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Modelling Supply Chain Gaps

Thesis submitted for the fulfilment of the Master of Business in Management (Research) Degree

Candidate: Brett Sukara

Principal Supervisor: Dr Fawzy Soliman

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Certificate

I certify that this thesis has not already been submitted for any degree and is not being submitted as a part of candidature for any other degree.

I also certify that the thesis has been written by me and that any help that I have received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

Signature of Candidate

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Abstract

Competitiveness of organisations and in particular resource-based organisations such as supply chain companies which are operating as part of a network could be improved by reducing or eliminating gaps between their perceptions of customers' expectations and the customers' experiences (actual delivery) in the expected level of service, quality, cost and speed of delivery of goods and services to be delivered to customers.

After the identification of source(s) of differences (gaps), supply chain organisations need to design and implement techniques for reducing or avoiding such gaps.

To assist the design of an appropriate model which contains essential new techniques, this thesis examined the role of mapping in determining gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services.

These techniques could assist supply chain network organisations in identifying knowledge used in decisions related to the expected level of service, quality, cost and speed of delivery time of the goods and/or services concerned. Ultimately, this could lead to the identification of the various other kinds of defects (gaps) that may exist in supply chain organisations. Furthermore, the thesis explored the proposition of what supply chain companies should do to eliminate or reduce these gaps.

This thesis aimed to identify gaps in knowledge and strategy in supply chain companies. Factors influencing and causing such defects (gaps) were identified by this research. Special attention was given to gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services as these product/service elements represent the key attributes of the "*value*" proposition.

The researcher presented a set of hypotheses and then attempted to verify them by using both quantitative and qualitative research methods. Quantitative surveys (questionnaires)

were used to collect and analyse data. The instrument consisted of a number of quantitative as well as qualitative questions in order to understand the evolving processes and perceptions involved in the study in a particular empirical context, which was examined and analysed in the selected supply chain population sample in the context of the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

Findings from this study suggest that differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected levels of service, quality, cost and speed of delivery do exist and that the overall impact on supply chain company performance is statistically significant.

The proposed model highlighted the benefits of applying the concept of identification of gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services in supply chain companies. It is anticipated that the findings from this research will assist managers to better manage supply chain activities. It is also hoped that this study will be helpful for further research in the future.

Keywords: supply chain management, supply chain gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

Chapter 1: Introduction

1.1 Introduction:

An organisation's competitiveness largely depends on how efficiently and effectively it manages its organisational resources. In light of that, different organisations take different approaches in managing their resources and develop their plans of action accordingly. However, with increasing competition, organisations alone could not achieve what collectively a network could achieve and thus organisations increasingly tend to form new or join existing networks as these have a potential to provide greater competitive advantages. One such form of a chain/network is a supply chain network. In today's increasingly competitive environment where competition is less between individual companies and increasingly between supply chains, in order to gain competitive advantage, supply chain organisations need to pay special attention to any differences or gaps between themselves and their customers. That is, between suppliers' perceptions of customers' expectations and the customers' experiences (actual delivery) that may appear in the key value attributes, namely, in the expected level of its service, quality, cost and speed of delivery of goods and/or services to customers and which may impact on their performance as suppliers. This is the main focus of this research thesis. It is expected that the eventual findings from this research are going to assist management of supply chain organisations to better manage any differences (gaps) that might exit between them and their customers and thus aid them in their development of customer long term and day to day planning and execution strategies. To understand potential issues that may arise from it, it is first important to understand the supply chain concept.

Supply chain is a complex organisational network and the concept of supply chain management (SCM), which is still evolving is used to manage its operations and processes. Its application to this thesis will be described in more detail following a brief introduction of other types of global organisational networks.

Amongst other global networks are many multinational (MNC) and trans-national organisational networks, non-government organizational networks, specific industry, business and political networks and supply chain organizational networks amongst others.

According to DeSanctis and Fulk (1999, p. 72), "global network organizations are based on a sophisticated information technology infrastructure that supports rapid, cost-efficient communication across network linkages. The technology permits the addition and deletion of linkages as relationships emerge and fade and offers common platforms for information sharing across systems, organizations and nations, assists communication across the vast distances, time zones, and cultures and aids in meeting the coordination challenges that accompany such differentiation."

Another type of a global network are multinational organisations, which according to Wilkins et al (2010, p. 638) are defined "as firms that cross borders, making foreign direct investments. They can be family firms, state-owned businesses, publicly traded enterprises or a combination of both. Their integration abroad can be vertical (forward and backward), horizontal or diversified (related or unrelated). They disseminate capital, product, process, research and development methods and findings, intellectual property, technical and managerial know how, logistical expertise, entrepreneurial talents, technologies and knowledge, both explicit and tacit, which are diffused within the organisation".

Trans-national organisation defined by Porter (1986, p. 372), on the other hand, is one which in its "cross-country coordination of national operations aims to capture the scale economies beyond those that can be supported by a single market, while simultaneously retaining the ability to respond to national interests and preferences".

As opposed to multinational and global organisations, the trans-national organisation" builds and legitimises multiple diverse internal perspectives able to sense the complex environmental demands and opportunities; its physical assets and management

capabilities are distributed internationally but are interdependent; and it requires a robust and flexible internal integrative process" (Porter 1986, p. 378).

Yet another type of global organisation is a non-governmental organisation, which according to Landim (1987, p.29) "started out as ideological entities and developed in the context of authoritarian regimes, as nuclei of social initiatives working in economic and political resistance with the most disadvantaged sectors of the population. In general, they have a common outlook, one which involves (popular education) activities carried out at the grassroots level. Their main objectives are to promote participation, autonomy, and pluralism. They can be differentiated based on the types of projects they prioritize as well as by the groups benefiting from their actions. The recent attempts to form more permanent networks of non-government organisations bolster their chances of becoming actors that count in the political and social relations among various countries".

However, one of the most recent and currently talked about global organisational chain forms, namely a supply chain network imminently and evidently all around us and throughout the world stands to shape the way we live and work for years and decades to come. Supply chain network organizations as such will inevitably continue to evolve with us and with the ever changing business, and the all too important political, economic, social, technological, legal, cultural and environmental landscapes. According to the Council of Supply Chain Management Professionals glossary of terms (2010, p.180):

"Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers.

In essence, supply chain management integrates supply and demand management within and across companies. SCM is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives

coordination of processes and activities across marketing, sales, product design, finance and information technology".

In the same context, it is also important to mention that even though supply chain management and demand chain management terms are used interchangeably and are inseparable, a difference between them does exist and the most noted and quoted difference between supply and demand chain management is that in supply chain management, the onus is on the suppliers' push processes, whereas in demand chain management, the emphasis is on the consumers' pull processes (Li and O'Brien, 1999).

According to Bonney et al., 1999 in Mazahir et al (2011, p. 92) "a push manufacturing system is characterized by an approach in which production and inventory decisions are based on long-term forecasts", and as such can achieve economies of scale, however, as forecasts are most often inaccurate, the system's success often faces uncertain demand and excessive levels of inventory.

Alternatively, "production can also be managed by a pull manufacturing system driven by the orders of customers, which ensures reduced lead times, high service levels, reduced inventory levels, and enables companies to cope with a fluctuating market. However, it causes higher costs as economies of scale cannot be taken advantage of (Mazahir et al 2011, p. 92)."

What this means in supply chain terms is that "suppliers need to be able to adapt their offering to a wide variety of customer situations and needs. Understanding the customer's situation and needs together with the right offering contributes to good co-operation in improving the joint demand chain, which further leads to superior demand chain efficiency and high customer satisfaction" (Heikkila, 2002, p.747).

Thus, the main goals of supply chain management strategy are efficiency and effectiveness in the maximisation of value of products and/or services, integration of processes, continuous improvement in responsiveness and reduction in cycle times and final costs (Li and O'Brien, 1999). Even though, supply chain management is a very

important economic, social, technological, cultural, political, legal and environmental concept and an ever evolving system, to this date, it still remains under-researched and as such lacks in many aspects.

1.2 Thesis Structure:

The structure of this thesis is organised in the following way:

The introductory chapter provided background information about the main area of research, namely, supply chain management and supply chain gaps which culminated into research on the alleged differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences with a special emphasis on the main value attributes: the expected level of service, quality, cost and speed of delivery. The role of mapping of the suspected supply chain gaps was also proposed and discussed in the first chapter followed by the research problem and an indication of the contribution to knowledge.

The second chapter dealt with literature review in search of supply chain and supply chain management gaps in the supply chain literature field. Initially, the researcher directed attention to the discrepancies and the observable weaknesses emanating from organisational capacities and capabilities of supply chain organisations and their consequential knowledge and strategic gaps which are presumably linked with the alleged differences between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery to customers in supply chain organisations. The extensive review examined a variety of articles that were suspected of having any involvement in addressing potential supply chain gaps proposed in this thesis project.

Since no significant articles could be found that address the research problem and research questions of this thesis, the literature review ended with the development and

explanation of a novel concept aimed at bridging the newly alleged gaps in the literature and industry practice.

The third chapter described the theoretical framework based on the grounded theory and illustrated the development of the hypotheses and all of the methodological components that were utilised in the pursuit of answering the research questions. The final section of the third chapter likewise addressed the sampling frame and research subjects, research process and ended with a short summary.

The fourth chapter explained the development of the hypotheses followed by chapter five which analysed data and presented results. Finally, conclusions and recommendations summed up the main findings from this thesis project.

1.3 Supply Chain Management:

1.3.1 Definition Issues:

It is important to mention that many authors have attempted to define what supply chain management (SCM) is, and to this date, opinions are many and highly divided and disputed. Supply chain management concept origins are not that precise however most literature indicators and other evidence point to transport and logistics and similar forms of industries dealing with material distribution of goods and/or services. Early origins are often credited to Forrester's (1958) theory of industrial dynamics and his definition which states: "Management is on the verge of a major breakthrough in understanding how industrial company success depends on the interactions between the flows of information, materials, money, manpower, and capital equipment. The way these five flow systems interlock to amplify one another and to cause change and fluctuation will form the basis for anticipating the effects of decisions, policies, organisational forms, and investment choices "(Forrester, 1958, p. 37).

This definition seems to have touched upon most supply chain management parameters and its related concerns even after fifty years since its inception. Forrester (1958) seems to have forecasted quite explicitly that future advantages will be derived by companies who develop and well utilise their understanding of the different company units and their inter-related functions, as well as their inter-relationships with other industry enterprises and markets.

However, this definition lacks in other approaches that are crucial in today's global supply chain environment, such as issues dealing with emergent sustainability, innovativeness, governance, leadership, real time integration, flexibility and especially focus on the key elements of the value package, namely; the expected levels of services, cost, time and quality in an intertwined manner from the perspectives of suppliers' perceptions of customers' expectations and the actual customers' experiences (actual delivery). The new definition should therefore need to include these and other up to date metrics based on the time and the environment in which supply chains operate today to reflect their true state.

Differences between suppliers' perceptions of customers' expectations and the actual customers' experiences could give rise to mismatches or gaps in either product or service delivery. It is one of the objectives of this thesis to identify and include these differences (gaps) if they exist, which will inadvertently contribute to this consensus, and thus assist in overcoming such a definition gap hoping to bring the definition and thus its purpose under one universally acceptable umbrella.

As already mentioned, there are almost as many definitions as there are authors discussing the subject. Definition of supply chain management according to the Global Supply Chain Forum in (Croxton et al 2001) states the following: "Supply Chain Management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders" (p.14).

Croxton et al (2001, p.13) further emphasize the increasing importance of "supply chain management being recognized as the management of key business processes across the network of organizations that comprise the supply chain. While many have recognized the benefits of a process approach to managing the business and the supply chain, most are vague about what processes are to be considered, what sub-processes and activities are contained in each process, and how the processes interact with each other and with the traditional functional silos".

In the words of Richard and Wisner (2005) in Fletcher and Polychronakis (2007, p.193): "Supply chain management (SCM), represents the integration of key business processes among industry partners to add value for the end customers. It tightly links together several consecutive elements of the industry value chain: from upstream suppliers; to sub-assembly manufacturers; to final manufacturers; to distributors; to retailers; to end-customers. The ultimate goal is to make the process more efficient and the products and services more differentiated".

Besides the division on a universally acceptable definition of supply chain management, there are also other pressing matters which the supply chain field and its profession need to deal with and find solutions to. From the above text and researched literature, it is clear that the supply chain management field faces many challenges. Quite central and very significant challenges that this thesis has identified are the suspected differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences regarding the expected level of service, quality, cost and speed of delivery to customers and their impact on supplier performance. These gaps are influenced and by a variety of factors.

1.4 Factors That Influence Supply Chain Gaps:

The quest thus begins with the inevitable question: where should one start looking for the potential influences and causes of the suspected differences (gaps) and how then, if and when found, can these be neutralised, isolated, reduced or completely eliminated?

Part of the answer lies in understanding how expectations and perceptions become formed, that is, what driving factors influence customers' and suppliers' decisions in the forming of perceptions and expectations.

Factors that influence supply chain gaps such as culture, information, technology, money, convenience, prestige, customer and supplier knowledge and product/service processes most imminently and importantly affect consumers' understanding of quality, cost, speed of delivery and the expected level of service and as such inevitably influence purchase decisions and investment preferences, policies and organisational network strategic forms and structures. These elements further promote a closer understanding of how the main components of this research thesis, that is, the expected levels of service, cost, quality and speed of delivery influence customers' expectations and suppliers' perceptions, which ultimately impact on performance outcomes.

These factors are continuously influenced by the changing and increasingly more competitive global marketplace with all of its demographic, social, economic, political, technological, legal, environmental and other factors, which require fast, responsive and highly adaptable organisations to capitalize on emerging and upcoming opportunities. Supply chain organisations, being part of organisational networks and thus part of the solution to these global issues have a potential to provide greater competitive advantages and potentially create larger economies of scale (McCarthy and Anagnostou, 2003).

With their key features, they differ significantly from traditional organisational forms in their structures, shapes and reach and are consequently far more flexible and a lot less hierarchical (DeSanctis and Fulk, 1999). According to Quinn (1992, in Desanctis and Fulk, 1999, p. 81) "the necessity to generate an ever-increasing number of new products and services requires an organisational form that is knowledge intensive".

Quinn (1992, in Desanctis and Fulk, 1999, p. 82), further points out that "successful corporate strategies must identify core competencies, those activities that it does best and should outsource all other activities required to produce its products or deliver its

services, meaning that it should hire, buy, contract and otherwise obtain all other productive elements other than those that comprise its core competencies."

Therefore one of the key functions of a successful supply chain network organisation, is to focus on its best competencies and complements most other activities through its intra and inter-organisational networks or chains. This serves to avoid duplication and minimize costs and thus generate higher outputs. According to Dickson (2003 in Craighead et al 2009, p. 407) "by extension, the embeddedness of knowledge development capacity in the chain makes duplication efforts by other firms very difficult".

There are however, as previously mentioned, impeding issues at various stages along the supply chain and with ever increasing numbers of participating firms, gaps are becoming more evident and ever important to bridge. Supply chain as already mentioned is a huge network of many enterprises and many relationships. The more entangled, bigger and longer the supply chain network is, the more complex it is to manage. Its desire to become bigger for instance, by expanding too soon and too fast without adequate research, preparation, resources and experimentation may often create inefficiencies. By doing so, it is effectively taking on extra burden and responsibility, and thus prolonging the achieving of the wanted results. Instead of becoming more effective and therefore more competitive, it in fact may become more defective.

Supply chains can also become victims of their own success, influenced by the concept of outsourcing that itself by its very nature creates some dependencies, which could if they are not managed effectively damage its long term viability (Luvisen and Bendixen, 2010).

For these reasons, supply chain firms' desire to become more competitive, also often leads networks/chains and their member organisations to search for ways to remove defective decisions and activities which are hampering their progress. As already mentioned, the more intertwined inter and intra-related business relationships are, the

more likely the occurrence of defective decisions and activities is. These may often result from a lack of knowledge and ineffectual policies and investment choices derived from them which in turn are likely to produce defective strategies and new complexities that will most probably negatively impact on serving and fulfilling customers' expectations. For this reason, they require special attention, as these may be the very keys that could unlock supply chain success ingredients.

Consequently, enormous cost and time savings and quality and flexibility gains in the expected level of service, quality, cost and speed of delivery could be derived from more resourceful measures, better designed and altogether better and more effective supply chain systems. These are expected to result from collaborative and innovative products and processes and proactive knowledge and action exchanges of the supply chain participants and all of the stakeholders concerned. It is also important to stress that the larger, longer, more entangled and thus more complex supply chains become, the more crucial and inevitable dealings with gap issues, especially those related to the expected level of service, quality, cost and speed of delivery gaps become.

Furthermore, as the global economy unavoidably becomes more and more knowledge intensive and companies increasingly and heavily rely on knowledge based intangibles which are hard to come by, relevant/useful knowledge and knowledge programs which incorporate all of the crucial components in this puzzle become highly precious ingredients on this mutual road of a highly competitive progress and sustainability.

Issues such as effective communication, coordination, cooperation and integration, innovation, flexibility, agility, adaptability, alignment, continuous learning and training, talent exploration and exploitation, sustainability and leadership amongst many others are increasingly demonstrating and showing their levels of interconnectedness and inseparability in the current business environment. If these are bonded through relevant/useful knowledge programs, they have the potential of bridging and closing the gaps between the various layers and levels in the supply chain that as their main objective exist to serve and satisfy the end user of its products or services, its customer. This thesis

will therefore focus on the identification of gaps and the factors causing them in the key product/service "*value*" attributes, namely; in the expected level of service, quality, cost and speed of delivery of goods and/or services in selected supply chain organisations and thus consequently assist in overcoming/eliminating those gaps and improving their supply chain performance. One method that is commonly used to identify gaps is a process called process mapping (Soliman, 1998; Soliman and Spooner, 2000).

Knowledge management activities and associated practices have been classified under the following three headings: a) knowledge processing; b) knowledge domains; and c) knowledge formality (Vincenti, 1990, Faulkner, 1994, Coombs and Hull, 1998). The processes of managing organisational knowledge in organisations have been described by Soliman et al. (1999) as the means by which value is added to *raw-knowledge* (inputs) in order to create *processed-knowledge* (outputs) i.e. adding value for their clients". Soliman and Spooner (2000) have noted that most organisations would attempt to utilise five types of knowledge management processes in order to *Create*, *Capture*, *Organise*, *Access* and *Use* knowledge. These five processes cover the entire scope of most organisational functions and are significantly important to the process of supply chain integration.

According to Beckett (2000), historically the perceived value has been driven by its financial and capital assets, however, in recent times the intangible value should be considered side by side with the value of capital base. Some researchers (Sveiby, 1997) are seeking ways to characterise and value these intangibles. However, recent research by Soliman (2012a) could provide some insight into the characteristics of the supply chain knowledge which could be important for evaluation of the supply chain performance.

1.5 Mapping supply chain gaps:

That is why, this research will progress in the direction which will aim to clearly map and identify sources of such gaps or discrepancies in researched supply chains and their associated causes in order to neutralise or preferably completely eliminate them. It intends to use mapping techniques to assist it in the identification of the related and

relevant knowledge and strategic decisions that may impact on suppliers' perceptions of customers' expectations and the actual customers' experiences in the key product/service value attributes in question, that is, the expected level of service, quality, cost and speed of delivery of goods/and or services.

