AN ANALYSIS OF SUPPLY CHAIN IMPROVEMENT STRATEGIES BY FIRST TIER AUTOMOTIVE SUPPLIERS IN THE NELSON MANDELA METROPOLE

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Submitted in fulfilment for the degree Master in Business Administration

Promotor: Prof E van Biljon
DECLARATION

“I, Pieter Johannes Tinderholm, hereby declare that:

1. This work has not been previously accepted in substance for any degree and is not currently being submitted in candidature for any degree.

2. This dissertation is being submitted in partial fulfilment of the requirements for the degree of Masters in Business Administration.

3. This dissertation is the result of my own independent work/investigation, except otherwise stated. Other sources are acknowledged by complete referencing. A reference list is attached.

4. I hereby give consent for my dissertation, if accepted, to be available for photocopying and for interlibrary loan, and for the title and summary to be made to outside organisations.”

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ACKNOWLEDGEMENTS

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- Annalette Viljoen for the editing.
SUMMARY

First tier automotive suppliers in the Nelson Mandela Metropole are under continued pressures created by the process of globalisation. To stay globally competitive suppliers have to rethink their supply chain strategies. It is important that suppliers understand the environment that it operates within, this environment present first tier automotive suppliers with numerous problems and challenges. An analysis of this problems and challenges are needed and supply chain strategies need to be developed to overcome these problems and challenges. Before these strategies can be developed a full understanding of the supply chain is necessary.

This dissertation aims to assess the problems and challenges facing first tier automotive suppliers, give a full understanding of the supply chain and present strategies to overcome these problems and challenges. The supply chain has become less structured and closer partnerships are needed between trading partners. The connectivity, transparency and visibility of the supply chain have improved through developments in the communication technology field. Strategies need to utilise these technologies to create a competitive edge. Effective supply chain strategies need to enable first tier automotive suppliers to deliver materials:

- At the right time
- In the right quantities
- At the right quality
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CHAPTER 1

INTRODUCTION AND RESEARCH DESIGN

1.1 MAIN PROBLEM

In today’s fiercely competitive business environment, certain factors are characteristic to those who survive and prosper. Developing effective business strategies, have become norms of successful businesses that wish to enter the global market (Poirier and Reiter, 1996: Preface).

“Going global” has become a goal of every business; only a few companies have achieved this goal. Companies need to find the right blend of centralized planning and decentralized decision-making, common processes and information technologies to successfully achieve this goal. “Going global” is fundamentally a logistics undertaking. Companies need to highly coordinate international flow of goods, cash, information and work processes to become globally competitive (Tyndall, Gopal, Partsch and Kamauff, 1998: Introduction).

According to Christopher (1992:3) the relationship between activities of demand creation and physical supply, illustrate the existence of the two principles of interdependence and balance. Failure to coordinate any of these activities within the organisation or between different organisations will lead to a disruption of the balance within the business environment and will damage the competitive advantage of the organisation. Organisations need to develop effective supply chain strategies to effectively coordinate the activities of demand creation and physical supply.
Organisations need to differentiate itself in the eyes of its customer not only from its competitors but also by operating at a lower cost and at greater profits. Any organisation has to seek a sustainable and competitive advantage; organisations need to be alert to the realities of the global market place (Christopher, 1992:2).

The aim of this research is to design supply chain improvement strategies that will give first tier automotive suppliers in the Nelson Mandela Metropole a sustainable and competitive advantage.

This lead to the following main problem that will be addressed by this research:

What supply chain strategies can selected first tier automotive suppliers in the Nelson Mandela Metropole develop to make them more globally competitive?

1.2 SUB PROBLEMS

In order to develop a research strategy to deal with and solve the main problem, the following sub problems have been identified:

- What problems and challenges are automotive component suppliers facing in the global market?
- What is supply chain management and what is the role of first tier automotive suppliers in an automotive supply chain?
- What improvement strategies can be designed and implemented by first tier automotive component suppliers?
1.3 DEFINITIONS OF KEY CONCEPTS

1.3.1 First tier supplier

Materials, parts, assemblies, information, ideas and sometimes people all flow through the network of customer-supplier relationships formed by all these operations. On the supply side an operation has its own suppliers of parts and information. These suppliers themselves have their own suppliers who in turn could have their own suppliers. This creates a network of suppliers, which is all inter dependent. On the demand side, the operation has customers. These customers might not be the final consumers of the operation’s products or services; they might have their own set of customers (Slack, A; Chambers, S; Harland, C; Harrison, A and Johnston, R 1998: 197).

Automotive assembly operations, such as Volkswagen of South Africa and Delta Motor Corporation, service the customer and all suppliers that supply directly to these assembly operations are called first tier suppliers. These first tier suppliers service as customers of the next tier of suppliers, which are called second tier suppliers (Slack et al, 1998: 197).

1.3.2 Supply chain

Traditionally the majority of organisations have viewed themselves as entities that exist independently from others and need to compete with one another to survive. In the modern world of globalisation this view has become redundant as organisations need to support each other to survive. It is no more a question of the survival of the fittest (Christopher, 1992: 12).
In the past operations managers have seen their main responsibility lying within their own operations. As operations became more focused on a tightly defined set of tasks and consequently buy more of their materials and services from specialist suppliers, the contribution of purchasing and supply to the business has become increasingly more important (Slack et al, 1998: 510).

Christopher (1992:12) defines supply chain as a network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer. Slack et al (1995: 510) view the supply chain as the flow of materials and information through a business from the purchasing activity, through the operations and out to customers, by way of a distribution or services delivery activity. The supply chain is the complete flow system into, through and from the organisation. It is important to note however that there are two flows the physical material flow and the information flow. These two flows generally flow in opposite directions (Wild, 1995: 487).

According to Christopher (1992:12), supply chain is not the same as vertical integration; vertical integration normally implies ownership of upstream suppliers and downstream customers. This was once thought to be the desirable strategy but more organisations focus on their own core business and outsource all non-core activities.

Heizer and Render (1999:416) define supply chain management as the activities that procure raw materials, transform those materials into intermediate goods and the final products and deliver the products through a distribution system.
1.3.3 Logisitics management

Slack et al (1998: 511) refer to logistics management as the management of materials and
information flow from a business, down through a distribution channel, to the end customer.
Logistics management can be seen as the integration of material flow and information flow in the
organisation. Logistics management combine materials management with physical distribution
management (Saunders 1997:41).

1.3.4 Improvement strategies

Slack et al (1998: 81) define a strategy as the total pattern of decisions and actions, which position
the organisation in its environment and are intended to achieve its long-term goals. The strategy of
the organisation is set, its products, services and processes are designed and its work is being
planned and controlled on an ongoing basis. Management’s responsibilities not only lie at the
maintaining of these strategies, but goes much further. Managers must improve their organisations’
performance and this can only be done by improving these organisational strategies. Failure to
improve at least as fast as competitors or at the rate of customers’ expectations can lead to the
organisation losing business and losing their competitiveness (Slack et al, 1998: 37).
1.3.5 Purchasing

The purchasing function traditionally encompasses the process of buying. It involves determining the need, selecting suppliers, arriving at a proper price, specifying terms, issuing the contract or order and following up to ensure proper delivery (Van Weele, 1995: 8).

According to Van Weele (1995:9) the following activities are covered by the purchasing function:

- Determine the specification of the goods and services that need to be bought
- Select the most suitable supplier
- Prepare and conduct negotiations with supplier in order to establish an agreement
- Place the order with the selected supplier
- Monitor control of the order
- After-care and evaluation

1.4 DELIMITATION OF THE RESEARCH

1.4.1 Management level

The study will be limited to operations managers and logistics managers. Other levels of management will be used to obtain secondary information as to the flow of materials during the transformation process.
1.4.2 Size of organisation

The organisations that will be analysed will be medium-sized automotive component suppliers to Volkswagen South Africa (VWSA) and Delta Motor Corporation. Interviews and questionnaires were conducted with the following first tier automotive suppliers:

- Venture South Africa
- Alloy Wheels International
- Bell Essex
- Johnson Control
- Behr
- Coordinated Materials Handling

1.4.3 Geographical demarcation

The empirical component of this study will be limited to selected first tier automotive component suppliers within the Nelson Mandela Metropole.

1.4.4 Evaluation field

The main area under evaluation in this study will be the logistics department of first tier automotive suppliers. First tier suppliers in the Nelson Mandela Metropole primarily import their raw materials and it is important for these suppliers to develop and consistently improve their supply strategies to remain profitable and competitive.
1.5 SIGNIFICANCE OF THE RESEARCH

As the business world becomes more and more competitive, it presents management with new complexities, challenges and concerns. Of the many strategic issues that confront the business organisation today, perhaps the most challenging, are in the area of logistics (Christopher, 1992: 16).

Christopher (1992:16) identifies some of the most important issues facing modern organisations:

- The customer service explosion
- Time compression
- Globalisation of the industry
- Organisational integration

As operations become more focused on a tightly defined set of tasks and consequently buy in more of their materials from specialist suppliers, the contribution of purchasing and supply to business increases in importance. At the demand side of the business it is claimed that up to 25 per cent of total costs can lie in the distribution chain. This flow of materials and information, which form the supply chain, needs to be firmly controlled by managers. Managers can obtain speed, dependability, flexibility, cost and quality benefits with effective control of this flow, which will lead to leaner organisations and make such an organisation globally competitive. Even beyond the immediate supply chain, there are often strategic benefits to gain from managing the flow between customers’ customers and suppliers’ suppliers (Slack et al, 1998: 510).

It is increasingly recognised that good supply chain management provides a major opportunity for organisations to improve efficiency and increase customer service. Supply chain management
focuses on the organising, integrating and operation of the complete materials management function (Wild, 1995: 486).

Improved customer service and reduced supply chain costs are the outputs of effective logistics management and it is through the achievement of these two objectives, that logistics contributes to corporate performance. During the last two decades, companies have become more aware of the importance of customer service as a key competitive issue and it has been an undisputable reality that efficient management of the flow of materials through the supply chain is critical to achieve high levels of customer satisfaction. Companies now realise that logistics management is much more than mere distribution. The concept is much broader and improvements in logistics can improve service and reduce costs and thereby give the company a significant competitive advantage, which in turn, can then be exploited as a key element of its marketing strategy. Logistics costs represent a significant element of a firm’s total cost. In companies where logistics have not been well managed, there is considerable scope for cost savings. The starting point for these companies is to analyse their supply chain and start to implement improvement strategies (Taylor, 1997: 3).

Purchasing and supply can no longer be treated as a second-order function. The way forward lies with integrated materials management; pulling together suppliers, production and distribution. In the future, those who do not have their purchasing and supply operations in place will not be competitive (Saunders, 1994:1).

According to Saunders (1994:1) currently organisations worldwide design and implement strategic approaches in purchasing and supply management. Organisations that want to make a successful
transition from mass production to being a lean enterprise must find answers to the following questions:

- Are you underrating the importance of purchasing and supply to your business?
- How good is your purchasing and supply operation?
- Do you have a strategic approach to purchasing and supply?
- Is your relationship with suppliers co-operative rather than adversarial?
- Does purchasing and supply integrate with other disciplines?
- Can you improve your purchasing effectiveness?
- How can you move towards a more strategic and integrated approach to purchasing and supply?

In recent years the purchasing phenomena has been changing in many companies. This is emphasised by the increased attention this discipline is receiving from industrial managers and practitioners. As a result of the implementation of improvement programs in engineering, manufacturing and logistics management, many companies feel the need to improve their relationships with suppliers. These relationships should result in engineering lead-time reduction, just in time delivery and zero defects on new and existing incoming parts (Van Weele, 1995:1).

1.6 RESEARCH DESIGN

The main problem being researched in this study is the question of what supply chain strategies can first tier automotive suppliers introduce to be more globally competitive. In carrying out this evaluation, it is necessary to evaluate the present situation within selected first tier automotive suppliers in the Nelson Mandela Metropole.
The literature study in Chapters 2, 3 and 4 was used to establish the answers to the three sub problems. The empirical study aims to help create an understanding of practical issues experienced within first tier automotive suppliers. Five first tier automotive suppliers were selected and the organisations’ supply chain strategies were surveyed.

The Eastern Cape is regarded as having the potential to become the Detroit of Africa and therefore it was identified as the appropriate geographical area. The supply chain forms the crucial link between suppliers and customers. Organisations need to develop effective supply chain strategies to become lean and globally competitive. Organisations must have the ability to integrate the latest information technologies with the physical flow of materials.

In this chapter the researcher identified the main problem facing automotive component suppliers. The key concepts pertaining to the study was highlighted and explained in this chapter. The researcher explained the significance of the research and identified some previous research related to supply chain strategies.

To solve the main problem, the researcher identified three sub-problems. The sub-problem that was dealt with in Chapter 2, identified problems and challenges facing automotive component suppliers. The structure of Chapter 2 was based upon the macro-environmental forces as described by Porter (1995). Strategic partnerships and the reengineering of the supply chain are strategies organisations need to address to successfully and effectively overcome the challenges poised by the Microenvironment.
The sub-problem dealt with in Chapter 3 described the supply chain and gave suggestions that would help organisations to understand the supply chain and how the supply chain integrates with the value chain of an organisation.

Chapter 4 dealt with supply chain improvement strategies that automotive component suppliers need to introduce to overcome the problems and challenges dealt with in Chapter 2.

The primary objective of this research was to analyse supply chain strategies used by automotive suppliers and to integrate these strategies with the theoretical material available based upon previous research.

This chapter will describe the methodology used by the researcher and the theoretical basis for conducting this type of research. After discussing the research methodology in general and the reasons for choosing a particular method for this study, attention will be given to questionnaire construction and administration.

1.6.1 Basic research methodology used

Research is a systematic examination to discover new information to expand or verify existing knowledge in an attempt to resolve a problem (Leedy, 1997: 5-9). Leedy further describes methodology as the logic of implementing scientific methods in the study of reality within the research cycle. The following four research methodologies may be used depending on the type of research objective:

• The historical method
• The descriptive survey method
• The analytical survey method
• The experimental method

Three methods of data collections are the standardised, unstructured and structured data collection methods. Both standardised and unstructured data collection methods are specialised techniques and require considerable experience to administer. Structured data collection methods are not as specialised or analytical therefore they can be used by most researchers (Leedy, 1997: 241). The descriptive survey method as an example of the structured method was used to obtain data for this research.

1.6.1.1 Literature study

Supply chain strategies will be identified from the literature survey. The researcher will identify the role of component suppliers in an automotive supply chain by conducting a literature survey.

1.6.1.2 Empirical study

(a) Mail survey

A mail survey will be conducted among logistics managers by using a questionnaire drawn up by the researcher to analyse the information obtained from conducting the literature survey in 1.7.1.1. The questionnaire will identify the supply chain strategies currently in use as well as problems and challenges facing automotive component suppliers.
(b) Measuring instrument

As mentioned above, the researcher will develop a comprehensive questionnaire for this research project to determine which supply chain strategies are currently in use as well as problems and challenges facing automotive component suppliers.

(c) Sample

The researcher will identify six component suppliers in the Nelson Mandela Metropole. The reason for identifying only four component suppliers to conduct the survey is to enable the researcher to make an indepth analysis of the current supply chain strategies in use.

1.6.1.3 Designing the empirical study

According to Leedy (1997:93) research is the planning process that consists of the visualisation of data and the problems associated with employment of those data in the entire research project. Research is a combination of common sense and the clear thinking necessary for the management of the entire research endeavour.

Leedy (1997:93) describes the scientific method of research as the means whereby insight to the unknown is sought by:

- Identifying the problem that defines the goal of the quest
- Gathering the data with the hope to solve the problem
- Positioning a hypothesis both as a logical means of locating the data and as an aid to resolving the problem
- Empirically testing the hypothesis by processing and interpreting the data to see whether the interpretation of them will solve the question that initiated the research.
According to Leedy (1997:105) in designing the empirical survey there can be distinguished between two approaches a quantitative and a qualitative study. In this research paper the researcher made use of the qualitative study.

The purpose of a qualitative study according to Glesne and Peshkin (1992:6) is coming to understand and interpret how the various participants in a social setting construct the world around them (Leedy, 1997:106). Qualitative researchers conduct their research with an attitude of discovery or exploration that leads to discovering, building or enhancing theory as as opposed to testing.

Qualitative research is a more holistic view and the researcher focus on the design, interview instruments, interpretations developments and changes along the way. The researcher need to interact with the participants and with this interaction variables will emerge from the data which will lead to patterns and theories that will shape and explain the study (Leedy, 1997:106).

Qualitative researchers assume that the environment is ever changing and that the realities they wishes to study is not easily divided into discrete, measurable variables. The data is collected with the personal involvement of the researcher and the experience in the field of research. The sample size is small and the researcher is personally involved in conducting the interviews and collecting the data (Leedy, 1997:107).

Qualitative studies tend to draw a more generalized conclusion whereby the data collected is generalized to various cases in the industry (Leedy, 1997:107).
The findings in a qualitative study are based on the interpretation of the data and the development of theories in a more literary style. The researcher uses more descriptive language and uses the language of the participants in the study (Leedy, 1997:108).

According to Van Biljon (1998: 250) placing research in absolute categories is inappropriate and could be misleading. Some authors are of the opinion that no pure form of the above categories exists. All research can be placed on a continuum from pure qualitative to pure quantities research. Researchers integrate both approaches into a structure that will support both qualitative and quantities study.

Interviews were structured along the lines of the literary study that was conducted and explained in chapters 2 to 4. The basic structure of the interviews consisted of an article published in the November/December issue of Supply Chain Management conducted by Ljungdahl. This approach was used to integrate the theory available with the results of the imperial study. The researcher’s findings and recommendations will be based upon this integration of literature and the empirical study.

Questionnaires were structured along the lines of the literary study conducted in Chapters 2-4 and questions from a survey conducted by the University of Tennessee.

Graphs constructed in Chapter 2 were based on information supplied by First National Bank and Naamsa this was constructed to identify industry trends.
1.7 **THE QUESTIONNAIRE** (see Annexure A)

To relate a quantitative study to the supply chain is difficult, because many of the components that are used to construct a supply chain strategy is abstract and accurate measurements cannot be done. The questions used to construct the questionnaire are open-ended questions and is representing of the theory presented in chapters 2, 3 and 4. The questions are practical questions that analyse the current situation in first tier automotive suppliers in the Nelson Mandela Metropole.

The questionnaire was divided into 4 sections that represent the chapters 2,3 and 4. The questionnaire was into the following 4 sections:

- **Section 1: General questions**
- **Section 2: Problems and challenges first tier automotive suppliers**
- **Section 3: Understanding the supply chain**
- **Section 4: Supply chain strategies**

1.7.1 **Testing the questionnaire**

Before completion of the questionnaire, the questions were checked by a senior logistics manager and a general manager from selected first tier automotive suppliers and a professor from the Department of Business Management at the Port Elizabeth Technicon.
1.7.1.1 Validity

Leedy (1997: 32) states that validity is concerned with the soundness and effectiveness of the measuring instrument. Does it measure what it is intended to measure or not, and how accurate is that measurement? In the case of this study, does the questionnaire measure what it was intended to measure?

Leedy (1997: 33) states that there are several types of validity. These are:

- **Face validity**: This refers to a subjective validity where the questions are scrutinised to establish their relation to the subject under discussion. Face validity refers to whether the questions seem appropriate;
- **Criterion validity**: This is where validity is determined by relating a performance measure to another measure that may be set as a standard against which to measure results.
- **Content validity**: This is related to face validity and is where the accuracy of the instrument in measuring the factors of concern to the study is gauged;
- **Construct validity**: This is the degree to which the content of the study is measured by the questionnaire. In this case “Supply chain strategies for first tier automotive suppliers”.
- **Internal validity**: This is the freedom from bias in formulating conclusions based on the data received.
- **External validity**: This is the degree to which the conclusions reached in the study may be generalised.

