type and arrangement of questions is dependent on how the survey will be administered, for example, a mail survey versus a telephone survey.

Colleagues from the Department of Logistics and the Department of Information Technology at the Nelson Mandela Metropolitan University assisted with the final design and the formatting of the questions used in the structured questionnaire of this study. Struwig and Stead (2001:89-91) propose the following guidelines for the designing, wording and phrasing of questions:

5.4.1 Questionnaire design guidelines

- Instructions should be precise and clear as to how questions should be answered
- The questionnaire should be divided into logical sections
- Start with general questions and then pose specific questions
- Personal or sensitive questions should be posed last
- Consider limiting the number of questions to avoid respondent fatigue

These guidelines were thoroughly considered prior to the finalisation of the questionnaire used in this study.

5.4.2 Wording of the questionnaire

As far as the wording of the questionnaire is concerned, a researcher needs to:

- Be concise
- Pose definite questions that require definite answers
- Ask one question at a time
- Avoid leading questions
• Avoid using direct questions which relate to sensitive information
• Provide for all possible answers
• Avoid wording that can create respondent embarrassment

The questions posed in the questionnaire used in this study, were concise and the respondents were able to answer them with relative ease as it related directly to their field of expertise. Questions were grouped in such a manner that each group focused on gathering information on a specific topic.

5.4.3 Phrasing of questions

Requirements for the phrasing of questions include:

• Define the specific issue at hand
• Consider the required subjectivity or objectivity expected from the answers given by the respondents
• Decide if questions should be positively, negatively or neutrally phrased
• Do not ask ambiguous questions
• Do not pose leading questions
• Phrase questions in such a manner that it prevents the respondents from giving general answers

The pre-testing assisted in phrasing the questions in the questionnaire used in this study to be clear and unambiguous, and clearly requested specific responses from the respondents. This avoided the respondents to give general answers.

5.4.4 Types of questions available to researchers

Various types of questions are available to researchers who have a need to collect primary data. The eventual choice finally decided upon could be a specific type or a
combination of different types of questions. The following types of questions are available for use (Struwig & Stead 2001: 92-95):

- Open-ended questions. These questions allow the respondents to answer in their own words and freely express themselves. It is appropriate for introductory questions and is useful when further clarification is required.

- Multiple choice questions. These questions offer the respondents specific alternatives to choose from. It simplifies the recording, tabulation and editing process.

- Dichotomous questions. With this question type, the respondents are offered a choice between two options only, for example “Yes” or “No”. Advantages are similar to those of multiple choice questions. Its drawback is that it cannot be factor analysed.

- Scaled-response questions. The purpose of this question format is to collect data on the attitudes and perceptions of the respondents. Two examples include the Likert-type scale, which is linked to a number of statements in a five to seven point scale, and the semantic differential scale, which only displays two bipolar adjectives on a scale between seven and eleven points.

- Ranking questions. With these type of questions, the respondent is asked to rank a set of items in terms of given criteria.

A questionnaire, consisting of Likert-type scale and open ended questions, were used in this research study as a means of gathering the required information. The questionnaire was mailed and e-mailed to the identified respondents. The five point Likert-scale was mainly used as the respondents were asked to rate their level of agreement on a given subject. It purposefully included a middle point reflecting the neutral response as it was felt that this will erase researcher bias if it was left out. Another reason for its use was
that it could be more easily statistically analysed. A few open-ended questions were also posed which allowed for a greater variety of responses on particular subjects which could be used as backup or motivation on certain issues raised throughout the study.

5.4.5 Questionnaire pre-testing

To erase any ambiguity in the questions posed and to ensure that no problems exist with its wording, pre-testing the questionnaire among a few of the respondents normally gives a researcher a good idea of its appropriateness (Sekaran 2000:248). According to Struwig and Stead (2001:89), pre-testing should highlight any problems the respondents may experience with the instructions or their understanding of particular questions. If any ambiguities or concerns are highlighted through the pilot test, adjustments could then be made prior to administering the final questionnaire to the entire sample.

This study’s questionnaire was pre-tested by eight part-time B Tech students in the researcher’s class who are employed on a full-time basis in the automotive industry. The pre-testing assisted to do some rewording, rephrasing and changes in the format with regard to some of the questions. After these minor adjustments had been done, the researcher felt confident that the questionnaire will produce the results it was intended to give.

5.4.6 Population and sample make-up

Collis and Hussey (2003:56) perceive a sample as a sub-set of a population, which in turn is described as “a set of people or a collection of items on which the study focuses”. The results obtained after studying the sample, will enable a researcher to draw conclusions which could be generalised over the entire population. According to Sekaran (2000: 268), sampling sometimes results in more reliable research results as fatigue is reduced. This results in fewer errors in data collection, especially when the population is very large.
Two major types of sampling design exist, namely probability sampling and non-probability sampling. In probability sampling, the population elements have a known chance of being selected as part of the sample, whereas their chances with non-probability are unknown. Sekaran (2000:271) further argues that the use of probability sampling design is motivated by the importance of the representativeness of the sample, as conclusions will be generalised and because time and other factors favour the use of non-probability sampling. Both sampling designs have different strategies.

For the purpose of this study, stratified random sampling, which is a probability sampling strategy, was used. Thomas (2004:107) contends that this strategy implies the use of known characteristics of the population during sampling, which in turn will increase the likelihood of selecting a representative sample. The population is divided into sub-groups from which a sample is randomly drawn. The author is of the opinion that stratified random sampling requires knowledge of particular variables, which are important in terms of the aims of the study. Examples of particular variables in this study include the sub-sectors supplying electrical or metal pressing components. The empirical study included these variables and is discussed in the next chapter.

For this reason the study’s sample population was divided into different automotive sub-sectors that represent the entire automotive industry. Sample members from each of these sub-sectors were randomly chosen. The automotive sub-sector industries included the metal, plastic, rubber, chemical and electrical industries, as well as OEMs in the Eastern Cape Province. A section termed “other” was used to include those who will perceive themselves as not being part of the mentioned sub-sector industries, or as a combination of the different automotive sub-sector industries. A total of 63 automotive business firms were selected for the sample.
5.4.7 Administration of the questionnaires

Contact with the respondents mostly started with a personal telephone call to individuals who were responsible for managing the purchasing functions in the mentioned sub-sectors, as well as senior managers at individual automotive firms. The aim was to introduce and explain the purpose of the research study and to request their participation. This was followed by the actual completion of the questionnaire. The questionnaire was accompanied by a cover letter (see Annexure A) which explained the aims of the research study. Although most of the questionnaires were e-mailed, some were hand delivered and later collected.

5.5 RESPONSE RATE FOR THIS STUDY

Initially the response rate was relatively slow. This was attributed to the fact that the questionnaires were sent out just before the 2007 end-of-year/shut-down/holiday period for most of the respondent firms. A thorough follow-up by telephone and/or e-mail early in 2008 resulted in a much improved response rate. Respondents at two of the three Eastern Cape-based OEMs, namely General Motors and Volkswagen, as well as 34 of the 60 automotive component manufacturers, completed the questionnaire. A response rate of 57,0% was achieved. As indicated in Section 5.4.6 of Chapter 5, the sub-sectors in which employees were interviewed, were the metal, plastic, rubber, chemical and electrical industries, as well as a sub-sector termed “other” for respondents who perceived themselves not part of those previously mentioned or a combination of the different sub-sectors.

The response rate from the different sampled sub-sectors is illustrated in Figure 5.1. Although the respondents are from the entire range of sub-sectors mentioned above, the majority of the respondents are from the “other” sub-sector which indicates that they are either not part of the sub-sectors mentioned, or that their operations cover a combination of activities performed in different sub-sectors.
Figure 5.1: Questionnaire response rate of the different sub-sectors

![Pie chart showing response rates for different sectors]

### 5.6 CONCLUDING REMARKS

This chapter addressed the purpose of research in general and briefly described the difference between quantitative and qualitative research. The discussion on the design of questionnaires and its associated guidelines were of assistance in the finalisation of the questionnaire used in this study.