Mapping organisational activities can be a useful method of finding where possible weaknesses and inefficiencies reside. However, as mapping does not necessarily point directly to the problem, the researcher needs to know where to look, what to look for and how to assess the probable sources of defects or gaps (Soliman and Spooner, 2000).
The mapping of knowledge management processes was originally designed by Clarke and Staunton (1989) and the concept was later modified by Soliman (1998). The original mapping model aimed to a) decide what knowledge should be mapped and to b) determine the level of knowledge mapping required. The modified version on the other hand, according to Soliman (1998) is capable to answer the first question, whereas the second one targeting the set amount of knowledge mapping required is in fact led by the economics of the intended aim. As an extension to the above model, Soliman (1998) presented a micro-mapping concept that can be applied in global organisational contexts including supply chain organisations too.

In the text of Soliman and Spooner (2000, p.343), "there exists a level of the micro-knowledge map beyond which the knowledge mapping effort may be a waste". That is why, according to Demarest (1997 in Soliman and Spooner, 2000, p.343), "one needs to understand the three relevant infrastructures within which the knowledge process takes place; the cultural, organisational and technical infrastructure". Additionally, the mapping process has to consider organisation's essential business elements and its fluid, dynamic reality to be effective (Soliman, 1998). It needs to target organisation's essential business matters so that for example, less reworking or errors occur, and manufacturing cycles become reduced, thus offering beneficial outcomes and enhancing firm's efficiency.

Consequently, this evolving global supply chain mapping process is inevitably bound to create differences among supply chains of which the final differentiator will be

performance outcomes that will mainly be derived from organisational capabilities to either to lead, or follow chain leaders or lag behind (Poirier and Swink, 2007). Those supply chains which manage to identify and neutralise or eliminate differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences will hold a competitive advantage over those competitors who do not identify and eliminate them and typically rely on old forecasting techniques. However, only those supply chains which effectively and in an integrated manner utilise all of their resources may expect to gain such results.

That is why, in order to be equally effective, supply chain member firms will need to employ and implement equally effective policies and disseminate equally effective strategic, knowledge and capital resources in addition to all of the other necessary resource exchanges with the aim of full integration. Similarly, Barney and Mackey (2005 in Craighead et al 2009, p. 406), noted that "resources have no value in and of themselves, and only create value when they are used to implement strategies".

In that light, it is becoming more evident that organisational performance depends on many organisational internal and external factors. Being a member of a network in order to bring and build together and have access to/share its mutual customer base and information repositories and other necessary resources is a very important step towards improving organisational performance, however this alone neither guarantees better and improved outcomes nor is it sufficient to ensure long term supply chain management (SCM) success.

Furthermore, Favilla and Fearne (2005) listed the so called "10 golden rules important for SCM success" (p. 243). Though, their example of a management checklist may serve as a basic guideline map, it is essential to look into the relevant issues that affect SCM a lot deeper below the surface as gaps in performance do not occur single handily or as checklist items and are most often a combination of a variety of factors and causes. As chains expand, these varieties also become new variations and as such present new challenges. Once identified, however, the factors causing unwanted supply chain

performance (ie. gaps in the expected levels of service, quality, cost and speed of delivery) can be turned into a positive and supply chain wide integrated learning experience which can then be managed a lot more efficiently should they ever occur in the future again. This is an imminent benefit of a deeper analysis of the researched, identified and examined SCM issues.

In that context, Siemieniuch and Sinclair, (2004a) pointed out that supply chain firms need to assess their own preparedness to obtain and benefit from knowledge within and outside its boundaries and to exploit it effectively by applying it throughout its chain of operations. In relation to that, a number of authors have acknowledged that performance improvement is related to improvements in knowledge capturing and knowledge dissemination inside and outside organisations' boundaries having involved all key players in the knowledge management process (Siemieniuch and Sinclair, 1993; Siemieniuch and Sinclair, 1999a).

Researchers and scholars in the supply chain field also some time ago recognised the undisputable essence of collaboration and integration in the pursuit of better performance (Sheth and Sharma, 1997; Morash and Clinton, 1998). In today's marketplace, besides all of the functional supply chain units that collaboration and eventual integration need to include customers, without whom success is a gamble and most likely future failure outcome.

It should be noted that Zulfikli and Khan (2006, p. 678) likewise stated the importance of "the internal-external relationship or integration, by assessing several variables such as leadership, commitment, trust development, sharing environment, integration, partnering issues (processes, practices and development), relationship management, rewards and incentives, information and communication, teams and training and satisfaction measurement".

Therefore, there are other critical factors that are related to the entrepreneurial conduct of the firm. In this regard, we are seeing more and more innovation in intra and inter - organisational contexts and new types of organisational networks/chains are being

invented with the aim of boosting organisational performance and achieving better outcomes for all stakeholders.

The above mentioned ingredients have a direct impact on supply chain performance through its growing relationships to customers. In addition to these, Goetschalckx et al. (2002) pointed out that globalised supply chain companies could face increased uncertainty as well as poorer transparency and visibility due to factors such as lead-times, critical infrastructures, taxes, duties, and fluctuations of exchange rates. These complicating factors have been further identified by Hendricks and Singhal (2005a) as complex sets that could lead to, accidents, disruptions and break downs. These disruptive factors may give rise to supply chain gaps (Soliman, 2010b) and in particular supply chain gaps that are likely to occur as a result of the differences in suppliers' perceptions of customers' expectations and the actual customers' experiences that were examined as part of this research.

The main onus of the research was specifically placed on gaps in the following value attributes: in the expected levels of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain companies.

Additionally, Soliman (2009) presented a methodology to address quality deficiencies or discrepancies in traditional human resource departments. However, the concept has a potential for wider applications in supply chain companies. In fact, Soliman (2010a and 2010b) has pointed out that gaps could exist in organisational value attributes such as Quality, Cost and Speed of Delivery to customers.

Likewise, Soliman (2011a) proposed that organisations could enhance their relationships and ultimate performance through a more effective management of discrepancies or gaps that exist in both suppliers' perceptions and customers' expectations in relation to the deliveries of goods and/or services. The same paper also indicated that mapping methods could assist in identifying such gaps with a special emphasis on products' and services' crucial and most imminent value components of quality, cost and speed of delivery.

These attributes have a direct impact on performance and as such deserve all the important, detailed and special research attention.

Soliman's (2011b) paper, however, did not refer to the expected level of service and its resulting effect on customers and suppliers, that are as important as the other attributes in their direct link with supply chain performance and which may be caused by a number of factors.

Knowledge transfer processes depend largely on the type of knowledge to be transferred. This applies to supply chain knowledge itself.

According to Beckett (2001), as organisations become more proficient at knowledge acquisition and dissemination, the volume of information and opportunities for improvement multiplies rapidly. Accordingly, a focus on the criticalness of supply chain knowledge must also be consistent with the organisation's strategy so that performance and progress measures could be identified.

In addition Lucier and Torsilieri (1997) and Davenport (1996) observed that failure of knowledge management schemes in many companies is because the focus was only on making that resource available, while ignoring that there must be action to deliver value. Accordingly, supply chain knowledge must be aligned with the organisational strategy.

Lucier and Torsilieri, (1997) and Vicari and Toilo (2000) in considering the link between knowledge creation and creativity, have reported that knowledge and in turn supply chain knowledge may be necessary for developing the operational *know how* to support organisational strategy. In other words, knowledge is regarded as an asset and hence it could be sold or exchanged or donated to deliver value for the purpose of improving products and/or processes. If knowledge is regarded as a facilitator of creative practices that help a company compete, then it must lead to beneficial change such as above average return and/or more efficient operations of the supply chain components Soliman and Youssef (2003b).

According to Beckett (2001) and Soliman and Youssef (2001) organisations, that are successful over long periods of time, indicate that, not only they must the achieve excellence in their current operations, but they must also understand future options and pursue strategic innovation. Furthermore, Martin (1997) and others consider knowledge as a resource that is critically linked with innovation and productivity. In addition Beckett (2000) considers that the integration with supply chain activities could affect and influence the speed of innovation and re-using knowledge to enhance operational productivity.

Soo, et al (2000), reported that the following four factors may be critical to knowledge management:

1. Knowledge acquisition through informal networking activities, combined with formal knowledge capture.
2. Creativity in problem solving as a key driver of new knowledge creation.
3. Availability of adequate individual and organisational absorptive capacity.
4. Knowledge as an input to innovative while financial performance as output.

In addition, Soliman and Youssef (2003a) demonstrated that knowledge itself could play a role critical role in enterprise knowledge management. This implies that supply chain knowledge is also critical the organisational knowledge management activities. This in turn could lead to identifying those supply chain knowledge factors that could be critical to knowledge management.

Accordingly, a further study about the criticalness of some of the above factors may be useful for future research.

1.6 Factors Causing Supply Chain Gaps

Supply chain discrepancies or gaps are often caused by supply chain instabilities (Sterman, 2005), vulnerabilities and risk factors (Peck, 2005) and the modes of mental

behaviour of decision makers in the supply chains (Sterman, 2005), whether they are first, second or last tier suppliers or final users, that is customers or consumers.

Various instabilities in an economy can cause chain reactions between different fluctuating indicators such as a lack of commitment by suppliers, production shortages, employment figures, volumes of goods produced, profitability and income, supply chain network relationships, complexity and divided loyalties among supply chain partners (Peck, 2005), amongst other factors that can damage companies, customers and the economy via disproportionate production, weak levels of consumer service and needless resource investment (Sterman, 2005).

Market instability diminishes labour skill levels, damages competition and deteriorates working conditions and labour- organisation affairs. Unstable profit margins threaten capital borrowing expenses. Instead of focusing on the creation and launching of new services and products, company management becomes preoccupied with crisis management (Sterman, 2005). Under these circumstances, any failures to deliver expected levels of service, quality, cost and speed of delivery become consequential by-products.

In the broader sense, it can be argued that supply chain gaps may be caused by a range of vulnerabilities and risk factors. According to Peck (2005, p. 218), "sources and drivers of supply chain risk operate at several different levels.

These are value stream/product or process level (workflows and information flows); asset and infrastructure dependencies level (fixed and mobile assets); organisations and inter-organisational networks level (contractual and trading relationships) and the environment (social and natural environment)".

At the value stream/product or process level, principal threats that can cause gaps are of a commercial or monetary nature arising from "inefficiencies or sub-optimal supply chain performance, including the inability to react swiftly to volatility in demand and the

changing needs of the market place" (Peck, 2005, p. 219). The accessibility and flow of plausible and trustworthy information is fundamental to this "process management perspective' that is 'dependant on the willingness of the parties to share demand and process monitoring data in order to neutralize this threat, which requires a high level of trust and cooperation between adjacent organisations; itself evidence of a heightened sense of shared enterprise and shared risk" (Peck, 2005, p. 219).

In the same context, it can be said that the very attributes that were created to make supply chains more agile and lean such as the adoption of just in time delivery systems have consequently made them more and more dependable on secure, consistent and proficient communications, distribution and transportation infrastructure, all potential sources and causes of supply chain gaps.

In terms of assets and infrastructure, potential gaps could arise due to the failure of communications links (information processing, equipment, call centres and the like); malfunction of production equipment, inaccessibility of production sites, fields or facilities and distribution outlets which all need to be linked internally and externally to serve their purpose. Besides these factors, the most significant would be the loss of experienced workforce (Peck, 2005). Organisations tend to assess these causes of potential gaps in terms of their own assets, their most immediate needs and business activities. Some firms may be more concerned with information technology issues, others with transportation and distribution, yet others with retail operations.

However, supply chains need to look at every potential source and cause of supply chain gaps holistically as operational mistakes or concrete failures in any one organisation could have widespread consequences in others. For instance, the failure of a major satellite could affect the tracking of goods or services in transit (shipment tracking or digital mobile payment transactions). Labour strikes or power blackouts could have an impact on a huge array of business and personal transactions, emergency and countless other services (Peck, 2005).

At organisational and inter-organisational level, potential causes of supply chain gaps are derived from trading partnerships and the power reliance amongst partner companies. While the overall position is that all information and threats will be equally shared amongst all member firms, irrespectively of their power status in the chain, there are often factors which derail such efforts as in the case with "powerful customers using contractual means to push risk associated with inventory management, technology or new product development back up the chain to weaker suppliers who are less able to shoulder the burden" demonstrating opportunism as a cause of supply chain gaps (Peck, 2005, p. 221).

Where there is strong will, determined resources, intention and action amongst supply chain member firms to act in a collaborative, open and transparent way, supply chains will extend and grow. However, this is not always the case and consequentially organisations tend to opt for a reduced number of suppliers and most often deal with a single supplier of choice due to the ease of managing, scrutinizing and apparently developing the lowest supply cost option. What often ensues is a high likelihood of failure of that single supplier and the resultant supply chain disruptions or discrepancies (gaps) (Houghton et al, 2003 Latour, 2001).

Furthermore, suppliers may decide to elevate their position by acquiring, merging or entering into a strategic alliance partnership. These progressively more visible forms of global consolidations can as a result change the balance of domination in a supplier-customer relationship contributing to a reduced amount of choices for consumers. These consolidations can almost cause overnight disruptions in the asset and infrastructure dependencies level described above. The most obvious example is "the likely post-merger removal of excess capacity" which may 'advance suppliers' margins, but it may also reduce its liability to cope with unexpected surges in demand" (Peck, 2005, p. 222) thus affecting levels of expected service, quality, cost and speed of delivery.

On the contrary, powerful customers may influence the restructure of supply chains in order to obtain more favourable cost benefits (savings). The threat to the supply chain in

this instance is that "customers can unwittingly strip vital volume out from existing suppliers' networks, thus undermining their viability" (Peck, 2005, p. 222).

Another source of potential supply chain gaps is related to a loss of control and visibility or the so called outsourcing trend. Luvisen's and Bendixen's (2010) showed in their article on outsourcing paradoxes how the perceived decrease in operational range may cause the firm to exert incremental managerial effort; how attempts to make the organisations' operations simpler can cause the organisation to need further education, and how the outsourcing of apparently non-core competencies can lead to strategic reliance on other new and even previously possessed but now lost competencies.

An unavoidable and extremely important element that can cause supply chain gaps is the social and natural environment, which consists of economic, political, technological, social, legal, geological, pathological and meteorological factors. Many discrepancies or gaps deriving from these factors are often unknown and thus uneasy to control. What can however be done is assess the vulnerability in advance so that better decisions can be made in relation to the identified risks and their calculated risk management.

Technological innovations have been and still continuously are well known factors that can cause entire industries and economies' restructuring through either the creation of demand for new or obsoleteness of existing products, through improved supply chain facilitation of visibility, cooperation, coordination, integration, creation and start-up of new commercial models and channels, thus producing new and enhanced reliance amongst supply chain networks, companies and their associated infrastructures (Peck, 2005).

Social and political disturbances such as labour strikes, accidents, acts of terrorism, protests and similar events can certainly cause economic and political vulnerabilities such as production and supply shortages, product/service boycotts (e.g. buy domestic products only), inflation, unemployment, high food, and petrol prices amongst other social and political ramifications. Any form of social and political instability has in fact the potential

to cause an increase in black market activities. These factors would certainly undermine legally run businesses causing some loss in the number of customers and income and thus threatening their viability.

Among the environmental causes, pathological factors, according to Peck (2005) are hardest to foresee and "potentially the most disruptive. Whether Foot and Mouth Disease, SARS, or the man-made computer viruses that mimic them, highlight how efficient consolidated seamless distribution systems can become victims of their own success" (p. 224).

Dependence on particular forms of transport in particular countries can in fact very easily cause disruptions even in the most efficient distribution systems (Australian rural and country side population is heavily dependent on supplies delivered by road trains, trucks and railway where available, thus any strikes by transport companies could have fast and wide-ranging effects).

In addition to market instability, vulnerabilities and risk factors that were discussed above, possibly most influential sources of causes of potential supply chain gaps are in fact of operational and behaviour related nature of the decision makers in the supply chain. For instance, most aerospace managers that were interviewed as part of a rare case study into the UK aerospace industry supply chains, quite unexpectedly left out earthquakes, floods, sabotages, as well as nature caused critical events that could cause gaps in supply chains and instead directly pointed out to "often unanticipated side-effects or consequential risks to supply chain processes, arising from specific managerial decisions, requirements and industry trends.

Demand for shorter lead times, outsourcing and increasing use of global sourcing and supply, as well as "off-set" (politically determined counter trade agreements) were among the legitimate and well intentioned sources of risk to supply chain performance" and its inherent supply chain gaps (Peck, 2005, p. 214). Industry structures, complexity of supply chains and the restrictions enforced "by the safety-critical nature of the products

were also identified as contributory factors" (Peck, 2005, p. 214). The above operational and behaviour related factors of the decision makers in a supply chain are discussed in more detail in the section on factors causing speed of delivery gaps.

As there are many risks that may arise from the above mentioned causes, one of the most sensitive outcomes is a loss in market share as customers switch to competition. To ameliorate such effects, a huge and crucial task that supply chain organisations have is to do all they can to gain customer trust in order for them to stay loyal during such operational and behavioural swings.

As it is a well-known fact that trust cannot be gained in a short time, however can be very quickly lost, supply chain organisations need to adopt long term orientation and long term thinking models. Long term orientation creates long term trust and in turn reaps long term benefits and repeat business advantages. This reduces many potential costs inclusive of advertising and potential customer replacement (lost customers) or customer turnover costs.

Thus, an essential question to management of supply chain organisations is whether they are thinking in this direction to educate and establish such a management culture.

Summarised below are three groups of factors that can cause supply chain gaps:

- Supply chain instabilities such as lack of commitment by suppliers, capital, production, labour market and labour skill shortages, volumes of goods produced, unstable profit margins, income, network relationships, complexity, divided loyalties, disproportionate production, weak levels of customer service, needless resource investment, competition, customer supplier relatinship instabilities, deteriorated working conditions and labour-management relationships among other associated factors.
- Vulnerabilities and risk factors that are operating at several levels:
    - value stream/product or process level (workflows and information flows such as fiscal or business "inefficiencies or sub-optimal supply chain

performance including the inability to react swiftly to volatility in demand and the changing needs of the market place" (Peck, 2005, p.219), inaccessibility of plausible and trustworthy information, lack of information sharing, trust and cooperation);

- asset and infrastructure dependencies (fixed and mobile assets such as high dependence on specific communications, distribution and transportation infrastructure, failure of communications links – information processing, equipment and call centres, malfunction of production equipment, inaccessibility of production sites, field or facilities and distribution outlets and loss of experienced workforce);
- organisations and inter-organisational network level (contractual and trading relationships issues such as power reliance, power inequality or misbalance among partner companies, opportunism by either powerful customers or suppliers, failure of a single supplier, monopolies and oligopolies, change in industry structure and customer/supplier power balance due to mergers, acquisitions or strategic alliance partnerships and loss of control and visibility due to outsourcing);
- the environment (social and natural environment impacted by political, economic, technological, social, legal, environmental, geological, pathological and meteorological factors such as industry and economic restructuring as a result of the creation of demand for new and obsoleteness of existing products, lack of supply chain visibility, cooperation, coordination, integration, creation and start-up of new models and channels producing new and enhanced reliance among networks, companies and associated infrastructures, labour strikes, protests, product/service boycotts, inflation, unemployment, high living costs, man-made computer viruses, earthquakes, accidents, acts of terrorism and other related factors); and

- Modes of mental behaviour of decision makers in the supply chain:
  - their attitudes, attributions about other actors, and the heuristics and routines they use to interpret information they have;

- poor production, capacity and pricing decisions (Sterman, 2005, p.2);
- unanticipated side-effects or consequential risks to supply chain processes, arising from specific managerial decisions, requirements and industry trends such as demand for shorter lead times, outsourcing and increasing use of global sourcing and supply, as well as "off-set" (politically determined counter trade agreements), industry structures, complexity of supply chains and the restrictions enforced "by the safety-critical nature of the products (Peck, 2005, p. 214).