In this study, face validity, content validity and construct validity were used.
1.7.1.2 Reliability

According to Leedy (1997: 35) reliability is seen as the consistency with which the measuring instrument performs. This means that apart from delivering accurate results, the measuring instrument must deliver similar results consistently. Singleton, Straits and Straits (1993:121) state that reliability may be improved by conducting exploratory studies in the area of interest or by conducting pretests on a small sample of persons similar in characteristics to the target group. In the study under consideration, both were conducted by the researcher - in the form of a comprehensive literature study (see Chapters 2,3 and 4 of the study) and the questionnaire was constructed from the information gained during the literature study which accounted for the reliability of the questionnaire.

1.7.1.3 The analysis of the questionnaire

The researcher’s aim of the questionnaire was to give the theoretical information gathered a meaning by analysing the real time scenario. The study was designed to determine those items in the supply chain that has an influence on the development of a strategy. The interview section relates to the organisation and activities within the organisation that forms the basis of an effective supply chain strategy. Section 2 relates to external factors that influence the automotive industry. These factors are based on Porters model of competitive forces. Section 3 relates to the actual disciplines that forms part of the supply chain. Section 4 analysis the strategies that are currently in use in first tier automotive suppliers.

The answers to the questions were related to the opinions formed in the theoretical study this comparison was then used to create the model presented in Chapter 5.
1.8 STRUCTURE OF PAPER

The paper is divided into five chapters. The model in Figure 1.1 explains the structure of the paper.

In Chapter 1, the Problem statement and research design are given. Chapter 2 focuses on the problems and challenges facing automotive component suppliers. In Chapter 3 the supply chain and the development of the supply chain is explained. Chapter 4 focuses on Supply chain improvement strategies for first tier automotive suppliers. In Chapter 5 the researcher present a general conclusion and recommendations forthcoming from the study.

Figure 1.1 represents the structure of the research paper and highlights the major concepts in each chapter. In Chapter 2 the researcher presents the impact of environmental forces on first tier automotive suppliers and how these suppliers react to these forces.

In Chapter 3 the researcher introduce the supply chain concept, this information can now be used to develop improvement strategies in chapter 4. In Chapter 5 the researcher conclude with manageable and improved strategies.
FIGURE 1.1. GENERAL STRUCTURE OF PAPER

- THREATS
- CHALLENGES
- OPPORTUNITIES
- PROBLEMS

IMPACT ON AUTOMOTIVE COMPONENT SUPPLIERS

HOW DO THESE SUPPLIERS REACT?

INTRODUCE SUPPLY CHAIN MANAGEMENT

CHAPTER 2

CHAPTER 3

CHAPTER 4

CHAPTER 5

DEVELOP SUPPLY CHAIN IMPROVEMENT STRATEGIES

RESULT: IMPROVED AND MANAGEABLE STRATEGIES
CHAPTER 2

• THREATS
• CHALLENGES
• OPPORTUNITIES
• PROBLEMS

IMPACT ON AUTOMOTIVE COMPONENT SUPPLIERS

HOW DO THESE SUPPLIERS REACT?

CHAPTER 3

INTRODUCE SUPPLY CHAIN MANAGEMENT

CHAPTER 4

DEVELOP SUPPLY CHAIN IMPROVEMENT STRATEGIES

CHAPTER 5

RESULT: IMPROVED AND MANAGEABLE STRATEGIES
CHAPTER 2

PROBLEMS AND CHALLENGES FACING FIRST TIER AUTOMOTIVE SUPPLIERS

2.1 INTRODUCTION

Successful companies take an outside-inside view of their business, they recognise that the marketing environment is constantly changing and presenting them with new opportunities and threats, and they need to continuously monitor and adapt to the changing environment (Kotler, 1997:147).

Lawrence Denton President of Dow Automotive is of the opinion that highly structured automotive supply chains are becoming less structured. Designations like automotive assemblers, tier 1 and tier 2 are becoming less clear and new positions for automotive suppliers are forming. Although traditional strategies were focused on size and positioning, globally competitive suppliers need to move away from these strategies and focus on strategies that promote innovation, improved technology and strategic partnerships. Suppliers need to become industry-focused, they need to look at the demands in the industry, analyse industry trends and take these demands and trends back to their business and develop strategies that respond to these demands and trends. This is a major challenge facing automotive suppliers (Automotive sourcing, 51).

General Motors (GM) is the world’s largest car company; the company is a leader in many aspects of developing the best practices of purchasing and supply. The company communicate
increasingly with its suppliers via the Internet and GM and Daimler-Chrysler has subsequently developed their own website dedicated to their suppliers. This will provide suppliers with information on contracts, opportunities and GM’s overall purchasing philosophy. In a message posted on the website in May 1999, Harold Kutner, Group Vice-President of Worldwide Purchasing, explained the aim and the intentions of the site: “Globalisation in today’s fiercely competitive world-wide marketplace is the major driver of change for GM, this trend presents great opportunities for customers and suppliers. Worldwide Purchasing (WWP) is a global organisation and offers suppliers unprecedented volume levels and an opportunity to expand world-wide”. One of the major challenges facing first tier automotive component suppliers is to develop information networks with their customers and suppliers by introducing the latest information technology. Automotive assemblers like GM is committed to this process and suppliers need to follow their example to remain globally competitive (Automotive Sourcing, 39).

The global trend of linking businesses has several advantages for organisations. It allows businesses to develop skills, create jobs and be internationally competitive. Businesses in South Africa must take advantage of these benefits. These business linkages can take several forms, the most common of which is linking the procurement of goods and services and outsourcing of non-core business functions. In an increasingly competitive global business environment, businesses find it more profitable to subcontract or outsource non-core business functions. This entails that the organisation can focus on its primary business function. Linking small businesses with global companies will increase the technological capacity and productivity of small businesses, create jobs as well as generate wealth and increase the efficiency of large businesses (Traders magazine, January 2000:18).
Companies and their suppliers all operate in a macroenvironment of forces and trends that shape opportunities and pose threats. To be successful, companies need to respond to these forces. The global picture is rapidly changing and companies need to monitor six major forces: demographic, economic, natural, technological, political and social forces (Kotler, 1997:150).

In this Chapter the researcher will discuss three major challenges for automotive component suppliers forming strategic partnerships, reengineering of the supply chain, the effect of macroenvironmental forces and the influence of globalisation on businesses.

2.2 GLOBALISATION

Hill (1999:5) defines globalisation as the shift towards a more integrated and interdependent world economy. Globalisation according to Hill (1999:5) has two main components:

- The globalisation of markets
- The globalisation of production

The globalisation of markets refers to the merging of previously distinct and separate markets into a huge marketplace.

The globalisation of production refers to the outsourcing of goods and services from locations around the world to take advantage of national differences in the cost and quality of factors of production. It was important for businesses to be globally competitive in the past. Today it is imperative for businesses to be globally competitive. For South African businesses, the markets have opened up and environments are more competitive. Globalisation and international competition have become the driving force behind businesses.
After the markets opened up, companies in South Africa were exposed to the global market and international companies could compete with South African companies on a global scale. South African companies could no longer rely on their skills of competing in the local market. They had to adapt global strategies to be able to compete against these global players. South African companies were forced to align their businesses with these global competitors, get rid of non-core operations and develop additional skills. Companies that failed to adapt to these strategies, did not survive (Management Today, Vol 16 No 4, May 2000:7).

According to a survey conducted by a European consulting firm, Roland Berger and Partners, suppliers will assume more risk and responsibilities as a result of industry globalisation with e-commerce and electronic technology adding value and lowering costs. They predict that by the year 2010, there will only be eight independent global vehicle manufactures, which will drive globalisation and consolidation of their suppliers further. This will create new opportunities for suppliers. Roland Berger and Partners furthermore states that ten years from now, fewer than fifty ‘mega-supplier groups’ will compete for large, global platform contracts and take more responsibilities for systems integration and sub-supplier management. Successful suppliers need to be innovative and create value-added activities through e-commerce.

The Roland Berger Consulting Group identifies ‘Nine Mega-Trends reshaping the automotive supplier industry’. These trends are outlined below (The winners and losers in motor industry globalisation – 9 megatrends, Roland Berger and Partners, May 2000):

- Value-added content per vehicle replaces volume growth. Vehicle-volume growth in major markets may slow down in the near future. Suppliers will have the chance to increase their revenues by providing additional value-added content through technological innovations that improve the safety, reduce the weight, boost fuel economy, enhance component
performance, improve driver and occupant functionality and increase driver and occupant comfort.

- The concentration of vehicle manufactures will result in eight global purchasing hubs and trigger supplier globalisation.

- Increasing platforms and model varieties. This trend will require advanced project management capabilities. By 2010, 82% of all models will share a platform. Today only 65% of all models share platforms. This will create new opportunities for suppliers to become more innovative and adjust their strategies to stay globally competitive.

- Suppliers will continually stay under price pressures; suppliers that have built their businesses around component manufacturing will experience pressures to reduce their prices.

- Suppliers will take over systems integration responsibilities and the supply chain management of assemblers. Tier one suppliers will need to sharpen their capabilities to manage a wider and more complex base of suppliers of lower tiers.

- E-commerce will shape the supply chain and suppliers need to adapt their strategies accordingly. Vehicle manufactures are rapidly moving towards Internet-based platforms for their supplier relationships and are implementing different models to carry out these strategies. Suppliers need to take action to adapt their operations and accordingly design new products and new business models.

- The electronics revolution will change the shape of the industry.

- Suppliers will establish closer links with their customers. Many suppliers will benefit from branding their technologies and services to differentiate themselves. By branding their products suppliers, will create new opportunities in the aftermarket.

- The supplier pyramid will be led by fifty mega-suppliers and will set the performance standards for the industry.
These nine mega-trends will have a direct impact on the profitability of a supplier. Organisations will be forced to sharpen their focus in key areas of their business. Key focus areas will be (The winners and losers in motor industry globalisation – 9 megatrends, Roland Berger and Partners, May 2000):

- Customer relations
- Innovation
- Cost
- Integration
- Global delivery
- Management of cooperative ventures and mergers

2.3 MACROENVIRONMENTAL FORCES

The world market is rapidly changing, globalisation is joining together past distant markets. These rapid changes are influencing the supply and purchasing functions. Generic factors that help shape perceptions can be identified. For organisations to stay competitive these factors must be identified and analysed in detail. Saunders (1997:55) developed a model (Figure 2.1) that illustrates the interrelationship between these factors. The core of the model is the firm or organisation for which the analysis is being conducted. Included inside the outer ring are three boxes to indicate that the factors of the general external environment impact on activities on both the upstream (suppliers) and downstream (customers) sides of the supply chain, as well as on the competitors in the same industry. The researcher will discuss the general factors in the outer ring with specific reference to factors that influence first tier automotive suppliers in South Africa.
2.3.1 Micro economical factors

2.3.1.1 Income distribution

Markets require purchasing power and the money available in the market will determine the purchasing power of that particular market. Nations vary in their level and distribution of income. A major determinant is the industrial structure of the nations (Kotler 1997:156). According to Kotler (1997:156) there are four types of industrial structures:
• Subsistence economies – The majority of people engage in simple agriculture, they consume the majority of their products themselves and barter the rest for simple goods and services.

• Raw material economies – These economies are rich in natural resources but poor in other respects. The majority of their income derives from the exporting of these natural resources. An example is the countries in the Middle East that export oil. These countries are good markets for extractive equipment, tools, material handling equipment and trucks.

• Industrializing economies – These economies are highly dependent on manufacturing and manufacturing accounts for ten to twenty percent of the country’s gross domestic product. Examples are India, Egypt and the Philippines. As manufacturing increase these countries rely more and more on imports of raw material and less on the import of finished products. These economies create a new rich class and a growing middle class, both demand new products and goods and some can only be satisfied by imports.

• Industrial economies – These countries are the major exporters of manufactured goods and investment funds. These countries buy manufactured goods from each other and also export them to other types of economies in exchange for raw material and semifinished goods. These countries represent a large middle class, which make them rich markets for all sorts of goods.

Income distribution of any country is directly related to a country’s industrial structure. According to Mohr, Fourie and Associates (1998:132) South Africa has a highly skewed distribution of income. It is widely accepted that South Africa has one of the most unequal distributions of personal income in the world. South Africa’s income distribution has traditionally followed racial lines, with Whites earning the most, followed by Asians, Coloureds and Africans. After 1994, the
gaps between the different races have tended to become smaller. The distribution within the African group has become more unequal, because of increased unemployment and increase in the wages of African workers.

The income distribution will have a direct influence on vehicle sales and in terms of derived demand, will have a direct effect on first tier automotive suppliers. Income distribution reflects the purchasing power of the general consumer. South Africa has a skewed income distribution, which has been influenced negatively by high interest rates and high inflation. From 1996 to 1999, the prime interest rates fluctuated between 20% and 25%. This had a negative influence on the sales of new vehicles. After 2000, interest rates dropped and stabilised at much lower levels, which had a positive effect on vehicle sales.

In an African context, South Africa is an economic giant. However, in global terms, South Africa is neither a particularly rich nor a particularly poor country.

2.3.1.2 Interest rates and the production of new vehicles

Interest rates can affect consumer spending in two ways. Most consumers purchase durable goods such as vehicles, washing machines, refrigerators and video recorders on credit. The cost of consumer credit is the interest that consumers have to pay on the amount they borrow. The higher the interest rate, the more expensive credit becomes and the smaller consumer spending. Interest rates also represent the return on savings. The higher the interest rate, the better the return on savings. In the past the South African economy has been characterised by high interest rates. These high interest rates had a negative affect on vehicle sales. The drop in vehicle sales reduced the
demand for components and had a negative affect on the profits of first tier automotive component suppliers (Mohr, Fourie and Associates, 1998: 520).

In 1996, 379227 new vehicles were produced. The prime interest rate was 20%. After 1996 prime interest rates increased to 25%. This led to a decrease in new vehicle production, reaching a low in 1998 of only 302 140 new vehicles. During 1999, prime interest rates started to decrease and there was a slight improvement in the production of new vehicles. In 2000 the prime interest rate improved to 14% and an increase of 15% was experienced in the production of new vehicles (Figure 2.2 and Figure 2.3). This shows that the production of new vehicles is directly related to the prime interest rate. As stated before the production of new vehicles has a direct influence on the well being of first tier automotive suppliers.

FIGURE 2.2 The production of new vehicles: 1996-2000

![Vehicle Production Graph](image)

SOURCE: Researcher’s own construction (based on NAAMSA statistics www.naamsa.co.za)

2.3.1.3 Exchange rates, imports and exports
According to Mohr, Fourie and Associates (1998:490) the exchange rate is the price of one currency in terms of another currency. In the last decade, the Rand has depreciated against the major currencies of the world. This phenomenon has made imports more unattractive and exports more attractive. It has therefore become expensive for motor manufactures to import components and they rather rely on local component suppliers. Exports on the other hand had become more lucrative.

FIGURE 2.3 Prime Interest rates: 1996-2001

From 1995 to 2000, the Rand started to depreciate significantly against major currencies. During 1996, South Africa imported 34 600 units and only exported 11 553 units. During 2000, South Africa imported 60 000 units and exported 68 031 units this was an increase in exports of 488% and an increase of only 73% in the period 1996 to 2000 (Figure 2.5). During this period, the value of the rand depreciated by 91% against the British pound and by 86% against the United States dollar (Figure 2.4). The depreciation of the Rand and a subsequent increase in exports have allowed South
African manufactures to earn more foreign currencies and it has encouraged foreign manufactures to invest in South Africa.

FIGURE 2.4 Exchange rate comparisons SA (Rand) against major currencies.

![Exchange Rate Comparison](image)

SOURCE: Researcher’s own construction (based on data supplied by First National Bank)

FIGURE 2.5 Import and export of full build-up units.
2.3.2 Technological factors

One of the most dramatic factors that influence business today is technology; no organisation can stay competitive without the latest technology. New technologies provide superior value in satisfying needs, stimulating investments and generate economic activity. First tier automotive component suppliers need to continue to improve on their technology (Kotler, 1998:158).

According to Saunders (1997:59) the most visible of any technological change to consumers is that of changes built into the array of products and services offered in the marketplace. The pace of change is increasing and product design life cycles are shortening, as a result of both market pull...
and technology push. Product policies of organisations may reflect both new and changing customer needs and new product possibilities. An analysis of change in the design of products that reach the final customer will usually reveal that the innovative features are not just added by the final producer’s manufacturing operation, but many of the features are embedded in the parts and materials produced by the upstream side of the supply chain (Saunders, 1997:59).

Organisations continuously change their manufacturing processes to stay competitive and improve their productivity. The introduction of robotics is an example. Robotics has change the scope of processes and has improved performance characteristics such as speed, consistent quality and cost (Saunders, 1997:59).

Venture industries in East Londen (a supplier of painted parts to Daimler-Chrysler) has changed all their manual spraying techniques to robotic spraying technique. According to Venture Industry, this change will improve the plant efficiency by 50 percent.

Improvements in technology have also opened up new opportunities in the field of storage, transport and distribution. A combination of these improvements has contributed to improved performance in supply operations. These technological changes in supply operations have led to the introduction of automated warehousing techniques. Maritime, road and air transport have all adapted to the use of containers as a way of speeding up and reducing the cost of materials handling. The largest contributing factor of these changes is the more effective controlling and tracking of goods and parcels through the use of computers and barcoding (Saunders, 1997:60).

The physical factors of the business are also directly affected by technological change. The introduction of computer-aided design and computer-aided engineering has transformed the product
design. Drawings and design data can be stored and transmitted via computer systems. Computer-aided production management and the use of information technology in purchasing and supply have also major implications in streamlining the supply chain (Saunders, 1997:60).

One of the major technological changes of the last decade is the introduction of Internet. The Internet is no longer just for advertising and for company websites; it replaces private networks and can dramatically simplify the supply chain communications and cut costs. Organisations are using the Internet because it can effectively link suppliers to their customers and exchange supply and procurement related information by avoiding private network electronic data interchange (EDI). The cost for individual suppliers to support their customer’s EDI reaches thousands of rands every year. The Internet assures communication and interoperability between supplier and customer regardless of the differences in computing hardware and operating systems (Apics magazine, February 1998:41-42).

According to Saunders (1998:60) failure to recognise and exploit such innovations can jeopardise the future of their organisations.

2.3.3 Legal and Political factors

2.3.3.1 South Africa and the European Union (EU)

According to Kotler (1997:160) organisations are strongly affected by developments in the political and legal environment. This environment is consists of laws, government agencies and pressure groups that influence and limit organisations. These laws can also create opportunities for organisations.
Kotler (1997:161) identified three main advantages that legislation holds for business:

- The protection of companies against unfair competition.
- The protection of interest of society from unbridled business behaviour.
- The protection of consumers against unfair business practices.

Legislation affecting business has steadily increased over the years. With the forming of the European Union (EU) European countries established a new framework of laws covering competitive behaviour, product standards, product liability and commercial transactions (Kotler, 1997:161).

Hill (1999:243) identifies the following changes that the formation of the European Union (EU) will bring to business.

- Remove all frontier controls between EU countries, thereby abolishing delays and reducing the resources required for complying with trade bureaucracy.
- A product standard developed in one EU country should be accepted in another providing it meets the basic requirements in health and safety.
- Open public procurement to nonnational suppliers, reducing cost directly by allowing lower cost suppliers into national economies and indirectly forcing national suppliers to compete.
- Remove all restrictions on foreign exchange transactions between member countries by introducing a single currency the Euro.
As long as the EU is successful, the member countries can expect significant gains from free flow of trade and investments.

South African businesses and the EU have developed significant trade and investment links. The EU accounts for 20% of all South Africa’s exports and for 40% of all imports. The trade agreement signed between South Africa and the EU, will have cost benefits as well as quality benefits. The reduction of taxes and tariffs will reduce the cost of importing and exporting products and components and will enable South African business to be more price competitive in the European market. The trade agreement will also improve the quality of products produced in South Africa and will force South African businesses to adhere to international quality standards (Traders magazine, January 2000:12).

The last decade has seen a revolution in the design and the manufacturing of exhaust systems in Europe and South Africa is soon to follow. The main driving force has been the arrival of exhaust emission regulations, which entailed that any new petrol-engined car must incorporate a catalytic converter and meet demanding durability. The EU has enforced this regulation upon its member countries. Twenty years ago the only concern of exhaust designers were to devise an easily fitted system which carried exhaust gases from the engine through one or two silencers as cheaply as possible. These exhaust systems were not durable and forced manufactures to develop more durable exhaust systems, which complied with government legislation (Automotive Sourcing, 274).