The next chapter addresses the empirical findings of the study. It describes the factor analysis that was performed and explains the reliability of the study’s measuring instrument that was used for gathering the research data.
CHAPTER 6

EMPIRICAL FINDINGS OF THE STUDY

6.1 INTRODUCTION

This chapter presents the empirical findings of the study with the aid of tables and figures. The tables and figures are summaries of the questionnaire responses. The empirical findings are based on summaries of the questionnaire responses and presented in terms of the respective study objectives as identified in Section 1.2 of the first chapter. This approach should allow the reader to conclude objectively on the success of the research study. It should be noted that the Eastern Cape Province is home to 30.0% of the country’s automotive suppliers, which consist of various tier suppliers. Only first-tier suppliers, the Automotive Industry Development Centre (AIDC) and the three locally based OEM’s were approached as respondent firms.

6.2 ACHIEVEMENT OF THE RESPECTIVE STUDY OBJECTIVES

The study’s main and sub-objectives are again stated in this section, together with the specific questions that were posed to the respondents in order to get their responses as they relate to their specific activities in the automotive industry. This is followed by a discussion of the empirical findings for each objective.

6.2.1 Primary objective: To identify the key factors a supplier needs to adhere to in order to be classified a world-class supplier from the South African automotive industry perspective

The main aim of the study was to determine the key factors required for a supplier to be regarded a world-class supplier from the South African automotive industry perspective. To achieve this objective, the respondents were asked to indicate their levels of agreement on the possible factors which were identified as being important for
becoming a world-class supplier. The factors were identified as a result of the literature review and personal interviews done.

Table 6.1: Synopses of responses (expressed in %) for questions 1-24 in Section B of the questionnaire

<table>
<thead>
<tr>
<th>Key factors required to be regarded a world-class supplier</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Culture of continuous improvement</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>33,3</td>
<td>66,7</td>
<td>4,67</td>
<td>5,00</td>
</tr>
<tr>
<td>2. Ability to respond to customer schedule changes</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>47,2</td>
<td>52,8</td>
<td>4,53</td>
<td>5,00</td>
</tr>
<tr>
<td>3. Consistently meeting delivery deadlines</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>30,6</td>
<td>69,4</td>
<td>4,69</td>
<td>5,00</td>
</tr>
<tr>
<td>4. Clear and open communication</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>41,7</td>
<td>55,6</td>
<td>4,53</td>
<td>5,00</td>
</tr>
<tr>
<td>5. Respect for business ethics</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>33,3</td>
<td>63,9</td>
<td>4,61</td>
<td>5,00</td>
</tr>
<tr>
<td>6. High product reliability</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>19,4</td>
<td>77,8</td>
<td>4,75</td>
<td>5,00</td>
</tr>
<tr>
<td>7. Consistent application of their quality policy</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>33,3</td>
<td>63,9</td>
<td>4,61</td>
<td>5,00</td>
</tr>
<tr>
<td>8. Conforming to specifications</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>27,8</td>
<td>69,4</td>
<td>4,67</td>
<td>5,00</td>
</tr>
<tr>
<td>9. Quoting fair prices</td>
<td>0,00</td>
<td>0,00</td>
<td>2,8</td>
<td>47,2</td>
<td>50,0</td>
<td>4,47</td>
<td>5,00</td>
</tr>
<tr>
<td>10. Prompt response to business requests</td>
<td>0,00</td>
<td>2,8</td>
<td>2,8</td>
<td>52,8</td>
<td>41,7</td>
<td>4,33</td>
<td>4,50</td>
</tr>
<tr>
<td>11. Supplier back-up support</td>
<td>0,00</td>
<td>0,00</td>
<td>5,6</td>
<td>58,3</td>
<td>36,1</td>
<td>4,31</td>
<td>4,00</td>
</tr>
<tr>
<td>12. Technical capability of the supplier</td>
<td>0,00</td>
<td>2,8</td>
<td>5,6</td>
<td>36,1</td>
<td>55,6</td>
<td>4,44</td>
<td>4,00</td>
</tr>
<tr>
<td>13. Buy-in from supplier with respect to new business strategies</td>
<td>0,00</td>
<td>0,00</td>
<td>8,3</td>
<td>52,8</td>
<td>38,9</td>
<td>4,31</td>
<td>5,00</td>
</tr>
<tr>
<td>14. Strict adherence to contractual commitments</td>
<td>0,00</td>
<td>0,00</td>
<td>8,3</td>
<td>41,7</td>
<td>50,0</td>
<td>4,42</td>
<td>4,50</td>
</tr>
<tr>
<td>15. Competent supplier representative(s)</td>
<td>0,00</td>
<td>0,00</td>
<td>8,3</td>
<td>58,3</td>
<td>33,3</td>
<td>4,25</td>
<td>4,00</td>
</tr>
<tr>
<td>16. Willingness to assist in new product development</td>
<td>0,00</td>
<td>2,8</td>
<td>5,6</td>
<td>47,2</td>
<td>44,4</td>
<td>4,33</td>
<td>4,00</td>
</tr>
<tr>
<td>17. Short delivery lead times</td>
<td>0,00</td>
<td>2,8</td>
<td>8,3</td>
<td>36,1</td>
<td>52,8</td>
<td>4,39</td>
<td>5,00</td>
</tr>
<tr>
<td>18. Application of quality policy company-wide</td>
<td>0,00</td>
<td>0,00</td>
<td>11,1</td>
<td>38,9</td>
<td>50,0</td>
<td>4,39</td>
<td>4,50</td>
</tr>
<tr>
<td>19. Good cost reduction buy-in and initiatives</td>
<td>0,00</td>
<td>0,00</td>
<td>11,1</td>
<td>38,9</td>
<td>50,0</td>
<td>4,39</td>
<td>4,50</td>
</tr>
<tr>
<td>20. Availability of supplier representatives</td>
<td>0,00</td>
<td>2,8</td>
<td>11,1</td>
<td>66,7</td>
<td>19,4</td>
<td>4,03</td>
<td>4,00</td>
</tr>
<tr>
<td>21. Healthy supplier financial status</td>
<td>0,00</td>
<td>0,00</td>
<td>16,7</td>
<td>47,2</td>
<td>36,1</td>
<td>4,19</td>
<td>4,00</td>
</tr>
<tr>
<td>22. Product innovation</td>
<td>0,00</td>
<td>2,8</td>
<td>13,9</td>
<td>47,2</td>
<td>36,1</td>
<td>4,17</td>
<td>4,00</td>
</tr>
<tr>
<td>23. Open book pricing policy</td>
<td>2,8</td>
<td>5,6</td>
<td>11,1</td>
<td>52,8</td>
<td>27,8</td>
<td>3,97</td>
<td>4,00</td>
</tr>
<tr>
<td>24. Fair supplier profit margins</td>
<td>0,00</td>
<td>2,8</td>
<td>22,2</td>
<td>52,8</td>
<td>22,2</td>
<td>3,94</td>
<td>4,00</td>
</tr>
</tbody>
</table>
Table 6.1 reflects the responses given by the respondents for questions 1-24 in Section B of the questionnaire, as well as the means and medians obtained for each individual response. The table contains a range of 24 possible factors that a supplier should adhere to in order to be classified a world-class supplier in the South African automotive industry. The factors relate to specific business policies, programmes, expectations, initiatives and actions from suppliers that will ensure economical pricing, acceptable quality, and high service levels to customer firms in the automotive industry. The respondents were requested to attach their levels of agreement against each of these factors. The arrangement of the responses given in the table is based on the most positive to the least positive responses received from the respondents.

An analysis of the responses indicates that respondents were in strong support that these key factors were important for the establishment of a world-class supplier base. This support is evident in the high means and medians achieved against each response as indicated in the last two columns of Table 6.1. The means achieved on all 24 items covered a range of between 3.94 and 4.75 while the medians covered a range of between 4.0 and 5.0.