1.6.1 Factors causing expected level of service gaps:

Expected customer service levels can come in both hard and soft forms. Hard forms include tangible components such as availability of products or services, cycle time and on-time performance, receipts, demands for payment, bills of lading, order/service records, whereas soft forms are revealed in the relationship linking the activities of supply chain participants and the responsiveness in the provision of service to the end consumer (Maltz and Maltz, 1998). Service levels can be affected by a range of factors which have a potential to cause expected level of service gaps.

Proximity or distance between suppliers, warehouse or distribution centres and retail outlets to customers is the most obvious factor. Availability of expected quality products and services in a timely and preferred / acceptable manner to the customer is another factor. Consequently, the level of customer service received will depend on its design and delivery and should on a continuous basis have the full inclusion of the customer in mind in real life context as in fact the initiator (source or service ideas), moderator (service improvement referee) and direct as well as indirect service user (through both experiential journeys as well as a port of referral and generator/pillar of future compound, repeat and referred business).

Furthermore, service capabilities of suppliers and their upstream and downstream partners may often have an impact on the delivery of the expected customer service

levels. These are reflected in value stream/product or process (workflow and information flow capabilities), assets and infrastructure dependencies (whether fixed or mobile), organisations and inter-organisational networks (contractual and trading relationships) as well as social and natural environmental causes impacting on capabilities of suppliers to deliver expected levels of service (Peck, 2005).

Supply chain system and its structural design decisions can have a direct affect on product/service accessibility and convenience as well as product/service range due to the decisions relating to "the minimum number and locations of warehouses/distribution centres to supply with a required service level, optimal delivery route for each warehouse/distribution centre and the decision on the demand of product at the plant to supply all the warehouses/distribution centres and demanders' needs with a certain service level" (Hwang, 2002, p.284). These decisions all effectively impact on the delivery of planned and actual service levels.

There could also be situations where one firm cannot respond to its customer demands due to the current stock-outs or immediate contractual obligations to deliver certain categories of goods and/or services within the designated time that is about to expire, in which alternative sources of supply may be the only option. In this case, supply chain member firms usually fill the gap by supplying each other from the nearest available firm in the chain (another retailer with excess stock) as these are usually closer than suppliers. This policy is also known as lateral trans-shipment policy whereby current inabilities by retailers to meet demand are temporarily matched by fast delivery response from nearby retailers. There are two types of lateral trans-shipment policies: emergency lateral trans-shipment and preventative lateral trans-shipment policy with emergency lateral trans-shipment policy designed as a fast response in cases of stock shortages (stock-outs) and preventative lateral trans-shipment policy acting as a risk reduction measure in cases of stock-out anticipation (Lee et al 2007).

According to Lee et al (2007) expected service levels can be determined by adding up forecasted consumer demands, sales that were lost and a variety of costs inclusive of

those linked with inventory, business environment and business strategy as these all effect strategy design and eventually consumer satisfaction. One such example is a production restriction imposed upon a supplier by the government or another business entity which might be caused by unmet regulations and any other irregularities or reasons.

These could affect the fulfilment of contractual obligations and delivery deadlines or even disable a key customer or a whole set of downstream customers through no fault of theirs. Without a back-up sourcing plan, service levels would experience definitive discrepancies (gaps) affecting their operations, revenue stream and trust among consumers (Schmitt, 2011).

Schmitt (2011, p.1267) thus recommends "multiple strategies for protecting expected levels of customer service. These include holding extra periods' worth of demand at distribution centres, backing up service from specific distribution centres if a disruption should occur there, and backing up the actual manufacturing plants or transportation sources".

Factors that can cause gaps in the expected level of service are summarised below:

- proximity of distance between suppliers, warehouses or distribution centres and retail outlets to customers,
- availability of expected quality products and/or services in a timely manner,
- the level of customer service delivered and received,
- suppliers' product / service capabilities to satisfy customer needs,
- product / service accessibility / convenience,
- product / service range,
- supply chain system and structural design decisions (minimum number and locations or warehouses/distribution centres and the decision on the demand of stock at the plant), suppliers' contractual stock delivery obligations and
- government and other business entity restrictions.

1.6.2 Factors causing quality gaps:

In today's business environment with so many products and services on offer, "the key to sustainable competitive advantage lies in delivering high quality service that will in turn result in satisfied customers" (Shemwell et al., 1998 in Seth et al., 2006, p.547).

A very influential and substantial amount of work on service quality and its dimensions has been produced by Parasuraman et al. (1985, 1988, and 1991). Their work on service quality conceptualized the comparative differences in the perceptions of customers' expectations and the assessment of customers' service experiences and produced a service quality gap model supported by a service measurement instrument named SERVQUAL and a gap analysis technique.

The initial model had 22 items in total including five service dimensions which incorporate all of the service quality evaluation factors. These ten factors are: reliability, responsiveness, competence, tangibles, courtesy, security, credibility, accessibility, understanding the customer and communication. As mentioned, they are all incorporated into five dimensions of reliability, responsiveness, tangibles, empathy and assurance (Parasuraman et al., 1991, 1988).

Following Parasuraman et al. (1985) pioneering work on service quality gaps, further contribution came from Brogowicz et al. (1990), who added design associated gaps, information or feedback associated gaps, implementation associated gaps, communication associated gaps and customers' expectations and perceptions gaps to service quality gap literature.

The gaps proposed by Parasuraman et al. (1985) are summarised below as follows: (Seth and Deshmaukh, 2005 in Shahin and Samea, 2010, p. 2):

Gap1: Customer expectation-management gap. This gap addresses the difference between consumer's expectations and management's perceptions of service quality.

Gap 2: Management perception-service quality specifications gap. This gap addresses the difference between management's perceptions of consumer's expectations and service quality specification, i.e. improper service-quality standards.
Gap 3: Service quality specification-service delivery gap. This gap addresses the difference between service quality specifications and service actually delivered, i.e. the service performance gap.
Gap 4: Service delivery-external communication gap. This gap addresses the difference between service delivery and the communications to consumers about service delivery, i.e. whether promises match delivery.
Gap 5. Expected service-perceived service gap. This gap addresses the difference between consumer's expectation and perceived service. This gap depends on size and direction of the four gaps associated with the delivery of service quality on the marketer's side.

Later on, more service quality dimensions and other conceptual service quality evaluation models were added to the literature as many other authors used those in different industrial contexts. The result has been that up until today there has been no consensus on which service quality dimensions should be used when measuring a particular service performance. What has been common practice is that researchers and industry practitioners have been choosing to use service measurement models as they see them fit for their purposes.

Revealed below is a list of some of those different authors and a compilation of their proposed service quality dimensions, each of which could separately undergo a gap analysis test for any potential causes of discrepancies in service quality. These have been adapted from Seth et al. (2006, p. 550 and 551).

"Lehtinen and Lehtinen (1991) proposed the following service quality dimensions:
Physical quality (physical products plus the physical environment); Interaction with persons and equipment's; Corporate quality; and Process quality" (Seth et al. 2006, p. 550).

“Heywood-Farmer (1988) suggested three categories with each containing a number of dimensions. The first category addresses behavioural aspects which contain timeliness, speed, communication (verbal, non-verbal), courtesy, warmth, friendliness, tact, attitude, tone of voice, dress, neatness, politeness, attentiveness, anticipation, handling complaints and solving problems.

The second category named professional judgement includes: diagnosis, advice, skill, guidance, innovation, honesty, confidentiality, flexibility, discretion and knowledge. And the third category known as physical facilities and processes contains the following attributes: location, layout, décor, size, facility reliability, process flow, capacity, balance, control of flow, process flexibility, timeliness, speed, ranges of services differed and communication” ” (Seth et al. 2006, p. 550).

“Parasuraman et al. (1985) proposed these dimensions: Credibility, Access, Reliability and Communication. Later on in Parasuraman et al. (1988) further dimensions were added: Assurance, Responsiveness, Tangibles and Reliability.

Gronroos (1984) recommended these attributes: Technical quality, Functional quality and Corporate image. Four years later in Gronroos (1988), four other attributes were added amongst which were: Recovery, Attitudes and Behaviour, Accessibility and Flexibility and Reputation and Credibility” (Seth et al. 2006, p. 550).

“Dabholkar et al. (2000) suggested: Reliability, Comfort, Features and Personal attention, while Philip and Hazlett (1997) had the following list: Pivotal attributes, Acquired information, Core attributes, Reliability, Responsiveness, Assurance, and Empathy, and Peripheral attributes: Access and Tangibles. Johnston (1995) suggested: Responsiveness, Care, Availability, Reliability, Integrity and Friendliness” (Seth et al. 2006, p. 551).

“Rosen and Karwan (1994) recommended these dimensions: Reliability, Tangibles, Knowing the customer and Assurance. Ghobadian (1994) on the other hand proposed: Competence, Access, Reliability, Responsiveness, Credibility and Understanding the

customer. Ennew et al. (1993) proposed these dimensions: Knows business, Knows industry, Knows market, Gives helpful advice, Wide range of services and Competitive interest rates. Mersha and Adlakka (1992) suggested: Knowledge of service, Thoroughness/accuracy of the service, Consistency/Reliability, Willingness to correct errors, Reasonable cost and Timely/prompt service" (Seth et al. 2006, p. 551).

Shahin and Samea (2010) discussed and reviewed previous models and ended up adding five new dimensions: ideal standards, service quality strategy and policy, translation of strategy and policy into service quality specifications, management perceptions of customer expectations and employee perceptions of customer expectations and developed eight new gaps:

Gap 2: Management perception versus Service quality strategy and policy;
Gap 3: Service quality strategy and policy versus service specifications;
Gap 4: service specifications versus ideal standards;
Gap 5: service specifications external communication;
Gap 11: Customers' perceptions versus management perceptions;
Gap 12: The discrepancy between management perceptions and Service quality strategy;
Gap 13: Customers' perceptions versus employee perceptions; and
Gap 14: The discrepancy between employee's perceptions and management perceptions of customer" (Shahin and Samea, 2010, p. 6).

Service quality gaps exist due to a number of factors. As already mentioned, the above service quality dimensions could be separately tested as potential causes of service quality gaps, to what extent and how they affect supply chains and how their causes can be remedied. Some service quality gaps are discussed by Seth et al. (2006).

The first gap named "Interface gap 1.2 F: (forward): logistics service provider (TPL1) – logistics user (F): covers the processes of third party logistics TPL1 (focal firm) as well as the transactions between focal firm and TPL1. It exists due to a lack of coordination between various functions of the TPL1, lack of organizational shared vision, poor

management procedures and policies, improper communication between functions, poor planning, lack of facilities etc. at the TPL1" (Seth et al. 2006, p. 558).

The second gap named "Interface gap 1.2R: (reverse): logistics user (F) – logistics service provider (TPL1) (focal firm – TPL1) covers the transaction between the focal firm and TPL1 and also reverse transactions between various departments within the focal firm.
Some of the reasons for this gap may be attributed to a rigid hierarchical system, poor communication mechanism, poor work culture, inadequate wage structure, etc. at the focal firm and thus affect the relation/deal/contract with TPL. In either of the interface gap 1.1F to 1.6R, this results in the loss/distrust/dissatisfaction of the customer, thereby incurring a loss to the efficiency of the supply chain. Thus, they need to be monitored on a real time basis so that a suitable and timely action can be taken" (Seth et al. 2006, p. 559).

In terms of a customer/supplier relationship, an important gap may be caused by a customer/supplier balance of power. Take for instance, powerful customers who impose their requirements upon the supplier and in such a way disrupt usual production and delivery objectives giving priorities to more powerful customers over those less powerful, whose most likely choice is to look for alternative suppliers which causes further cost and disruptions. On the other hand, in case where a supplier is stronger, if a weaker customer complains, due to unsatisfactory quality, there is a gap arising from a generalised legal definition which for instance states that customers have rights to products of quality that is merchantable. According to Groocock (2000), this does not produce much of an impact as suing suppliers is quite expensive, time-consuming and stressful, thus achieving very little or nothing for consumers.

To manage this situation more fairly, the best way forward in balancing the power suppliers have over customers in the statement by Groocock (2000, p. 373) states the following: "For a customer to be categorised as powerful, the following conditions must apply: the customer must have an excess of suppliers having the capability to meet its

requirements. If this is not the case and it applies the sanction of rejecting bad product it will find it lacks supplies. Also, it will not be able to transfer its business from an unsatisfactory supplier to a better one. The customer must buy from each supplier enough of the latter's turnover for the threat of its applying its sanctions to be taken seriously by the supplier. The customer must have the technical and other capabilities to carry out its part of the quality system it imposes on its suppliers".

Generally speaking, the expectation in the world increasingly seems to be that cheap is preferred. The outcome by and large is when competition intensifies on price as cost pressures intervene, quality is likely to be victimised. As a result of such pressures, quality is likely to suffer at the hands of lowered prices which also inevitably impact on the overall service expectations and final product service deliveries thus creating another quality gap due to cost pressures.

Factors that can cause gaps in service quality are summarised below:

- Perceived and actual differences in reliability, responsiveness, tangibles, empathy, assurance and service efficiency and all of the other quality dimensions as mentioned above;
- Supply chain design associated gaps, information or feedback associated gaps, implementation associated gaps, communication associated gaps (Brogowicz et al. 1990);
- The difference between consumer's expectations and management's perceptions of service quality;
- The difference between management's perceptions of consumer's expectations and service quality specification, i.e. improper service-quality standards;
- The difference between service quality specifications and service actually delivered, i.e. the service performance gap;
- The difference between service delivery and the communications to consumers about service delivery, i.e. whether promises match delivery;
- The difference between consumer's expectation and perceived service; (Seth and Deshmukh, 2005, p.916).

- Management perception versus service quality strategy and policy;
- Service quality strategy and policy versus service specifications;
- Service specifications versus ideal standards;
- Service specifications external communication;
- Customers' perceptions versus management perceptions;
- The discrepancy between management perceptions and service quality strategy;
- Customers' perceptions versus employee perceptions;
- The discrepancy between employee's perceptions and management perceptions of customer (Shahin and Samea, 2010, p. 6).
- Lack of coordination between various functions of the third party logistics provider, lack of organizational shared vision, poor management procedures and policies, improper communication between functions, poor planning and lack of facilities;
- Rigid hierarchical system, poor communication mechanism, poor work culture, inadequate wage structure;
- Customer/supplier balance of power;
- Generalised legal definition regarding customers' rights to products of merchantable quality and
- Lowered prices due to cost pressures amongst other associated factors.

1.6.3 Factors causing cost gaps:

Any form of supply chain instability described earlier can in effect have wide-spread cost consequences. Some of these "include record inventory write-offs, excess capacity, price cuts, layoffs, and bankruptcies in high-tech industries after 2000, and waves of zero interest financing, employee discounts for all, and cash-back incentives accompanying surplus inventory in the automobile market" (Sterman, 2005, p.1).

Supply chains generate multiple costs. The most fundamental costs are business financing, logistics or transportation costs, costs to attract and retain customers, skilled and non-skilled staff (whether seasonal, permanent, contract, part-time or full-time staff),

set-up infrastructure and asset maintenance costs, product/process workflow and information flow costs, contractual and trading relationship costs, risk management and various other operational, institutional, political, economic, social, legal and environmental, pathological costs and product/service quality cost amongst others.

There has been a lack of research into total supply chain costs and their causes as various authors however, focused on some aspects and overlooked other segments that are at least equally or even more important in the running of supply chains, thus creating operational and research gaps. A recent study by Pettersson and Segerstedt (2012) has attempted to bridge this gap.

Pettersson and Segerstedt (2012, p. 3) in their study of some of the biggest thirty national and international companies in Sweden involved in ten different industrial sectors, defined "total supply chain cost as the sum of the Manufacturing cost, Administration cost, Warehouse cost, Distribution cost, Capital cost and Installation cost". They compared two different measurement methods, one based on actual cost and the other based on calculated standard cost and found a significant difference between the two measurement methods. That is, "if the standard costs used are too rough, the right information about the supply chain costs will not be observed. Therefore, the company may use its resources ineffectively and it will create disadvantages, and it will not be possible to see whether the product (or customer) is profitable or not.

The company may have inadvertently assigned too many people and resources to the supply chain. The cost is absorbed somewhere in the organisation. If the product should carry its own cost, then the number of people and amount of equipment needs to be cut back" (Pettersson and Segerstedt, 2012, p. 6). Not understanding actual costs right from the start contributes to the wrong composure of the supply chain and most dangerously leads to wrong decision making due to insufficient information. According to their findings, many companies do not measure total supply chain cost and only measure some parts of it, which inevitably contributes to a gap in real/actual costs incurred, which "may present a false impression about how cost-effectively the supply chain is being managed;

decisions based on such calculations may therefore end up not supporting the most cost-efficient methods for the company" and the supply chain as a whole (Pettersson and Segerstedt, 2012, p.6).

Pettersson and Segerstedt (2012, p.6) also concluded that "general thorough cost and supply chain analyses are underdeveloped in many companies, and a cost analysis shows that a product or even total product family is unprofitable and consumes much more resources than previously believed" which led to rejections as companies felt threatened, uncomfortable and tried to deny this finding.

Therefore, companies benefit from supply chain cost measurement which is based on actual cost. Without total supply chain cost measurement, costs may be manipulated, which leaves plenty of room for discrepancies (gaps). Pettersson and Segerstedt (2012) recommend that "future costing systems and management accounting take into account that more of the processing in the supply chain may be performed by subcontractors and suppliers and not, as before, by the companies themselves" (p.6).

Other authors such as, Hwang (2002) focused on more traditional aspects of supply chain such as logistics. According to Hwang (2002, p. 285) logistics cost is defined "as the sum of transportation cost of demand per period and the deterioration cost incurred during the in-transit time for the period of delivery from a facility of upper-echelon to a destination of lower echelon". Inclusive elements in the mathematical formula of the logistics cost by Hwang (2002) are: location of retailers, possible location of supply centres, logistic cost incurred between the lower and upper echelon, required service level, demand at the lower echelon, demand change (at an increasing or decreasing rate), distance between the lower and upper echelon and travel time between the two echelons.

The key logistics arbiters in the distribution of goods and/or services are vehicles (modes of transportation used, such as trucks, cars, trains, ships, aeroplanes or computers in e-commerce). In a typical logistics scenario, vehicles follow route schedules aimed at minimising "the total logistics cost for the service of the set of customers without being

tardy or exceeding the capacity and available travel time of the vehicles" (Hwang, 2002, p.289).

However, distance of travel, travel time limit, number and type of available vehicles, travel time constraints, speed, vehicle capacity, location of distribution/supply centres, transport information, traffic congestion, non-functional or damaged goods, goods returned for rework, the amount of stock transported according to the warehouse pick up order and actual demand (difference between the target point of inventory and current stock plus previously placed but overlooked customer orders) may contribute to partial fulfilment of customer orders and thus factors causing cost gaps (in this case the most likely cost gap would be loss of sales, trust and reputation to suppliers caused by their unreliability and additional costs of sourcing and testing of alternative goods and/or services to customers).

Supply chain companies likewise face multiple supply costs derived from dealings with multiple suppliers or even retailers within the same supply chain network. These are often due to responses in changes in demand, penalty and ordering costs. These strategic multiple supply dealings may also act as a preventative measure to avoid switching costs that can be incurred as a result of customers trying alternative products or service whereby the one that the customer was looking for was not available at the time or the product was not in stock. It is a highly likely scenario in fast moving consumer goods where customers are offered almost immediately alternative brands through a wider range of choices than ever before in human history. Those retailers who are sensitive and highly aware of this scenario are eager to ensure sufficient inventories to meet expected service levels and minimise risk of lost sales through a number of alternative sources though temporarily incurring an increase in the running costs through increased inventory (Schmitt, 2011).