2.3.3.2 The Motor Industry Development Programme (MIDP)

According to The Minister of Trade and Industry, Mr Alec Erwin, the South African automotive industry has accepted the challenges posed by global integration with the forming of the Motor
Industry Development Programme (MIDP) in 1995. The common vision of the MIDP was to establish a viable, competitive industry locally and internationally, capable of achieving both continuous growth and sustainable job creation.

The MIDP has been in operation for six years and has led to rapid structural change in the automotive industry. Strategies in the past were aimed at developing local industry by imposing local content requirements and placing high tariffs on imports. These strategies were effective in the establishing of a significant assembly industry supported by a diverse component sector. Most of these producers were not internationally competitive and most of domestically assembled vehicles were sold at a premium compared to world prices. The protected environment that producers operated within led to low volumes of vehicles being produced and the result was significant cost-raising factors; exports was minimal.

Phase four of the local content programme measured local content by value. This enabled vehicle manufacturers to include exports as part of their local content. It encouraged exports of especially components and placed increasing competitive pressures on the component industry. The next stage in this process was a gradual reduction in assistance from the government up to year 2007. This led to the establishment of the MIDP. The aim of the MIDP was to develop an internationally more competitive and growing automotive industry, which will be able to:

- Provide high quality and affordable vehicles and components to the domestic and international market.
- Provide sustainable employment through the increase in production.
- Make a greater contribution to the economic growth of the country by increasing production and achieving an improved sectoral trade balance.
The following are some of the objectives already achieved by the MIDP:

• A surge in exports completely build-up units and automotive components.
• Increased investment by OEMs and their suppliers.
• The creation of a platform for sustainable job growth in the future.
• An improved trade balance.
• Improved affordability as a result of vehicle prices being based on increases below inflation levels.

The major challenges lying ahead include the following:

• Production rationalisation
• A further diversification of the automotive component export growth
• Growth in industry profitability
• Productivity gains in increased volume production
• Continued growth in the export of completely build-up units and automotive components
• Technology transfer via joint ventures and FDI.

(Current developments in the automotive industry, 2000:2)

2.4 STRATEGIC PARTNERSHIPS

The old rules of yesterday have all but disappeared as today’s industry leaders embrace the new realities of differentiating themselves from competitors. Many companies have streamlined their internal operations by creating in-house teams that coordinate day-to-day operations cross-functionally. These companies have experienced financial and competitive benefits from becoming lean, agile and focussed. The next challenge lies in integrating the supply chain. The
whole process starts at the top with management’s commitment to build alliances that support the strategic business plan. The driving force is meeting the needs of customers who want quality products at the right time at the right price. Management’s motivation for carrying out this innovation is profitability (Apics magazine, March 1998: 82).

Companies around the world are adopting the Japanese approach to supplier-customer partnership techniques like just in time (JIT). These techniques demand changes throughout the supply chain. The effectiveness of streamlining efforts such as JIT depends to a great extent on the quality and nature of the linkages along the supply chain. These relationships that organisations share with their suppliers, is a potential source of competitive advantage for firms. Western firms are paying much greater attention to supply chain management and integration. Table 1.1 highlights the difference between traditional and new supplier partnerships (Dornier, Ernst, Fender and Kouvelis, 1998:147).

Organisations need to make the transition from the traditional approach of doing business to the supplier partnership approach; this process of change is not easy and present management with new challenges. For organisations to stay competitive and obtain a competitive advantage this organisational change has become a necessity. People in general do not like change.
TABLE 2.1 Traditional versus new supplier partnerships

<table>
<thead>
<tr>
<th>Traditional approach</th>
<th>Supplier partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary emphasis on price</td>
<td>Multiple criteria</td>
</tr>
<tr>
<td>Short-contracts</td>
<td>Longer contracts</td>
</tr>
<tr>
<td>Evaluation by bids</td>
<td>Intensive and extensive evaluation</td>
</tr>
<tr>
<td>Many suppliers</td>
<td>Fewer suppliers</td>
</tr>
<tr>
<td>Improvements benefits share by one party</td>
<td>Improvement benefits are shared</td>
</tr>
<tr>
<td>Improvements at discrete time levels</td>
<td>Continuous improvement is sought</td>
</tr>
<tr>
<td>Problems are suppliers’ responsibility</td>
<td>Problems are jointly solve</td>
</tr>
<tr>
<td>Information is proprietary</td>
<td>Information is shared</td>
</tr>
<tr>
<td>Clear delineation of business responsibilities</td>
<td>Quasi vertical integration</td>
</tr>
</tbody>
</table>

**SOURCE:** Adapted from Dornier et al (1998:147)

Organisations need to introduce cross-functional team building to initiate the process of change. The challenge to team formulating is having the right people from the right functions with the right focus. These teams include members from customer service, logistics, purchasing, inventory and materials management and manufacturing. Representatives from each function needs to be limited, as too many people on the team can slow down the process.

The biggest challenge to organisations is overcoming organisational barriers that have taken years to build up and are very difficult to bring down. Table 2 illustrate the barriers to effective
sourcing. To overcome these barriers good management expectations must be set for the whole team. Team members must consider what is the best for the entire supply chain; direct goals must be set for the whole team (Apics magazine, March 1998:82).

Once the organisation has effectively overcome these barriers, the enterprise must be extended to the external partners of the supply chain, this will increase collaboration and profitability for all members of the supply chain. Organisations must pick partners carefully, select firms that are the best in materials, products or services and have true staying power.

In Section 2.4.1 the researcher will discuss the process of identifying the right partner. Organisations must work towards getting the entire supply chain lean and agile and focus on bringing the customer value-added products and services.

Communication is the vital link in the supply chain and information must flow smoothly. When the customer buys the product or service all partners along the supply chain have a need to know in real-time. This information influences buying decisions, sales and marketing forecasts, inventory turns and control and the influence on the bottom-line (Apics magazine, March 1998:82-83).
TABLE 2.2 Barriers to effective sourcing

- Several departments within the same organisation conduct negotiations with the same supplier.
- Departments deviate from the preferred supplier lists.
- Purchasing is done outside the negotiated discount contracts.
- Organisations take advantage of the payment terms and conditions of suppliers.
- Purchasing activities are spread through multiple company areas.
- Supplier performance measures are insufficient and do not reflect the true business requirements.
- Suppliers are not certified for quality, delivery performance, capacity, capability and flexibility.
- Company personnel work with to many or too few resources.
- Inventory visibility is poor throughout the pipeline.
- Inappropriate inventory levels are deployed based on demand and sourcing requirements.
- The company is unable or unwilling to manage inventory jointly with other supply chain partners.

**SOURCE:** Tyndall et al (1998:133)
2.4.1 The challenge of effective outsourcing

The biggest challenge to companies is to select the right partner with whom it can form a long and effective partnership. The systematic investigation and comparison of sources, the evaluation and monitoring of performance of supply sources and the development of appropriate procedures with suppliers are very important (Wild, 1995:490). An important decision companies have to face is whether to source products or services from one or more suppliers. This process is known as single or multi-sourcing. According to Slack et al (1995:518) companies that multi-source, do so exclusively for their own short-term benefits.

Japanese automotive suppliers use fewer than 300 suppliers; their Western equivalents use 1000-2500 suppliers. Japanese companies have realized the benefits of developing long-term relationships with their suppliers. This relationships needs to benefit both the customer and supplier.

Dornier (1998:146) suggested that many companies are changing their manufacturing structure as a response to the globalisation of markets and consequently increase in competition. The companies of the 1990’s are leaner and more flexible; these companies focus on core competencies or strategically important activities and withdraw from noncore functions. The outsourcing of manufacturing has become a strategically important function for many companies.

According to Tyndall, Gopal, Partsch and Kamauff (1998:131) purchased goods and services represent 50-70 % of a manufacturing company’s value potential. As more and more parts, material, goods and services are purchased outside the organisation, companies are changing
their relationship with their customers. Traditionally, relationships were viewed as transactional and functionally competitive and the only important factor was price. In order to survive, suppliers needed to reduce their prices. This had a negative effect on their profitability and the customers were seen as supply chain bullies. Today, suppliers are working to avoid such customers.

Leading companies are moving away from these traditional strategies and are using effective supplier relationships to give them a competitive advantage. Companies have realized that their success are increasingly defined by the relationships and linkages with organisations outside their immediate sphere of influence.

Tyndall et al (1998:132) identified the importance of closely tied relationships with suppliers as:

- Leverage of purchasing across the organisation while capitalising on common information and information systems.
- Building strong commodity teams to support supplier partnerships and alliances.
- Consolidating using common parts and reduce supplier set.

Sourcing managers become managers of external manufacturing or service delivery operations. The goal of these managers is to extend the organisation across the traditional boundaries and to vertically integrate with suppliers without the capital investment. The focus of strategic sourcing has changed from a traditionally cost focused strategy to an effective integration strategy between customer and supplier with benefits to both. The research of Tyndall et al (1998:132) has found that enterprise-wide strategic sourcing can reduce the cost of external purchasing by 10 to 20 percent. Optimising the physical distribution network, increasing the level of vendor management and consigned inventory and minimizing or eliminating the
many causes of weak or ineffective sourcing practices can compound these savings. For organisations to achieve a competitive advantage identifying these inefficient sourcing practices and overcoming them is the start to an efficient customer-supplier relationship. Table 2.2 highlight some of these problems.

Banfield (1999:89) identifies several factors that can help organisations to overcome these barriers to develop a strategic sourcing strategy. Table 2.3 highlights some of these factors.

It is important that all managers and supervisors are clear about the vision, strategy and business objectives of the strategic sourcing program. The savings of the strategic sourcing program must be evident to management. Teams must be developed to communicate strategies and plans across the company. This will lead to successful cross-functional work. The infrastructure must be redesign; including organisational structures, IT systems, processes, procedures, roles and responsibilities. Infrastructure changes may range from company-wide to sourcing team specific (Banfield, 1999:89).

2.4.2 Importance of forming a strategic partnership

Strategic partnerships are designed to give companies a competitive advantage and allow them to be globally competitive by concentrating on what they do best and paying outsiders to do the rest. In a survey conducted by the Business Times (Business Times, 11 June 2000) it is apparent that the biggest mistake companies make, is to believe that because they have paid someone to handle their non-core aspects of their business, they can let go as far as those aspects are concerned. This approach can be harmful to businesses and they can lose control of their suppliers, which will affect their supply to their customers.
TABLE 2.3 Critical success factors in strategic sourcing

- Align the organisation around a common vision, strategy and measurable business goals.
- Stakeholders need to understand the benefits of the strategic program to their business unit and company as a whole.
- All employees needs to understand strategies and plans and this needs to be communicated to all involved.
- Redesign the infrastructure to match the requirements of redesigned process.
- Develop new technical, organisational and behavioural skills to support a new way of doing business.

**SOURCE:** Banfield (1999:89)

The survey (Business Times, 11 June 2000) reveals that the successes of strategic partnerships is very much dependant on the relationship between outsourcing companies and clients. Strategic outsourcing will give the client company a competitive edge and it will enable the company to save time to concentrate on its core business area. It will also lead to cost savings and increased efficiency in non-core business areas. Partnerships do not always work. These dysfunctional relationships will cause frustration and vast amounts of money being spent pointlessly. An outsourcing relationship will only work where both parties are actively engaged in serving the relationship.
For South African companies, outsourcing is necessary as a response to a global economy. Today, South African businesses are part of the global economy which means that companies need to be internationally competitive, not only to enter international markets but also to be able to compete with international competitors entering the local market. To be competitive, companies need to invest in the latest technologies and attract the best skills. Technology costs are high and developing skills is expensive, which in turn is putting more and more financial pressure on companies. Attracting and holding skills from a vast pool is making companies in South Africa less profitable. The only option is to focus scarce resources on the core business and outsource everything else to specialists (Chris Barron, Business Times, 11 June 2000).

2.5 REENGINEERING THE SUPPLY CHAIN

If any company wishes to compete in the global market, the company has to reassess their position in the market and develop strategies to be competitive in the market (Ellis and Williams, 1995: 221).

The modern trend of globalisation is causing markets to shrink through faster communication, transportation and financial flows. Products developed in one country are finding enthusiastic acceptance in other counties. Many companies have been conducting international marketing for decades, but global competition is intensifying. Domestic companies that never thought about foreign competitors suddenly find these competitors in their backyard. Therefore, companies can no longer protect themselves from international competition and the only way for companies to compete is to continuously improve their strategies, adapt their internal structures and reassess the relationships with the customers and suppliers within the supply chain (Kotler, 1997: 403).
According to Poirier and Reiter (1996:127) organisations need to reengineer the supply chain to achieve changes necessary for being globally competitive. The effective implementation of this concept is a major challenge to companies. Companies need to understand the idea of reengineering and redesigning of processes and what impact it will have on the organisation. The technique of reengineering needs to be implemented at the right locations in the supply system and must continue as further opportunities to make dramatic and advantageous changes. Continuous improvement is the ultimate intention and companies must strive towards optimisation.

Hellriegel, Jackson and Slocum (1999:450) define reengineering as creating new ways to get work done, involving redesigning the processes related to logistics, distribution and manufacturing. The goal is to design the most effective processes for delivering a product or service. Processes can be evaluated according to their cost and quality benefits, while effective processes are those that cost the least but produces quality products and quality service to the customer.

Saunders (1997:106) identify several problems that arises from the management of change:

- Problems arising from conventional organisational structures.
- Problems arising from recruitment and staff development.

2.5.1 Problems arising from conventional organisational structures

The process of reengineering starts within the organisation. According to Christopher (1992: 186) the major barrier to the implementation of the logistics concept is organisational. Organisational structures are rigid and companies do not recognise the need for organisational change. These companies will never achieve the improvements in the competitive advantage that integrated
logistics management can bring. The demands on first tier suppliers are increasing because of an increase in competition in the marketplace. This calls for a paradigm shift in the way organisations think of themselves and their competitors. A paradigm shift calls for a redesign of the way business is conducted.

The problem of conventional structures is that the cost is locked up in the logistics pipeline. The flow of information and material between source and user needs to be coordinated and managed as a system. This concept is known as integrated logistics management. Companies need to link each process as materials move closer to the customer. The goal is to maximise customer service and to minimise cost and reduce assets locked up in the logistics pipeline. Most companies are organised on a functional basis. Each vertical function in a conventional organisation is normally headed up by senior managers who come to regard their functional area as their territory (Christopher, 1992:187).

Christopher (1992:188) identifies four major problems, which contribute to these conventional organisational structures.

- Inventory build up at functional boundaries – In the conventional structure individual functions are encouraged to optimise their own costs. This often leads to the increase in inventory across the whole system. Production needs to minimise the unit costs by maintaining long production runs. This creates more inventories than is normally required. On the other side of the chain, the purchasing function seeks low cost material by buying material in bulk. This leads to the creation of excess inventory ahead of the production process, which creates excessive financial pressure on the company as the majority of the company’s working capital is tied up in inventory.
Pipeline costs are not transparent – The cost related to the flow of materials across functional areas is not easy to measure. The problem is that conventional organisations only identify cost related to functional areas. The problem is due to the accounting system that is being used in the organisation.

Functional boundaries limit process management – The main objective of any company is to satisfy the customer demands through a process that starts with inbound supply and continues through the manufacturing process and onwards to distribution to the customer. This process needs to be managed as an entity in functional structures. The time it takes to process an order is a good example the process is extent by the checking and re-checking the paperwork. This adds unnecessary process. The cost of these non-value added processes to organisations are huge.

Conventional organisations present many faces to the customer – The problem arises when customers have to do business with each functional department. The problem is that no person or department is empowered to manage a customer from enquiry, through to order delivery.

To overcome the above problems component suppliers have to redesign their processes through the process of reengineering. Organisations need to adopt an innovative approach to this process and must realize that this process never stops, but is a process of continues improvement.

2.5.2 Problems arising from recruitment and skills development

According to Saunders (1997:108) corporate and business strategies need to entail human relations strategies. Job design, reward packages and conditions of work have to be carefully considered to
balance the needs of the organisation with the conditions of the labour market as well as the hopes and expectations of people.

In any organisation people tend to resist change. They will favour the stable situation and resist more demanding and stressful work. Management needs to consider a contingency approach in which considerations of the environmental demands; the style of management and the types of personnel have to be taken into account. Managing the process of change is an important part of implementing strategies that call for a change in the current way of operating. Saunders (1997:109) identify a variety of reasons way people resist change. The main reason is the fear for the unknown. Some may fear that responsibilities may disappear or that they may become redundant because of a lack of appropriate skill for the redesigned jobs. People may also not be able to adapt to new values and styles of management. These fears have been the strongest amongst middle management. Programs of change must take into consideration these concerns and develop steps to overcome resistance and to reduce or eliminate the fears that people may have (Saunders, 1997:109).

2.6 ANALYSIS OF EMPIRICAL STUDY

2.6.1 Macro environmental forces.

The effect globalisation had on these global companies was extremely apparent from the interviews and questionnaire. Before 1994, South African first tier automotive companies were isolated and had to rely on local knowledge and skills to stay competitive. This situation has changed dramatically in recent years. Today, international linkages world-class knowledge and skills are available to these companies. These companies can now be competitive in the global market place.
During the period before 1994, the majority of first tier suppliers were South African owned companies. These first tier suppliers relied heavily on trends in the local market. The local market was small and consumer buying power determined the market. This period was characterised by high inflation rates and high interest rates, which had a negative influence on consumer buying power. First tier automotive suppliers experienced times of low sales, low return on sales and limited chance to expand their markets.

Since 1994, first tier automotive suppliers’ general structures have changed. The majority of these suppliers have international linkages and forms part of an international network of companies with a holding company in a foreign country. The markets have grown tremendously and have become a global market with increased competition, where the influence of local buying power is not as significant as before in determining the market size. First tier automotive suppliers have changed their focus from satisfying the local markets’ needs to satisfying the needs of a global market. Therefore the challenge lies in producing high quality parts that will satisfy the needs of global customers.

Volkswagen South Africa (VWSA), as many other automotive assemblers in South Africa, has obtained large export contracts, which had a direct influence on the volumes and quality of their first tier suppliers. For the automotive assemblers to deliver a quality vehicle to their foreign customers, their first tier suppliers must deliver quality parts to their assembly lines. This has led to the upgrading of facilities to accommodate the increase in volume and higher quality standards.

Exchange rates, trade agreements and global industry trends have become more and more important for first tier automotive suppliers. The weak performance of the rand against foreign currencies has made exports far more attractive than supplying to the local market.
The trade agreements between South Africa and the European Union have removed previous trade barriers and South African companies can now freely trade on foreign markets.

Global industry trends like economies of scale and rationalisation of small business units (SBU) have effected first tier automotive suppliers in the Nelson Mandela Metropole directly. One of the companies interviewed started with fourteen SBU’s, which has been reduced to three business units since it has been taken over by a foreign company. Foreign companies tend to maximise the utilisation of their facilities to have the maximum return on their capital investments.

2.6.2 Electronic evolution

It is apparent that organisations need to adapt their strategies to stay competitive. E-commerce will make the supply chain more visible, increase its connectivity and reduce the reaction time of suppliers.

Updated information is readily available through the Internet to all organisations along the supply chain. The Internet gives suppliers a window of information on events that will follow and suppliers use this information to determine their long-term strategies. The information gathered from the Internet will allow the following strategic improvements in the supply chain:

- Reduce lead-time.
- Cost reduction.
- Lower inventory levels.
- Improved flexibility to the customer demands.
Many suppliers are still using the EDI technology, but the EDI has limitations it only connects first tier suppliers to their customers and there is now transparency of information to second and third tier suppliers. A web-based supply chain enables all suppliers along the supply chain to have excess to the information of the end-customer.