Support for the first nine items in Table 6.1 in particular was very strong. An average of 34.9% of the respondents agreed and 63.3% strongly agreed that these factors were key in establishing a world-class supplier base. Items 1 (culture of continuous improvement), 2 (ability to respond to customer schedule changes) and 3 (consistently meeting delivery deadlines) scored a full agreement (100.0%) response rate from respondents. Items 4 (clear and open communication), 5 (respect for business ethics), 6 (high product reliability), 7 (consistent application of quality policy), 8 (conformance to specifications) and 9 (quoting fair prices) scored an average agreement response rate of 97.2% while the agreement response rate on the balance of the items covered a range of between 75.0% and 94.5%.

Figure 6.1 illustrates the responses which the respondents gave to question 25 in Section B of the questionnaire. In this question the respondents were requested to rate
their level of agreement with a statement that implied that a lack of the key factors required to become a world-class supplier, was the root cause of current inferior supplier performance. The results strongly support the concluded view of the respondents with regard to the 24 key factors required to become a world-class supplier. In total, 36.1% of the respondents agreed, while 41.6% of the respondents strongly agreed that these factors were key to the establishment of a world-class supplier.

Figure 6.1: Presentation of responses for question 25 in Section B of the questionnaire.

6.2.1.1 Factor analysis

As questions 1-24 in Section B of the questionnaire relate to the core focus of the study, a factor analysis was performed to determine its reliability.

The measurement of a research study’s reliability relates to testing the effectiveness of the instrument used by the researcher for gathering the research input (Jackson, 2008:67). It refers to the consistency or stability of obtaining the same results when the study is replicated under similar conditions.
According to Kline, in Struwig and Stead (2001:33), reliability measurement is ideal when the sample used consists of 200 or more individuals. However, if the sample size is small, reliability coefficients for the tests used should be given. The authors prescribe the use of Cronbach’s coefficient alpha when individuals respond to items of multiple levels, especially when Likert-type scales are used. The calculation of Cronbach’s coefficient alpha is based on the inter-correlations among test items that address a particular concept. The closer it is to 1.00, the higher the instrument’s internal consistency and reliability. Internal consistency outcomes calculate the extent to which test items address the same attribute.

Factor analysis is frequently used in the development of questionnaires to ensure that questions posed, relate to the constructs it intends to measure. According to Field (2000:424), the use of a correlation matrix in which inter-correlations between the studied variables are given, is seen as the point of departure for a factor analysis. Its goal is to identify variables with high inter-correlations that measure one underlying variable, which is referred to as a “factor”. The author states that the projection of scores of the original variables on the factor, results in creation of factor scores and factor loadings. Reitveld and Van Hout (1993:292) describe factor scores as “the scores of a subject on a factor”, while factor loadings are the “correlation of the original variable with a factor”. Stevens, in Field (2000:441) recommends that only factor values greater than 0,4 which explains a variance of around 16,0%, be considered for interpretation. A correlation exists if test questions measure the same variable. If a variable do not correlate with other variables or only with a few, its exclusion should be considered.

The factor analysis of this study and the measuring instrument’s reliability test was done by using the Statistical Package for Social Sciences (SPSS, 2008) computer programme. The factor analysis performed on the statistical results of this study focused on three factors, namely the pricing, quality and service delivery of a world-class supplier base. Each factor was linked with a specific set of test items which related to
the core focus of the study. The grouping of these items depended on their areas of impact.

Factor 1: Quality

The seven items linked to the factor of quality, relate to specific business practices applied and actions taken by suppliers that will ensure acceptable product quality levels to customer business firms. A confirmatory factor analysis, in which one factor (quality) was extracted, was performed on the seven items that constituted it. The main purpose was to determine the percentage variance when linking it to the factor being analysed. The loading of each item is given in Table 6.2.

Table 6.2: Factor loadings and percentage variance explained for the factor analysis on the seven items which constituted the factor of quality

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor (Quality)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical capability of the supplier</td>
<td>0,810</td>
</tr>
<tr>
<td>High product reliability</td>
<td>0,735</td>
</tr>
<tr>
<td>Consistent application of quality policy</td>
<td>0,694</td>
</tr>
<tr>
<td>Culture of continuous improvement</td>
<td>0,693</td>
</tr>
<tr>
<td>Conformance to specifications</td>
<td>0,610</td>
</tr>
<tr>
<td>Application of quality policy company-wide</td>
<td>0,566</td>
</tr>
<tr>
<td>Product innovation</td>
<td>0,479</td>
</tr>
<tr>
<td>Percentage variance explained</td>
<td>44,00%</td>
</tr>
</tbody>
</table>

Extraction method: Principal component analysis

From Table 6.2 it is observed that each of the item loadings was greater than 0,4 and that the total variance explained for the factor (quality) is 44,0%. Although the percentage variance explained is not high, it is acceptable.
Table 6.3 portrays the internal consistency reliability tests conducted on the items comprising quality and shows the results of the reliability analysis on subscale exhaustion.

Table 6.3:  Internal consistency reliability test for the seven items that constituted the factor of quality

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.764</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Scale mean if item is deleted</th>
<th>Scale variance if item is deleted</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s Alpha if item is deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical capability of the supplier</td>
<td>27,25</td>
<td>5,050</td>
<td>0.658</td>
<td>0.692</td>
</tr>
<tr>
<td>High product reliability</td>
<td>26,94</td>
<td>6,054</td>
<td>0.592</td>
<td>0.719</td>
</tr>
<tr>
<td>Consistent application of quality policy</td>
<td>27,08</td>
<td>5,694</td>
<td>0.557</td>
<td>0.722</td>
</tr>
<tr>
<td>Culture of continuous improvement</td>
<td>27,03</td>
<td>6,256</td>
<td>0.534</td>
<td>0.730</td>
</tr>
<tr>
<td>Conformance to specifications</td>
<td>27,03</td>
<td>6,313</td>
<td>0.435</td>
<td>0.745</td>
</tr>
<tr>
<td>Application of quality policy company-wide</td>
<td>27,31</td>
<td>5,933</td>
<td>0.405</td>
<td>0.754</td>
</tr>
<tr>
<td>Product innovation</td>
<td>27,53</td>
<td>5,913</td>
<td>0.331</td>
<td>0.778</td>
</tr>
</tbody>
</table>

The values in the column labeled “Alpha if item is deleted” are the values of the overall Cronbach Alpha if that item is not included in the calculation. The overall Cronbach Alpha is calculated at 0.764 and, for a good reading, all the values in the last column should be around this value. By studying the table it is clear that all of these values are around a value of 0,764 and the overall Cronbach Alpha is greater than 0,7. This indicates internal consistency for the subscale of quality.
Factor 2: Pricing

The four items comprising the category on pricing are related to business practices applied and actions taken by suppliers that will ensure acceptable prices to customer business firms. A confirmatory factor analysis in which one factor (pricing) was extracted, was performed on the items which comprise it. The loading of each item is portrayed in Table 6.4

Table 6.4: Factor loadings and percentage variance explained for the factor analysis on the four items which constituted the factor of pricing

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor (Pricing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoting fair prices</td>
<td>0,864</td>
</tr>
<tr>
<td>Good cost reduction buy-in and initiatives</td>
<td>0,861</td>
</tr>
<tr>
<td>Fair supplier profit margins</td>
<td>0,661</td>
</tr>
<tr>
<td>Open book policy with regard to pricing</td>
<td>0,291</td>
</tr>
<tr>
<td>Percentage variance explained</td>
<td>50,25%</td>
</tr>
</tbody>
</table>

Extraction method: Principal component analysis

Table 6.4 indicates that one factor was extracted which achieved an acceptable variance explained of 50, 25%. Three of the four items loaded higher than 0,6 while the fourth item loaded 0,291.