One way of managing supply and demand uncertainty is via either centralised or decentralised inventory management system in a single or multiple distribution centres/warehouses.

Schmitt (2011, p.1268) "quantify the impact that disruptions and stochastic demand have on both expected costs and cost variance, and compare the risk pooling effect and risk diversification effect; risk pooling reduces costs through centralizing inventory, whereas risk diversification allows for lower spikes in cost (lower variance) if inventory is decentralized".

According to Kim and Park (1985 in Schmitt, 2011, p.1268) partial lost sales "costs depend on time; the cost of each unit backordered depends on the backorder duration. On the other hand, Padmanabhan and Vrat (1990 in Schmitt, 2011, p.1268) believe that lost sales are due to "the current level backordered; in fact, the fraction backordered increases with the length of a shortage".

Costs can vary significantly amongst different industries, different tolerance risk levels, and different mitigation types employed. To effectively mitigate and thus minimise costs, according to Schmitt (2011, p.1281), "the best protection can be achieved through a balance of proactive and reactive measures. Proactive measures (inventory reserves) cover the front-end of a disruption (discrepancy) and provide immediate protection until reactive measure can be implemented. Reactive measures (back-up capabilities) protect the supply chain until the disruption's end and prevent long (or permanent) interruptions to customer service". To achieve the lowest obtainable cost and maximise customer service, supply chain partners need to have a very close relationship and strong commitment to each other (Stank el at., 2001).

Factors that can cause supply chain cost gaps are summarised below:

- Inventory write offs, excess capacity, price cuts, layoffs, bankruptcies, zero interest financing, employee discounts for all, cash back incentives;
- Business financing, logistics costs, costs to attract and retain customers, skilled and non-skilled staff, infrastructure and asset maintenance costs, product/process workflow and information flow costs, contractual and trading relationship costs, risk management and operational, institutional, political, economic, social, legal, environmental and pathological costs among others;

- Cost measurement based on calculated standard method as opposed to actual cost method represented by the sum of all manufacturing costs, administration costs, warehouse costs, distribution costs, capital costs and installation costs representing total supply chain cost;
- Distance of travel, travel time limit, number and type of available vehicles, travel time constraints, speed, vehicle capacity, location of distribution/supply centres, transport information, traffic congestion, non-functional or damaged goods, goods returned for rework, the current level backordered, backorder duration, the length of a shortage, the amount of stock transported according to the warehouse pick up order and actual demand (difference between the target point of inventory and current stock plus previously placed but overlooked customer orders);
- Changes in demand, penalty and ordering costs, increased inventory to prevent customer switching costs and
- Supply and demand uncertainty, expected cost and cost variance via risk pooling (centralised) and risk diversification (decentralised) inventory management system.

1.6.4 Factors causing speed of delivery gaps:

As already mentioned above, speed of delivery is influenced by the dynamics of supply chain structures, which consist of both behavioural as well as operational factors. Causes for operational discrepancies "refer to physical and institutional structure". Physical in the form of inventories placed "throughout the network of suppliers and customers and time delays in production, order fulfilment, transportation" and the like and institutional in the form of "horizontal and vertical integration and competition among and within firms, the availability of information to each organisation and department, and the incentives faced by each decision maker. Behavioural causes encompass the mental models of the decision makers, including their attitudes, attributions about other actors, and the heuristics and routines they use to interpret the information they have and make decisions such as production, capacity and pricing" (Sterman, 2005, p.2).

It is assumed in operations management literature that decision makers are sensible and make the best possible decisions provided the accessible information and associated incentives. This behaviour can produce the so called “bullwhip effect” given quantity discounts that stimulate volume purchases.

However, most mental models that decision makers in supply chains usually rely on “grossly simplify the environment, incorporate few feedback processes, ignore or underestimate time delays, and fail to account for key stock and flow structures. The same bounds on rationality slow learning, thus enabling supply chain instability to persist” (Sterman, 2005, p.2).

These are potential causes of supply chain gaps that affect not only speed of delivery, but quality, cost and expected levels of service as well, as they are all closely and intricately interlinked and inter-dependent components of the value chain.

Corresponding to the above behaviour modes, are the variations in the so called business cycle which are portrayed by three key characteristics: amplification or misalignment of demand and supply, its oscillation and phase lag or delay. These are quite constant supply chain factors and are prominent in some industries more than in others. Typical examples include petrol, oil and gas industries (Sterman, 2005). Additional to these factors are “poor production systems and inconsistencies with information and data handling procedures” (Taylor and Fearne, 2009, p.379).

Operational factors that can cause the bullwhip effect from which gaps in the speed of delivery as well as other gaps can be derived include “production and processing delays, procedures for demand forecasting, order batching to take advantage of scale economies or quantity discounts, rational responses to product shortages (phantom orders) and price fluctuations caused by promotions. Behavioural reasons for volatility were pioneered by Forrester (1958, 1961). These behavioural explanations highlight the bounded rationality of decision makers, particularly the failure to account for feedback effects, accumulation, and time delays” (Sterman, 2005, p.3-4).

What typically tends to happen is that managers act in line with the discrepancies between their aimed and actual or present inventory levels, not taking into account those orders that have already been requested by customers, however not yet delivered, thus causing instability. Some industry systems are prone to manifold phase lags or delays, fluctuation and volatilities.

According to Taylor and Fearne (2009, p. 389), "reliable and consistent data between chain partners on consumer sales, ordering patterns and inventory levels is a pre-requisite for more effective and integrated demand management". How information from consumers is communicated and distributed to upper levels in the supply chain is essential for its effectiveness.

To make it more effective, intra and inter-company information handling systems need to be streamlined through a fast and cost effective implementation of a "web-based demand management software" that defines appropriate data requirements, correctly documents necessary data and timely transmits information between partners in a supply chain thus creating the opportunity for involvement in the demand management process of smaller scale suppliers by substantially reducing the cost and the complexity of access to downstream information and management systems" which in effect reduces "administrative costs, errors and reconciliations in order processing" and consequently improves speed of delivery (p.389).

An important area of improvement in supply chain responsiveness and speed of delivery relates to "the use of a single forecast by the entire chain". It can either be "produced jointly by representatives from all companies in the chain, or at least agreed by them all and then used as the basis for capacity and resource planning across the chain". To achieve this outcome, a change in culture, business environment, and rival attitudes towards "more collaborative and integrated approaches to supplier relationship management, in tune with the customer relationship practices" are needed (Taylor and Fearne, 2009, p. 389).

Another very important element that may impact on the speed of delivery is variability in demand. According to Taylor and Fearne (2009, p. 389), demand variability for some products and services may be due to seasonality and weather, however for most others, it is increasingly more variable due to promotional activities or the so called "amplification effects or supply side policies". Irrespectively of these facts, "end-user demand is the least variable element of demand and activity within the supply chain". These effects are internally generated within the supply chain and are therefore controllable by management. Reduced variability in upstream demand will have significant benefits to companies in terms of reduced inventory management, more consistent resource planning (e.g. labour requirements), and improved production and delivery efficiency".

Furthermore, supply chains need to pay special interest to "daily order patterns within the weekly trading cycle and to the timing of order transmission between retailers and processors. This could significantly affect costs by avoiding either over production and resultant product waste, or under-production and increased costs due to overtime working or emergency deliveries" Taylor and Fearne (2009, p. 389).

Factors that can cause supply chain speed of delivery gaps are summarised below:

- Dynamics of supply chain structures (operational and behavioural factors);
- Lack of a single forecast system by the entire chain (Taylor and Fearne, 2009);
- Bullwhip effect stimulated by time delays in production, order fulfilment, transportation, processing delays, demand forecasting procedures, order batching to take advantage of scale economics or quantity discounts, rational responses to product shortages (phantom orders), demand variability and price fluctuations caused by promotions;
- Horizontal and vertical integration, competition among and within firms, the availability of information to each organisation and department and incentives faced by each decision maker (Sterman, 2005, p.2);
- Mental models of the decision makers, their attitudes, attributions about other actors, and the heuristics and routines they use to interpret information they have and make decisions such as production, capacity and pricing (Sterman, 2005, p.2);

- Oversimplification of the environment, failure to account for feedback effects and its processes, accumulation and underestimation of time delays, failure to account for key stock and flow structures (including the discrepancy between aimed and present inventory levels, not taking into account those orders previously requested by customers, however not yet delivered) and rationality slow learning (Sterman, 2005, p.2);
- Amplification or misalignment of demand and supply, its oscillation and phase lag or delay;
- Poor production systems and inconsistencies with information and data handling procedures (Taylor and Fearne, 2009, p.379).

1.7 Research Problem:

Suppliers offer goods and/or services to their target market customers which are perceived to be meeting or even exceeding customers' expectations. Soliman (2011a, b) considered the level of compatibility between suppliers' perceptions and customers' expectations and reported that suppliers' perceptions of how the service should be delivered could influence customers' expectations. However, it is rare that suppliers' perceptions of customers' expectations coincide with the customers' actual experiences. That is, differences, or *gaps*, may exist between *suppliers' provision of goods and/or services* due to *suppliers' perceptions of customers' expectations* and *the actual customers' experiences*.

Soliman (2010b) proposed that the critical gaps would occur in three of the most important attributes in a supply chain, i.e. in quality, cost and speed of delivery of goods and/or services. Although Soliman (2010a, b) pointed out to the link between gaps in quality, cost and speed of delivery, his findings however did not identify supply chain gaps as important factors for assessing the performance of supply chain companies and did not include the expected level of service as one of the most central elements in the identification of differences (gaps) between suppliers' provision of goods and/or services

due to suppliers' perceptions of customers' expectations and the actual customers' experiences.

These gaps could impact on the performance of the suppliers.

Thus, the aims of this research are:

1. To identify differences (gaps) between suppliers' provision of goods and/or services due to their perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services in the targeted supply chain population sample;
2. To discover the factors that are causing them and;
3. To evaluate whether the identification of supply chain gaps could impact on the performance of supply chain organizations.

Accordingly, the research problem may be formulated by the following questions:

(1) Are there any differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service to be delivered to the customer?

(2) Are there any differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the quality of goods or services delivered to the customer?

(3) Are there any differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the cost of goods or services to the customer?

(4) Are there any differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the speed of delivering the goods or services to the customer?

(5) What factors are likely to cause the occurrence of differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of

customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organizations?

(6) What is the likely impact of these gaps on suppliers' performance?

To achieve the above research aims and solve the formulated research problem, a mix of quantitative and qualitative data needed to be collected after a suitable questionnaire had been designed, followed by a mixed methodological analysis, synthesis and writing.

From the above discussion it is clear that the focal point in this approach would be the supply chain firm's ability to recognise and satisfactorily manage defects or gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services in the supply chain.

It is one of the aims of this research to examine the relationship between well managed supply chain gaps in the expected level of service, quality, cost and speed of delivery and their likely causes in the targeted supply chain companies and therefore this thesis has examined these key research areas in order to then utilise this knowledge in the assessment of the alleged differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in targeted supply chain organisations. However, to understand the relationship between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences, one needs to critically and thoroughly examine decision making processes that may have led to the outcomes in question in the first place.

Therefore, the main goal of this research thesis is to investigate the correlation between the defects (gaps) in the supply chain caused by the differences between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences. Reasons for the claimed success or failure might be identified and examined as a result of this study with the aim of finding a

set of factors that could increase the chance of improving the performance of supply chain organisations. It is also hoped that the reasons for supply chain organisations' inability to perform better even though they use supply chain management could be established from the results of this study.

It is envisaged that this research will lead to understanding the rules and/or conditions for maximising the benefits from employing supply chain management in supply chain organisations. In addition, the thesis will also investigate the factors that may cause supply chain gaps. The effectiveness of using supply chain gap analysis in supply chain organisations will also be investigated in this project.

The aim of this research was to investigate whether the differences in the key product/service "*value"* attributes exist in practice between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences and what factors or sets of issues are likely to cause them and why. In doing so, it is necessary to identify mismatches between the attributes of a supply chain (in the expected level of service, quality, cost and speed of delivery of goods or services) from the perspectives of the customer and the supplier.

As far as literature coverage has been concerned, many articles were published in the last decade on the effect of information technology and other continuous improvement programs on the performance of organisations, however, very little has been written on the effect of supply chain gaps on supply chain organisations.

Clearly, supply chain organisations intending to implement supply chain management programs would be interested in obtaining answers to the following questions which complement the main aims of the research above:

1. Can the use of supply chain mapping lead to the identification of supply chain gaps in the expected level of service, quality, cost and speed of delivery in supply chain organisations?

2. Can the identification of supply chain gaps (in the expected level of service, quality, cost and speed of delivery) lead to the discovery of factors causing differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in supply chain organisations?
3. Can the identification of supply chain gaps (in the expected level of service, quality, cost and speed of delivery) impact on the performance of supply chain organisations?

The above research problem was investigated through an appropriate model that suggested testing it through a selected sample pool of respondents.
Results from this research are likely to offer supply chain companies highly valuable insights, which once embedded properly, may significantly enhance supply chain outcomes.

1.8 Expected main contributions to knowledge and contribution to published work:

The success of supply chain organisations is increasingly dependent on the product and service value attributes in the expected level of service, quality, cost and speed of delivery of goods and/or services. The right combination of all of these value ingredients can only emanate from the correct knowledge and accurate and timely business intelligence about the differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences and accurately executed customer strategy.

Exploration and investigation of customers' expectations and suppliers' perceptions related knowledge is an ever changing and innovative research field, in which no single organisation is an absolute expert. Therefore, organisational networks need to continually design newer and up to date models that as correctly as possible measure and share relevant changes in customer expectations and supplier perceptions on the basis of which future demand can be forecasted more accurately and timely. This is an area that requires deep

understanding and continuous research, and as such can never be fully explored to its full potential and in that context, this thesis project is certainly a fresh face on the block.

This research topic is thus beneficial and significant to every supply chain organisation in this universe as organisations continue to look for competitive edges in whatever way they can. It is certainly relevant and equally significant to all of the other forms of organisations too. With the expansion of global competition and outsourcing and the rise of global supply chains through the most recent advances in technology and growing forms of human and other resource exchanges available, sources of potential advantages are narrowing down.
New know-hows and inventions of today may be short lived as easier and faster access and more and more market participants get exposed to the latest products' and processes' developments amid loose patent laws and loosened international regulations.

To stay ahead of the game, supply chains need to continually find ways to improve communications effectiveness and efficiencies with their current and new stakeholders.
The critical factor is how supply chains deal with fulfilling their customers' demands and expectations not through the lenses of suppliers' own perceptions, but inevitably more importantly and increasingly through their customers' actual experiences.

This research was thus aiming to delve into the communications and decision making processes that take place on both the suppliers' and customers' sides and their perceived lack of interconnectedness that are likely to produce proposed gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations. Once defects (gaps) in either, the expected level of service, quality, cost or speed of delivery are identified and classified according to the proposed research model, this is where this research becomes so crucial and significant to every supply chain and many other forms of organisations in this universe.

It will then be possible to find out more about the causes of such defects (gaps) and consequently map knowledge that is critical for its reduction or elimination. A model contained in this research, through its testing has provided an indication to supply chain

managers in how to go about mapping critical knowledge that they will endeavour to transform after differences (gaps) and their causes between them and their customers have been identified with the aim of producing better outcomes for both customers and suppliers.

By weighing the importance and type of a particular gap, supply chains will be able to prioritise which activities and/or business processes require more attention sooner.
This research has also made a contribution through its data results. These may indicate to supply chain companies what should be done to neutralise, avoid, reduce or eliminate gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

1. As far as the candidate knows the proposed thesis research project will be the first study of its kind.
2. The proposed model will aim to identify differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations. This is a new work in this field.
3. The proposed model will examine the relationship between supply chain gaps and gaps in the expected level of service, quality, cost and speed of delivery. This is a new work in this field.
4. It is hoped that the findings of this thesis will be helpful for further research in the future.
5. No published work was found in the field of supply chain that links suppliers' perceptions of customers' expectations and the actual customers' experiences to supply chain gaps.
6. No published work was found in the field of supply chain gaps that relates the existence of supply chain gaps to gaps in the expected level of service, quality, cost and speed of delivery.
7. The method proposed for the determination of supply chain gaps in supply chain organisations is an original contribution to knowledge.

8. The method proposed for proving that supply chain gaps in global supply chain organisations are related to gaps in the expected level of service, quality, cost and speed of delivery is an original contribution to knowledge.
9. The results from this research will assist managers to better manage supply chain companies.

1.9 Chapter Summary:

The introductory section of this thesis has introduced the phenomenon that needs imminent attention, namely, unwanted supply chain performance from the angles of the expected level of service, quality, cost and speed of delivery, being the most predominant attributes of goods and/or services and their intertwined relationship with consumers in supply chains. The relevant concepts for the understanding of the area of research have been defined and analysed and their application in supply chain context outlined.

The following section will deal with more intricate details of what has already been achieved by researchers and practitioners through the review of published literature in the field of supply chain management with a special onus on discrepancies or gaps in the expected level of service, quality, cost and speed of delivery of products and/or services in global supply chains followed by the research methodology chapter, research limitations, and concluding remarks for future work in the field of supply chain gaps in customers' expectations and suppliers' perceptions.

Chapter 2: Literature Review

2.1 Introduction:

The chapter on literature review firstly introduces the research phenomenon and its main components followed by the exploration of supply chain and supply chain management gaps in the supply chain field. The initial research focuses on deficiencies coming from the apparent weaknesses in organisational capacities and capabilities of supply chain member firms and their resulting outcomes into both knowledge and strategic discrepancies as the missing glue that is holding and steering the organisation's course. These most apparent gaps may lead to further and deeper gaps in the expected level of service, quality, cost and speed of delivery, the proposed theme of this thesis. This is followed by the reviews of various articles dealing with diverse kinds of supply chain gaps in search of any articles that might be dealing with the proposed theme of this thesis project. Nevertheless, no author has been found to have dealt with the differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in relation to the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in global supply chain organisations. This section occupied most of the literature review, moved on to the modelling of supply chain gaps and culminated into the development of a brand new concept that deals with these issues in a global supply chain context.

As indicated in the previous section, an area of crucial importance and the phenomenon in case, namely, *unwanted supply chain performance*, in the context of the expected levels of service, quality, cost and speed of delivery have been identified and the parameters for its research set in order to pursue an important course of action.
Furthermore, supply chain networks remain an area of interest to many interested parties in the global economy as they have been under researched and are a relatively new field of study. The literature has been inundated with various actors and industry segments

that deal with broad-spectrum issues affecting supply chain operations. While these issues of universal importance have received considerable attention, supply chain management still faces numerous obstacles and challenges. Therefore, the purpose of the literature review in this thesis is to scrutinize an area of research concerned with the field of supply chain gaps, in an attempt to expose any published material that might be dealing with the alleged differences (gaps) between suppliers' provision of goods and/or services due to perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and /or services to customers.

2.2 Supply Chain Gaps:

Supply chain gap field is a new research area in both industry and academia. There have been attempts made on the part of some researchers to highlight weaknesses in organisational capacities and capabilities as members of supply chains and their linkages to both knowledge and strategic deficiencies, however, no work has been done which targeted supply chain gaps and specifically differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers, the primary concern of this thesis.