One of the companies interviewed has limited electronic strategies in place to forecast for future happenings. A characteristic of their supply chain is high inventory levels and high shipment costs. Companies like these are in danger of high obsolesces. With the effective use of the Internet and electronic information companies can drastically reduce their inventory levels and reduce the risk of high obsolesces.

According to the first tier suppliers interviewed the electronic evolution has created a supply chain with stronger and closer linkages.

2.6.3 **Summary of findings – problems and challenges facing first tier automotive suppliers**

To summarize this section it is important to highlight the following factors that will help shape the supply chain. These factors are forthcoming from the interviews conducted:

- Macro environment
  - Interest rates
  - Income distribution
  - Inflation
  - Exchange rates
  - Trade agreements
  - Global industry trends
• Electronic evolution
  ▪ Web-based supply chain
  ▪ Real-time information
  ▪ Visible information

The researcher will use the above findings when constructing the proposed modern supply chain.

2.7 CONCLUSIONS

For organisations to stay competitive in the global marketplace they need to become lean and innovative to differentiate themselves from their competitors. Organisations need to improve their skills of doing business in the global marketplace. Customers are looking for world-class strategies and world-class standard teams with international expertise.

Suppliers need to realise the importance of the environment that they operate within and align their operations accordingly. The process of developing world-class strategies must be high on the priority list of suppliers. Vehicle manufactures will only award business to suppliers that have successfully developed world-class strategies.

To increase profitability suppliers need to develop their core business and outsource their non-core business that does not add value.

The South African economy is in a phase of recovery and it is predicted that interest rates and inflation will stabilize. This will ensure an active domestic market. The production of new vehicles
will continue to increase, which will lead to stability amongst first tier suppliers. These suppliers will be able to secure their own future, also the future of their employees and develop their employees according to the growth in the market.

It is also been predicted that the rand will continue to depreciate against major foreign currencies, export will stay attractive and imports will stagnate. Naamsa response group predict that the export of completely build-up units will increase to 100 800 in 2001, this is an increase of 48% in terms of 2000 exports (www.naamsa.co.za).

This will have the following major effects:

- Continued foreign direct investments.
- Increased production of locally manufactured sub-components for the domestic as well as the international markets.
- Job creation
- Technological improvements.
- Improvements in quality standards.

The MIDP program has been extended until 2007 which will provide the necessary stability and a platform for the industry’s future planning. The modifications to the programs strive to ensure a balance between international competitiveness and protection for the domestic industry is maintained. Since the introduction of the program in 1995 considerable strides have been made in an increasingly global and domestic environment. The industry has succeeded in many of the objectives set by the MIDP:

- Exports have increased by nearly 500%.
• Increased Foreign Direct Investments.
• Productivity gains and the creation of an export base for sustainable growth.

The challenge lies in increasing the volumes, improve productivity and as well as growth in overall industry profitability.
THE STRUCTURE OF THE PAPER

- THREATS
- CHALLENGES
- OPPORTUNITIES
- PROBLEMS

IMPACT ON AUTOMOTIVE COMPONENT SUPPLIERS

HOW DO THESE SUPPLIERS REACT?

CHAPTER 2

CHAPTER 3

INTRODUCE SUPPLY CHAIN MANAGEMENT

CHAPTER 4

DEVELOP SUPPLY CHAIN IMPROVEMENT STRATEGIES

CHAPTER 5

RESULT: IMPROVED AND MANAGEABLE STRATEGIES
CHAPTER 3

UNDERSTANDING AND DEVELOPING THE SUPPLY CHAIN

3.1 INTRODUCTION

It is essential for businesses to continuously improve their strategies in order to function at high levels of effectiveness. Companies need to focus on high levels of quality, productivity, cost efficiency and customer satisfaction to survive in the global marketplace (Poirier and Reiter, 1996: Preface).

Business organisations face internal and external pressures to find new and more effective means to develop their products and services from a concept and creation physical delivery to the customers (Poirier and Reiter, 1996: 1).

The pace of doing business is accelerating. Customers demand better products and services of a larger variety in less time. To be able to have a competitive edge, organisations must constantly develop and revise strategies, tactical plans, operational plans and capitalise on new technologies that emerge daily. Supply chain management concepts are being used by organisations around the world as they search for new methodologies to differentiate their business from that of their competitors. Supply chain management is the major influence on business today (Apics magazine, January 1998:74).

Organisations are faced with the need to evaluate both tactical and strategic supply chain management decisions, from the sourcing of raw material to the ultimate distribution of finished
goods to the customer. The effective management of the product supply chain has grown in
importance with the realization that it represents a major opportunity for organisations to improve

In this chapter the researcher will explain concepts related to supply chain and describe the role of
first tier automotive suppliers in the supply chain.

3.2 Tiers in the Supply Chain

According to Hines (1994:66) supplier tiering can be described as a pyramid supply system. The
final assembler is at the apex of the pyramid. Automotive assemblers like VWSA, Delta and
Daimler Chrysler will form the apex of the pyramid.

According to Saunders (1997:272) the outsourcing of parts and components and the purchasing of
assembled systems or complete subassemblies, introduced another level into the supply chain
(Figure 3.1 and Figure 3.2). This approach helps automotive assemblers to reduce their immediate
supplier base. The reduction in the supplier base gives the automotive assemblers the opportunity to
form better and more strategic partnerships with fewer suppliers. The responsibility for the
investment in product and process developments moves from the automotive assembler to the first
tier supplier. The first tier supplier will also have the responsibility of co-ordinating the required
supply of inputs from second tier suppliers. The automotive assemblers have taken the initiative in
stimulating quality improvement programmes at the different levels. The responsibility of co-
ordinating the second and third tier suppliers still lie with the first tier supplier. Second and third tier
suppliers are often small organisations with low overheads and lower wages. Effective linking of
the different tiers will allow flexibility of the supply chain and will enable organisations along the
supply chain to respond quicker to the changes in the demand of the end customer (Saunders, 1997:273).

The pyramid structure demonstrates the supply system of a single organisation with the automotive assembler at the apex and the first tier supplier at the demand side. First tier suppliers are supported by second and third tier suppliers (Figure 3.1).

**FIGURE 3.1** Pyramid supply system

![Pyramid supply system diagram]

**SOURCE:** Adapted from Hines (1994:66)

The responsibility of supplying quality parts, on time and in the right quantities has been shifted onto first tier automotive suppliers.
3.3 VALUE CHAIN

According to Christopher (1992:8) first tier automotive suppliers are looking for strategies that will provide superior value in the eyes of the customer. Porter (1985) introduced the concept of a value chain. Organisations that have successfully introduced a value chain have gained a competitive advantage (Christopher, 1992:8).

According to Christopher (1992:8) the competitive advantage of any first tier automotive supplier cannot be understood by merely looking at the organisation as a whole. Any organisation performs many discrete activities in designing, producing, marketing, delivering and supporting its product. Each different activity within the organisation contributes to the cost position and competitive advantage of an organisation. The value chain integrates all these activities and an organisation can gain a competitive advantage by performing these activities more cheaply than its competitors.

The value chain suggests that an organisation’s success is affected by achieving a competitive advantage through cost leadership and differentiation (Saunders, 1997:100).

The value chain can be categorised into two main activities – primary activities and supporting activities (Figure 3.2). Inbound logistics, operations, outbound logistics, marketing and sales and services form the primary activities while infrastructure, human resource management, technology development and procurement form the secondary activities. The support activities support each of the primary activities within the organisation. An organisation will gain a competitive advantage in the way it organises and performs these activities within the value chain. An organisation can
present its customer with superior value in a unique way that creates greater buyer value by effectively integrating (Christopher, 1992:10).

According to Saunders (1997:101) the supply chain is the linking of all the value chains of the organisations that make-up the supply chain. The final customer becomes the recipient of the value of the end product or service. The final customer can be seen as receiving a bundle of values from the different organisations within the supply chain (Figure 3.3).

**FIGURE 3.2 Value chain**

The support activities have become more and more important for first tier automotive suppliers. Traditionally the perception of manufacturing has been a production line, which need to maximise its throughput. In most cases the traditional manufacturing organisations was characterised by low
efficiencies, high manufacturing costs and high inventory levels the reason being the disregard of the value of support activities. The modern manufacturing organisations are driven by modern manufacturing technologies developed and maintained by support activities. This ensures high efficiencies, lower manufacturing costs and lower inventory levels. The success of first tier automotive suppliers relies heavily on the extend which support activities are integrated with primary activities.

3.4 MATERIALS MANAGEMENT

According to Slack et al (1995: 527) materials management is the concept that integrate the flow of materials within the organisation and originate from the purchasing function. Purchasing initiate the flow of materials. Material flows through the organisation and out to immediate customers. Materials management includes the functions of purchasing, expediting, inventory management, stores management, production planning and control and physical distribution management (Figure 3.4).
Materials management can be seen as a means of reducing total cost associated with the acquisition and management of materials. The stages of materials movement through the organisation are buffered by inventory. In many organisations where the integrating concept is not in place, different managers manage the different stages. The result of this separate functional management of materials is often high inventory levels. This high inventory levels increase the lead-time of moving materials through the system, time is wasted while materials are held in inventory. Materials need to be purchased much earlier to ensure that they are available at the start of production. It is difficult to control the flow of materials and to keep track of the materials, because materials can be located in many different places. Organisations need to introduce the materials management concept to control the flow of materials and give the responsibility of the whole materials flow and information flow to one part of the organisation. This will enable organisations to co-ordinate, reduce and remove same
FIGURE 3.4 The materials management concept

SOURCE: Adapted from Slack et al (1995:528)

intermediate inventories. This speed up the operations reduces lead-times and reduces the time need to purchase raw materials, which in turn reduce the forecasting time. This improvement will enable organisations to have more accurate schedules and increase effectiveness of the organisations planning (Slack et al, 1995: 528).

3.5 LOGISTICS MANAGEMENT

According to Slack et al (1995:529) many organisations link the logistics function with the flow of finished goods downstream from the plant to the customers; this function in the modern organisation is more relevant to ‘physical distribution management’. Logistics include the total flow of materials and information. Slack et al (1995:529) explain the difference between logistics and materials management as follows: materials management does not include the physical distribution of the finished
product. Both these concepts form an integral part of supply chain management. Any supply chain
is built on two basic elements, which is information flow from the customer and material flow to the
customer. Logistics management involve both these elements.

According to Christopher (1992:10) the mission of logistics management is to plan and co-ordinate
all the activities that are necessary to achieve the desired levels of service and quality at the lowest
possible price. Logistics management (Figure 3.5) can be seen as the activity within an
organisation’s value chain that link the market place and the operating activity on the demand as
well as on the supply side. Logistics management begin with the purchasing of raw materials and
end with the supply of the finished product. Logistics management involves the satisfying of the
customer’s demand through the co-ordination of materials and information flow via the operation to
the end customer. In the past for example the manufacturing and marketing activities have been
seen as separate activities within the organisation with separate objectives and separate goals. In
today’s highly competitive environment the manufacturing and marketing activities can no longer
function as separate activities. These activities must be integrated to form a lean and cost effective
organisation with similar objectives and goals (Christopher, 1992:10).

3.5.1 Purchasing

According to Slack, et al (1995: 513) the purchasing function provides the link between the
operation itself and its suppliers, the purchasing function attempts to obtain goods and services:
One of the major decisions purchasing managers need to make is whether to buy from a single source or several sources. Recent trends have moved towards single sourcing. This trend is clearly illustrated in Japanese companies, which tend to reduce their supplier base in terms of number of companies supplying any one part or service. Some Japanese automotive manufactures involve fewer than 300 suppliers; Western equivalents may deal with 1000-2500 suppliers. This trend of
supplier base reduction has developed because of the realization of far greater benefits of developing long-term co-operative relationships with suppliers rather than trading with them at arm’s length in an adversarial hostile way. Slack, et al (1995: 519) consider the advantages and disadvantages of single-and multi-sourcing, because both these trends have arguments for and against it.

On the demand side of the supply chain Slack, et al (1995: 521) identify the physical distribution of an organisation’s goods and services to be communicated or moved to the customer. In the case of manufacturing operations it involves the physical transportation of goods to the end customer. Slack, et al (1995: 521) limit their discussion to manufacturing operations and only to those transportation operations, such as trucking companies whose primary concern is physical distribution.

Heizer and Render (1999: 419) identify purchasing as the most costly activity in most firms. If a huge portion of a company’s revenue is devoted to purchasing, an effective purchasing strategy is vital. Purchasing provides a major opportunity to reduce costs and increase contribution margins.

Purchasing is the acquisition of goods and services and the objectives of the purchasing function is (Heizer and Render 1999: 419):

- To help identify the products and services that can be obtained externally.
- To develop, evaluate and determine the best supplier, price and delivery for those products and services.

Van Weele (1995: 4) focus on the role of purchasing in the supply chain and identify the following functions needed for effective purchasing:
• Determining the specification (in terms of required quality and quantities) of goods and services that need to be bought.
• Selecting the most suitable supplier.
• Preparing and conducting negotiations with the supplier in order to establish an agreement.
• Placing the order with the selected supplier.
• Monitoring and controlling of the order (expediting).
• After-care and evaluation.

Van Weele (1995: 12) is in agreement with Heizer and Render (1999: 419) that the largest part of the production value is taken up by the purchasing function. In some companies the purchase value in relation to the production value is as high as 60%.

The purchasing function should ensure an optimal supply system, which must move towards the needs of production and materials planning. The purchasing function is therefore a very important link in the production chain of organisations. The purchasing function is concerned with the obtaining of all goods and services necessary for running, maintaining and managing the company. The great variety in the purchasing function makes it difficult to delineate the field of purchasing in practise. The purchasing function is subject to many changes, such as higher demands on quality of goods to be purchase and the reduction of stock while cutting down on lead times in logistics and production cause higher demands on suppliers. The purchasing department is the logical party to communicate these demands to the suppliers and see to it that they are met (Van Weele 1995: 19).

Slack et al (1996: 524) includes the negotiation of contract terms between customer and supplier. In any supply transaction the buyer and supplier need to agree who takes the responsibility for the risk and who pays for the transportation. This is of particular importance in international trade where
knowledge of international trade agreements, legislation and documentation are critical to purchase successful from other countries. Internationally recognized terms are now in operation, which are applied to international transportation by sea or air.

In addition to the contract arrangements, international purchasing and supply has a significant impact on the planning and control within the operation. While goods are in transit they are not yielding any benefit to the buyer who may have to pay for this goods or some of the goods. Goods that are moved across the sea take up to three months and therefore it is important that documentation is done accurately to avoid any unnecessary delays (Slack, et al 1995: 525).

3.6 SUPPLY CHAIN MANAGEMENT

According to Slack, et al (1995: 195) no operation or part of an operation can exist in isolation, every operation is part of a larger interconnected network of operations. The major resources of this network are suppliers and customer. This also include suppliers’ suppliers and customers’ customers and so on. It is important for organisations to understand their position in this network and to develop new strategies and improve current strategies to be competitive in the global market. These strategies will help organisations in determining to what extent they need to vertically integrate with other organisations in the network, the location of each organisation within the network and the capacity of each part of the network.

It is important to position the organisation in the context of all the other organisations it interacts with of which some are its suppliers and some of which are its customers. Materials, parts, assemblies and ideas all flow through a network of customers-supplier relationships within all of
these organisations. On the supply side an organisation has its suppliers of parts, information or services. On the demand side an organisation has customers (Slack, et al 1995: 1996).

Slack, et al (1995: 511) identified the importance of viewing the supply as a whole they compare the supply chain with the flow of water in a river: organisations closer to the original source of supply are described as being ‘upstream’ while those located closer to the end customer are ‘downstream’. Purchasing, supply and physical distribution relate to only one part of the whole supply chain, upstream and downstream respectively. Logistics and materials management includes larger parts of the supply chain while supply chain management includes the whole chain.

Heizer and Render (1999: 416) recognise the strategic importance of the supply chain, as organisations strive to increase their competitiveness via product customisation, high quality, cost reduction and speed to the market, they need to place added emphasis on the supply chain. The key to effective supply chain management is to make suppliers ‘partners’ of the organisation’s strategy to satisfy an ever-changing marketplace. Strategies of low cost or rapid response demand different actions from the supply chain. These strategies can be defined as strategies of differentiation. Heizer and Render (1999: 417) emphasize the importance of achieving integration of its selected strategies up and down the supply chain. As more and more companies enter global markets expanding their supply chain becomes a strategic challenge.

The development of a successful strategic plan in a global environment according to Heizer and Render (1999: 417) must be:

- Flexible enough to react to sudden changes in parts availability, distribution or shipping channels, import duties and currency rates.
- Able to use the latest computer and transmission technologies to manage the shipment of parts in and finished products out.
• Staffed with local specialists to handle duties, trade, freight, customs and political issues.

According to Christopher (1992: 184) higher levels of turbulence in the business environment has led to organisations being much more customer focused than ever before. Traditional organisations have grown heavy with layer upon layer of management and bureaucracy, such organisations have little change of remaining competitive in the new global marketplace. Removing these layers of management and forming flatter organisational structures is not sufficient. It must be accompanied by changing the networks and systems that deliver service to the customer. Christopher (1992: 185) identifies the process of developing a shared supplier-customer vision. The purpose of this vision is to clearly indicate the basis whereby the business intends to build a position of advantage through closer customer relationships. It is evident throughout the research of Christopher that the development of strong customer-supplier relationships up and down the supply chain is important for survival in an increasing global market.

Christopher (1992: 204) identifies the benefits of managing a supply chain effectively by using the basic philosophy of co-makership. Through co-makership the supplier is considered an extension of the customer’s factory with the emphasis on continuity and a ‘seamless’ end-to-end pipeline.

• Shorter delivery lead-times
• Reliable delivery promises
• Less schedule disruptions
• Lower stock levels
• Faster implementation of design changes
• Fewer quality problems
• Stable, competitive prices
Orders given high priority

3.7 WHY IS SUPPLY CHAIN MANAGEMENT IMPORTANT?

Since 1994, the South African industry has been confronted by global competition. Tariffs and other forms of protection against imports have declined and competition in many sectors has increased substantially. Firms selling to external markets are now competing against low-cost and sophisticated producers (Policy Brief, School of development Studies University of Natal, Issue 3: October 2000).

South African firms must make the transition to World Class Manufacturing. They need to upgrade their operations to world-class levels. However this transition will not ensure their survival. Their survival is not only dependent on their own transition, but also on the ability of their downstream suppliers and upstream customers to change their operations into world-class enterprises. This is due to the fact that each firm operates in a broader chain of production and that chain of production is as strong as its weakest link. If one firm in the chain does not comply with world-class practices, the survival of all firms in the chain is under threat (Policy Brief, School of development Studies University of Natal, Issue 3: October 2000).

It is important that efficiency does not only arise within each link in the supply chain, but also in the relationships between the links. The two dimensions of efficiency in the supply chain are (Policy Brief, School of development Studies University of Natal, Issue 3: October 2000):

Inside the firm

- An effective business strategy
Effect product development
Efficient manufacturing operations in regarding to quality and inventories

In the relations between firms

- Coordinating product development along the chain
- Coordinating inventory logistics along the chain (just-in-time deliveries)
- Ensuring quality at source along the chain

For the supply chain to be effective, organisations need to coordinate the above dimensions. Inside the firm strategies need to be developed that support the operation and these strategies need to be supported by a close relationship with upstream customers and suppliers downstream.

3.8 PURPOSE OF THE SUPPLY CHAIN

Supply chain management has a major influence on modern business. Businesses are moving away from the traditional supply chain and are continuously looking at new ways to improve the supply chain and develop strategies to give them a competitive advantage.

The traditional supply chain model describes the flow of materials, information and funds in the context of a linear collection of enterprises called a supply chain (Figure 3.6). The model emphasis the interdependence of enterprises along the supply chain. Strategic partnerships are important to increase supply chain responsiveness. The model does not explain the reason why the supply chain should be managed effectively (Apics magazine, January 1998: 74).

Organisations need to take a three dimensional, comprehensive view of the supply chain by using the 3-P model. The model dictates the choice of partner and the value of each partner to the supply
chain. The purpose, partnerships and process form the components of the 3-P model. By linking these components strategic, tactical and operational plans can be developed that will support the basic purpose of the business. The components can be describe as follows (Figure 3.7):

**Purpose:** The purpose of the supply chain or extended enterprise is established. The purpose defines the value proposition, customer satisfaction and the financial returns.