Table 6.5 presents the internal consistency reliability tests conducted on the items comprising the factor of pricing, and shows the results of the reliability analysis on a subscale exhaustion.
Table 6.5: Internal consistency reliability test for the four items which constituted the factor of pricing

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
<th>Scale mean if item is deleted</th>
<th>Scale variance if item is deleted</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s Alpha if item is deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,577</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>12,31</th>
<th>2,733</th>
<th>0,488</th>
<th>0,443</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoting fair prices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good cost reduction buy-in</td>
<td>12,39</td>
<td>2,359</td>
<td>0,529</td>
<td>0,377</td>
</tr>
<tr>
<td>and initiatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair supplier profit margins</td>
<td>12,83</td>
<td>2,486</td>
<td>0,377</td>
<td>0,491</td>
</tr>
<tr>
<td>Open book policy with regard</td>
<td>12,81</td>
<td>2,561</td>
<td>0,167</td>
<td>0,707</td>
</tr>
<tr>
<td>to pricing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The values in the column labeled “Alpha if item is deleted” are the values of the overall Cronbach Alpha if that item is not included in the calculation. The overall Cronbach Alpha is 0,577. By deleting the fourth item “open book policy with regard to pricing” because of its weak loading (0,291) and impact on the initial Cronbach Alpha (0,577), a much improved Cronbach Alpha of 0,707 is achieved. Internal consistency for the subscale pricing is thus achieved. The result of the change to three items is presented in Table 6.6.
Table 6.6: Revised internal consistency reliability test for the three items comprising the factor of pricing

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.707</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Scale mean if item is deleted</th>
<th>Scale variance if item is deleted</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s Alpha if item is deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoting fair prices</td>
<td>8.33</td>
<td>1.371</td>
<td>0.668</td>
<td>0.481</td>
</tr>
<tr>
<td>Good cost reduction buy-in and initiatives</td>
<td>8.42</td>
<td>1.221</td>
<td>0.570</td>
<td>0.556</td>
</tr>
<tr>
<td>Fair supplier profit margins</td>
<td>8.86</td>
<td>1.323</td>
<td>0.386</td>
<td>0.811</td>
</tr>
</tbody>
</table>

Factor 3: Service delivery

This factor comprised a total of thirteen items which impact on the service levels offered by suppliers to customer business firms. It includes business practices applied and actions taken by suppliers that will ensure acceptable service levels to customer business firms. A confirmatory factor analysis, in which one factor (service delivery) was extracted, resulted in the achievement of the loadings and the percentage variance displayed in Table 6.7.
Table 6.7: Factor loadings and percentage variance explained for the factor analysis on the thirteen items which constituted the factor of service delivery

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor (service delivery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier back-up support</td>
<td>0.813</td>
</tr>
<tr>
<td>Prompt response to business requests</td>
<td>0.805</td>
</tr>
<tr>
<td>Ability to adapt to customer schedule changes</td>
<td>0.786</td>
</tr>
<tr>
<td>Willingness to assist in new product development</td>
<td>0.675</td>
</tr>
<tr>
<td>Competent supplier representative(s)</td>
<td>0.658</td>
</tr>
<tr>
<td>Clear and open communication</td>
<td>0.643</td>
</tr>
<tr>
<td>Strict adherence to contractual commitments</td>
<td>0.595</td>
</tr>
<tr>
<td>Healthy supplier financial status</td>
<td>0.583</td>
</tr>
<tr>
<td>Buy-in from suppliers with regard to new business strategies</td>
<td>0.578</td>
</tr>
<tr>
<td>Consistent meeting of delivery deadlines</td>
<td>0.573</td>
</tr>
<tr>
<td>Short delivery lead times</td>
<td>0.452</td>
</tr>
<tr>
<td>Respect for business ethics</td>
<td>0.324</td>
</tr>
<tr>
<td>Availability of supplier representative(s)</td>
<td>0.078</td>
</tr>
<tr>
<td>Percentage variance explained</td>
<td>37.685</td>
</tr>
</tbody>
</table>

Extraction method: Principal component analysis

Table 6.7 indicates that one factor (service delivery) was extracted, explaining a total variance of 37.685%. The fact that not all the items loaded strongly can be regarded as the reason for the percentage variance that was achieved. Loadings on eleven of the thirteen factors were greater than 0.4. Two items, namely “respect for business ethics” and “availability of supplier representative”, achieved weak loadings of 0.324 and 0.078 respectively.

Table 6.8 presents the internal consistency reliability tests conducted on the items which constituted this factor and shows the results of the reliability analysis on a subscale exhaustion.
Table 6.8: Internal consistency reliability test for the thirteen items that constituted the factor of service delivery

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,785</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Scale mean if item is deleted</th>
<th>Scale variance if item is deleted</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s Alpha if item is deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier back-up support</td>
<td>51,61</td>
<td>17,730</td>
<td>0,768</td>
<td>0,742</td>
</tr>
<tr>
<td>Prompt response to business requests</td>
<td>51,58</td>
<td>17,507</td>
<td>0,677</td>
<td>0,745</td>
</tr>
<tr>
<td>Ability to adapt to customer schedule changes</td>
<td>51,39</td>
<td>18,530</td>
<td>0,690</td>
<td>0,753</td>
</tr>
<tr>
<td>Willingness to assist in new product development</td>
<td>51,58</td>
<td>17,964</td>
<td>0,545</td>
<td>0,758</td>
</tr>
<tr>
<td>Competent supplier representative(s)</td>
<td>51,67</td>
<td>18,457</td>
<td>0,573</td>
<td>0,758</td>
</tr>
<tr>
<td>Clear and open communication</td>
<td>51,39</td>
<td>18,759</td>
<td>0,561</td>
<td>0,760</td>
</tr>
<tr>
<td>Strict adherence to contractual commitments</td>
<td>51,50</td>
<td>18,886</td>
<td>0,441</td>
<td>0,769</td>
</tr>
<tr>
<td>Healthy supplier financial status</td>
<td>51,72</td>
<td>18,492</td>
<td>0,458</td>
<td>0,767</td>
</tr>
<tr>
<td>Buy-in from suppliers with regard to new business strategies</td>
<td>51,61</td>
<td>18,759</td>
<td>0,489</td>
<td>0,765</td>
</tr>
<tr>
<td>Consistent meeting of delivery deadlines</td>
<td>51,22</td>
<td>19,663</td>
<td>0,461</td>
<td>0,770</td>
</tr>
<tr>
<td>Short delivery lead times</td>
<td>51,53</td>
<td>18,771</td>
<td>0,367</td>
<td>0,776</td>
</tr>
<tr>
<td>Respect for business ethics</td>
<td>51,31</td>
<td>20,847</td>
<td>0,129</td>
<td>0,793</td>
</tr>
<tr>
<td>Availability of supplier representative(s)</td>
<td>52,89</td>
<td>21,359</td>
<td>-0,085</td>
<td>0,853</td>
</tr>
</tbody>
</table>

The values in the column labeled “Alpha if item is deleted” are the values of the overall Cronbach Alpha if the item is not included in the calculation. The overall Cronbach Alpha is 0,785 and, for a good result, all the values in the last column should be around this value. When studying Table 6.8 it is shown that all of these values are around 0,785
and the overall Cronbach Alpha is greater than 0.7 which indicate internal consistency for the subscale of service delivery.