In most supply chain research, it is assumed that knowledge is absorbed and transferred with little difficulties. What is however frequently unobserved is that wrong decisions are often made caused by gaps in knowledge and the outcome is not always as expected.

In other words, defective decisions resulting from defective supply chain knowledge gaps have received little attention in the literature i.e. there is no link found in the literature between the existence of supply chain gaps and particularly gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain companies.

The following paragraphs summarise some of the closest attempts by various authors' articles to address in some aspects the issues that this thesis is about to delve into.

As pointed out in the introduction, no research has been carried out yet, which focused on supply chain gaps in the expected level of service, quality, cost and speed of delivery, and yet these attributes have a direct impact on every supply chain in the world. Consequently, by answering the key research problem questions and fulfilling its objectives, this thesis will contribute to overcoming many existing gaps (defects) that exist in the supply chain field, supply chain literature as well as supply chain industry practice.

Amongst such matters in the literature, there is still a lack of research about the effect of knowledge gaps on the functions of supply chain management activities such as marketing and information technology, storage systems, distribution and purchasing (Polychronakis and Syntetos, 2007; Bellini and Storto, 2006) which directly affect the provision of customer services and supplier performance. This lack of research has to a greater extent contributed to a lack of standardised SCM research methods that could be accepted widely.

As mentioned above, there is to this date no consensus on the definition of supply chain management. Consequently, there appear many knowledge gaps in the supply chain management field (Polychronakis et al., 2005).

This thesis will deal with such knowledge and strategy gap issues in the context of the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and how these impact on suppliers' perceptions of customers' expectations and the actual customers' experiences in global supply chain organisational context.

Furthermore, very few published works tended to elaborate on supply chain management and associated defects (gaps) in any depth (Hilmola et al., 2005), and in particular knowledge and strategic gaps in supply chain companies.

Various authors' reviews focused on very narrow sections of supply chain management components and were basing their research on opposing supply chain management definitions, whether they are strategic, literature review, essential functions or other management review issues (Wadhwa et al., 2006). Today's business environment, however, requires more integration and dynamism and in such light, supply chains need to continually adjust their operations especially when it comes to understanding and eventually overcoming the discrepancies between suppliers' perceptions of customers' expectations and the actual customers' experiences.

Effective knowledge management plays a major role in this endeavour as the bridge between all direct and indirect stakeholders in the supply chain network from which continuous new relationships, inventions, knowledge competences, advantages and benefits are likely to emerge. The main focus is thus, placed on humans and the exchange of knowledge in any given supply / demand chain context through the appropriate and effective knowledge management programs and processes which should be designed to improve the understanding of the differences between supplier's perceptions of customers' expectations and actual customers' experiences.

Amongst others, Diakoulakis et al (2004) highlighted the need for integration between knowledge management and organizational strategies.

However their work does not acknowledge that the difficulties in developing business strategies are linked to the shortcomings in the organisation's knowledge gaps, which may translate into gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services. In addition, the holistic model presented in their paper cannot be extended to cover the more complicated settings in global supply chain organisations. This thesis will examine the alleged discrepancies between suppliers' perceptions of customers' expectations and the actual customers' experiences in the context of the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in global supply chain organisations and present a method for avoiding such gaps upon the identification of the factors that may cause them.

Hellstrom and Husted (2004) have presented the findings of a focus group study in a university setting showing that knowledge mapping could be a useful tool in knowledge management. However, their findings are limited to educational environment and there is no evidence that the findings could be generalised to global supply chain organisations. Furthermore, they do not address global supply chain gaps and hence the findings are not related to the development of business strategies or resulting gaps that may exist. This thesis intends to consider the process of mapping customer expectations and supplier perceptions in order to identify probable supply chain defects (gaps) in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and hence contribute to the discovery of knowledge and strategic defects (gaps) in global supply chain organisations.

Smith (2004) emphasised the relationship between internal competitive strategies and knowledge management strategy. Smith also reported the findings of a study of three organisations based on the grounded theory approach. Smith's findings are limited to internal competitive strategies and lack the generalisation to global supply chain organisations. Furthermore, Smith could not identify how the weaknesses in the relationship could be attributed to the existence of knowledge gaps that could lead to gaps in the organisation's internal competitive strategies. Soliman at al (2001) have shown that the grounded theory could be employed to identify organisational critical success factors. The same theory could similarly be employed to examine other organisational attributes such as gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers. This thesis will present the results of a study showing that elimination and/or avoiding of gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations will in turn lead to ultimate improvements in the performance of supply chain organisations.

Maier and Remus (2003) have reported that most organisations improve their knowledge management initiatives by linkages to business strategies. However in doing so, organisations may be overlooking the fact that defects (gaps) such as strategic defects (gaps) could occur. Maier and Remus on the other hand, failed to recognise that

organisational performance might be related to the actuality of supply chain defects (gaps) in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers. This thesis will propose that improving the performance of supply chain organisations is dependent upon managing the existence of differences in suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

Neef (2005) reported that many organisations use a combination of knowledge and risk management to boost performance. Neef (2005) also pointed to the need for taking into account risks resulting from the emergence of globalisation. However, Neef overlooked that emerging gaps may lead to further risks and in turn adversely affect the performance of global supply chain organisations as a result of the existence of discrepancies in changing customers' expectations and suppliers' perceptions of customers' expectations. This thesis will present a model for the identification of supply chain gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers. This is a necessary step for organisations wanting to eliminate gaps and in turn improve performance.

Tokman et al (2007) focused on 'gaps in the supply chain literature relating to SME satisfaction with their cooperative relationship portfolio'. They attempted to explain the importance of cooperation between buyers and their suppliers "by examining the impact of a partner's choice of an exploration or exploitation relationship strategy" (p. 39). Their study however concentrated on the Greek economy and included only SME firms that had between 10-250 employees and did not look at any other significant supply chain gaps. This thesis has attempted to discover whether supply chain gaps that may occur between suppliers' perceptions of customers' expectations and the actual customers' experiences existed in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and which may ultimately impact on strategy and thus lead to strategic gaps that could affect the performance of supply chain organisations.

Luvisen and Bendixen (2010, p. 32) analysed effects on organisations coming from outsourcing decisions and actions and the three paradoxes arising as a result. Their article utilised these paradoxes to design a behavioural theory that is derived from firm's decisions to outsource. Luvisen's and Bendixen's article states how the "first paradox discusses the perceived reduction in operational scale causing the firm to exert incremental managerial effort; the second explains how efforts to simplify the firm's operation cause the firm to need additional learning, and the third discusses how the outsourcing of seemingly non-core competencies can create strategic dependence on new competencies". Their research however is very general and did not focus on supply chain organisations or networks and in particular not on gaps or differences between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers that could lead to poor performance outcomes, which this thesis will attempt to explore.

Lao et al (2010) utilised the resource based view to analyse supply chain flexibility in manufacturing firms. They researched 'supplier network and supplier flexibility' which according to them have a positive correlation with supply performance and ultimately 'sustainable competitive advantage' (p. 18).

While they attempted to research a relationship and a proposed gap between 'supply management, supply flexibility and performance' (p. 9), their study was specific to manufacturing firms and did not deal with gaps (differences) between suppliers' perceptions and customers' expectations in the expected level of service, quality, cost and speed of delivery in supply chain organisations, and their aftermath strategic deficiencies. It is the objective of this thesis, which is aiming to prove that there are differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers which may impact on supply chain performance.

Chuah et al (2010, p. 724) attempted to investigate the link between 'organisational context, supply management practices and supplier performance', using an 'in-house'

study. Their study however was very limited and failed to address the importance of supply chain differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services which may have a direct impact on supply chain performance. It is the aim of this thesis to explore.

Bendavid and Cassivi (2010, p. 1) attempted to bridge 'the gap between RFID/EPC concepts, technological requirements and supply chain e-business processes" by highlighting and explaining some of the key difficulties currently experienced by practitioners and theorists in academia and supply chain networks in the serving of its customers. They however did not explore in any detail the issues of supply chain gaps between suppliers' perceptions of customers' expectations and actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers, being responsible for supply chain organisations' and networks' performance, which is the objective of this thesis.

McCarthy (2003) looked into the functioning of marketing as a possible bridge between "demand and supply chain management". Her research dealt with integration of 'structures and processes involved in supply chain relationships, the antecedents to integration and resulting performance outcomes" (p. 7).
Her study however failed to address the fact that supply chain gaps could adversely affect supply chain strategic direction and thus inevitably its performance. This thesis will deal with the adversities of supply chain differences (gaps) between suppliers' perceptions of customers' expectations and actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services in selected global supply chain organisations and their interconnectedness with performance outcomes.

Zeng and Pathak (2003) attempted to research "information integration" in business to business electronic exchange "e-hubs". While examining two case studies in transportation and procurement segments of a supply chain respectively, they found that gaps and weaknesses "from the perspectives of facilitating supply chain activities in e-hubs do exist" (p. 657) and proposed a model of integration of the kind of enterprise

resource management and customer relationship management software in an attempt to fill the gaps and to enhance possible integrative solutions. Their study however, was quite limited and offered no insight into differences (gaps) between suppliers' perceptions of customers' expectations and actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services in global supply chain organisations that may be brought about by wrong decisions and which could thus cause strategic mishaps, ultimately leading to poor and costly performance. This thesis aims to explore the above mentioned supply chain gaps in selected supply chain organisations.

Chow et al (2007) surveyed "knowledge management practices" in association with "applications and technologies adopted when developing the knowledge management system in build to order supply chains (p. 882)". They recognised the shortcomings of the research as it "solely focused on a single knowledge problem for enabling individual supply chain members to attain operational excellence" (p.882), thus failing to incorporate various other sources of supply chain knowledge and bypassing inter-chain coordination of knowledge and its ultimate integration.

Clearly Integration is assumed to be a reason for improving company performance. There are a number of evidences that companies' performance has declined as a result of integration. Obviously, this may not always be the case. According to Soliman et al (2001), current advances in technology have led more manufacturers to integrate their business functions with supply chain systems. Further, they reported that integration with supply chain systems is complex, involving many factors and requires careful exploration of the integration problems and how to overcome or reduce the severity of these problems.

While companies are rushing to embrace supply chain management, Chow et al (2007) recognised that "general SCM skills are incapable of managing the unique characteristics of build to order supply chain" and thus new sets of skills and technological capabilities are required. They however failed to address the importance of supply chain gaps within

and across supply chain functions which may transfer into strategic deficiencies (gaps) and consequently poorer performance of the chain as a whole and its member firms inclusively. This thesis will explore this area of critical research in order to identify and show the supply chain link between differences (gaps) in suppliers' provision of goods and/or services due to suppliers' perception of customers' expectations and actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services and how these may affect organisational performance within individual firms and across the supply chain. This thesis will also explore a proposition of what should be done to reduce, neutralise or eliminate these gaps.

Craighead et al (2009, p. 405) explored the hypothetical relationship between "knowledge development capacity and intellectual capital, innovation-cost strategy and action to firm-level performance" (p. 405) in firms within a supply chain and found that "each strategy type requires different constellations of knowledge development capacity and intellectual capital to enhance action and create superior firm performance". They also concluded that knowledge development capacity and intellectual capital are organisational efforts that could complement supply chain strategies and enhance action efforts towards superior firm performance.

Furthermore, they pointed out that supply chain strategy, knowledge, and action are key drivers for firm performance. They however, failed to deal with the differences (gaps) in suppliers' perceptions of customers' expectations and actual customers' experiences in the level expected of service, quality, cost and speed of delivery of goods and/or services and their likely impact on both firm's as well as entire supply chain's performance.

It was the aim of this thesis to address and identify these gaps and explore the factors causing them in order to develop supply chain knowledge and strategic understandings of the differences (gaps) in supplier perceptions of customers' expectations and actual customers' experiences which may indicate what supply chains should do with them to neutralise or eliminate them.

While the above issues of knowledge and strategy gaps represent the wider core focus inside which other deeper issues of the expected level of service, quality, cost and speed of delivery lie, the focal point that suppliers are ultimately concerned with is also one of the greatest challenges for suppliers to this date. It lies in the sensitive details which trigger consumer perceptions at the point of making a purchase decision. In that context, Zeithaml (1988, p.2) tried to provide answers to questions such as: "What do consumers mean by quality and value? How are perceptions of quality and value formed? Are they similar across consumers and products? How do consumers relate quality, price, and value in their deliberations about products and services?"

Zeithaml (1988) likewise attempted to define the notion of quality, price and value from the customer based viewpoint in a concept model through which he examined accessible data, proposed and evaluated fourteen propositions and recommended further research needs. He concluded that the assessment of goods and/or services, besides other aspects, has to include quality, cost and time/speed of delivery. It is important to mention that from the consumer perspective, all of the three attributes in question possess perceived and actual value. Thus, we can have perceived quality (Holbrook and Corfman, 1985; Parasuraman et al, 1986; Dodds and Monroe, 1984; Garvin, 1983) which differs from actual quality and the same can likewise apply to cost and time/speed of delivery. This finding indicates that differences (gaps) in the expected level of service, quality, cost and speed of delivery of goods and/or services are quite likely.

A few years later, Zeithaml et al (1993) attempted to determine the nature and determinants of consumers' expectations. Their research is quite significant even today. They discovered that the nature and basis of expectations among different focus groups that were being researched at the time were in fact very similar, irrespectively of their different backgrounds, namely; business customer focus group, experienced customers, inexperienced customers and consumers of pure and product associated services essentially sharing the same nature and determinants.

This model considered both perceived and expected service quality levels with quality being recognised as the core of every service provision. While perceived service dimension stands on its own, expected service consists of desired and adequate service with the zone of tolerance dividing them. The difference in the level of expectation in fact sets them apart. Desired service quality is what consumers hope to be the highest possible or realistic level of attainable service. Adequate service, on the other hand is a lower acceptable level that consumers would be content with, which can be compared to the least tolerable expectation level of (Miller, 1977) that customers are prepared to accept. Perceived quality of service is derived from the contrasting evaluation by customers as is apparently wished for by them regarding their receiving of service and what is perceived by them to actually occur. It is thus envisaged as the difference in the path level dividing consumer desires and perceptions.

While Zeithaml et al (1993) were among the first researchers to explore the issues of service quality, and quality being at the core of every service and product provision, their 1993 model is referred to in this thesis as an initial research concept in the assessment of service quality from both customers' and suppliers' perspectives. Though significant in the area of customer perceptions research at the time in relation to price, value and quality, Zeithaml et al (1993) nonetheless failed to deal with the differences (gaps) in suppliers' perceptions of customers' expectations and the actual customers' experiences in regards to the key value attributes, that is, the expected level of service, quality, cost and speed of delivery in a joint and integrated model, that is highly applicable in today's supply chain context, and which is dealt with, developed and tested in this thesis project.

In a similar context, however, from a slightly different perspective, Andronikidis (2009) attempted to discover customer accepted dimensions in the measurement of service quality in the automotive repair industry in Greece and the likely variants of the quality of service on the perceptions of customers, determined on the basis of customer buying manners and analysed through different loyalty samples. Holistic customer consideration, empathy and infrastructure were identified as service quality dimensions. Holistic customer consideration related to a customer response in a trustworthy and welcoming

setting. Infrastructure was identified as the visible, tangible component of service, while empathy was viewed as the reassurance, belief in the service and thorough individually tailored courses of action and communication practice factors.

By using these three service dimensions, Andronikidis (2009) attempted to measure customer service experience perceptions and concluded that managers in the automotive repair sector in Greece face main challenges when deciding how to assign resources on the basis of these dimensions and customer preferences and evaluations so that the greatest possible outcomes are obtained. In regards to the relationship between the perception on service quality and consumer loyalty, he likewise concluded that other facets of service may become more important to customers than service quality at different times due to different priorities. New customers appeared to have a relatively higher excitement thinking they their level of service quality is higher in comparison with the more and longer established customers. This might indicate possible gaps (differences) in customer loyalty. Management should be concerned with this pattern and should do its best to find out what other factors apart from service quality impact on customer loyalty. As Andronikidis (2009, p.14) concluded with: “although service quality is a critical factor for customer satisfaction, it is not a panacea”.

Therefore, further research is needed to produce suggestive evidence. Is it determined by maturity stages or other factors such as cost, speed or an altogether higher level of service? This is where this research thesis will attempt to provide the relevant answers.
Though relevant, Andronikidis (2009) dealt with only one segment of what is proposed in this project (perception of customer service quality), his research specifically examined nine Greek automotive repair companies and provided insight into the development of customer perceptions, which is significant. His article however did not deal with supply chain gaps in global supply chain companies, and especially not with those that might provide answers that have not yet been provided. Specifically, those answers that would offer a more rounded picture into customer behaviour and decision making processes through the combined attributes of the expected level of service, quality, cost and speed of delivery and both perceived and actual context.

The following supplementary section briefly introduces a very important aspect of supply chains; their agility, adaptability and alignment which can be a very useful tool that may be used to assist supply chains in reacting to unexpected customer changes in demand or preferences and in filling the incurred gaps. At the same time, this tool can be used to enhance better outcomes in cost, quality, speed of delivery and level of services management.

2.3 Supply chains' Adaptability, Agility, and Alignment:

Supply chains amongst themselves as much as the key organisational dimensions discussed and analysed above, differ in how adaptable, agile and aligned they are in their capacities to attempt reaching competing business priorities. Furthermore, Ketchen and Hult (2006, p. 574) stated that "Adaptability, Agility and Alignment of Supply Chains could impact on the effectiveness of strategic supply chain management". Lee (2004) pointed out to the link between the three Supply chain attributes, namely Adaptability, Agility and Alignment which serve as the enablers of a supply chain to quickly form its position in case of an unpredicted market movement of either demand or supply. According to Hult et al. (2002 and 2003) filling those gaps in accordance with those three attributes has become a necessary condition for creating shared values and beliefs which have as their main aim customer focused service philosophy.

According to Lee (2004) in Ketchen and Hult (2006 p. 574) "adaptable supply chains rely on information or knowledge systems to identify shifts in the market, and then take appropriate actions such as moving facilities, changing suppliers, and outsourcing. Adaptability sometimes requires developing more than one supply chain for the same product in order to ensure distribution". Therefore, supply chains may be potential generators of a gap between what a customer desires and what the company could or is capable of offering. Hult et al. (2002) referred to this *Adaptability* as the will on organisations' part to modify their chain operations if and when needed in an attempt to avoid those gaps. This organisational willingness could lead to improving organisational performance outcomes by excelling in multiple ''competitive priorities'' such as more

accurate interpretation of the expected level of service, speed of delivery, quality of goods or services and cost of providing or making those goods or services, and flexibility in the offerings. Neither Lee (2004) nor Ketchen and Hult (2006) have ever dealt with the identification of the differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences through the lenses of the expected level of service, quality, cost and speed of delivery in global supply chain organisations in a single study concept. It is however going to be addressed in this thesis project.

Agility of supply chains, on the other hand, has emerged as a concept in response to continuously unpredictable market demand fluctuations. Due to this emerging trend, organisations have had to figure out how to become more flexible in meeting the changing consumer demand. Christopher and Towill, (2000) describe *agility* as a set of network-wide competences and capabilities such as network structures, information and communications systems, logistics and transportation processes and particular ways of thinking. Its main centre of attention is to sustain good output during uncertain demands (Hello, 2004) and to accomplish the establishment of "a seamless supply chain in which all players think and act as one" (Mason-Jones and Towill, 1999, in Faisal et al, 2006, p. 884).