**Strategy:** A strategy is developed that align the purpose of the supply chain and the supply chain in such a way that the purpose is fulfilled. Markets are defined, products are positioned and key partnership needs are determined.

**Partnerships:** Partnerships with customers and suppliers are developed into an extended enterprise with the common goal of achieving the purpose.
Through strategically aligned partnerships tactics are developed that align the resources to support the required processes. The processes need to be supported by an infrastructure of information technologies, facilities and equipment. The partnerships through their collective operations deliver the value, satisfaction and returns as establish in the purpose (Apics magazine, January 1998:74).

The purpose describes the intent of all parties along the supply chain and it is similar to the mission statement of a single enterprise. All the parties along the supply chain must share the mission and the vision; all parties must have a common goal. The following is an example of the purpose of a supply chain: “Provide superior value to consumers by ensuring continuous product availability while maintaining the lowest possible inventory levels and eliminating all redundant costs.” It is important that all the suppliers along the supply chain share the available information as this will ensure continuous product availability and reduce and eliminate all redundant cost. Shared information will lead to an improved visibility along the supply chain and common vision and mission.

The participants identify four critical areas in the purpose namely (Apics magazine, February 1998:82):

- Superior value of their product to the customer.
- Continuous availability of product.
- Maintaining the lowest possible inventory levels.
- Eliminating all redundant costs.
FIGURE 3.7  The 3-P model

PURPOSE

Value

Satisfaction Returns

STRATEGY

Alignment of supply chain

Customers

Enterprise Supplier

OPERATIONS

Fulfilment of purpose

Information Technology

Facilities Equipment

TACTICS

PARTNERSHIPS

Alignment of resources

PROCESS

SOURCE: Apics magazine, January 1998:74

The importance of the purpose is to balance the elements by obtaining reliable products, the lowest possible inventory levels and elimination of redundant costs along the supply chain.

In obtaining this goal the organisations along the supply chain can ask themselves the following questions (Apics magazine, February 1998:82):

- Who are our supply chain’s customers of products and services?
- What does superior value look like to our customers?
What limits our ability to deliver the best value product or service?

Organisations need to answer these questions to define the purpose of their supply chain, after answering these questions organisations can collaborate and develop strategies that support this purpose.

3.9 SUPPLY CHAIN STRATEGIES

Christopher (1992: 2) emphasise the importance of having effective supply chain strategies in place which will provide organisations with a major source of competitive advantage. These strategies will give organisations a superior position over its competitors in terms of customers’ preference. Seeking a sustainable and defensible advantage has become the concern of every manager who is alert to the realities of the market place. Good products will no longer sell themselves, neither is it advisable to imagine that success today will carry forward into tomorrow. Since 1994, the motor industry has become more and more competitive, with international organisations participating in the local market. This has forced local suppliers to realign their supply chain strategies to stay competitive.

Wild (1995: 487) identify three stages for developing supply chain strategies:

- Evaluating the competitive environment.
  - Understanding the market characteristics;
  - examine current strategies;
  - decide on market-winning strategies.

Review existing supply chain operations

  - Develop a cost model;
- identify those activities which can have a significant impact on customers;
- list improvement techniques for these activities.

Develop the supply chain.
- The aim here is to develop an integrated supply chain to achieve the market-winning strategies on those key elements identified above.

Wild (1995: 487) continuous in saying ‘to develop an integrated supply chain requires consideration of functional, internal and external integration’.

• Functional integration takes place within the organisation the aim is to remove the separations between functions within the organisation by merging previously separate activities, example purchasing and receiving; sales and distribution.
• Internal integration is aimed at improving the interfacing of the remaining activities by for example reducing or eliminating inventories.
• Finally the objective of external integration will be to improve the input and output side of the organisation by removing inventories and improving information flows.

Heizer and Render (1999: 420) describe five supply chain strategies in their research:

• Negotiating with many suppliers and playing one supplier off against another. Suppliers aggressively compete with one another. This approach holds the supplier responsible for maintaining the necessary technology, expertise and forecasting abilities, as well as cost, quality and delivery competencies. Long-term ‘partnering’ relationships are not the goal of this strategy.
• The second strategy is to develop long –term partnering relationships with a few suppliers who will work with the purchaser to satisfy the end customer’s needs. Few suppliers each with a large commitment to the buyer will be willing to implement just-in-time systems and
provide innovations and technological expertise. These strategies represent vertical integration, where firms may decide to use vertical backward integration by actually buying the supplier. On the other hand, forward integration suggests that a manufacturer of components provides the finished product.

- A fourth variation is a combination of a few suppliers and vertical integration, known as ‘keiretsu’. In a keiretsu, suppliers become part of a company coalition. Many large Japanese manufactures make use of this strategy; these manufactures are often supporters of suppliers through ownership or loans.

- The last strategy is to develop virtual companies that use suppliers on an “as needed” basis. Virtual companies rely on a variety of supplier relationships to provide services on demand.

Each company needs to analyse it own position in the supply chain and then need to implement the appropriate strategy according to its analysis.

3.10 ANALYSIS OF THE EMPIRICAL STUDY

It was apparent from the research that many of the first tier suppliers do not understand the functioning of the supply chain and the benefits an effective supply chain can hold for a company.

First tier automotive suppliers interviewed does regular audits on their supply chain to determine what hidden costs are in their supply chain. They develop strategies to eliminate these hidden costs and by doing this improve their levels of effectiveness. First tier suppliers have introduce new technologies, like creating their own Master Requirements Plan (MRP). These MRP programs continuously update the supplier’s requirements and create its own order levels based on the customers’ demand.
First tier automotive suppliers look at the requirements of their customers to satisfy the customer’s needs in terms of the following:

- On time delivery – Parts shortages
- Total quality performance – Parts per million returned to supplier (PPM)
- Costs of delivering the products – Waste by delivering non-conforming parts

Based on the above, first tier suppliers improve their supply chain strategies and use these results as benchmarks to improve on.

The traditional supply chain model was a highly structured model. First tier suppliers are continuously moving away from these highly structured supply chain, with the introduction of electronic information systems. Trading partners along the supply chain is moving closer together through the Internet and the highly structured supply chains are disappearing.

All the first tier suppliers interviewed, have introduced total quality management (TQM) principles as one of their overall business objectives. All the companies are certified ISO 9002 and VDA 6 accredited companies. By maintaining these systems, companies ensure that their products comply with the requirements of their customers. The effect is that they supply reliable products at the lowest possible costs. Redundant costs are eliminated by effective MRP systems, which relate updated information to their second and third tier suppliers.

Automotive assemblers VWSA and Delta Motor Corporation are actively involve in developing their first tier suppliers and all the first tier suppliers interviewed are actively involved in these programmes. Key performance indicators (KPI’s) are used to measure continuous improvements.
First tier suppliers evaluate their second and third tier suppliers by using questionnaires to monitor continuous improvement.

The latter use bufferstock on the supply side and the receiving side of their supply chain to ensure enough flexibility to react to sudden changes in parts availability and distribution. The electronic evolution ensured that better information is readily available to increase the flexibility.

First tier suppliers use accurate KPI’s to analyse their position and implement appropriate strategies.

First tier suppliers are using MRP systems to reduce costs, which will ensure that stock levels are controlled and waste created by over stock, is eliminated. Planning and scheduling are done according to the demand of the customer and the JIT principle.

Figure 3.8 shows the structure of logistics departments in first tier suppliers. This structure ensures that the desired levels of service and quality at the lowest possible cost are achieved. The receiving side is handled by an inbound logistics manager, which performs the purchasing as well as the planning functions. An outbound logistics manager handles the supply.
3.10.1 The value chain

In the past the supply chain was characterised by high inventory levels, which led to high obsolescence in the supply chain. The scrap rate was high and because of the high scrap rate the cost in the supply chain was high and suppliers recorded high monetary losses. Although the activities of the value chain were in place, the coordination of these activities was identified as being a major shortcoming.

First tier automotive suppliers introduced a planning activity to their value chain to coordinate the primary and support activities this led to a drastic reduction in inventory levels and obsolescence, same suppliers reduced their scrap rates by as much as 10%.
Figure 3.9 illustrates the adapted value chain of first tier automotive suppliers. The value chain is divided into support activities, primary activities and a planning activity that coordinates the support and primary activities.

**FIGURE 3.9  Value chain**

The planning function receive information from the customer and allocate this information to the support and primary activities in the value chain, these activities react upon the receiving of this information. With the introduction of the planning function first tier automotive suppliers increased their flexibility to changes in the customer’s demand and also increased their response time. The

**SOURCE:** Researcher’s own construction
following is examples of information that the planning function filters through to the support and primary activities in the value chain:

- **Support activities**
  
  - Human resource management need information to recruit people, allocate people to the support and primary activities and develop a wage structure, it can only perform this function accurately if real-time up to date information is available. The planning function presents this information according to the demand of the customer, which the human resource managers use to develop their people deployment.
  
  - Technology development and new business development need information as to the introduction of new models. The planning function presents this information according to the forecast of the customer, new products are developed accordingly, and with this accurate information the organisation can ensure that lead times are meet. This information is also necessary for operation improvements and what resources are needed for the new product development.

- **Primary activities**
  
  - On the purchasing and procurement side the organisation need to know the exact quantities of raw materials and the timing on the supply of these raw materials. The purchasing department analyse information, presented by the planning function and place orders on their suppliers. This information is real time accurate information and will ensure that the organisation meets the required timing on the raw materials.
  
  - The planning department creates a schedule that informs the operational function as to what to produce in what quantities. In the past one of the major obstacles was the production of the wrong products in the wrong quantities this led to the high inventories and high levels of obsolescence. Accurate information presented by the
planning function will prevent the above situation. Accurate information has also helped organisations to improve their operational efficiencies; resources in the operational processes are now allocated to the required products.

- On the distribution side the planning function presents accurate information that informs the distribution activity as to the JIT demand of the customer.

The introduction of the planning function has also increased the credibility of first tier automotive suppliers; the customers receive their products now on the right time and in the right quantities.

3.10.2 Purpose of the supply chain

Figure 3.7 illustrates the 3-p model. This model illustrates a three dimensional, comprehensive view of the supply chain. The components of the model can be implemented as follows to assist first tier automotive suppliers:

**Purpose:** First tier automotive suppliers has linked the purpose of the supply chain closely with the business objectives of the organization. The following business objectives can be identified and is closely related to the purpose of the supply chain:

- 100% on-time delivery
- Supplier of choice
- Provide value to customer
- Innovative manufacturing processes
- Lean cost reduction

Most activities within the supply chain are non-value-added activities. First tier automotive suppliers have identified these costs by introducing Activity Based Costing (ABC). Activity based
costing identifies the activities that are linked to the operations involving designing, obtaining supplies, producing, marketing and delivering of products. These activities although mostly non-value-added need to be established. These activities consume resources and the cost of them needs to be established. First tier automotive suppliers are introducing ABC costing to trace as many of these indirect activities as possible to the particular products or services that consume them and to avoid the more arbitrary allocation of traditional approaches.

**Strategy:** First tier automotive suppliers in the Nelson Mandela metropole has identified VWSA and Delta motor corporation as their customers and are aligning their supply chain strategies accordingly. Key partnerships with customers and suppliers are been formed. Delta motor corporation introduced a Supplier Development program to ensure continuous improvement at suppliers and to reduce the risk of supplying defective parts and to avoid parts shortages on their assembly lines. Each supplier is been measure by using Key Performance Indicators as a benchmark. These KPI’s represent the performance of the supplier according to:

- Product quality
- On time deliveries
- Customer returns

**Partnerships:** The supply chain must be viewed as a total entity with common goals in place. VWSA and Delta motor corporation have created quality and supply standards for their first tier automotive suppliers. One of the requirements is that first tier automotive suppliers have quality systems in place that support the business. All the suppliers interviewed are accredited companies and have either ISO 9002 or VDA 6 systems in place. The major drive with first tier suppliers is to support their suppliers to introduce the same quality systems. This will ensure that the standards set by the automotive assemblers are feedback right through to the last level in the chain.
The following criteria is being used by first tier automotive suppliers in sourcing their parts:

- Suppliers will be selected after the purchasing department have evaluated their ability to supply materials or services which must satisfy the sourcing criteria of first tier automotive suppliers relative to:
  - International standards in pricing
  - Quality and ability to supply goods and services on-time, in the right quantity, to the right place and at a right service level.
- It is the policy of first tier automotive suppliers to foster long term relationships as long as the above criteria are maintained.

Operations: The fulfilment of the purpose depends on the operation. The presence of international companies in the local market has place high demands on first tier automotive suppliers especially in the following areas:

- Information technology needs to be competitive to supply all participants in the supply chain with real-time information. First tier automotive suppliers are using the Internet as the basis for presenting information.
- Facilities were upgraded to accommodate the latest manufacturing technologies. One of the suppliers interviewed constructed a R100 million facility to accommodate robotic manufacturing techniques.

The above criteria need to support the processes to enable the operation to deliver superior value of their product to their customer with the best return on investments.

First tier automotive suppliers have identified the following critical areas in the purpose of the supply chain:
• Superior value of products to the customer by using the latest technology available on the market.
• Continues availability of product. First tier automotive suppliers have introduced pull systems (Kanban systems) to ensure that they respond to the customers demand.
• Maintain the lowest possible inventory levels.
• Eliminating all redundant costs.

3.11 CONCLUSIONS

Organisations need to understand the functioning of the supply chain and what benefits the effective implementation of the supply chain can have for the organisation. A supply chain can only function effectively if the organisations understand where they fit into the supply chain and what value added contribution the organisation need to make.

Organisations must understand the requirements of the upstream customers and need to set standards for their downstream suppliers that will ensure superior product quality and the timely delivery of products.

Internally organisations need to understand how the different activities in the organisation are linked together to ensure effective value creation in the organisation. For example support activities have to support primary activities to ensure high quality products that meet the requirements of the customer. A supply chain can only function effectively if all the organisations contribute to the success of the supply chain.
The motor industry has been characterised by foreign organisations entering the local market. It has become essential for local organisations to not only invest in the best manufacturing technologies, but also to understand the effect that concepts like supply chain management will have on their business.

The supply chain forms the backbone of any organisation. If organisations do not understand the supply chain the backbone of that organisation will be skewed and unnecessary costs will be endeavoured.
STRUCTURE OF THE PAPER

- THREATS
- CHALLENGES
- OPPORTUNITIES
- PROBLEMS

IMPACT ON AUTOMOTIVE COMPONENT SUPPLIERS

HOW DO THESE SUPPLIERS REACT?

CHAPTER 2

INTRODUCE SUPPLY CHAIN MANAGEMENT

CHAPTER 3

DEVELOP SUPPLY CHAIN IMPROVEMENT STRATEGIES

CHAPTER 4

RESULT: IMPROVED AND MANAGEABLE STRATEGIES

CHAPTER 5
CHAPTER 4

SUPPLY CHAIN IMPROVEMENT STRATEGIES FOR FIRST TIER AUTOMOTIVE SUPPLIERS

4.1 INTRODUCTION

Saunders (1997: 82) define a strategy as the direction and scope of an organisation over the long term; the strategy matches the organisations resources with the changing environment that the organisation operates within. A strategy is the effective deployment of resources through which an organisation can achieve a competitive advantage. Supply chain strategies must be seen as part of an organisation’s overall corporate strategy and cannot be seen in isolation thereof.

According to Copacino (1997:27) logistics or supply chain strategies involves the determination of what service levels and cost objectives the logistics system must maintain to support the corporate strategy of the organisation. An organisation’s logistics strategy involves consideration of the company’s strategic objectives its specific marketing strategy and customer service requirements.

Through the globalisation of markets the competitive environment has become more demanding. Gattorna (1998:8) identifies two factors that affect the way in which organisations conduct business. First, the environment in which organisations operate is characterised by rapid change and growing uncertainty. Organisations find it increasingly difficult to establish a sustainable competitive advantage and have less time to develop and implement strategies.
Secondly, the drivers of success vary from organisation to organisation and the development of strategies is a complex process. Organisations have to consider a wide array of complex and often conflicting factors in developing their strategies. This increasing complexity and the pace of change have a direct impact on the ability of organisations to achieve a competitive edge. Organisations have to assess and improve their current strategies.

According to Gattorna (1998:8) organisations need to take a more dynamic and interactive view of strategies. Organisations must realise that the ability to execute strategies has become a critical element of a competitive strategy. Organisations have to realise that competitors are continuously improving their strategies and therefore to sustain a competitive edge organisations need to execute their strategies more effectively than their competitors.

In this chapter, the researcher will discuss the strategic management approach for first tier automotive suppliers and how strategies can be improved to obtain a strategic advantage.

4.2 THE STRATEGIC SUPPLY CHAIN MANAGEMENT APPROACH

According to Gattorna (1998:18) the management of the supply chain has changed over the last two decades from an emphasis on integrating logistics and lowering costs to providing better products and services quickly and cheaply to customers. The challenge is to make supply chain management a strategic part of the organisation’s overall strategies.

Organisations must realise that strategic supply chain management can drive the business strategy, rather than just form part of the organisation’s operations strategy.
Gattorna (1998:23) identify four dimensions necessary for formulating supply chain strategies

(Figure 4.1):

- Sourcing strategy
- Demand flow strategy
- Customer service strategy
- Supply chain integration strategy

Organisations need to focus on these four dimensions. By focusing on these four dimensions organisations will be able to design and develop effective supply chain strategies that will meet the needs of the market and integrate with supply chain partners to deliver improved products to the end customer. The strategies developed need to be aligned with the overall business strategy of the organisation.

**FIGURE 4.1** Four dimensions of strategic supply chain management

![Diagram showing the four dimensions of strategic supply chain management: Sourcing strategy, Demand flow strategy, Customer service, and Supply chain integration strategy.](source: Gattorna (1998:24))
4.2.1 Customer service strategy

According to Gattorna (1998:24) formulating a customer service strategy involves three steps:

- Customer service segmentation
- Cost to serves
- Revenue management

Organisations need to identify the unique segments of the organisation’s customer base, which include the service needs, and expectations of the customer. The organisation needs to analyse the standards set by the customer and develop their products accordingly, to meet these standards.

Organisations need to analyse the current customer service delivery cost structure and the costs of meeting the new service levels.

Gattorna (1998:25) describes revenue management as the process of determining the market share and price premium impact of the behavioural response of customers to improved levels of customer service. Organisations need to understand the impact of introducing improvement strategies on the organisation’s profitability and growth.

4.2.2 Demand flow strategy

According to Gattorna (1998:26) there are three elements that shape an organisation’s demand flow strategy:

- Channel design
- Demand planning
- Supply chain configuration
Technological developments have increased the number of channels whereby organisations can communicate with its customers. Information and communication developments such as the Internet have improved the communication between supplier and customer. Organisations have to align their strategies according to these technological developments to attain a competitive advantage. The choice of channel structures will directly influence the level of customer satisfaction.

Suppliers need to determine the demand of the customers and respond to these demands as quick and effectively as possible. The level of production and inventory requirements to meet the customers demand is critical to most organisations. Gattorna (1998:27) identify the following as components of demand planning:

- Distribution resource planning
- Manufacturing resource planning
- Inventory control

Cost and asset control is critical to an organisation’s success and is conducted by accurately analysing the demand of the customer’s suppliers. This can minimize costs and assets within the organisation and across the supply chain.

The positioning of the organisation within the supply chain is a critical element of the organisation’s overall supply chain strategy. Suppliers have to understand their position within the supply chain to allow for the effective capital investments in the right equipment, facilities and other assets.
4.2.3 **Sourcing strategy**

According to Gattorna (1998:27) organisations have to consider the following in choosing a sourcing strategy:

- Make or buy
- Capacity management
- Manufacturing management

Whether an organisation will manufacture its own products or buy these products will affects the cost structure and the exposure to risk. Organisations need to consider factors such as labour costs, labour disputes, exchange rate volatility, transportation interruptions, political restrictions and changes in taxation.