Although two of the factor loadings were less than 0.4 an additional confirmatory factor analysis was performed to determine the effect on the Cronbach Alpha. This is depicted in Table 6.9. The resultant Cronbach Alpha was 0.808. As the change was not significant, the results of the initial factor analysis were used.
Table 6.9: Additional internal consistency reliability test for the thirteen items which constituted the factor of service delivery

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.808</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Scale mean if item is deleted</th>
<th>Scale variance if item is deleted</th>
<th>Corrected item – total correlation</th>
<th>Cronbach’s Alpha if item is deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier back-up support</td>
<td>51,5556</td>
<td>19,854</td>
<td>0.666</td>
<td>0.779</td>
</tr>
<tr>
<td>Prompt response to business requests</td>
<td>51,5278</td>
<td>19,056</td>
<td>0.694</td>
<td>0.773</td>
</tr>
<tr>
<td>Ability to adapt to customer schedule changes</td>
<td>51,3333</td>
<td>20,171</td>
<td>0.699</td>
<td>0.780</td>
</tr>
<tr>
<td>Willingness to assist in new product development</td>
<td>51,5278</td>
<td>19,399</td>
<td>0.585</td>
<td>0.782</td>
</tr>
<tr>
<td>Competent supplier representative</td>
<td>51,6111</td>
<td>20,359</td>
<td>0.530</td>
<td>0.789</td>
</tr>
<tr>
<td>Clear and open communication</td>
<td>51,3333</td>
<td>20,629</td>
<td>0.524</td>
<td>0.790</td>
</tr>
<tr>
<td>Strict adherence to contractual commitments</td>
<td>51,4444</td>
<td>20,540</td>
<td>0.450</td>
<td>0.794</td>
</tr>
<tr>
<td>Healthy supplier financial status</td>
<td>51,6667</td>
<td>20,286</td>
<td>0.441</td>
<td>0.795</td>
</tr>
<tr>
<td>Buy-in from suppliers with regard to new business strategies</td>
<td>51,5556</td>
<td>20,540</td>
<td>0.474</td>
<td>0.793</td>
</tr>
<tr>
<td>Consistent meeting of delivery deadlines</td>
<td>51,1667</td>
<td>21,286</td>
<td>0.488</td>
<td>0.794</td>
</tr>
<tr>
<td>Short delivery lead times</td>
<td>51,4722</td>
<td>20,542</td>
<td>0.357</td>
<td>0.803</td>
</tr>
<tr>
<td>Respect for business ethics</td>
<td>51,2500</td>
<td>21,679</td>
<td>0.318</td>
<td>0.804</td>
</tr>
<tr>
<td>Availability of supplier representative(s)</td>
<td>51,8889</td>
<td>21,359</td>
<td>0.085</td>
<td>0.853</td>
</tr>
</tbody>
</table>

Table 6.10 presents the overall means and standard deviations. The latter measures the deviation of each score from the mean and then averages the deviations. Table 6.10
also portrays the Cronbach Alphas achieved for each group of items which were linked to the three respective individual factors analysed and highlights the number of respondents (N) who responded. The means and standard deviations achieved indicate that the responses of the respondents were alike. It also portrays an acceptable Cronbach Alpha for each factor analysed.

Table 6.10: Synopsis of the overall means, standard deviations and Cronbach’s Alphas achieved for the three individual factors analysed

<table>
<thead>
<tr>
<th>Factors</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>36</td>
<td>4,527</td>
<td>0,397</td>
<td>0,764</td>
</tr>
<tr>
<td>Pricing</td>
<td>36</td>
<td>4,268</td>
<td>0,533</td>
<td>0,707</td>
</tr>
<tr>
<td>Service Delivery</td>
<td>36</td>
<td>4,297</td>
<td>0,373</td>
<td>0,785</td>
</tr>
</tbody>
</table>

The empirical results obtained in terms of the identified sub-objectives, are discussed in the following paragraphs.

6.2.2 **Sub-objective 1:** To source the reasons why a firm will find it important to trade with a world-class supplier base in the Eastern Cape automotive industry

Question 1 in Section C required the respondents to state the benefits they experience with regard to dealing with world-class supplier performance. The main benefits indicated by the respondents when dealing with world-class suppliers include:

- Production schedules are met as the business firm does not experience any production stoppages, delays or any untimely production schedule changes.

- The business firm experiences improved productivity as downtime is limited.

- Crisis management situations owing to bad supplier performance are limited.
• Performances of world-class suppliers are conducive to the application of modern business practices such as lean manufacturing, total quality management and JIT-supply by business firms.

• World-class supplier performance allows the business firm to become more flexible to the changing needs of its customers.

The positive impact on the firm’s product offerings specifically when dealing with world-class suppliers includes:

• World-class suppliers render assistance to the business firm with regard to the design and development of new products. This results in better designs at lower costs and at faster rates.

• The good infrastructure, well-established procedures and quality systems of world-class suppliers ensure that the business firm is supplied with quality products at economical prices, in the correct quantities required, and at the right time. This in turn enables the firm to manufacture quality products at competitive prices, timeously.

• Business practices applied by world-class suppliers, such as continuous improvement and TQM, impact positively on the quality and cost structures of the business firm’s own products.

• Open-book pricing by world-class suppliers ensures that prices quoted are not inflated. This allows the business firm to submit competitive quotations to their customer base.

• High customer service levels rendered by world-class suppliers enable the business firm to offer high service levels to its customer base.
The positive impact on the *profitability* specifically of the firm when dealing with world-class suppliers includes:

- More efficient and effective internal operations which lead to lower cost structures are achieved, thereby increasing the firm's competitiveness in terms of pricing, quality and service delivery. This enables the firm to attract more business, which increases profitability.

- Less working capital is tied up in inventory as world-class suppliers offer short lead times and have the necessary infrastructure to support JIT and lean manufacturing business practices. By achieving lower inventory carrying costs, operational costs decrease, resulting in an increase in profits.

- Cost-saving initiatives from world-class suppliers create substantial savings in purchasing costs, thereby increasing the firm's competitiveness and profitability.

As far as the overall supply chain is concerned when dealing with world-class suppliers, it was found that the supply chain is more efficient, effective and responsive to the needs of its final customers. This enhances the competitiveness and overall profitability of supply chain members.

### 6.2.3 Sub-objective 2: To determine whether the current levels of supplier performance as experienced by buying firms in the automotive industry, could be regarded as world-class

The goal of this sub-objective was to determine the current levels of supplier performance as experienced by buying firms in the Eastern Cape automotive industry. To determine this, the respondents were presented with a wide spectrum of inferior supplier performance areas in questions 1-14 of Section A of the questionnaire. The respondents were required to attach their levels of agreement to these performance areas. The results are shown in Table 6.10.
Table 6.11: Synopsis of responses (expressed in %) for questions 1-14 in Section A of the questionnaire

<table>
<thead>
<tr>
<th>Inferior supplier performance areas</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Late deliveries</td>
<td>8,3</td>
<td>11,1</td>
<td>8,3</td>
<td>41,7</td>
<td>30,6</td>
<td>3,75</td>
<td>4,00</td>
</tr>
<tr>
<td>2. Inability to respond to customer schedule changes</td>
<td>5,6</td>
<td>19,4</td>
<td>5,6</td>
<td>50,6</td>
<td>19,4</td>
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<td>3. Lack of continuous improvement</td>
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<td>47,2</td>
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<td>38,9</td>
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</tr>
<tr>
<td>5. Quoting lengthy lead times</td>
<td>8,3</td>
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<td>47,2</td>
<td>11,1</td>
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</tr>
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<td>6. Products not conforming to specifications</td>
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<td>30,6</td>
<td>25,0</td>
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<td>7. Lack of quality policy / philosophy</td>
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<td>19,4</td>
<td>19,4</td>
<td>36,1</td>
<td>16,7</td>
<td>3,33</td>
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<td>8. Lack of technical ability to infrastructure</td>
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<td>30,6</td>
<td>13,9</td>
<td>36,1</td>
<td>13,9</td>
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<td>9. Incompatible business philosophies</td>
<td>5,6</td>
<td>16,7</td>
<td>30,6</td>
<td>25,0</td>
<td>22,2</td>
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<td>10. Withholding of cost structures</td>
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<td>16,7</td>
<td>30,6</td>
<td>36,1</td>
<td>11,1</td>
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</tr>
<tr>
<td>11. Poor overall management</td>
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<td>13,9</td>
<td>27,8</td>
<td>25,0</td>
<td>22,2</td>
<td>3,33</td>
<td>3,00</td>
</tr>
<tr>
<td>12. Unavailability of supplier representatives</td>
<td>11,1</td>
<td>22,2</td>
<td>27,8</td>
<td>30,6</td>
<td>8,3</td>
<td>3,03</td>
<td>3,00</td>
</tr>
<tr>
<td>13. Incompatible e-commerce software packages</td>
<td>8,3</td>
<td>11,1</td>
<td>44,4</td>
<td>27,8</td>
<td>8,3</td>
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<tr>
<td>14. Displaying of unethical behaviour</td>
<td>22,1</td>
<td>25,0</td>
<td>19,4</td>
<td>16,7</td>
<td>16,7</td>
<td>2,81</td>
<td>3,00</td>
</tr>
</tbody>
</table>

Table 6.11 consists of the 14 areas of inferior supplier performance to which the respondents had to attach their levels of agreement. The areas were identified in line with the literature study that was done. These inferior performance areas will impact negatively on the prices offered, quality levels supplied, as well as service levels rendered by suppliers. The arrangement of the responses given in Table 6.10 is based on the most negative to the least negative responses received from the respondents.