The incentive that makes them think and act as one leads to the concept of *Alignment*, of which according to Mentzer et al. 2001 in Faisal et al. 2006, p. 881) "a key component is sharing both risks and rewards among the members of the supply chain". This might require restructuring of network wide partner firm relationships through increased collaboration, trust and long term commitment in cooperation. The most widely implemented restructuring has so far taken place in the form of electronic cooperation and resource sharing, made possible by the internet, which has been successful in product/service processes' value adding and producing enhanced bottom lines (Cheng et al. 2006; Peng et al, 2005).

In order for the incentives to function successfully, all risks, expenditure as well as benefits need to be distributed equally and justly throughout the supply chain network. Proceeds sharing agreement or revenue distribution mechanism make this concept

feasible (Narayanan and Raman, 2004). In order "to consciously reduce mistrust in existing relationships, supply chain managers must continually draw attention to the benefits, which arise due to a certain degree of trust between the parties", which is established through constant and expected actions of the organisation over an extensive time episode (Sahay, 2003 in Faisal et al. 2006, p. 881).

The concept of alignment has as its ultimate aim to maximise the supply chain's interests as a whole. However, the interests of the supply chain as a whole is to serve the interests of its customers. Supply chains should therefore aim to serve customer needs and expectations through the provision of the expected level of service, quality, cost and speed of delivery. The new concept explained and illustrated in this thesis project has as its main objective the identification of the alleged differences between suppliers' provision of goods and/or services due to suppliers perceptions of customers' expectations and actual customers' experiences aimed at improving organisational response and performance in the provision of the expected level of service, quality, cost and speed of delivery.

In other words, the supply chain process may influence crucial organisational outcomes by ensuring that the total customer value is optimised (Hult et al. 2002, Hult and Ketchen, 2006).

The total customer value is predominantly represented through the attributes of the expected level of service, quality, cost and speed of delivery of goods and/or services to customers. Further Soliman (2010a and 2010b) highlighted the significance of gaps in the organisational value attributes i.e. quality, cost and speed of delivery time. In that context, the whole "value" package, that is, the most important components which comprise "value" will be researched by this thesis; namely, quality, cost and speed of delivery and the expected level of service of goods and/or services.

2.4 Modelling Supply Chain Gaps:

Soliman (2009) identified four types of gaps namely, Customer Demand Knowledge , Firm's response to Customer Demand Knowledge, Planned Supply Chain Delivery and Actual Supply Chain Delivery. However, Soliman (2009) did not imply that the four gaps are applicable to global supply chain companies. Additionally, Soliman also overlooked the existence of other very significant gaps, either in supply chain or other industrial contexts.

These relate to customer perceived and customer actual demand attributes. Thus, we can have another eight types of gaps on the customer side, namely: Perceived Customers' Expected Level of Service and Actual Customers' Received Level of Service; Perceived Customers' Expected Quality and Actual Customers' Received Quality; Perceived Customers' Expected Cost of goods and/or services and Actual Customers' Incurred Cost of goods and/or services; Perceived Customers' Expected Speed of Delivery of goods and/or services and Actual Customers' Experienced Speed of Delivery of goods and/or services.

The same additional eight gaps, making it sixteen new gaps in total, likewise may exist on the supplier side, namely: Perceived Suppliers' Proposed Level of Service and Actual Suppliers' Delivered Level of Service; Perceived Suppliers' Pre-consumption service/product Quality and Actual Suppliers' Delivered Post-consumption service/product Quality; Perceived Suppliers' Pre-consumption Cost of goods and/or services and Actual Suppliers' Post-consumption Cost of goods and/or services; Perceived Suppliers' Pre-consumption Speed of Delivery and Actual Suppliers' Post-consumption Speed of Delivery of goods and/or services to their customers following an up to date innovative, efficient and timely supplier-customer product/service feedback assessment and information exchange practice.

For the purpose of this thesis, gaps can be defined as differences or disparities between suppliers' perceptions of customers' expectations and the actual customers' experiences.

These disparities can be further classified into different categories and levels and given type names and weights.

This thesis will employ a theoretical framework to determine whether within the supply-demand context, supply chain defects (gaps) between suppliers' perceptions of customers' expectations and actual customers' experiences exist or not. Specifically, this thesis will examine the alleged perceived and actual differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in terms of the expected level of service, quality, cost and speed of delivery.
In addition, the thesis intends to demonstrate that supply chain defects (gaps) in supply chain networks do exist and to exhibit the different kinds of supply chain defects (gaps). As a result of the above supply chain management effort, it is also hoped that this thesis will contribute to overcoming supply chain literature and theory gaps and to bring the conceptual and methodological consensus in the field of SCM closer to its establishment base and under one framework.

To this date, insufficient research has taken place to address the abovementioned significant issues of concern in supply chains. The phenomenon in research question, namely, unwanted supply chain performance as regards the differences (gaps) between suppliers' perceptions of customers' expectations and actual customers' experiences resulting from the perceived and actual expected level of service, quality, cost and speed of delivery of goods and/or services needs a thorough and deep analytical attention in order to be understood, positioned into an appropriate perspective and resolved. Extensive analyses of the core causes need to be considered.

The starting points in any endeavour in fact are decisions. Supply chain decisions are no exception. That is incompetent decisions are often made and as a result the outcome is not always as expected. Therefore, there is a reason to suspect that one possible cause might be defective or weak and insufficient knowledge that is being used as the basis for decisions. For that reason it is important for us to examine supply chain decision making processes and their execution results for a possibility of finding defects or gaps.

This is leading us to the research problem, namely supply chain gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations.

In this thesis, the following figure (Figure 1) illustrates the role of supply chain management in assessing the appraisal of supply chain management programs based on the identification of apparent supply chain gaps.

Soliman (2009) has demonstrated that gaps could adversely affect organisational performance. However there is no study that has identified the joint link between suppliers' perceptions of customers' expectations and actual customers' experience gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and performance of supply chain companies. Therefore, this study aims to identify that link, and further explore the existence of the contributing factors for the supply chain gaps outlined below.

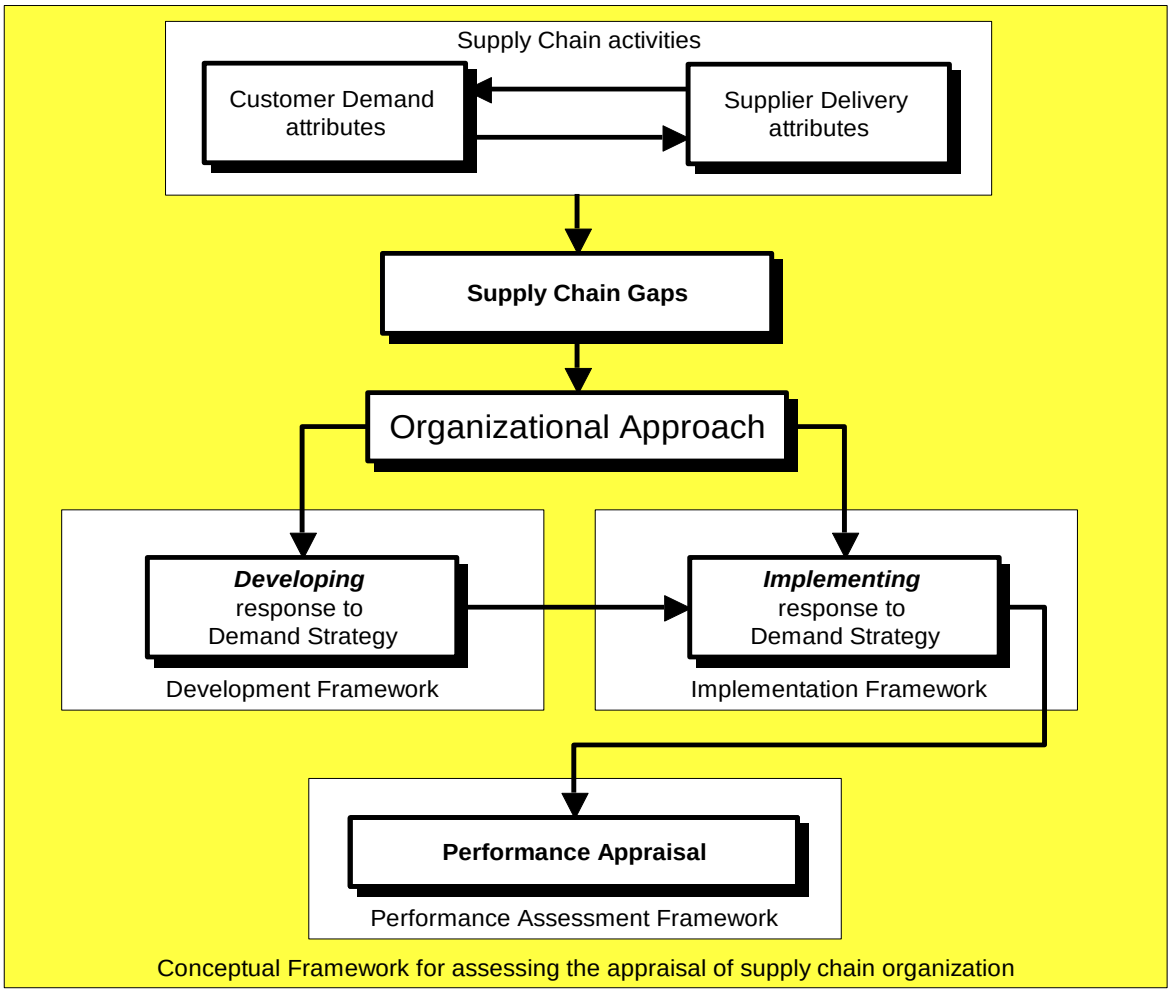


Figure 1: Conceptual model for assessing the appraisal of supply chain management based on the identification of apparent supply chain gaps (After Soliman, 2010)

The supply chain actual and expected maps could be constructed to assist management in developing or improving performance models or programs and also to identify any mismatches between what the customer expects and what the supplier actually delivers. These mismatches or defects have been referred to by Mehrez (2010) and Soliman (2010) as gaps that should be removed or avoided. As pointed out by Hsieh and Yuan (2010, p.1128) "global service providers have to grasp the relevance between customers' satisfaction and customers' expectations. Although it is essential for service providers to realise what customers want, it is still difficult to realise customers' desirable needs.
The gap between service providers and customers still exists in practice". Furthermore, it will be important to establish whether the customer's expectation of the expected level of

service, quality, cost and speed of delivery is constant with that supplied by the supplier. In other words, gaps created due to a disparity of the customer's expected and that actually delivered could be named *Expectation Gaps* (Soliman, 2010).

Soliman (2010b), has indicated that mapping could result in the identification of supply chain gaps and stated that performance indicators of supply chain activities may be divided into three important groups (quality, cost, and speed of delivery) as described by the following map (Figure 2). The fourth indicator; namely, *expected level of service* has been added by the author.

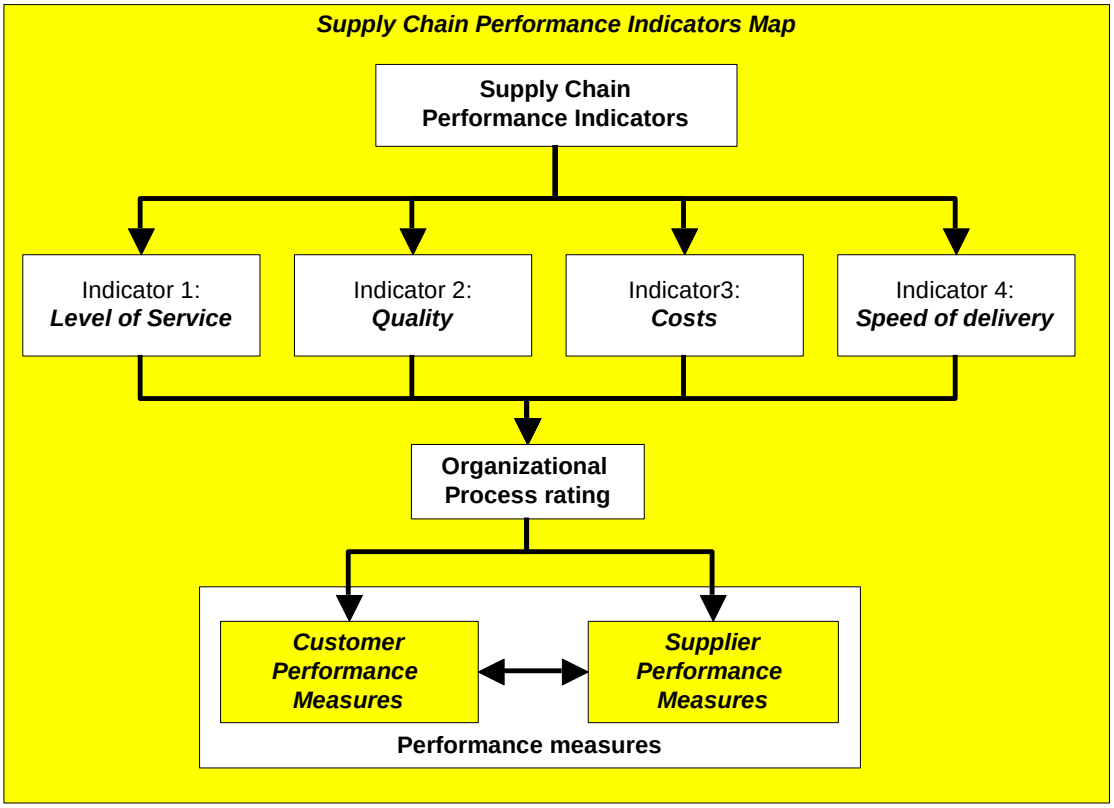


Figure 2: *Expected* Level of Service, Quality, Cost, and Speed of Delivery as performance indicators of a supply chain (extension to Soliman 2010)

These *Expectation Gaps* are in fact gaps generated due to mapping performance activities of the expected against those actually being delivered using the process of *Forward Mapping*. Therefore the role of forward mapping is to identify any gap that might exist between the *expected* and *delivered* services.

That is, forward mapping identifies for each indicator (*expected* level of service, quality, cost or speed of delivery) for each service whether the delivered goods or services are as expected by the customer. For example, forward mapping identifies at quality performance indicator, whether the quality of the goods or services were received as it was expected namely; above expected, adequate, or below expected.

It needs to be distinguished that these mismatches could be potential sources of performance gaps that should be either eliminated or isolated completely. The starting point in the identification of performance gaps is to establish whether the customer's expectations of the goods or services are consistent with the supplier's actual delivery for each attribute i.e. the *expected* level of service, quality, cost and speed of delivery. This means the organisational processes may be subjected to *Perception Gaps.*

The process that will be used for the identification of perception gaps is named *Backward Mapping*.

A map illustrating the connection between perception gaps and expectation gaps is as revealed in the subsequent diagram (diagram 3) below. Consequently, the diagram shows that there are 4 types of gaps, a blend of perception gaps or expectation gaps, as a result of which business processes in supply chain functions might face risks. For that reason, it is essential that the supply chain organisation be responsive to these likely disparities and manages the difficulty linked with them (Soliman, 2010b).

Moreover, if there is a disparity between the attributes of received and expected goods or services, then a *Forward Gap* is discovered.

That is, a quality disparity or a quality gap as named by Soliman (2009) and Mehrez (2010) is established. This type of inconsistency may be named as *Forward Gap Type 1*. Equally for the other three key elements of value; that is the *expected* level of service, cost and speed of delivery, it is likely that *Forward Gap Type 2*, *Forward Gap Type 3,*

and Forward Gap Type 4 can be discovered respectively. A depiction of these kinds of gaps is revealed in the following illustration (diagram 3).

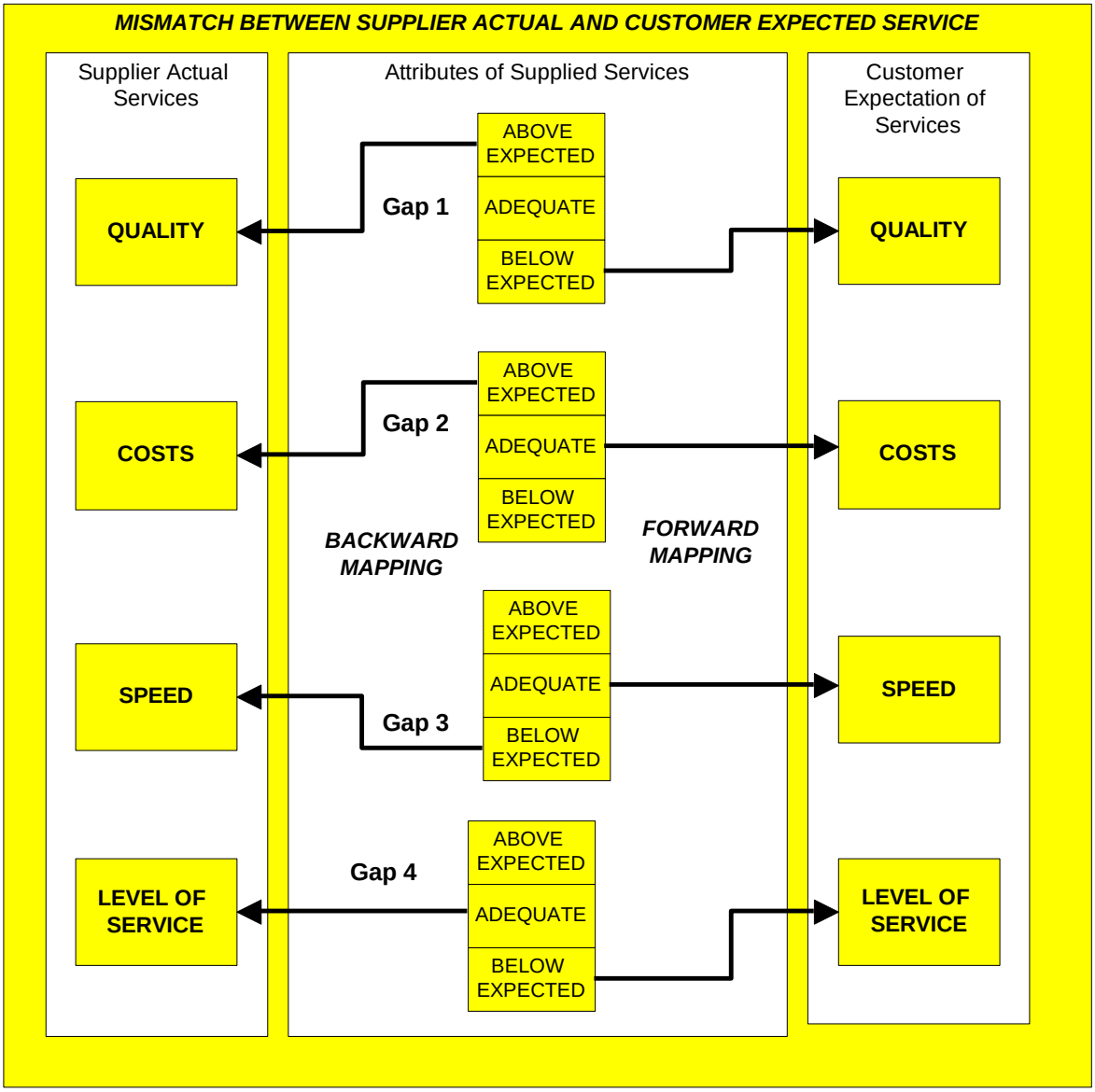


Figure 3: Map of Forward and Backward gaps for *Expected* Level of Service, Quality, Cost and Speed of Delivery of goods and/or services (extension to Soliman, 2010)

No researcher so far has ever carried out and tested together the impact that these key supply chain value attributes; namely, the *expected* level of service, quality, cost and speed of delivery of goods and/or services have on supply chain networks in a joint study

project. This is leading us to the formation of an innovative supply chain concept, which is an extension to the theoretical model proposed by Soliman (2010a).
The novel concept is introduced in the following section of this research thesis, and it is going to be tested in this significant pioneering project.