Organisations must determine the geographical location of its plants and suppliers and the level of capacity that will exist at each and then align the demand of the end customer according to the capacity of each supplier in the supply chain. This will enable organisations to maximise the capacity utilization of each supplier and all suppliers will remain profitable.

The balance between customer satisfaction and efficiency has become a critical factor with organisations. Organisations can no longer afford to just satisfy the customer needs and forfeit their own efficiency and profitability. Their processes must optimise the balance between customer satisfaction and efficiency. In the automotive industry just-in-time manufacturing requires reliable and consistent suppliers. Only by effective manufacturing management can suppliers become reliable and consistent suppliers and practitioners of just-in-time manufacturing (Gower, 1998:29).
4.3 **INTEGRATION OF THE SUPPLY CHAIN**

The success of any supply chain strategy depends on the extend to which an organisation can achieve the integration of material and information flow internally and externally. The performance of the manufacturing system as a whole is important.

Organisations need to achieve a balance between supply and demand through supply chain strategies. Organisations have to develop integrated planning and control systems such as manufacturing resource planning, distribution resource planning and Kanban systems. Developments in the Internet and World Wide Web have improved the speed and cost of communications and the handling of information on an interorganisational basis. These technological developments also lead to the linking of planning systems to gain more effective control of material flow in supply chains and distribution channels. It will give organisations a strategic advantage if it is successfully integrated into the supply chain strategies (Saunders, 1997:131).

Since the early 1990’s, technology has changed the elements of the supply chain from being product-focused building, procuring and shipping to being information-focused planning, dynamic sourcing and optimising. Information technology has dramatically improved the cycle time and delivery performance of the manufactures. One of the biggest influences that the information revolution had was a reduction in the levels of assets. Leading manufactures have downsized people, reduced warehouses and outsourced logistics. Technology will have a powerful impact on supply chains through the Internet. Industries will change the way they trade within markets. How companies interact with their alliance members and competitors will also change. The Internet will
allow more integrated approaches to working with partnerships, while at the same time permitting participation in the open dynamic markets. It represents a new way of developing enhanced relationships with trading partners and customers. Products will be redefined and new models of service and business models will be created through personalisation and mass-customisation. This convergence of the Internet and the supply chain is called the e-value chain (Salcedo, S and Grackin, A; Supply chain management Review, Winter 2000:63).

4.3.1 Web-based supply chain

According to Harold Kutner, Group Vice President of Worldwide Purchasing and North American Production Control and Logistics at GM, GM is using the Internet to communicate more effectively with suppliers. Their aim is to tell suppliers of their future schedules and to advise suppliers of production schedule changes as soon as possible. The Internet forms a critical part of General Motor’s broader communication strategy. The Internet enables suppliers to excess up-to-date information regarding commercial contracts, warranty information and the performance of their components in the field. The introduction of the Internet and advance information technology (IT) will enable organisations to keep costs down. General Motor’s purchasing operations use the same IT systems and they are all linked into a single network, which works on a real-time basis. This enables buyers world wide to obtain information on quotes and suppliers around the world on a 24-hour basis. The use of this advance information technology, gives General Motors a competitive advantage over its competitors (Automotive Sourcing, 49).

The Internet is changing the way of conducting business. Web technology has enabled manufactures to change industrial-era models of transportation, pricing, procurement and customer satisfaction. Through the Internet, manufactures can take inefficient channels and make them
efficient by eliminating administrative activities that consume money. Technology is the engine of change in the supply chain. Information technology give manufactures the ability to develop strategies that are competitive (Fontanella, J; Supply chain management review, Winter 2000:17).

Customers want to buy products anytime, anywhere and at the lowest possible price. Fast suppliers need to be able to react on these demands and must structure their strategies accordingly. The Web gives suppliers the opportunity to make the supply function more efficient. The Web tie the entire forecasting and planning of the supply chain to actual market events in a collaborative environment. The success of the e-business strategy can be measured at how well do the supplier serve its customer. At the time of receiving an order the supplier must be able to commit to product availability, price and delivery time. If the product need to be manufactured the supplier need to know the capability of the manufacturing operation and understand the internal processes to be able to deliver the product on time (Fontanella, J; Supply chain management review, Winter 2000:17).

According to Fontanellla (Supply chain management review, Winter 2000:17) the Web-based supply chain is a responsive, flexible environment that transforms itself as e-business models change. The Web-based supply chain manages multiple enterprises as one collaborative process. Flexibility is no longer sacrificed for consistency.

The Internet is global and it is important that South African manufactures start to develop their strategies along the guidelines of these global players. With international shipments increasing excellence in the fulfilsments operations becomes critical. In order to achieve excellence in the supply chain within the global context the entire supply chain must be integrated.
The increasing speed of decision-making is changing the role of the supply chain. The traditional boundaries between planning and execution cycles are obsolete. Strategies need to be developed to provide near real time available to promise information, deriving much of the information from close integration with transactional systems and close collaboration with trading partners.

Optimisation engines are installed within the supply chain management system to spot process disruptions and recommend the best recovery steps (Fontanella, Supply chain management review, Winter 2000:17).

The following steps are important considerations for manufactures to take into account when designing Web-based supply chain strategies (Fontanella, Supply chain management review, Winter 2000:17):

- Evaluate current supply chain strategies. Traditional electronic data interchange strategies does not provide the sufficient scale and flexibility, to raise the level of electronic connectivity between different partners in the supply chain. The supply chain needs to be building on an information backbone.

- Consider the effects of disintermediation on systems requirements. As manufactures streamline their distribution channels the operations profile will change. Systems have been tuned to support asset optimisation.

- Global sales and supply are almost implicit in e-business. When shipping goods internationally, international trade logistics is a requirement.

- Use technology as aggressively as Internet competitors do. Competitors know what the customers want and they will use Web technology to provide it.
4.3.2 The e-value chain

The e-value chain differs from the web-based supply chain in such a way that the e-value chain is representative of the internal organisation, where as the web-based supply chain is representative of each organisation along the supply chain.

The new age business model will satisfy the shareholders and at the same time satisfy the customers’ demand as the integration of the Internet and the supply chain becomes critical for long term business success. The e-enabled enterprise needs to establish strategies with emphasis on improved customer relationships, supply chain management as well as cash engineering. These processes will be performed within the enterprise and across the commerce backbone (Figure 4.2).

**FIGURE 4.2** The e-Value Chain Model

<table>
<thead>
<tr>
<th>BUSINESS STRATEGY</th>
<th>VISIBILITY</th>
<th>BUSINESS PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CASH ENGINEERING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CUSTOMER RELATIONSHIP MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUPPLY CHAIN MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMMERCE BACKBONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INTEGRATION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENTERPRISE BACKBONE</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** Adapted from Salcedo and Grackin; Supply Chain Management Review, Winter 2000:63
The commerce backbone is a mix of proprietary formats, value-added networks and the open Internet. The economic opportunities afforded by the Internet, will have a major impact on priority networks in the future because the commerce backbone is global in scope and will allow new levels of commerce for enterprises. Management of trade will have the ability to work in real time with trading partners and this will play a key role in the development of strategies in the future. For enterprises to sustain their global competitiveness, they will have to continue their high rate of technology investments.

According to Salcedo and Gracin the new business environment will have the following characteristics:

- Customers will demand agility and speed in response to their needs.
- Businesses will look at new ways to expand their market share and generate more revenue.
- Global competition will be driving companies not only to look at their cost structures but also at the total cost to deliver their goods and services to customers.
- Companies are putting pressures on the other players in the value chain to investigate new ways of cutting costs.
- Traditionally businesses have looked internally at their operations to optimise their operations, but the latest trend is to collaborate with their trading partners to identify cost-cutting opportunities.

New supply chain strategies need to take into consideration the processes, problems and opportunities of their trading partners.
The Internet present information according to the demand of the end customer to all the trading partners in the supply chain. The suppliers respond to this information regarding the timing of shipments, delivery dates as well as the availability of goods. The rapid response of the supplier is imperative to create value in the supply chain, although warning must be given if a supplier cannot meet the shipment dates. The more time the business has to react to the change, the better but constant communication between trading partners is essential in the supply chain. With supply chain visibility, communication can be real-time as the demand occurs (Salcedo and Gracin, Supply Chain Management Review, Winter 2000:65).

4.3.3 Collaboration

The knowledge gained from Japanese practices is increasingly applied as the emphasis is placed on closer supplier and customer relationships on a long-term basis. These relationships rely less on legal conditions of contracts and more on mutual trust and recognition of shared interests for the successful implementation of arrangements. Collaboration between the supplier and the customer enables both sides to work together to introduce product and operational improvements over time and to improve supply (Saunders, 1997:18).

Effective collaboration demands confidential plans be to openly shared between customers and suppliers. Collaboration changes the face of the buyer and the seller as they work together to achieve common goals. Rather than competing customers and suppliers would collaborate and work together as team members.
Collaboration can only succeed if both parties can benefit from the situation supply chain collaboration starts with defining teams, work flows, communications, training and organisational structures for supply chain collaboration (Apics magazine, October 1997: 116).

To effectively collaborate, both companies must answer the same critical questions these questions are fundamentally important to determine the extent of the partnership (Apics magazine, October 1997: 116):

- Where can collaboration have the biggest impact on the company: customer relationships, supplier relationships or remote sites or divisions?
- How can all parties gain financially and strategically from this collaboration?
- How formal should the interaction be for the exchange?
- How interactive will the collaboration be?
- Can a single view into the plan provide the basis for feedback or does the partner need to actually update the plans as it is refined?
- Can the plan be changed again and is there a pre-defined sequence?
- Is the interaction on a fixed schedule or event based, or both?
- What will the investment be from each partner? The partners have agree on the technologies they need to implement to make the partnership work this could result in initial capital investments and continuously upgrading of the technologies.
- Does the partners trust each other enough to change the fundamental rules of the relationship, and to set these rules together?

Once these issues and processes are understood the trading partners can simulate operations to design new responsive collaborative processes. The trading partners need to monitor each other’s
progress and this will give them an indication as to how the process will look in the future. They can plan together in real time to ensure that their plans and expectations are realistic. Effective collaboration will synchronise the e-value chain, because in the e-value chain, knowing what the suppliers and distributors can do to optimise the performance, will make business operations more responsive to customers needs’. In order to streamline their operations effectively, companies need to continually monitor and simulate business operations. The keys to flawless execution is to see what is happening across the chain and to know what to do when a situation arises (Salcedo and Gracin; Supply Chain Management Review, Winter 2000:65).

4.3.4 Developing the e-Value Chain Strategy

Developing an effective e-value chain strategy is a process of strategic thinking by all the trading partners and it is driven by effective collaboration and a focus on the value returns (Figure 4.3).

It is important that the design and the vision of the strategy are flexible enough to react on the changes that might take place, but even more important is that all trading partners understand the benefits of true collaboration. Organisations need to understand that their customer relationship and financial success depends on the performance of the supply chain. Salcedo and Grackin describe the following steps as essential in the development of an effective supply chain (Figure 4.3):

**Step 1: Design the blueprint.** The supply chain must be representative of the vision of the organisation. The strategy needs to consider the business process design, the organisational implications, the systems requirements, partnership modification, change management and other infrastructure changes.
- An inter-enterprise level design. The e-value chain solution is designed from inter-enterprise level and filter through the organisation. It is important that trading partners are involved in this stage.