An analysis of the responses indicates that customer business firms in the automotive industry are experiencing high levels of inferior supplier performances that impact negatively on their operations. This is evident in the high mean and median scores achieved for most of the responses as indicated in the last two columns of Table 6.11. The means achieved covered a range of between 2,81 and 3,94 while the median range was between 3,0 and 4,0.
Item 1 (late deliveries) received the most negative response as being a major area of inferior supplier performance, achieving an agreement response rate of 41,7% and a strongly agreement response rate of 30,6%. This was followed by item 2 (inability to respond to customer schedule changes) in which the agreement response rate was 50,6% and the strongly agreement response rate was 19,4%. More than 50,0% of the respondents were in agreement that items 3-8 (lack of continuous improvement, uneconomical pricing, lengthy lead times, products not conforming to specifications, lack of quality policy and lack of technical ability and infrastructure) were indeed areas of inferior supplier performances currently experienced.

Performance areas such as the displaying of unethical behaviour, the withholding of cost structures, as well as incompatible e-commerce software packages, received more positive levels of agreement as only an average of 26,9% of the respondents agreed and 12,0% strongly agreed that these are areas of inferior supplier performances experienced. This indicates the existence of acceptable performance levels from a substantial number of suppliers in specific performance areas.

Figure 6.2 shows in particular eight of the worst areas of inferior supplier performance experienced by firms in the automotive industry. This is of major concern, as inferior supplier performance areas, such as late deliveries, uneconomical pricing and a lack of continuous improvement, will impact negatively on a firm’s pricing, quality and service delivery to its customers.
As these areas of inferior supplier performance are experienced by the majority of the respondents, it should be the main focus areas in which corrective action is considered. This will ensure an improvement in the overall performance of suppliers and a positive impact on the operations of firms in the automotive industry.
6.2.4 **Sub-objective 3: To highlight the consequences to customer firms if supplier performance is not of world-class standard**

The goal of this sub-objective was to highlight the consequences to customer firms if supplier performance is not of world-class standard. To achieve this, the respondents were requested to complete question 15 in Section A of the questionnaire and to highlight the consequences of inferior supplier performance which they frequently experience.

The respondents highlighted an array of consequences of inferior supplier performance. Although some of the consequences were experienced by two or more respondent business firms, some were unique to others. The following is a range of ten consequences of inferior supplier performance identified from the responses given:

- The receipt of inferior quality products, late deliveries and under-shipments which result in production stoppages and production delays. This causes constant rescheduling of production which impacts negatively on productivity.

- Inferior supplier performance gives rise to an expensive and time consuming planning process in the business firm as approved plans and decisions require continuous adaptation. The firm is perceived as being reactive to problem solving instead of being proactive. This causes conflict in and damage to internal and external customer relationships, as well as low employee morale as a result of supplier-enforced short time.

- The business firm’s reputation suffers as dissatisfied customers perceive it as being unreliable. Current customers cancel their contracts and do not consider the firm when issuing future business contracts.
• Inferior supplier performance creates an uncertainty within the business firm with regard to product quality and continuous supply from its supply sources. As a result of this and in an effort to be more flexible, stock holding increases, giving rise to high levels of inventory carrying costs which result in lower profits.

• Uneconomical prices and inferior supplies from its suppliers cause a business firm to become uncompetitive.

• Additional costs are incurred to correct crisis situations caused by inferior supplier performance. These include additional airfreight costs, the reworking of inferior quality products, expensive product recall campaigns, as well as increased inspection costs. All these increase the business firm’s operational costs and thereby decrease its profitability.

• Inferior supplier performance leads to poor introduction to new products by customer firms.

• Incompatible e-commerce packages of suppliers disallow seamless MRP-functionality or efficient vendor inventory management.

• Lack of continuous improvement in the supplier base creates a gap between the process and specification requirements of customer firms and the supplier’s ability to produce it. Long lead times and the inability of suppliers to respond quickly to the demand changes of its customers, negatively affect the credibility of the business firm as an export supplier.

• Because of inferior performance, local suppliers miss out on new business opportunities which lead to the importation of components at high landed costs. This increases the firm’s price to the business firm’s customer base. The supply chain and its participants, therefore, become uncompetitive.
6.2.5 **Sub-objective 4: To identify the actions currently taken, as well as support programmes available to suppliers, in an effort to bring them in line with world-class standards**

The aim of this sub-objective was to identify the actions taken by customer firms, as well as support programmes made available to suppliers, in an effort to bring them in line with world-class standards if the need exists. Question 2 in Section C of the questionnaire was used to address this particular objective.

The responses from the respondents indicated that a wide range of programmes, incentives and actions were utilised by automotive business firms in an effort to realise world-class supplier performances. These include:

- Encouraging open dialogue with suppliers on how to better current performance and engaging in supplier development programmes.
- Rewarding good suppliers with more opportunities by granting them more business and threatening those with below par performance with cancellation of contracts.
- Engaging in full-cost analysis to identify areas wherein suppliers could improve their processes and pricing.
- Requiring suppliers to achieve quality certification linked to specific quality programmes.
- Having regular supplier audits and motivating improvement requests through the use of regular monthly performance reports.
- Applying thorough vendor evaluation before business is awarded and having mission-directed workshops.
- Establishing formalised quality agreements with suppliers that measure performance and give feedback for corrective action.
- Applying a formalised supplier rating process in which their quality, pricing and general performances are rated on a regular basis.
- Coaching suppliers in world-class practices and manufacturing concepts and establishing partnership agreements.
Motivating world-class performance by offering the possibility to be considered for global bidders’ list inclusion which focuses on exports.

6.3 ADDITIONAL FINDINGS OF THE EMPIRICAL STUDY THAT RELATE TO THE LITERATURE STUDY

Responses to questions 3 and 4 in Section C of the questionnaire support important issues, over and above the stated objectives, that were covered in the study. In question 3, for example, the respondents were asked to indicate how certain environmental variables have impacted upon their business activities. The responses were in line with issues relating to globalisation, new technologies, government legislation and information technologies which were referred to in Chapter 2 of the study. The responses are summarised in the following paragraphs.

According to the respondents, globalisation has had both a positive and negative impact on their business activities. Many of the respondents echoed their concern regarding the increasing levels of competition that have entered the local market. This has resulted in a loss of export business and market share, as well as fierce competitive pricing owing to low-priced imports, especially from China. Some business firms have opted to absorb labour, material and overhead cost increases to remain competitive. The findings confirmed the assumption that international customers are sourcing from suppliers that offer them better prices, quality and service. Pressures from multi-national business firms have lead to reduced profits owing to demand requests driven by parent firms for more economical prices. Locally based multi-national firms also face the risk of losing business to other firms within the group if they are not competitive enough. In terms of pricing, quality and service provision, all the above-stated issues have a considerable impact, mostly negative, on the profitability and survival of locally-based automotive business firms.