2.5 The Concept of Supply Chain Gaps in the Expected Level of Service, Quality, Cost and Speed of Delivery of Goods and Services to Customers in Supply Chain Organisations:

2.5.1 Concept's Background:

The concept of supply chain gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in this project is an extension to the theoretical model developed by Soliman (2010) and it hopes to set a strong foundation for future research into deeply embedded and critical supply chain issues that have already emerged and are likely to emerge further in the evolution of current and future supply chains.

The reasons for the concept's current and distant future applicability can be seen in several recent failures made public where supply chains failed as a result of a lack of knowledge and defective decisions and policies and investment choices derived from them, which produced defective strategies. This lack of knowledge came about as a result of knowledge management being set separately from the function of strategy.
For example, one of the biggest and most successful corporations in the world, with some of the best processes, which is named in most management books and articles as one of the best managed and resourced companies, yet it failed.

The corporation in question, Toyota, failed in the USA and in other countries around the globe fairly recently in its manufacturing operations of a particular vehicle series and did not even know it until a significant number of fatal road accidents had taken place and a manufacturing fault of an apparently very simple automotive part had been established. A

discrepancy in quality (quality gap) had caused this disastrous chain of events which led to the recall of many Toyota vehicles around the globe. The president of Toyota was even summoned to speak in front of the US Congress and publicly apologised. It was further evident that Toyota's knowledge programs and Toyota's strategy were out of touch by acting completely separately and as such had completely failed by allowing vehicles to be passed as roadworthy. Following this disastrous chain of events, Toyota had attempted to implement better quality practices since then. However, another gap in quality occurred again in October of 2012, as a result of which Toyota made a decision to recall over 7 million vehicles out of its global distribution. 300 000 of those vehicles were sold Australia wide and were affected by a power window installation fault that could potentially overheat and cause a fire in a vehicle (ABC News, 2012).

There are numerous other cases of corporate supply chain failures, amongst which are numerous financial institutions and bank failures; a very recent case of JP Morgan Chase, US's biggest bank's 20 billion dollar very irresponsible loss, and a few years earlier Lehman Brothers, HIH Insurance, Arthur Andersen, and many others just to mention a few whose failed strategies led to the chain of failures of other directly or indirectly dependent industries and companies and even entire chains where corporate strategy and knowledge programs were completely out of touch with each other causing a global financial crisis of which full ramifications are unknown and are still being experienced by billions of people worldwide to this day.

In contrast, Ketchen and Hult (2006) stress that supply chain issues need to be dealt with, in a strategically integrated way and further emphasise their importance in such a way that makes supply chain management an inseparable component of strategy. They further explain that it is neither the latest technology nor necessarily the best cooperation along the chain, but it is the essence of the issues at hand, that is crucial to problem solving.
These issues starting with decision making processes on both suppliers' and customers' side need to be looked at very carefully and critically as they may most likely be potential sources of supply chain gaps resulting from wrong or defective decisions and policies and investment choices being derived from poor or defective knowledge and strategic

deficiencies in relation with either the expected level of service, quality, cost or speed of delivery. Toyota's and JP Morgan Chase's very recent examples allude to such wrong or defective decisions creating the very knowledge and strategic deficiencies.

As mentioned above, these defective decisions may have a direct impact on the optimal value attributes; namely, the expected level of service, quality, cost and speed of delivery and as such need to be addressed and resolved. That's why knowledge and strategy resources need to work as one, intertwined, well immersed and fully integrated. This research has dealt with such defects (gaps) in the expected levels of service, quality, cost and speed of delivery to customers and propose what supply chains should do with them to avoid, neutralise, reduce or eliminate them.

Each attribute being researched, namely; the expected level of service, quality, cost and speed of delivery; carries enormous weight and is indispensable and inseparable to the intended and provided "value" as *perceived expected* versus *actual experienced*, and seen and felt from both the suppliers' and the customers' perspectives. The aim of this research was to carefully look at, explore and research both sides' perspectives separately in order to then bring them under a standard framework or umbrella which in this case may act as the arbiter or benchmark structure in assessing the perceived, expected and actual outcomes in a supplier/customer relationship.

This process aimed to produce a coherent joint model which shows functional elements within the researched sample and identifies which of those elements has gaps in either any or all of the following product and/or service value attributes, namely; in the expected level of service, quality, cost and/or speed of delivery, the type of gaps that these functional units may have, their weight and consequences, and perceived / expected and real outcomes before and after the model's application.

The next section defines and explains the research phenomena starting with the expected level of service, then moves onto quality, cost and finally speed of delivery of goods

and/or services to customers in a supply chain context and integrates them into the proposed model.

2.5.2 Expected Level of Service in a Supply Chain Context:

"Service" according to Hornby (2005, p.1386) of Oxford University Press, is a "system that provides something that the public needs, organised by the government or a private company; a business whose work involves doing something for customers but not producing goods; the work that such a business does; the serving of customers; a particular skill or help that a person is able to offer" amongst other similar indicative connotations.

Expected level of service in a supply chain context may be termed as an expectation of performance or a likely experience on the side of both customers and suppliers and all other stakeholders affected by the process of exchange of a particular service transaction or an experience. Since expectations are inextricably and intertwiningly linked with service levels of an appropriate type or kind considered for a particular service or exchanged transaction, service levels will differ in various respects as expectation levels change. For this reason, customer service levels and customer expectation levels require special research attention.

As far as consumers are concerned, these variations will depend upon many factors, some of which are specific individual consumer's past and present experiences, levels of education and information available, consumer needs, values, wants and desires, understanding of particular situations and tolerance levels amongst other criteria.

Customer expectations, on the other hand, are defined by Olson and Dover (1979 in Zeithaml et al 1993, p.1) as "pretrial beliefs about a product that serve as standards or reference points against which product performance is judged.

According to the Gaps Model of service quality (Parasuramaran et al, 1985; Zeithalm et al, 1988), customer assessments of service quality result from a comparison of service expectations with actual performance".

According to Zeithaml et al (1993, p. 10) there are "three types of service expectations: 1) desired service, which reflects what customers want; 2) adequate service, the standard that customers are willing to accept and 3) predicted service, the level of service customers believe is likely to occur." These service expectations can likewise be categorised under different levels of service.

The same authors define service quality "as the comparison between customer expectations and perceptions of service" (Zeithaml et al 1993, p.3). According to Zeithaml et al (1993), this comparison between customer service expectations and customer service perceptions in fact represents every single possible customer service expectation level, that is; desired, adequate and predicted level which in effect position service quality at the absolute core of every expectation and every service provision.

In relation to that, an apparent consensus exists agreeing "that expectations serve as standards with which subsequent experiences are compared, resulting in evaluations of satisfaction or quality. Consensus on the specific nature of the expectation standard, the number of standards used, and sources or antecedents of expectations has not yet been reached (Zeithaml et al. 1993, p.1)". These issues remain unresolved to this date.

Customer expectations have so far been addressed mainly in the literature on service quality and customer satisfaction and dissatisfaction. However, many questions remain unanswered. Thus the importance of this research stands even greater. Customer expectations vary according to various factors and their nature and determinants remain of great interest to researchers and scholars. To better understand customer expectations, Zeithaml et al (1993) attempted to define certain dissimilar types of customer service expectations and at the same time uncover the causes affecting and influencing the varying customer service expectation levels.

According to Zeithaml et al (1993), customer expectations can be categorised or classified into two standard categories. The first one is: expectations delineated as predictions standard and the second one is expectations delineated as ideal standard.
In the first one, customers are the ones who predict what should likely be encountered with a particular transaction or service experience. In other words, "expectations are consumer-defined probabilities of the occurrence of positive and negative events if the consumer engages in some behaviour (Oliver, 1981b, p.33 in Zeithaml et al 1993, p.2)". This standard was named "the expected standard" by Miller (1977 in Zeithaml et al 1993, p.2) who "defined it as an objective calculation of probability of performance, and contrasted it with three other types of expectations".

Others called these expectations 'predictive' describing them as expected levels of performance (Swan and Trawick, 1980; Prakash, 1984). However, "empirical support for distinctions between expectations as predictions and other standards has been offered" (Gilly, 1979; Gilly, Cron, and Barry, 1983; Swan and Trawick, 1980 in Zeithaml et al 1993, p.2).

In the other standard category, that is expectations delineated as ideal standard, which was proposed by Miller in 1977 had also been named "as the "wished for" level of performance" (Miller 1977 in Zeithaml et al 1993, p.2). Others, on the other hand gave it different names, such as *desired expectations* (Swan and Trawick 1980) characterising them as customer wanted performance levels or *normative expectations* (Prakash 1984) being identified as brand performing requirements that would entirely satisfy consumers. Furthermore, "expectations are viewed as desires or wants of consumers, ie. what they feel a service provider should offer rather than would offer" (Parasuraman et al. 1988 in Zeithaml et al. 1993, p.2) and are the main keys in determining how well consumers appraise the quality of service.

Besides the two abovementioned, there are also other empirically tested standards of consumer expectations. Woodruff et al (1983 in Zeithaml et al. 1993, p.2) suggested "that customers rely on standards that reflect what the focal brand should provide to meet

the needs and wants, but these expectations are constrained by the performance customers believe is possible based on experiences with real brands. They called these expectations *experience based norms* because they capture both the ideal and realistic aspects of expectations".

In 1977, Miller suggested "*minimum tolerable expectations*, defined them as the lower level of performance acceptable to the consumer, and *deserved expectation*, reflecting the consumers' subjective evaluation of their own product investment". On a similar note, Prakash (1984) suggested another standard named "*comparative expectations*", based on customers' expectations related to other comparable products (Zeithaml et al 1983, p.2). Prakash (1984) equally identified the following service expectation types: predictive, normative and comparative.

Based on the above description of consumer expectations standards, it is evident from the research conducted by Zeithaml et al (1993) that differences in the performing service/product variables do exist (desired, adequate, perceived) which can lead us to alleging that differences (gaps) in the expected levels of service might also exist parallel to the existence of such differing variables. What are those alleged differences and what causes those suspected differences will be identified and examined by the proposed model in this thesis.

All of the above standards of consumer expectations have some shortcomings, however to this date these are influential standards and thus are important in their combined assessment of consumer expectations. The addition of the concept of gaps between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery is a significant evaluation model which will add considerable value to the consumer expectations literature and consumer expectations standards consensus as regards the relationship of the expected level of service with quality, cost and speed of delivery in a joint empirical context.

2.5.3 Quality of Goods and Services in a Supply Chain Context:

The word "quality" according to Hornby (2005, p. 1233) of Oxford University Press, represents "the standard of something when it is compared to other things like it; how good or bad that something is; a high standard of excellence; a part of a person's character, especially something good; a feature of something, especially one that makes it different from something else". The word "quality" is further added to many other words or expressions to signify their meaning such as quality of life, quality assurance, quality product or service, quality newspaper, quality time, just to name a few.

In the marketplace, many would argue that ultimately, customers define quality. According to Miller (1992), a perfectly designed product or service, even be it the latest work of art and innovation which is not satisfactory in the eyes of the company's customers is bound to be unsuccessful. The key appears to be in knowing what products and services mean to customers and how they are seen, sensed and felt in the eyes of the customers while they are being designed and before the production stage in order to avoid any additional costs. This scenario is however only possible in cases where suppliers clearly know what their customers expect at a particular level of service and with the appropriate pricing strategy, and value provided. Not only are customers' expectations crucial to a company's success outcome or otherwise, customers also provide market intelligence and technological, knowledge and other needed clues that may help the company or network to keep ahead and in such a light, customers imminently affect the decision making processes (Zhang, 2001).

This perspective or view of quality is based on customer or user centred approach, which is derived from marketing literature on services. There are other perspectives too, besides a) the user or customer based approach amongst which are b) the transcendent approach; c) product based; d) manufacturing based; and e) value based approach (Tamimi and Sebastianelli, 2002).

The *transcendent approach* to quality recognises quality as being of a superior value and representing excellence. As a superior value, it is according to Evans and Lindsay (1996 in Zhang, 2001, p. 710) "both absolute and universally recognisable, a mark of uncompromising standards and achievement. It is often loosely related to a comparison of features and characteristics of products and aimed at developing quality as an image in the minds of customers". Familiar examples are prestigious products such as Lamborghini or Porsche automobiles. However, as excellence, its definition and standards contrast amongst consumers as well as producers and managers. Thus, "the transcendent definition is of little practical value to managers. It does not provide a means by which quality can be measured or assessed as a basis for decision making" (Zhang, 2001, p. 710).

The *product based* definition relates to a particular, quantifiable variable. Quality according to this approach is reflected in the quantity of a product's components. For instance, a building with more steel and cement will respond stronger in cases of an earthquake or flood than brick veneer or pure brick houses. This distinction in quality is very objective and highly measurable.

According to Crosby (1979 in Tamimi and Sebastianelli, 2002, p. 444) in the *manufacturing based* perspective, "quality is defined as conformance to specifications. It relates to the degree to which a product meets certain design standards". This perspective is very inward looking which considers quality as a result of manufacturing and engineering processes as compared to the most prevalent customer based approach, which is in contrast fairly outward or customer focused. Any divergence from the original "design specification results in inferior quality, and consequently increased costs due to scrap, rework or product failure. This definition allows for the precise and objective measurement of quality, although it has limited applicability for services" (Tamimi and Sebastianelli, 2002, p. 444). However, being inward looking, that is, having an internal focus is the prerequisite towards the accomplishment of the outward or external customer based focus.

Finally, the *value based* description of quality associates "quality with performance at an acceptable price, or alternatively conformance at an acceptable cost." This perspective originates from economics, "and is based on the notion that consumers often consider quality in relation to price" (Tamimi and Sebastianelli, 2002, p. 444). It is presumed that consumers make decisions when buying a particular product based on the purpose for which they intend to use the product and the means by which they can afford it. This perspective is thus fairly subjective. Of the five approaches described above, the user or customer base approach to quality is the most widely used in supply chain management operations today.

In terms of strategy, too, quality has its rightful place. According to Zhang (2001, p. 710) "*strategic quality* is the strategic benefits that result from product and service quality (Garvin, 1988). Quality is a way to differentiate a product from its competitors (Porter, 1980). It potentially provides the producing firm with a sustainable competitive advantage that allows it to earn above average profits. A product or service that exceeds the quality of competing offerings can increase a firm's market share and improve customer perceptions of the product (Deming, 1986).

Besides the differing perspectives or outlooks on quality, differences in perceptions of what constitutes quality do exist between producers, suppliers and buyers or customers, i.e. end users of products or services just as they exist amongst co-workers working on the same product or service provision, between functional units or company departments and various occupations or personnel as they all perceive what the ultimate quality of the product or service should be in order to achieve its targeted aims, which again will ultimately and truly be judged by the consumers or users of a particular product or service.

Consequentially, differences exist in the delivery of quality amongst all of the abovementioned factors and even in cases where the same person facilitates the provision of the apparent same service to a different client or customer.

It is therefore important to stress that any gaps in quality perceptions and expectations between producers or suppliers of products and/or services and its customers or users would potentially damage the competitive edge of a company or supply chain in question (Foster and Gallup, 2002). It is the aim of this thesis to identify where gaps in quality reside in researched supply chains' organisational functional units in order to help supply chains to neutralise, reduce or preferably eliminate them.

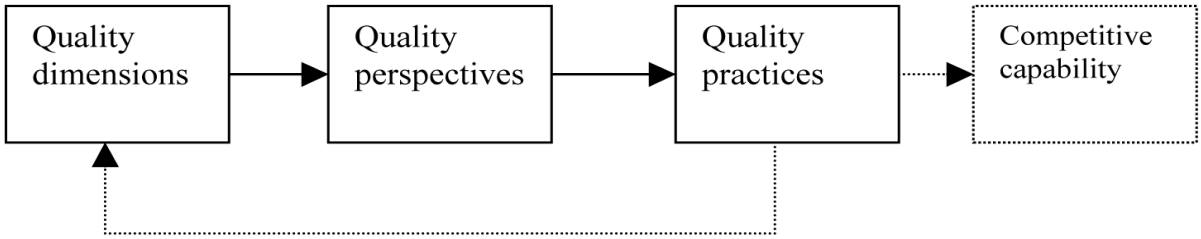
Above and beyond the differing perceptions, when speaking about quality from an organisational point of view, it is important to mention that quality also contains different dimensions which, according to (Foster and Gallup, 2002; Johns, 1992; Holmlund, 2008) relate to different occupational roles, that people perform and their exposure levels and interaction with customers. On the other hand, customer perspectives and perceptions of quality have been the focus of researchers over the past thirty years (Parasuraman et al., 1998, Gronroos, 1982) and as such have been instilled into service management and relationship marketing studies (Storbacka et al., 1994, Liljander and Strandvik, 1995, Lang and Colgate, 2003, Hennig-Tharau and Klee, 1997) as well as business to business marketing (Ivens, 2004, Naude and Buttle, 2000) sales management and direct selling (Parsons, 2002, Palmer and Bejou, 1994) and distribution channels (Johnson, 1999) amongst many other studies.

Similar to the divide on the definition of supply chain management, definition of quality is likewise divided and broken according to different authors and practitioners and the quality dimensions mentioned above and below. As stated by Pennys (1997, p. 503) "truly, quality is an elephant being described by blind men. There is no single definition of quality that can be applied to management, marketing, or health care areas. Quality definitions appear to be tailored for specific applications".

Woodside (1991 in Pennys, 1997, p. 503) "subdivides quality into three major components: conformance quality (meeting requirements stated in specifications), design quality (simplicity of style, assembly and operation), and fitness in use quality (the product-service match surpasses expectations sought by the customer)".

This definition however is insufficient and inappropriate for services as it does not adequately address customer responses. As implied by Johns (1992, p. 14) "in services, the expectations and perceptions of the customer are heightened because the customer is involved in the performance of the service".

In a similar light, Garvin (1988 in Zhang, 2001, p. 709) defines "quality as a multi-dimensional construct. Thus, quality can be seen differently from a particular angle (i.e. different perspectives). Basically, implicit multiple dimensions of quality lead to different perspectives about quality, which in return affect quality practices. The result of quality practices, the degree to which all dimensions of quality required by customers are met, creates competitive capability for the firm" as shown by the diagram below.



The review framework of quality dimensions, perspectives and practices
Source: Garvin (1988 in Zhang, 2001, p. 709)

As already mentioned, quality comes in different forms and it is therefore important to differentiate those dimensions. A large number of researchers have been referring to Garvin's work on quality dimensions, which is revealed below.

The following list of quality dimensions for both products and services and their definitions have been adapted from Garvin (1988 in Zhang 2001, p.709).

Dimension	Definition
Performance	The primary operating characteristics of a product such as acceleration, braking distance, steering, and handling of an automobile.
Features	The secondary characteristics of a product that supplement its basic functioning, the ``bells and whistles'' of a product, such as power option and a tape or CD deck of a car.
Reliability	The product's probability of failure-free performance over a specified period of time under stated conditions of use.
Conformance	The degree to which physical and performance characteristics of a product match pre-established standards.
Durability	A measure of useful product life, i.e., the amount of use a customer gets from a product before it physically deteriorates or until replacement is preferable.
Serviceability	The ease, speed, courtesy, and competence of repair.
Aesthetics	How the product looks, feels, sounds, tastes or smells, a matter of personal preferences.
Perceived Quality	Quality based on image, brand name, or advertising rather than product attributes and, of course, is subjectively assessed.