**FIGURE 4.3** Developing the e-Value Chain Strategy

```
<table>
<thead>
<tr>
<th>Step 2: Develop technology specifications and requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The real aspects of the process</td>
</tr>
<tr>
<td>• Personalised views that support the need for humans to understand the information delivered.</td>
</tr>
<tr>
<td>• Open integrative capabilities</td>
</tr>
<tr>
<td>• Other data manipulation requirements</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Step 3: Select the technology</td>
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<tr>
<td>Step 4: Pilot the solution</td>
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<tr>
<td></td>
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<tr>
<td>Step 5: Implement the solution phase</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Step 6: Establish a support organisation</td>
</tr>
</tbody>
</table>
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**SOURCE:** Researcher’s own construction based on Salcedo and Gracin (Supply Management Review, Winter 2000:65)

- Performance metrics. Organisations need to measure the success of the supply chain. This can only be effective if performance levels are established and the progress of the supply
chain is measured against these performance levels. This step identifies what those metrics will be and how they will be calculated as well as who will monitor them and react upon these measurements. This will form the basis of what needs to be monitored in the e-value chain.

- Organisational impact assessment. The organisation’s skills levels need to be assessed. This will give the organisation an indication of the readiness to implement the e-value chain. This assessment will identify the type and source of skilled resources needed and therefore educational programs appropriate for all levels should be planned.

- Risk assessment. Organisations need to assess what they need to achieve success and how this will influence the organisation’s overall performance.

- Definition of the new relationships. The e-value chain will introduce new processes and systems to the organisation. This will change the way information is shared between trading partners. The details should be addressed and resolved.

**Step 2: Develop technology specifications and requirements.** Although the e-value chain implementations differ from the traditional implementations, the e-value chain includes the classic evaluation of requirements for software and processes. In addition to the traditional analyses, organisations need to assess other key attributes when evaluating technology in the e-value chain. These include:

- The real-time aspects of the processes. This will have an effect on the hardware, software and integration approaches used.

- Specifications of the e-value chain should include the data elements that the end-user requires. The format needs to be defined as well.

- Open integrative capabilities.
Other data manipulation requirements. Specific planning requirements such as algorithms and solution quality can be specified.

**Step 3: Select the technology.** The selection of technology may vary from organisation to organisation. Organisations need to select technology according to industry specific functionality, organisational differences or cultural differences and pure preferences. Organisations need to prioritise the value-based strategy to know what is truly needed to achieve the desired results.

**Step 4: Pilot the solution.** The pilot phase should be short and constructive. The software will go through a pilot implementation to ensure that specifications are met. The pilot should not address all the requirements, but emphasis should be on how the solution will ultimately meet the business needs and the value returns. Strategies to reduce elements of risk in the implementation can be developed at this stage.

**Step 5: Implement the solution:** After the organisation has successfully completed the pilot phase, it needs to implement the solution. During this vital phase, it is important that trading partners work closely together to achieve consensus on the implementation of the e-value chain. The organisation needs a phased implementation approach which will ensure that the project to maintain momentum until its completion. The priority of integrating the systems should take be the main objective.

**Step 6: Establish a support organisation:** As the organisation introduces each phase a support organisation should be in place to address issues and improvements in processes and technologies. This organisation can perform the needed ongoing maintenance and recalibration of the monitoring and planning systems. This organisation must introduce training programmes for new users and act as the liaison with the support organisations in the trading partner’s operation. It is of the utmost
importance that new processes need to be tested and recalibrated regularly, while users involve in the implementation must go through the learning cycle and focus on the goal.

The suppliers to the first tier automotive supplier need to take a critical look at their current strategies and evaluate these strategies against the e-Value chain strategy. The shortfall of the current strategy should be evident and need to be constantly addressed. At this stage it is important to mention that every organisation has its unique requirements and that the e-Value chain strategy will form a guideline to first tier automotive suppliers in South Africa who want to be competitive in the global market place.

4.4 DIMENSIONS WITHIN THE SUPPLY CHAIN

Organisations need to evaluate their supply chain strategies by considering two major dimensions:

- Time dimension
- Cost dimension

In the following section, the researcher will discuss these dimensions:

4.4.1 Time dimension

Organisations that can react accurately and promptly to the needs of their customers are more likely to attract orders and show growth. The need to minimise wasted time in the supply chain is a matter of concern. (Baily, Farmer, Jessop and Jones 1998:123). Traditionally, supply chain strategies was focused on cost cutting, but in recent years the focus has shift to improved customers satisfaction and service.
According to Gattorna (1998:157) time compression increases customer service and responsiveness, while it also reduces imbalances in supply and demand and inventory holdings. Customers can no longer tolerate unresponsive suppliers with ever-increasingly global markets.

Time has become one of the most visible and valuable features in the supply chain. Product life cycles are shorter, industrial customers and distributors require just-in-time deliveries and end users are more willing to except a substitute product if their first choice is not instantly available. Christopher (1998:25) defines logistics lead-time as ‘how long it takes to convert an order into cash’.

**TABLE 4.1** The financial benefits of time compression

<table>
<thead>
<tr>
<th>Time compression feature</th>
<th>Benefit</th>
<th>Financial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer service</td>
<td>Customer loyalty and retention</td>
<td>Gross margin/price protection</td>
</tr>
<tr>
<td>Customer responsiveness</td>
<td>Reduce lost sales</td>
<td>Sales growth with existing assets</td>
</tr>
<tr>
<td>Balance between supply and demand</td>
<td>Lower stock wastage or write-offs</td>
<td>Net margins improvements</td>
</tr>
<tr>
<td></td>
<td>Manufacturing effective</td>
<td>Lower unit cost</td>
</tr>
<tr>
<td>Inventory levels</td>
<td>Less working capital employed in stock</td>
<td>Improved cashflow</td>
</tr>
</tbody>
</table>

**SOURCE:** Gattorna, 1999:157
According to Gattorna (1999:158) innovative organisations are rethinking their supply chain strategies, not for cost-reduction opportunities, but for opportunities to serve their customers better. Organisations that have shortened their lead-time within the supply chain, have experienced significant financial benefits (Table 4.1).

- **Customer service**: Organisations that compress their supply chain differentiate themselves from their competitors by manufacturing the right products for customers in the right place and at the right time. This means that the loyalty of customers increase and sustained business are created. The maintenance of high levels of customers service, ensure that organisations become first choice suppliers irrespective of the price of their product. This enables suppliers to protect their prices and their gross profit margins increases.

- **Customer responsiveness** – The ability to adapt quickly to changes in the demand of customers will enable organisations to satisfy the demand of customers timelessly. Sales growth will come from capturing those opportunities that was previously neglected, while high responsiveness will also enable organisations to take the market share from less reliable suppliers. This will definitely lead to increase sales growth and high returns on existing assets.

- **Balance between supply and demand** – Inefficient organisations has their capital tied up in stock. The reason for this is that these organisations cannot balance demand and supply, because buying too much stock leads to stock write-offs and high wastage. If organisations can successfully synchronise supply and demand stock levels will drop and more capital will be available. Lower unit costs will present the organisation with higher profit margins.

- **Inventory levels** – The reduction of supply chain inventories is a major business goal. Inventory ties up valuable working capital and influences the cashflow of the organisation
negatively. Time compression strategies can release sufficient working capital to fund other projects, which will have a positive influence on profits.

Time has become the underlying dimension of the supply chain, because shorter order cycles improve service to customers. Shorter material throughput time reduces the costs of processing; this shortening in time brings the entire chain closer to the final customer. As forecasting time decreases, there is less need to forecast orders while shorter processing time increases respond to change in the demand. It also increases flexibility in volume or product changeovers. It is therefore obvious why time has become a key organising principle in the supply chain (Schary and Skjott-Larsen, 1995:317).

Time compression a key principle in the supply chain is based on adopting the following new approaches (Gattorna 1998:160):

• Organisations need to take a holistic view. The supply chain consisted of different organisations and to compress the supply chain all participants in the supply chain need to be taken into consideration. Organisations need to look beyond their own boundaries.

• Take advantage of technologies. The Internet has started a revolution in information technologies. Organisations that successfully implement these technologies will be able to compress their supply chain, which will give them a competitive advantage over organisations that fail to take advantage of these technologies.

• Cut out unnecessary steps. Organisations that are reengineering their supply chain needs to look aggressively at all opportunities to remove wastage and non-value-adding processes.

• Source with service as well as costs in mind. Through effective sourcing strategies, organisations will guarantee security of supply and this will lead to close collaboration in the early designing stages of products.
• Design products with supply chain in mind. Products need to be design with the supply chain objectives in mind.

• Reduce forecast time and increase accuracy. Key factors in effective time compression are not only to reduce forecast time, but to also increase forecast accuracy through the use of actual demand.

• Redesign the production processes. Traditional production processes were characterised by long production runs that eliminated waste of the changeover process. Although waste was eliminated at the changeover waste was created at the end of the production process due to excessive inventories. The reason for these long production runs was inaccurate demand forecasts. Developing production processes to meet actual demand can solve the problem.

• Rethink distribution options. In the past delivery frequencies were driven by transport economies. Products were only shipped when there were enough to fill the lorry or even the boat. Shipping these days need to correspond with the customer demand and not with shipping economies.

Customers will no longer tolerate the failure to meet their demand on time. Organisations that fail to do so, will no longer survive in a growing global economy.

4.4.2. Cost dimension

For logistics management to function effectively all direct and indirect decisions throughout the corporate system need to be taken into account. Decisions taken in one area, can often lead to unforeseen results in other areas. Logistics management influence most of the functions in the value chain of an organisation with cost implications in most of these functions, while conventional cost accounting has become obsolete in the cost analysis of the supply chain.
According to Christopher (1999:95) conventional costing presents the organisations with the following problems:

- There is a general ignorance of the true costs of servicing different customer types, channels and market segments.
- Costs are captured at a much too high level of aggregation.
- Full cost allocation still reigns supreme.
- Conventional accounting systems are functional in their orientation and are not output oriented.
- Companies understand product costs but not customer costs – yet products do not make profit, while customers do.

The main problem in the logistics pipeline is to identify the cost, because costs are in most instances not really visible. Organisations need to capture costs as products and orders flow towards the customer. This will ultimately represent the logistics cost. Basic cost accounting need to change from allocating all expenses to individual units to separating the expenses and allocate them to activities that consume the relevant resources. Activity-based costing seeks cost drivers along the pipeline that causes costs because they consume resources. In the past the cost of picking an order was determined by calculating the average cost per order. Activity-based costing suggests that it is the number of lines on an order that consume the picking of an order, picking should therefore be seen as the cost driver. Activity-based costing also enables each customer’s unique characteristics to be taken into account in terms of ordering behaviour and distribution requirements.

Christopher1999: 97).
The University of Tennessee Council of Logistics Management (1999:60) refers to the term “cost to serve” which represents the cost of services provided throughout the supply chain to individual customers or segments of customers. Cost to serve includes all non-manufacturing costs directed at individual customers and segments.

Organisations need to evaluate the profitability of their customer relationships when they decide to improve their logistics operations. The cost to serve not only entails the cost of the product to the customer, but also considers all cost incurred throughout the supply chain. The costs are much broader than the cost of distribution and logistics services. Activity-based costing techniques have enabled organisations to determine the cost of services provided throughout the supply chain to individual customers or segments of customers and include the following categories (The University of Tennessee Council of Logistics Management 1999:180):

- **Cost to services**
  - **Order-driven costs.** This represents the cost that occurs every time an order is placed irrespective of the size of the order. Examples are the cost of processing freight bills, preparing bills of lading and processing the order itself.
  - **Order fill costs.** These are the costs incurred to assemble the customer order. In some instances pallets are easy to pack which will have a comparatively lower cost than pallets that require more picking and assembling to fill.
  - **Freight costs.** This is often the largest single cost component. The total cost of freight need to be analyse to accurately evaluate and allocate these costs.
  - **Inventory carrying costs.** In the case of special products or unique customer demands, inventory carrying costs must be considerate separately from standard material and inventory costs.
• Cost to coverage. These costs relate to the direct sales force, promotional, advertising and off-invoice costs directly related to individual customers. Organisations need to determine the amount of time sales personnel commit to individual customers. This completes the supply chain view of cost to serve.

4.5 OPERATIONAL STRATEGIES

By applying sections 4.2 and 4.3 organisations can develop supply chain strategies to suite their operations. In this section the researcher will discuss same strategies that organisations can implement.

4.5.1 Push and Pull systems

According to Poirier and Reiter (1996:142) products in the supply chain move forward in a push manner. Suppliers build an inventory of their products and enlist sales organisations to push these stocks toward the manufactures for consumption in the ultimate market. If the supply chain is managed effectively, limitless opportunities exists to dramatically reduce inventories and cycle times. If the network of organisations, which form the supply chain are integrated effectively, organisations can move towards a pull system that brings stock to the point of consumption at the time of need for replenishment.

Millard (Apics magazine March 1998:49) discuss the validity of the pull system and the push system. Toyota developed an innovative manufacturing planning, scheduling and execution system
called the Toyota Production System. The concept behind the system is that materials only move when there is a demand for that specific material. The concept is based upon using work center authorizing product movement, where production starts the process and create a demand and “pull” the required materials from the supplying centre. The final assembly work centre is the driving force, because it has the best information about demand that needs to be shipped. The objective is always to satisfy the actual demand. The process is generally known as Just-in-Time and reduce the probability of producing either too many items or producing items that are not required.

The using work centre authorises both material movement and production before a supplying work centre can take action. This “pull” system is in stark contrast to the “push” system. The push system entails the process of making schedules for production that may or may not be feasible and then trying to push the product through the shop to meet a specific date. Push systems make use of a process called infinite loading, which is a characteristic of the materials requirement plan (MRP). Infinite loading follows the assumption that the requirements that begin the MRP process can be satisfied by a combination of existing inventory and work in process plus open work orders and purchase orders which is a result of running MRP. Over the years the “pull” system has replaced the “push” system.

According to Millard (Apics magazine, March 1998:49) the following can be seen as functions of a Kanban system:

- Provides pick-up or transport information.
- Provides production information.
- Prevents over-production and excessive transport.
- Serves as a work order attached to goods.
- Prevents defective products by identifying the process making the defects.
- Reveals existing problems and maintains inventory control.
The primary objective of the Kanban system is the elimination of waste:

- Waste of overproduction
- Waste of waiting
- Waste of transportation
- Waste of processing
- Waste of inventory
- Waste of making defective products

Top management need to rethink the conventional flow of production, transfer and delivery. They need to look at the process backwards later processes are picking up material from earlier processes. Operations no longer produce as much as possible, but production is driven by demand and not by capacity.

4.5.2. Enterprise resource optimisation (ERO)

According to Zweben (Apics magazine, October 1997:44) to remain competitive in the manufacturing industry manufactures must produce products globally, tailored to the customer’s market and deliver world wide in days and not weeks. Competitive pressures have forced manufactures to invent more innovative and powerful products with shorter life cycles while simultaneously reducing costs.

- Mass-customisation is spreading worldwide and requires manufactures to move away from producing standard products and to provide many options and configurations for the customer mix and match.
• Globalisation requires manufactures to customize products for local use and manufacture and distribute the product globally.

• Time-based competition is also driving manufactures. Sales orders need to be processed immediately, providing the customer with reliable products and extremely short delivery times. New products need to be introduced more frequently and organisations need to be ahead of their competitors.

Organisations need to shift from the push-orientated model supported by MRP to a pull-orientated model with Just-in-Time (JIT) principles.

According to Zweben (Apics magazine, October 1997:44) ERO was develop as a response to the global challenges facing automotive suppliers. The ERO concept suggests that organisations need to optimise their assets to deliver outstanding customer service. ERO allows remote direct sales or distributors to connect with factories, try configurations while online, get a price and reliable delivery date and place the order. By implementing ERO organisations can respond quickly to the changing demand and balance demand between multiple plants in the supply chain. Material acquisition and manufacturing can be postponed until the product is needed.

Modern strategies must enable manufactures to optimise its assets to provide on time delivery at the lowest possible cost and the workforce needs to be empowered to continuously improve business processes while increasing profits and improving customer service. Organisations must be flexible and adapt to changing technologies in order to gain a competitive advantage (Apics magazine, October 1997:44).
The ERO strategy optimise the most valuable assets of a manufacturing organisation, which include tangible assets like inventory and capacity, as well as more intangible assets like workforce and suppliers.

By implementing the ERO philosophy manufactures can gain the following advantage:

- Reduce inventory on hand and increase inventory turns.
- Improve throughput without major capital investment in new facilities.
- Streamline business processes, thus increasing workforce productivity.
- Manage strategic supplier relationships.
- Provide customers with the products they want and when they want the products.

According to Zweben (Apics magazine, October 1997:44) by implementing ERO manufactures can optimise assets in the following way:

- **Inventory** – organisations need to synchronise demand with supply to react to the demand swings. Inventories need to be re-evaluate daily and backlogs must be analysed. Inventory levels must be visible across the supply chain. ERO systems allows the manufacturer to react quickly and rework the amount of supply needed from raw materials. The manufacturer can achieve this by constantly delivering finished goods to meet the changing demand. ERO systems adjust production and procurement plans as the demand changes and can help manufactures to react to equipment failures and other unexpected events to ensure that facilities recover lost production. The ability to quickly change or redeploys procurement, manufacturing or distribution processes enables the manufacture to stock less inventory while maintaining a high level of customer satisfaction.

- **Capacity** – The key success factor to any manufacturing operation is to maximise its capacity. Organisations invest large amounts in equipment and need to evaluate their
throughput to ensure that they are utilising their capacity as close to 100 percent as possible. This is especially true for bottleneck resources as they constrain the entire supply chain. The ERO system will provide visibility across the supply chain and will allow the manufacturer to optimise capacity. The enterprise resource planning (ERP) technology assumes infinite capacity and is in contrast with ERO. Manufacturers can identify bottlenecks and under utilised resources across the supply chain by using ERO. They can also use the ERO system to repair the over allocation of scarce resources by intelligently rescheduling production for times when bottlenecks are more apt to be idle or less used.

Organisations can experience excessive changeover costs and set-up time due to poor sequencing. In this regard the ERO system can re-sequence the schedule to minimize the set-up costs and downtime associated with changeovers. The effect of minimising the set-up costs and downtime will result in an increase in the throughput and results in higher revenue and profits. The traditional ERP and earlier MRP systems ignored the capacity constraints and only relied on a push system.

- **The work force** – Many organisations implement processes and tasks that are unnecessary. These processes and tasks create waste. By eliminating or automating these processes and tasks waste can be eliminated and profits will increase. Organisations generally use workflow – a technology that automates the flow of information from one person to another – to solve the problems. Conventional systems handle these workflows manually. ERO handles these workflows through the use of advance workflow technologies. Workflow automates, streamlines and controls the flow of information through the organisation, improving the quality of work and reducing processing time and cost.

- **Suppliers** – Suppliers need to have raw materials available and this can mean the success or failure of a product introduction. Manufactures are seeking to establish strategic relationships with a few key suppliers due to shorter product life cycles. The ERO system
allows manufactures to communicate changes in the production and the introduction of new products to critical suppliers. This enables suppliers to react without delay to the changing demand of the customer. An ERO system can also allow for inter enterprise data exchange such as forecasts or unexpected materials requests. Manufactures can collaborate on the creation and maintenance of their plans with both their customers and suppliers by using Internet messaging.

- **Customer** – ERO systems provide on line delivery information via Web based extranet connections. ERO systems enable the supplier to quote accurate price and fulfilment dates immediately. Capable-to-promise (CTP) functionally accesses the in-memory model of the organisation to evaluate available inventory, raw materials, distribution constrains and transportation alternatives across the entire supply chain. CTP can recommend changing the organisation’s build to accommodate the changing demand of the customer and allocate raw materials and capacity to the new demand.

Traditional systems were driven by a forecast from which the manufacturer produces stock. Delivery of stock will only take place upon a demand from the customer. High inventory levels are a characteristic of these traditional systems.

Today organisations are shifting towards demand driven manufacturing where make-to-order or assemble-to-order production replaces the traditional systems.

4.5.3 **Planning and scheduling**

According to Saunders (1997:169) purchasing and supply are primarily concerned with the move and store of aspects in parts of the supply chain, which are under direct ownership. Strategic
planning forms an integral part of the supply chain and the success of the supply chain depends on effective planning. Scheduling arranges the demand of the customer in a sequence of priority starting with the most needed products and finishing with the less needed products. Scheduling control the flow of materials, which derives from the demand of the customer to the supply of the finished product to the customer.

Slack et al (1995:407) distinguish between forward and backward scheduling. Forward scheduling involves starting the work as soon as it arrives and backward scheduling involves starting the job at the latest possible moment to prevent them being late. MRP and JIT strategies use backward scheduling, only starting when the product is needed.

The following can be seen as advantages of backward scheduling (Slack et al 1995:407):

- Lower material costs – materials are not used until they have to be and therefore delaying added value is delayed until the last moment.
- Less exposed to the risk of the schedule change by the customer.
- Focus the operations on customer due dates.

**Today manufacturing organisations develop their strategies around these advantages of backward scheduling.**

Manufacturing organisations implement advance planning and scheduling systems (APS), which can be categorise into two categories namely planning-centric systems and scheduling-centric systems. Planning-centric systems focus on the longer-term tactical objectives (master scheduling, demand management, distribution scheduling, and optimisation of procurement). Planning defines certain business objectives, analyse these objectives and develop plans to achieve these objectives.
The analysis determines the constraints that might affect the accomplishment of these objectives. Constraints influencing long-term planning are less specific and more flexible than the constraints influencing short-term scheduling (Apics magazine, March 1998:44).

Scheduling-centric systems usually focus more on tactical objectives. A schedule is generated for shop floor production, short-term materials delivery and immediate shipments. Constraints for short-term scheduling are real. Short-term scheduling allow for limited changes due to the finite capacity of machines, personnel and tools. Material and component availability are a given and cannot be adjust in the short-term (Apics magazine, March 1998:44).

By introducing scheduling-centric APS systems organisations can deal with these finite constraints. The task of a schedule is to take a required production output as the objective and putting it into the context of the limitations through constraints to determine a feasible solution. The time horizon of a schedule is normally short and has to be adjusted or regenerated frequently. The results of both systems are intensions. Any schedule is a suggestion of actual output and not the result of actual production, because actual data results can only be obtained once the schedule or plan has been executed (Apics magazine, March 1998:44).

4.5.4 Total Quality Management (TQM)

Japanese business practices and techniques have helped manufactures to create a vast array of new techniques and philosophies and the manufactures that have implemented these practices and techniques have obtained a sustainable competitive advantage. The idea of a manufacturer as part of the value chain, positioned between a customer and supplier, as well as the emerging of techniques
like Total Quality Management and Just-in-Time, have transformed manufactures into more efficient units that focus on creating a lean and profitable unit (Saunders, 1997:14).

Since the 1980s, TQM have been one of the most significant new ideas in operations management (Saunders, 1997:141). TQM involves the entire business from the supplier to the customer. TQM is regarded as the right approach to quality improvement in the supply chain due to total involvement of the business. An effective TQM programme includes continuous improvement, employee empowerment, benchmarking, JIT, knowledge tools and customer-centred principles (Heizer and Render, 1996:82).

Heizer and Render (1996:82) describe TQM as the ongoing process of unending improvement – the setting and achieving of ever-higher goals (Heizer and Render, 1996:82). Continuous improvement forms the main component of TQM through which the supplier is encouraged to achieve cost-savings.

Another important component of a TQM system is the adoption of ISO quality management systems. ISO 9000 is a set of worldwide standards that establishes the requirements for business firms’ quality management systems (Slack et al, 1998:775).

4.6 ANALYSIS OF EMPIRICAL STUDY

All the first tier suppliers who have been interviewed have included the objectives of their supply chain in the overall objectives of their business. One of elements of TQM is to have objectives set for every department in the company, including the logistics department. These departmental objectives forms part of the overall business strategy of organisations.
With the introduction of MRP systems, suppliers have effectively integrated material flow and information flow. The main source of information is the automotive assemblers and by presenting this information, suppliers react to it by supplying the required materials.

Information technology allows suppliers to be more reliable, supplying materials

- On time
- At the right quantities
- At the right time

to meet the requirements of their customer.

Customers need first tier suppliers that are reliable and will not prevent them to meet the demand of the consumer. Customers are demanding agility and speed in response to their demand.

First tier suppliers are evaluating their suppliers; they use these results to benchmarking their suppliers and by doing this weaker suppliers are identified and dealings with these suppliers are discontinued or extensive supplier improvement programs are set for these suppliers. Suppliers that fail to react upon these programmes are eliminated and business is discontinued. First tier suppliers are focused to source only from the better suppliers to strengthen their supplier base.

The first tier suppliers, who were interviewed, understood the limitations of their trading partners. They consider the process, problems and opportunities of their suppliers in developing their own supply chain strategies. It is important to understand the activities of the trading partners.
First tier suppliers that react accurately and promptly to the needs of their customers will attract orders.

What was apparent from the interviews was the difficulty first tier suppliers had in identifying the costs in the supply chain.

Globalisation has changed the shape of markets and has changed the position of first tier automotive suppliers in the supply chain. The market focus of first tier automotive suppliers has changed drastically from a locally focussed market to an internationally focussed market. More pressure is on the quality of the product and the response to the demand of the customer’s requirements.

The electronic evolution has made the supply chain more transparent, it has improved connectivity and made the supply chain more visible. First tier automotive suppliers need to incorporate these improved technologies in their strategies to improve on current strategies.

First tier automotive suppliers need to understand the requirements of their customers and build their improvement strategies to satisfy these requirements. Closer partnerships are needed between customers and first tier suppliers and between first tier suppliers and second and third tier suppliers.

4.6.1 Information and material flow

First tier automotive suppliers develop their supply chain strategies based on the flow of information and materials. Figure 4.4 illustrates the flow of information from automotive assemblers to first tier suppliers and how this information is analysed by first tier automotive suppliers.

Information creates a demand and first tier automotive suppliers respond to this demand by manufacturing the required materials and supply these materials on a JIT basis.
The flow of materials and information can be seen as a Kanban system with the demand being created by the information and the flow of materials the respond to this demand.

**FIGURE 4.4** Materials and information flow in first tier automotive suppliers