On the positive side, the advent of globalisation has created various new opportunities for automotive business firms. Firstly, it has granted them the opportunity to market
their products in foreign countries and allowed them to source their requirements from low cost countries. This results in lower-cost structures, as well as increased competitiveness and profitability. Globalisation has also lead to the establishment of more effective and competitive supply chains owing to the pressures of ever-increasing customer expectations and competition.

Some of the respondents are of the opinion that high levels of international competition have also resulted in the establishment of dedicated Kaizen teams at business firms. The focus of these teams is normally on identifying opportunities in which the business firm can continually improve. An increase in benchmarking with the goal of improving manufacturing and logistics processes, for example, was cited as a consequence of globalisation. The positive impact of globalisation is further underlined by the number of responses which indicated an increased presence of a quality culture that was created within business firms. Motivation for this view lies in the fact that quality impacts directly on the competitiveness and success of business firms.

According to the respondents, new or improved technologies filtered down into improved processes and lead to higher productivity levels. It enables their business firms to produce better products, at faster rates, and by using less labour. Others indicated that new technologies have made it possible to enhance their product range and to become more flexible. Another benefit highlighted, centred on the use of new technologies in the local market which was developed by other firms in the supply chain. This has impacted positively on their product offering and competitiveness.

High costs to keep up with new technologies and pressure by customer firms to stay current, was identified as a significant draw-back. These costs relate to research and development costs, as well as costs incurred on skills development, learnerships and knowledge transfer. Another concern highlighted was that of reduced product lines and profitability in the case of locally based multi-national firms who have become merely importers of certain goods rather than manufacturers. Economies of scale in terms of
production volumes and total costs incurred with regard to design and development of new technology, were perceived as the main cause for this scenario.

Responses with regard to government legislation conveyed an appreciation for certain legislation issues, but also a concern for others. For example, some of the respondents agreed that lower tariff structures set by the Department of Trade and Industry (DTI) have decreased the cost of logistics and exports in general. There is also an agreement amongst the respondents that certain initiatives from government, such as the Motor Industrial Development Programme (MIDP), have a positive impact on exports and the economy at large. The respondents expressed their appreciation for the lowering of import tariffs as this resulted in better sourcing decisions, competitiveness and overall profitability.

Negative sentiment expressed towards government legislation centred on high import duties and levies which affect total cost structures and the competitiveness of business firms. The respondents uttered their concerns for the loss of business owing to increased imports which have been caused by the lowering of import tariffs and duties. Legislation regarding Black Economic Empowerment (BEE) was also highlighted as a concern as it impacts on supplier selection, pricing and capacity issues. Delays in the issuing of import permits are perceived as another cause for concern as it causes delays in the importation of goods.

Responses on the impact of information technology on automotive business firms were mostly positive. The respondents felt that it speeded up their reaction time to changes in demand, reduced paperwork, and increased the speed of information transfer. It had also improved their enterprise resources planning (ERP) systems, enhanced communication, and saved time. Other benefits derived from information technology include on-line communication which leads to improved supplier performance as customers are using web-based forecasts and quality systems. Direct linkages of multi-national business firms allow locally-based branches to share new technologies developed by other members in the supply chain. Information technology had also
eased the access of business firms to global markets. The use of web-based procurement systems allow for improved order visibility in the business system and reduce maverick spending owing to online-approval structures. The use of information technology lowered the costs of orders and minimise the possibilities of errors if electronic catalogues are incorrectly used.

Responses given to question 4 in Section C of the questionnaire relate to business strategies and practices which automotive business firms have adopted in response to changes in the external business environment. The business practices were discussed in Chapter 4 of the study. Figure 6.3 illustrates the various business practices followed by respondent business firms, as well as the number (in percentage format) of firms applying it.
It is important to note that between 41.7% and 80.6% of the respondents apply all five business strategies that were discussed in the literature study. These include supply chain management (SCM); lean manufacturing (LM); total quality management (TQM); just-in-time manufacturing (JIT) and outsourcing (OUTS). It is thus imperative that the performances of their supplier bases are of world-class standard to ensure the success of these strategies.

With an average of 47.2% of the respondents engaged in outsourcing activities, it could be assumed that firms are highly dependent on world-class suppliers with regard to the supply of their requirements. As these new business strategies are in essence responses to changing environmental factors, for example, more demanding customers,
failure from its supplier base will result in failure of the application of these business strategies. Lean manufacturing, for example, which is applied as a business strategy by 80.6% of the respondents, is only possible if the supplier delivers acceptable quality levels at the required time. Inferior supplier performance, such as unacceptable quality, will cause the failure of such a business strategy.

A total of 41.7% of the respondents engage in JIT-manufacturing. This requires that their suppliers adhere to strict delivery schedules as limited safety stocks are held. Failure to deliver on time will result in production stoppages, the constant rescheduling of production, and a loss of major business.

A total of 69.4% of the respondents are using a supply chain management approach in their business operations. This requires suppliers to render world-class performances as they are seen as an extension of their customer firm. Unacceptable supplier performance thus creates a weak link in the overall supply chain.

6.4 CONCLUDING REMARKS

The findings of the empirical study addressed the defined objectives of the study comprehensively. Information presented in the various tables and figures gives a true reflection of the responses of the respondents. The results of the factor analysis that was done, indicated that the questionnaire used for gathering the research data was reliable. With the responses received from the respondents for the sub-objective relating to the current levels of supplier performances in the automotive industry, the findings enabled the researcher to portray its current status and those which are of major concern. The findings on additional issues which are related to the literature study, also support the study’s objectives and were presented in logical sequence to the reader. The next chapter presents the study’s main conclusions, recommendations and prospects for future research.
CHAPTER 7

FINAL CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

7.1 INTRODUCTION

The main objective of this study was to determine the key factors required by a supplier in the South African automotive industry to be classified as a world-class supplier. In support of this, the study focused on achieving the following sub-objectives: the motivation for having a world-class supplier base; the identification of current levels of supplier performances; the consequences of inferior supplier performance; as well as identifying specific actions that are currently being taken and support programmes offered to assist suppliers in rendering world-class performance and service.

7.2 SHORT SUMMARY OF THE CONTENT OF THE DIFFERENT CHAPTERS

A review of related research in a South African context as described in Chapter 2, revealed that limited research on the specific topic has been done. A gap was identified in the literature which highlighted the challenges that business firms face as a result of constantly changing environmental variables. This initiated the topic for this study. A brief discussion was given on the importance of identifying the impact of these challenges through a process of environmental scanning. A discussion on a specific range of environmental changes faced by South African business firms followed, in which its impact as both opportunities and threats were highlighted.

The importance of business process re-engineering as a response to the challenges created by environmental changes was described in Chapter 3. Porter's value chain and the role of purchasing and supply management as an important support activity were also explained.
This was followed by a discussion on specific business trends and practices undertaken by firms globally in response to ever-changing environmental variables (Chapter 4). The important role of the purchasing function and its supplier base were highlighted in the context of each business trend and practice.

The literature and empirical study undertaken for the achievement of the study's objectives, resulted in the gathering of relevant data that underlined the importance of trading with a world-class supplier base (Chapters 5 and 6). The empirical findings made it possible to conclude on the study's findings in an objective manner.

7.3 MAIN CONCLUSION OF THE STUDY

As was discussed and illustrated by means of the factor analysis in Table 6.1 of Chapter 6, the respondents were asked to indicate their levels of agreement to 24 factors that are linked to world-class supplier performance. These 24 factors were identified in the literature study. The respondents indicated very strong agreement to a combination of 4 of these factors. This specific study outcome (response), together with formal and informal discussions with role players in the automotive industry, has lead to the following main conclusion of the study: For a supplier in the South African automotive industry to be regarded as being world-class, such a supplier should adhere to the following 4 factors or characteristics:

- A culture of continuous improvement
- Consistently meeting delivery deadlines by being able to respond to customer schedule changes
- Quoting fair prices and respect for business ethics
- The consistent application of a quality policy which leads to conformance to specifications and subsequent high levels of product reliability

The empirical findings in terms of these 4 main factors thus address the main aim and topic of the study.
7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

With reference to the conclusions drawn on the study’s primary and sub-objectives, the establishment of a world-class supplier base can be perceived as a very important prerequisite for firms in the automotive industry to operate successfully. To share in the benefits of world-class supplier performance and avoid the negative consequences of inferior supplier performance, it is recommended that automotive business firms strive to adhere to the key factors identified. Any business firm should actually take note of all 24 factors noted in Table 6.1 as they all, but especially the 4 main ones identified, plays a big role when selecting new suppliers and/or when a need exists to improve the performance of current suppliers who perform below par.