```
ASSEMBLER
- DELTA

FINISHED GOODS STORE

MANUFACTURING OPERATION

RAW MATERIAL STORES

SECOND TIER SUPPLIERS
```

- Information flow
- Material flow
SOURCE: Researcher’s own construction

This flow of information assists first tier automotive suppliers in their planning and forecasting. From this information first tier automotive suppliers can develop their own MRP.

It provides:

- Pick-up and transportation information
- Production information
- Prevents over-production and excessive transport

It assists first tier automotive suppliers to eliminate waste of:

- Overproduction
- Waiting
- Transportation
- Excessive inventories

Figure 4.4 can be explained as follows:

A – Automotive assemblers has a window of 1 year, which reflects their forecasted build. This forecast is presented to the first tier automotive suppliers, who analyse the information and makes it compatible for their own use. By using this information first tier automotive suppliers place orders on their different suppliers. The flow at (A) illustrates the flow of information from the automotive assemblers to the raw material or purchasing department of the organisation.

1. Receive information from customer, and supply parts according to this demand on a just-in-time basis. The information received will inform first tier automotive
suppliers what parts are needed and in what quantities. The order will be generated and supplied to the assembly lines.

- The information will be received on a fax message the first tier automotive supplier has a lead-time 2-4 hrs to deliver these ordered parts to the assembly lines.

2. Supply of parts to meet customer demand, demand determined by the information received in (1). Parts are delivered to the assembly lines according to the information received from the customer.

- Record finished goods supplied on stock control system to update stock levels.

3. Use information from the customer’s master production schedule to generate a production schedule. The production schedule will inform the production operation what parts are required and in what quantities they are required. The production schedule needs to take into consideration the capacity of the facility and production constraints.

- Schedule must be generated to meet demand of the customer.

4. Finished products from the manufacturing operation flow to the finished goods store to meet the demand created by information in (3).

- Finished goods need to be recorded at point of entry into the finished goods store to update stockholding in store to create live stock system.
5. The raw material store receives information from the production operation. Raw materials are issued according to this information to meet the requirements of the production operation.

6. Raw materials are issued to production according to information received at (5).
   • Stock levels are updated on stock control system to avoid stock shortages.

7. Orders are placed on suppliers of raw materials according to the master production schedule of the customers. This information informs suppliers the exact quantities required and the time of delivery.

8. Raw materials are supplied and stock levels are updated upon receiving of raw materials and stock control system is updated accordingly.

4.6.2 Developing the e-Value chain Strategy

One of the first tier suppliers interviewed are currently relocating their operation to East London. A supply chain needs to be developed to support supplying materials from the East London operation. Management are using the strategy presented in Figure 4.3. The following steps are used for the implementing of the supply chain:

**Step 1: Design the blueprint.**

• The mission is to design a supply chain that will enable the organisation to supply parts on time and in the right quantities to VWSA and Delta.

• Delta and VWSA are actively involved in the process of designing this strategy.
The implications to the organisation is that it needs to accommodate supplying parts over a distance of 300 km, this factor implies that the organisation needs an early warning system as to the requirements of the customer.

Step 2: Develop technology specifications and requirements.

- The real aspects of the process are that the organisation needs real time information.
- Software required must enable the organisation to decode information from the Internet onto their system into a user-friendly message. This will enable the supplier to create their own MRP. This will highlight operational requirements that are needed to meet the customer’s demand.
- Data will include a 25-day, a 7-day and a 3-day window related to the build of the automotive assembler.

Step 3: Select the technology.

- The supplier has selected Impact as the software for their supply chain. Impact systems will allow the supplier to decode Internet messages onto their system and create a MRP. The MRP will be used to create a production schedule.

Step 4: Pilot the solution.

- The pilot solution will be made under supervision of the software suppliers and members of VWSA and Delta. This will ensure that the system meets the requirements of the supplier and the customer.
Step 5: Implement the solution.

- After conducting the pilot solution and all trading partners are satisfied the system will be implemented.
- The system will be implemented in phases that will ensure the project to maintain momentum until completion.

Step 6: Establish a support organisation.

- The information technology department will be closely involve in the development of the systems. This department will perform the supporting activities once the system has been implemented.

4.6.3 Performance evaluation

For first tier automotive suppliers to continuously improve and stay competitive it has become a necessary to benchmark them against the best suppliers. One of the suppliers interviewed has an extensive continuous improvement plan in place with the objective of being the best first tier automotive supplier. With the advise of the automotive assemblers five areas was identified as critical areas that need to be addressed. Three of these five areas are directly related to the supply chain.

The process started by constructing a current state map (Table 4.1) that highlighted the current situation and addressed the five identified areas. A rating scale from 0-5 was used to quantify the situation; the supplier was rated by the automotive assemblers and benchmarked against the best suppliers. Improvement strategies were developed to ensure that the required ratings were achieved.
### TABLE 4.2 Current situation analyses

<table>
<thead>
<tr>
<th>Critical areas</th>
<th>Rating</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Delivery performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Delivery as per due date – quantity and mix</td>
<td>3</td>
<td>Introduce a planning department to handle all releases from automotive assemblers.</td>
</tr>
<tr>
<td>1.2 Flexibility – response to release changes.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1.3 Ordering and release administration</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>2. Product quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Defect rate – customer returns</td>
<td>2.8</td>
<td>Implement quality awareness programs at all levels of the supply chain. Deliver parts of zero defect at all ends of the supply chain.</td>
</tr>
<tr>
<td>2.2 Claims recorded in the field warranty</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2.3 Standard compliance of quality systems</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>2.4 Quality of documentation</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3. Customer relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Easy to contact</td>
<td>4</td>
<td>Appoint a business development manager that liaise with customer on current and future business.</td>
</tr>
<tr>
<td>3.2 Frequency of visits</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>3.3 Response to queries</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>3.4 Management of supplier relationships</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** Researcher’s own construction

An assessment of the situation is done on a monthly basis and action taken is evaluated and new actions are introduced where necessary. The first tier supplier have set itself goals according to these ratings, with the support of the customer and the commitment of all participants in the supply chain these goals will be meet. On time delivery, in the right quantities and at the right quality are being used as the backbone of the improvement plans.

The first tier supplier has put major emphasis on the planning function a planning department was created to handle all forecasting and scheduling, in the past planning was handled by individual
departments. This can be regarded as a major step towards achieving the ultimate goal of becoming the best first tier automotive supplier.

4.7 CONCLUSIONS

First tier automotive suppliers need to adapt their supply chain strategies to be able to be globally competitive. The supply chain strategy of an organisation cannot be seen in isolation. The strategy must, be integrated and coordinated with the overall business strategy of the organisation and the strategy must be aligned to serve the customer’s needs. The strategy must also align with the suppliers that serve the organisation. The strategy must satisfy the demand of the customer and suppliers need to satisfy the demand of the organisation.

The Internet has brought a new dimension to the development of supply chain strategies and organisations cannot ignore this new dimension any longer. The Internet has drastically improved the connectivity and visibility of the supply chain. Today organisations need to incorporate the Internet in their strategies. Successful organisations like GM and Daimler-Chrysler have successfully implemented Web-based supply chains and the use of the Internet has dramatically improved the cost and time dimensions of the supply chain, these two dimensions which forms the backbone of the supply chain. Information is quickly available and the reaction time of suppliers to this information is reduced.

The e-value chain strategy has improved the strategic thinking of all trading partners and is driven by effective collaboration of these partners. First tier automotive suppliers need to develop e-value chain strategies to be able to compete globally. If a supplier fails to develop effective e-value strategies, that supplier will lose its competitive edge.
These advanced technologies need to be able to support operational strategies like push and pull systems, as well as enterprise resource optimisation. Lean organisations have introduced the JIT principle successfully. The JIT principle addresses the cost dimension as well as the time dimension. Time to customer has become more and more important and automotive assemblers will only award contracts to first tier automotive suppliers that are able to reduce the lead-time of their product to the minimum. Reacting only to the customer’s demand will reduce the cost of carrying high inventories that lead to the high cost in the supply chain.

For first tier automotive suppliers it has become more and more important to keep track of the rapid changing world of technology. First tier automotive suppliers need to evaluate their strategies frequently to incorporate the rapid changing world of technology.
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter the researcher will conclude the research project by briefly discussing the extend to which the main problem and sub-problems were solved.

Through resolving the three sub problems, the main problem will also have been solved. The main problem addressed the question: How can first tier automotive suppliers develop supply chain improvement strategies? Conclusions concerning the achievement of the objectives of the study will also be made.

Recommendations will also be made to develop a supply chain model that will assist first tier automotive suppliers in the development of improvement strategies.

5.2 RESOLUTION OF THE FIRST SUB-PROBLEM

What problems and challenges are first tier automotive suppliers facing in the global market place?
A comprehensive literature survey was carried out in an effort to resolve this sub problem. Available models, definitions and guidelines were studied and the core elements extracted to identify the problems and challenges facing first tier automotive suppliers. To solve this problem Porter’s model of environmental factors influencing first tier automotive were used. This model presented the factors influencing the shape of the market place. An important aspect of solving this problem was to find out how first automotive suppliers need to react to these environmental factors and adapt their supply chain strategies accordingly, because first tier automotive suppliers need to form strategic partnerships with their trading partners. Strategic sourcing from preferred suppliers will ensure continued on-time supply. First tier automotive suppliers need to reengineer their supply chains in response to these environmental factors. This problem was addressed in chapter 2.

5.3 RESOLUTION OF THE SECOND PROBLEM

What is supply chain management and what is the role of first tier automotive suppliers in an automotive supply chain?

In pursuit of the basic requirements for the development of supply chain strategies first tier automotive suppliers need to understand the functioning of an automotive supply chain. Chapter 3 was used to present the fundamentals of an automotive supply chain. The different characteristics and viewpoints of authors were used to identify and present the supply chain.

It is important to understand is that the supply chain is a configuration of the individual supplier’s value chains. These value chains are strategically linked through the process of demand and supply to form a unit. Supply chain management manage these strategic linkages.
5.4 RESOLUTION OF THE THIRD SUB PROBLEM

What supply chain improvement strategies can be designed and developed for first tier automotive suppliers?

With a thorough understanding of the environment first tier automotive suppliers operate within and an understanding of the supply chain first tier automotive suppliers can develop improvement strategies. A comprehensive literature study was made on supply chain improvement strategies. Chapter 4 was used to present these improvement strategies.

The empirical study was done through interviews and questionnaires. The research field was limited to five first tier automotive suppliers in the Nelson Mandela Metropole. The research concludes in Chapter 5 with general conclusions and recommendations forthcoming from this study.

5.5 RESOLUTION OF THE MAIN PROBLEM

How can first tier automotive suppliers develop supply chain improvement strategies?

By solving the sub problems the main problem was solved and by analysing the data gathered in the literature study and the empirical study conducted the researcher will present recommendations in Chapter 5.
5.6 RECOMMENDATIONS: A MODEL FOR SUPPLY CHAIN IMPROVEMENTS

Figure 5.1 shows the researcher’s illustration of the modern Internet driven supply chain.

**FIGURE 5.1: MODERN INTERNET DRIVEN SUPPLY CHAIN**

<table>
<thead>
<tr>
<th>MARKET</th>
<th>AUTOMOTIVE</th>
<th>COMMUNICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST TIER</td>
<td>ASSEMBLER</td>
<td>SECOND TIER</td>
</tr>
<tr>
<td>DEMAND</td>
<td></td>
<td>MEDIUM</td>
</tr>
<tr>
<td>SUPPLIER</td>
<td></td>
<td>SUPPLIER</td>
</tr>
</tbody>
</table>

- **LOCAL**
  - Interest rates
  - Income distribution
  - Political and legal factors
  - Inflation

- **EXPORT**
  - Exchange rates
  - Trade agreements
  - Economies of scale

- **OEM**
  - Assembly lines
  - Parts coordination
  - Market analysis
  - Forecasts
  - Research and development
  - Export contracts

- **INTERNET OEM Website**
  - Real time information
  - Visible information

- **LOGISTICS PROVIDERS**
  - Transportation
  - Tracking and monitoring
  - Coordinate parts and information

**SUPI**
- Ana info
According to the researcher the following critical areas can be identified:

- Market demand
- Automotive assemblers
- Communication medium
- First tier automotive suppliers
- Second tier automotive suppliers
- Logistics providers

5.6.1 Market demand

Macro environmental factors influences automotive assemblers directly and first tier automotive suppliers indirectly. First tier automotive suppliers cannot ignore the effect of environmental factors on automotive assemblers.

The main factors influencing the market demand are macro environmental factors. The market can be divided into a local market and an export market. The following macro economical factors needs to be taken into consideration when developing a supply chain strategy that will help to shape the local and export market:

- Local market
  - Interest rates
  - Income distribution
  - Political and legal factors
  - Inflation
- Export market
  - Exchange rates
The market demand can be seen as the trigger in developing supply chain strategies and the focus of the strategies. It has become imperative for first tier automotive suppliers to realise these factors in developing their supply chain strategies.

Globalisation is rapidly changing the market place no longer can first tier automotive suppliers only consider their own operation; they need to take into consideration all the factors influencing the global market place. For South African first tier automotive suppliers to stay competitive they need to improve their supply chain strategies to meet the global demand.

5.6.2 The Automotive assemblers

The automotive assemblers can be seen as the catalysts of information presented by the market. An accurate market analysis is needed; from this market analysis the automotive assemblers generate their forecasts. The forecasts can vary from 1 month to a year. From this forecasts the automotive assemblers generate a Master Production Schedule (MPS) and a MRP. This information are published on the automotive assembler’s website first and second tier automotive suppliers have excess to this website. Suppliers need to analyse this information and develop their own forecasts in the form of a MRP.

Automotive assemblers coordinate materials supplied by first tier automotive suppliers on their assembly lines.
The automotive assemblers do the research and development of new vehicles. Materials are sourced from first tier automotive suppliers of choice; these suppliers participate in research and development programs. The development of supply chain strategies needs to form part of these programs.

VWSA has successfully negotiated export contracts and the majority of first tier automotive suppliers have benefited from these contracts.

5.6.3 Communication medium

Effective communication is one of the major stumbling blocks in the supply chain the Internet has transformed this perception. The Internet can be seen as the communication medium. Automotive assemblers use a website to present first and second tier automotive suppliers with visible and real-time information. The Internet is easily accessible and all suppliers can translate this information to develop their own MRP.

The Internet directly addresses three major elements of the supply chain connectivity, visibility and transparency. The Internet allows first tier automotive suppliers to be flexible to the changes in the customer demand. There is no longer a time delay in the flow of the information. Updated real time information is readily available to all participants in the supply chain. Through the Internet organisations can react accurately and promptly to the needs of their customers these organisations are more likely to attract orders and show growth.

Time compression is one of the major benefits of the Internet as communication medium it increases customer service and responsiveness, it also reduces imbalances in supply and demand
and inventory holdings. Time is one of the most visible and valuable features in the supply chain, time has become the underlying dimension of the supply chain shorter order cycles improve customer service. Shorter material throughput time reduces the cost of processing; this shortening in time brings the entire chain closer together. As forecasting time decreases, there is less need to forecast orders while shorter processing time increases respond to change in the demand. It is therefore obvious that time is a key organising principle in the supply chain and the Internet has a major tool in the compression of time in the supply chain.

5.6.4 First tier automotive suppliers

First tier automotive suppliers need to analyse the information published on the Internet. The information will identify the requirements of the automotive assemblers pertaining:

- Material requirements (vehicle models and part requirements)
- Quantity requirements
- Delivery time

Materials are delivered according to the JIT principle with the above information in mind.

The Internet will also give first tier automotive suppliers information as to what materials to source from their respective second tier suppliers.
5.6.5 **Second tier suppliers**

With the accessibility of the Internet, the second tier suppliers will have access to information published by automotive assemblers. The automotive assembler’s website will give second tier suppliers information as to the requirements of the automotive assemblers. This information can be translated into the requirements of the first tier suppliers. The second tier suppliers can create their MRP; which will enable them to supply materials on time and in the right quantities to the first tier suppliers to meet the demand of the automotive assemblers.

5.6.6 **Logistic providers**

Automotive assemblers are currently in the process of outsourcing functions in their logistics department. Logistics providers are being used to act as agents in the transportation, tracking, monitoring and coordinating of parts and information. These logistics providers react on the information presented on the automotive assembler’s web site.
5.7 CONCLUSION CONCERNING THE ACHIEVEMENT OF THE OBJECTIVES OF THE STUDY

First tier automotive suppliers need to become more and more aware of the global environment that it operates in. No longer can the South African market be seen in isolation. First tier automotive suppliers need to develop global strategies to stay competitive. Strategies must be developed with these global environmental factors in mind. For South African first tier automotive suppliers to become major role players in the global market they need to implement modern manufacturing technologies and adapt their supply chain strategies by introducing world-class information technologies.

The automotive industry in South Africa is characterised by mergers and buy-outs. Through mergers and buy-outs global companies are investing in first tier automotive suppliers in South Africa, first tier automotive suppliers are exposed to world-class technologies. These global also lend capital support to the local manufactures. With the necessary world-class technologies and capital support South African first tier automotive suppliers can become global role players.

The South African government has shown commitment to the automotive industry by introducing programs like the MIDP. The successful completion of the MIDP in 2007 will help the automotive sector to become one of the major role players in creating a healthy economical situation in South Africa. VWSA and Daimler-Chrysler have obtained large export contracts these contracts are already having major capital benefits for automotive assemblers and first tier automotive suppliers.
The further depreciation of the rand is making export contracts more and more lucrative for automotive assemblers.

First tier automotive suppliers need to understand the benefits of having an effective supply chain in place, the understanding of the supply chain has become extremely important. All participants in the supply chain need to know where and how they fit into the supply chain, only by fully understanding this can an supplier position themselves according to the demand of a customer.

The value chain consists of primary functions, which are directly related to the manufacturing and support functions that support the primary functions. The success of the primary functions is directly related to the expertise and knowledge of the support functions. Organisations need to realise the value of having effective support functions in place. A major function that need to be added to the value chain is the planning function, this function will ensure that all information are presented to the primary function to ensure that the customer’s requirements are meet.

Strategic partnerships between trading partners are an essential element of a successful supply chain. Customers need to take part in the development of their suppliers. All trading partners along the supply chain need to have a common goal in place; strategies must be based on aching these common goals.

The electronic evolution had a tremendous impact on supply chain strategies. First tier automotive suppliers can no longer ignore the impact of having the best available technologies in place. The electronic evolution has dramatically improved the connectivity and visibility of the supply chain. First tier automotive suppliers need to strategically align their supply chain strategies to
accommodate new technological innovations; only by introducing these strategies will they achieve a competitive advantage.

The objectives of this study as stated previously was to firstly identify the problems and challenges facing first tier automotive suppliers; secondly to have a full understanding of the supply chain and thirdly to develop and design supply chain improvement strategies.

These objectives have all being met and dealt through solving the sub problems and ultimately solving the main problems.
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INTERVIEWS: An analysis of supply chain improvement strategies for first tier automotive suppliers in the Port Elisabeth and Uitenhage region.

**Question 1:** What are the future trends in the industry and what are your competitors doing or planning to prepare themselves for these future trends?

**Question 2:** What are the needs and requirements of your customers and how is the organisation adapting itself to meet these requirements?

**Question 3:** How does your organisation document its processes and ensure that these processes are followed?

**Question 4:** What common methodology does you and your supply chain partners use to ensure that the connectivity between the partners is lean and effective?

**Question 5:** What is the state of your information architecture? When was this last upgraded?
**Question 6:** How ready is your organisation to change and what changes do you anticipate?

**Question 7:** Do your organisation have the will and resources to support those changes?

**Question 8:** What performance benchmarks are in place to measure the performance of the supply chain in the organisation?

**Question 9:** What continues improvement plans are in place to ensure that the organisation achieve the performance benchmarks set for the organisation?
Question 10: What non-financial recourses have you dedicated to prepare for future challenges within the industry?

Question 11: What expertise do you have in place for the digital supply chain effort?

Question 12: How are IT and process development working together to find optimum supply chain solutions?
Section 2: The problems and challenges facing first tier automotive suppliers

1. How will e-commerce shape the supply chain and how do suppliers need to adapt their strategies to comply with these changes.

2. How will your company adapt their strategies to become more productive to handle price pressures of the industry?

3. How will the electronic evolution change the shape of the industry?

4. How can your organisation continuously improve technology to stay competitive?
5. How will the depreciation of the Rand against foreign currencies influence your organisation?

6. What macro environmental forces will help to shape your organisations’ supply chain strategies?

7. How will management commitment to build strategic alliances that support the strategic business plan increase the profitability within the business?

8. How will streamlining efforts such as JIT contribute to the effectiveness of the your organisation and improve the quality and nature of the linkages alongside the supply chain?
Section 3: Understanding the supply chain

1. How can your organisation continuously improve their strategies to function at high levels of effectiveness?

2. How are your organisation moving away from traditional supply chain and are they continuously looking at new ways to improve their supply chains?

3. How is your organisation balancing the elements of having reliable products, the lowest possible inventory levels and elimination of redundant cost along the supply chain?
4. How is your organisation positioning itself in the context of all the other organisations it interacts with some of which are its suppliers and some of which are its customers?

5. What strategies is your organisation implementing to ensure that it is flexible enough to react to sudden changes in parts availability, distribution or shipping channels, import duties and currency rates?

6. What latest computer and transmission technologies is your organisation using to manage the shipment of parts in and finished parts out?
7. How does your organisation analyse its own position in the supply chain and then implement the appropriate strategy according to its analysis?

8. How is your organisation using effective materials management as a means of reducing total costs associated with the acquisition and management of materials?

9. How is your logistics department structured to achieve desired levels of service and quality at the lowest possible cost?

Section 4: Supply chain improvement strategies for first tier automotive suppliers

1. How does your organisation integrate supply chain strategies with the organisations’ overall strategy?
2. To what extent does your organisation succeed in successfully integrating materials flow and information internally and externally?

3. What effect has information technology on the performance of your organisation?

4. What demands does the customer place on your organisation in response to their needs?

5. “Global competition will drive organisations to not only look at their cost structures but also at the total cost to deliver their good and services to customers.” How has your organisation reacted upon the above statement?
6. When looking at your trading partners what does your organisation need to take into consideration in developing new supply chain strategies?

7. Strategies need to be flexible enough to react on the changes that might take place, how does your organisation ensure this flexibility?

8. What organisations are more likely to attract orders?

9. What factors are most likely to be effected by time compression?

10. Has your organisation successfully identified costs in the supply chain and reacted upon these factors influencing costs?