Data gathered during the study regarding the level of current supplier performance, highlights a need for continuous improvement to ensure acceptable performance levels. Based on the current status of supplier performance, future research on supplier development is recommended as it relates to the topic addressed in this study. Other topics recommended for future research that blend in with the outcomes of this study, include supplier selection, the certification of suppliers, as well as the development of instruments to measure supplier performance.

7.5 SHORTCOMINGS OF THE STUDY

Although it is felt that the study addressed the main and sub-objectives in a satisfactorily manner, shortcomings of the study in hindsight revolves around the limited number of sub-sectors from which the respondents were selected. A further division of some of the sub-sectors could have resulted in a larger range of sub-sectors from which the respondents could have been selected.
7.6 CONCLUDING REMARKS

Notwithstanding the above-mentioned shortcoming, it is felt that the main and sub-objectives of the study were fully addressed.
REFERENCE LIST


ANNEXURE A
THE RESEARCH INSTRUMENT
M TECH RESEARCH SURVEY

TOPIC: AN INVESTIGATION INTO FACTORS REQUIRED FOR THE ESTABLISHMENT OF A SOUTH AFRICAN WORLD CLASS SUPPLIER BASE, WITH SPECIFIC REFERENCE TO 1ST–TIER AUTOMOTIVE COMPONENT MANUFACTURERS AND MOTOR ASSEMBLERS IN THE EASTERN CAPE PROVINCE

The South African automotive industry has undergone tremendous changes during the past decade. Companies have increased their level of outsourcing and are relying more heavily on their supply chain as a source of their competitive advantage. Therefore, determining which suppliers to include in the supplier chain has become a key strategic consideration for companies in the automotive industry. To date, very little research has been done to investigate the processes followed by automotive companies to select capable suppliers which will enhance their ability to achieve their goals of becoming world class supplier themselves.

The objectives of this study is therefore to investigate the supplier-selection practices across the supply chain of first-tier automotive component manufacturers and motor assemblers in the Eastern Cape Province.

As the actions of a firm’s supplier base generally impact on cost, quality and service delivery levels, the questionnaire focuses mainly on price, quality and customer service, and has been structured as such. The questionnaire has also been prepared in such a way that it will require only 20 minutes to complete.

As no names or other identification mechanisms have to be furnished and anonymity is guaranteed. All information will be treated as confidential and it will be impossible to identify any individual or specific business firm on the basis of the results included in the final report.

Your co-operation in completing the questionnaire from your particular vantage point will be appreciated as the information obtained will direct me in achieving the study objectives. As a full-time academic at the Nelson Mandela Metropolitan University, I also perceive the expected research output to have academic value in the sense that it will be included into our Logistics programme offered by our Logistics Department.

Thank you for your co-operation.

Yours faithfully

GAVIN COOK
RESEARCHER
### General information

Please mark the applicable block with an “X”

State the position you hold with your business firm.

Indicate the automotive sector within which your business firm operate.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Plastic</th>
<th>Rubber</th>
<th>Chemical</th>
<th>Assembly</th>
<th>Electrical</th>
<th>Other (specify)</th>
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</thead>
</table>

### SECTION A

The following are examples of inferior supplier performance displayed by the current supplier base:

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<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Late deliveries</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>Products not conforming to specifications</td>
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<td></td>
<td></td>
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<td>3</td>
<td>Inability to respond positively to customer schedule changes</td>
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<tr>
<td>4</td>
<td>Incompatible business philosophies which make the successful application of customer business strategies/practices difficult</td>
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<tr>
<td>5</td>
<td>Uneconomical pricing</td>
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<td>6</td>
<td>Quoting lengthy leadtimes</td>
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<td>7</td>
<td>Lack of a quality policy/philosophy</td>
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<td>8</td>
<td>Displaying unethical behaviour</td>
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<td>9</td>
<td>Unavailability of supplier representatives</td>
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<td>10</td>
<td>Withholding of cost structures</td>
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<td>11</td>
<td>Lack of technical ability and infrastructure</td>
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<td>12</td>
<td>Lack of continuous improvement</td>
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<td>13</td>
<td>Poor overall management</td>
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<td>14</td>
<td>Incompatible e-commerce software packages</td>
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15. Give examples of the consequences of inferior supplier performance on your business operations.

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### SECTION B

The following are perceived as key factors for the establishment of a world class supplier base.

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<tbody>
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<td>Culture of continuous improvement</td>
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<td>2</td>
<td>Open book policy with regard to pricing (cost structure)</td>
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<tr>
<td>3</td>
<td>Respect of business ethics</td>
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<td>4</td>
<td>High product reliability</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Healthy supplier financial status</td>
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<tr>
<td>6</td>
<td>Availability of supplier representative</td>
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<td>7</td>
<td>Consistent application quality policy</td>
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<td>8</td>
<td>Short delivery leadtimes</td>
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<td>9</td>
<td>Product innovation</td>
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<td>10</td>
<td>Fair supplier profit margins</td>
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<td>Prompt response to business requests</td>
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<td>12</td>
<td>Competent supplier representative</td>
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<td>13</td>
<td>Application of quality policy “company wide”</td>
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<td>14</td>
<td>Technical capability of supplier</td>
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<td>15</td>
<td>Supplier back-up support</td>
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<td>16</td>
<td>Willingness to assist in new product development</td>
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<td>17</td>
<td>“Buy in” from suppliers with regard to new business strategies/practices applied by the customer/business firm</td>
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<td>18</td>
<td>Conformance to specifications</td>
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<td>19</td>
<td>Ability to adapt and respond positively to customer production schedule changes</td>
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<td>20</td>
<td>Strict adherence to contractual commitments</td>
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<td>21</td>
<td>Clear and open communication</td>
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<td>22</td>
<td>Consistent meeting of delivery deadlines</td>
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<td>23</td>
<td>Good cost reduction “buy-in” and initiatives</td>
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<td>24</td>
<td>Quoting fair prices</td>
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<td>25</td>
<td>The lack of the key factors listed in question 1 to 24 are the root causes of inferior performance in the current suppliers base</td>
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<td>27.</td>
<td>Which three factors listed above (1-24) do you perceive as being lacked mostly by your suppliers.</td>
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1. In your opinion what are the benefits of dealing with a world class supplier base?

   ................................................................................................................................................
   ................................................................................................................................................
   ................................................................................................................................................

2. Which action/incentives/programmes/policies can / does your business firm undertake to motivate suppliers to become world class?

   ................................................................................................................................................
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3. Changes in the business firm’s external environment generally impact on its operations, and, in particular, its relationship with suppliers. “Give an example of how the following variables have impacted on your company operations over the past decade.

   ▪ Globalisation
     ........................................................................................................................................
     ........................................................................................................................................

   ▪ New Technologies
     ........................................................................................................................................
     ........................................................................................................................................

   ▪ Government Legislation
     ........................................................................................................................................
     ........................................................................................................................................

   ▪ Information Technology / E-commerce
     ........................................................................................................................................
     ........................................................................................................................................

4. Some business firms within the automotive industry have adopted new business strategies/practices in response to changes in the external business environment. Indicate which of the following business strategies/practices your business firm have adopted:

   Supply chain management
   Lean manufacturing
   Total Quality Management
   JIT – Manufacturing
   Outsourcing
   Other (specify) .......................