Source: Eight product quality dimensions (Garvin 1988 in Zhang 2001, p.709).

Another set of dimensions has been suggested by "Parasuraman et al. **(**1985) and Zeithaml et al. (1990) in Lagrosen et al. (2004)). The following dimensions were initially included.

(1**) Reliability** – the service is carried out in the way it is promised.

(2) **Responsiveness** – services are carried out promptly according to the needs of the customers.

(3) **Competence** – the staff of the service provider have the knowledge and skills required for delivering the service in a proper way.

(4) **Access** – concerns, e.g. opening hours, physical location, etc.

(5**) Courtesy** – the staff are polite, friendly, respectful, etc.

(6) **Communication** – keeping the customers informed in a language that they can understand and listening to them.

(7) **Credibility** – the service provider is trustworthy, believable and honest.

(8) **Security** – freedom from danger, risk or doubt.

(9) **Understanding the customer** – the service provider makes an effort to understand the needs and wants of the individual customers.

(10) **Tangibles** – physical objects that are needed for carrying out the service such as facilities, equipment, etc" (pp.62-63)**.**

However, quite a number of other dimensions could be added to this list, which will be briefly introduced in some detail in the following text.

Service quality dimensions as well as product quality dimensions are of crucial importance to supply chains as they deal with both aspects. It is also important to point out that there are marked differentiations in quality dimensions depending on the industry and type of product or service provided. For instance, in hybrid services such as banking, according to Ganguli and Roy's (2010) study, the following dimensions were applied:

- Customer service;
- Staff competence;
- Reputation;
- Price;
- Tangibles;
- Ease of subscription;
- Technology security;
- Information quality;
- Technology convenience;
- Technology usage easiness;
- Reliability;

To justify the previously mentioned fact that there are marked differentiations in quality dimensions depending on the industry and type of product or service provided, Ganguli and Roy (2010) have likewise concluded that "the application of the service quality dimensions identified in this study cannot be generalized as we have taken only one industry (banking). So to confirm its applicability in other hybrid services like telecommunications and insurance and build a universal model of service quality dimensions in hybrid services, future research should carry out the same study in various other hybrid service industries"(Ganguli and Roy 2010, p.419).

In comparison with hybrid services, in e-commerce services or virtual operations, which relate to both products and services, according to Madu and Madu (2002), there are 15 e-quality dimensions which follow: 1) performance; 2) features; 3) structure; 4) aesthetics; 5) reliability; 6) storage capability; 7) serviceability; 8) security and system integrity;

9) trust; 10) responsiveness; 11) product/service differentiation and customisation; 12) web store policies; 13) reputation; 14) assurance and 15) empathy.

It is nevertheless important to stress that more dimensions often mean more complex consumer expectations and satisfaction issues to deal with. Some dimensions may co-relate and overlap and could thus be united or streamlined into a common frequency or a common factor. Each quality dimension should in fact be tested for its level of importance that customers and service/product providers attach to it.

As an extension to the work already done earlier, Berry and Parasuraman (1991) identified further quality dimensions relating to services only. These are 1) Assurance and 2) Empathy exclusively, besides the already mentioned dual product and service dimensions of 3) Tangibles, 4) Reliability and 5) Responsiveness (Madu and Madu, 2002).

Besides the acceptance of Parasuraman et al. **(**1985) ten quality dimensions as a general guideline for the higher education sector, Gro¨nroos (2000) offered an alternative "compilation of seven criteria of service quality perceived as good. He claims that these criteria are an integration of available studies and conceptual work" (Lagrosen et al 2004, p.63). These are: a) Professionalism and skills; b) Attitudes and behaviour; c) Accessibility and flexibility; d) Reliability and trustworthiness; e) Service recovery; f) Serviscape; and g) Reputation and credibility. On the other hand, Harvey and Green (1993) in Lagrosen et al (2004) suggested five distinct dimensions to look at quality. These are a) quality as being exceptional; b) quality as consistency or perfection; c) quality as fitness for purpose; d) quality as value for money and) quality as transformation. Finally, Lagrosen et al (2004) suggested the following quality dimensions for the higher education sector:

1) Corporate collaboration
2) Information and responsiveness
3) Courses offered
4) Campus facilities

5) Teaching practices
6) Internal evaluations
7) External evaluations
8) Computer facilities
9) Collaboration and comparisons
10) Post-study factors and
11) Library resources (p. 66).

In concluding remarks on higher education quality dimensions, Green (1994 in Lagrosen et al 2004, p. 63) "argued that, given the difficulties in defining quality in higher education it is necessary to define as clearly as possibly the criteria that each stakeholder uses when judging quality and take all these competing views into account."

The above categorisation of quality dimensions according to different industry sectors, product or service provisions clearly indicates that each supply chain network needs to deal with the specific quality dimensions relating to its market segment. It is generally accepted that enhanced quality has an impact on supply chain overall and ultimate performance (Stanley and Wisner, 2002; Mentzer et al., 2001, Chow et al., 1994, Perry and Sohal, 1999, Kearney, 1994). The affirmed connection of quality of services with increased consumer satisfaction, increased company performance and increased bottom line and reduced costs (Rust et al., 1995, Lee et al., 2000, Cronin and Taylor, 1992) additionally strengthens the undisputable power and importance of quality in both service and/or product facets.

Quality thus affects all stakeholders in a supply chain, irrespectively of whether they are suppliers, consumers, wholesalers or retailers, company staff and others directly or indirectly causing its growth or decline.

According to Seth el al (2006, p.548) "a majority of studies on service quality have focused on service industries, not supply chain as a whole. It appears that measurement of

quality of service in the context of supply chain management presents a challenge for researchers since:

- effective management of supply chain involves delivery of products as well as services;
- quality of service has both dimensions: quantitative and qualitative; and
- quality of service involves interplay of a variety of factors spanning suppliers, manufacturers, distributors, retailers and customers".

As stressed by Zhang (2001, p. 710) "the effective implementation and management of quality programs require consensus or cross-functional goals that are based on a shared understanding of quality definition". It is likewise urgently needed that the notions of quality and value be clearly differentiated and defined as their research constructs' indistinctiveness causes insufficient and overlapping interpretation ambiguity and leaves researchers with the only choice to rely on the various self-assuming definitions (Zeithaml et al, 1988).

One way of achieving this differentiation is by uncovering the different quality elements, product and/or service features and final value attributes as the culmination of all the characteristics. All of the four attributes researched in this thesis effectively represent the concept of value, namely, the expected level of service, quality, cost and speed of delivery. It will be further reinforced by the proposed model that will be empirically tested in this project.

2.5.3.1 Customer Quality Perspectives:

Parasuraman et al (1985) discovered four constant elements of quality perceived by consumers within four consumer service sectors, namely; empathy, reliability, responsiveness, assurance and tangibles. In a comparable study within 33 different food product groups, Bonner and Nelson (1985 in Zeithaml, 1988, p. 8) discovered that "sensory signals such as rich / full flavour, natural and fresh taste, good aroma, and

appetising looks – all higher level abstract dimensions of perceived quality were relevant".

Zeithaml et al (1988) developed a model in which three concepts were interrelated: the concept of perceived quality, perceived value and the concept of perceived price.
Perceived quality has been defined as being "different from objective or actual quality; a higher level abstraction rather than a specific attribute of a product; a global assessment that in some cases resembles attitude and a judgment usually made within a consumer's evoked set" (Zeithaml et al, 1988, p. 4). Objective quality, on the other hand, represents the real mechanical supremacy or distinction in a product (Monroe and Krishnan, 1985; Hjorth-Anderson, 1984), or some calculable and confirmable advantage as judged by a prearranged standard (Zeithaml, et 1988).

There are likewise perceived differences between managers and customers in what they consider to be significant units of quality measurement in a product or service. The final say, however is secured for consumers who judge products' and services' supremacy or their lack of it. This view of quality is in line with the consumer based perspective as described in the introductory text on quality. Some researchers are in an argument that the objective quality is non-existent as all appraisals are of a biased nature (Maynes, 1976) and that perceived quality is the only realistic one.

In the higher level abstraction rather than a specific attribute, quality is perceived as a series of functional and practical benefits that serve as the emotional payoff (Young and Feigen, 1975), whereas global assessment or attitude resemblance perceives quality as a type of general product/service assessment as reflected by an attitude (Olshavsky, 1985). It is considered in terms of cognitive and affective quality, where the higher the assessable quantity of attributes prior to purchasing, the higher the cognitive attributes of quality and vice versa, the higher the amount of experience with the product/service, the more affective quality becomes. And finally, consumers assess quality according to their evoked mind's judgment. The judgment occurs as a comparison of a product or a service in terms of its comparative supremacy amongst its alternatives (Maynes, 1976). What is

finally used as a comparison is decided by the consumer alone, and certainly not by the supplier or the company. This is an important distinction in understanding the concept of perceived quality. The following table shows the proposed relationships between quality and value as seen by the various outlined authors.

TABLE 1
Selected Means-End Chain Models and Their Proposed Relationships with Quality and Value

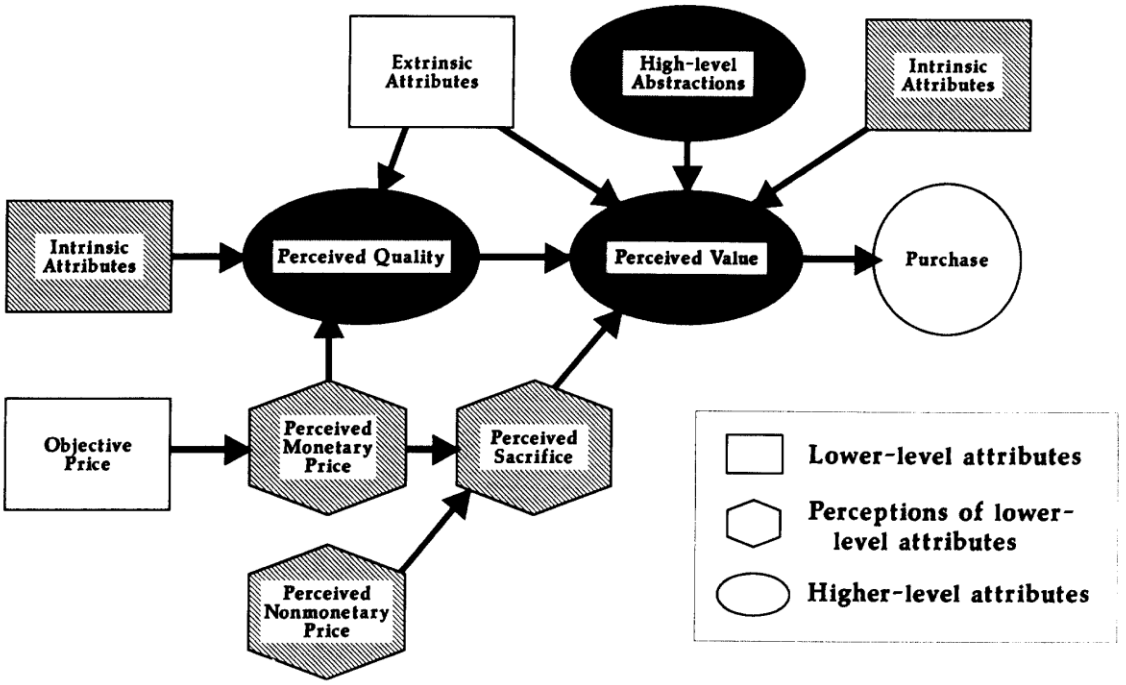
Scheme	Attribute Level	Quality Level	Value Level	Personal Value Level
Young and Feigin (1975)	Functional benefits	Practical benefit	Emotional payoff	
Rokeach (1973) Howard (1977)	Product attributes	Choice criteria	Instrumental values	Terminal values
Myers and Shocker (1981)	Physical characteristics	Pseudophysical characteristics	Task or outcome referent	User referent
Geistfeld, Sproles, and Badenhop (1977)	Concrete, unidimensional, and measurable attributes (C)	Somewhat abstract, multidimensional but measurable (B)	Abstract, multidimensional, and difficult to measure attributes (A)	
Cohen (1979)	Defining attributes	Instrumental attributes		Highly valued states
Gutman and Reynolds (1979)	Attributes	Consequences	Values	
Olson and Reynolds (1983)	Concrete attributes	Abstract attributes	Functional consequences Psychosocial consequences Instrumental values	Terminal values

Source: Zeithaml (1988, p.6)

Customers define quality along an assortment of conceptual (abstract) features starting with plain product traits such as its appearance (Myers and Shocker, 1981), functional benefits (Young and Feigin, 1975), solid, tangible and measurable characteristics (Geistfeld et al, 1977) or concrete points (Olson and Reynolds, 1983) amongst others.

Before the construction of the proposed model in this project, another model depicting the relationships between quality, price and value components is shown in the following figure by Zeithaml (1988, p.4).

FIGURE 1
A Means-End Model Relating Price, Quality, and Value



Source: Zeithaml (1988, p. 4)

According to Zeithaml (1988, p. 5) "consumers use lower level attribute cues to infer quality." These are mainly related to price, size, and basic functionalities in goods. Consumer behaviour forms around the perceived value that a particular product would do for them. For example, fashion lovers look for newer designs in styles while other consumers might be size sensitive and pay more attention to size features as a determinant of quality (houses in the suburbs may provide more room and thus more comfort than city dwellings). These attribute cues indicate two so-called quality signals, namely internal or intrinsic and external or extrinsic signals. Internal cues are those tangible features that products are made of, while in services these are experienced and consumed at the time of service provision. External cues are those associated with the name of the product or service, its price and popularity with consumers amongst others, just to name a few. Some cues are harder to categorise than others as they may appear as both intrinsic and extrinsic signals.

These are for instance packaging of a product, which may represent part of its tangible value contents or simply a brand name with a price on it (Zeithaml, 1988).

The second point that Zeithaml's (1988) model indicates is that internal or intrinsic product components that indicate quality are specific to each product concerned, however, quality dimensions could be broadened to suit general product divisions, though these always appear quite challenging. It is because products themselves commonly differ, even though they may belong to the same product group and the way that consumers see and perceive them also differs. For instance, paper quality for a daily newspaper differs from a paper used in theses presented as books. The more non-figurative or abstract an attribute happens to be, the more open to available alternatives it becomes.

External or extrinsic signs on the other hand commonly indicate quality traits based on product groups, classifications, price and brand names. There are other external attributes such as warranty and approval stamps by recognised institutes or other certifying bodies of authority. Research has also shown that consumers hold different perceptions between advertised and non-advertised products and/or services, being in favour of those highly advertised. Price alone was a determinant in cases where other cues were not available. However, when other signals are available, (typically internal ones), then price is less of a determining factor in purchasing decisions (Zeithaml, 1988).

There are also according to Zeithaml (1988) situations where consumers are dependent on internal quality characteristics more than on external characteristics. These may appear at the time when the product or service is consumed, in cases where internal characteristics promise bigger projecting worth or in product searches where internal characteristics are preferred over potential experiential characteristics (buying a beer of a tested quality as opposed to trying something else that may not taste as well). And vice versa, there are situations in which consumers rely on external or extrinsic characteristics more than on internal characteristics.

These are mainly situations where internal signals are unavailable (for example, before a service is consumed, internal cues are unavailable). Further, these may occur when time to assess internal product characteristics is considered to be too much work and time consuming (time conscious consumers with limited time) and in cases where quality cannot be easily determined (how long a car might last and how much needs to be invested on a regular basis to maintain it). These consumers most likely choose and decide on the basis of perceptions as regards brand names, price, product/service recommendations and other perceived quality dimensions. According to research by (Stokes, 1985 in Zeithaml, 1988, p.10) "price is used as a quality cue to a greater degree when brands are unfamiliar than when brands are familiar".

Likewise, in situations where consumers are faced with a perceived risk of buying an unknown product, the product with a higher price tag will be preferred over the cheaper one (Peterson and Wilson, 1985 in Zeithaml, 1988). Other attributes which may affect consumer perceptions and indicate changes in quality over a period of time are competitive market forces, advertising campaigns, additional information and variable customer preferences and tastes (Zeithaml, 1988).

It is also important to stress that, consumer preferences, as much as consumer needs and wants may change over time due to naturally occurring factors or as a result of other circumstances. Education has an enormous role to play too in the education of consumers.

According to Howard (1977, p. 28 in Zeithaml, 1988, p. 16) "it is essential to distinguish between the attributes per se and consumers' perceptions of these attributes, because consumers differ in their perceptions. It is the perception that affects behaviour, not the attribute itself. "Attribute" is often used to mean choice criteria, but this leads to confusion. To use "attribute" when you mean not the attribute itself but the consumer's mental image of it, is to reify what is in the consumer's mind."

Therefore, marketers should focus not on "objective reality but instead on consumer perceptions, which may be altered either by changing objective reality or by reinterpreting objective reality for consumers (Jacoby and Olson, 1985 in Zeithaml, 1988, p. 16)". The ultimate success of supply chain processes will therefore be achieved by those who manage to stay close to the customers and sustain the provision of the highest quality of products and/or services and thus satisfy customers (Shemwell et al., 1998).

As concluded by Tamimi and Sebastianelli (2002, p. 452) "understanding quality in terms of product dimensions may be a step toward developing the necessary measures that could ensure a firm's success with TQM (total quality management) programs, and ultimately ensure a firm's production of high quality products". Even though supply chains recognise that customer viewpoints are critical to their success, "translating this realisation into the actual effective monitoring of customers' expectations, experience, and satisfaction with their product" or services continues to be an enormous challenge (Tamimi and Sebastianelli, 2002, p. 452).

That is where this thesis plays an important role through the identification and appraisal of differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer. The subsequent evaluation of the performance of the goods or the services delivered to customers may be analysed through customers' experiences and satisfaction levels and its direct influence on supplier results.

2.5.4 Cost of Goods and Services in a Supply Chain Context:

The word cost, according to Cambridge University Press (2008, p. 315) represents "an amount of money needed to buy, do or make something, to produce or get the goods without any extra money added for profit, the amount of money a business needs to do a particular job, something which is given, needed, avoided or lost in order to get a particular thing".

In supply chain context, however, the word cost or to be precise supply chain cost has its own interpretations and associated connotations. According to a very recent article by Pettersson and Segerstedt (2012), most frequently mentioned logistics cost is often mistaken or taken as synonymous with supply chain cost. These two are however somewhat misunderstood as logistics cost is one component of a total supply chain cost. Logistics typically covers transportation, warehousing and distribution and thus relates to these operational functions' costs. However, total supply chain cost is a lot broader and includes all of the other functions needed for its full operational effectiveness. Pettersson and Segerstedt (2012, p.2) define supply chain cost "as all relevant costs in the supply chain of the company or organisation in question".

As shown above, literature divides cost into different categories and sometimes uses different terminology which in fact all represents cost. Such terminology includes "production cost" (Chen, 1997), and "Manufacturing cost" (Bowersox and Closs, 1996). Chen (1997) further partitions supply chain cost "into five categories: Production cost, Transportation cost, Warehousing cost, Inventory carrying cost and Internal material handling cost" (Pettersson and Segerstedt (2012, p.2).

As supply chain businesses and industries differ structurally and operationally in many segments, their costs will differ accordingly. In order to know what total supply chain cost is, each individual business needs to be analysed and measured thoroughly and those costs then added to the entire supply chain.

It is generally agreed that cost is "one of the most important performance metrics of a supply chain" (Solvang, 2001 in Pettersson and Segerstedt, 2012, p.2). This is especially reinforced by the global outsourcing trend, as a result of which, costs need to be analysed, measured and monitored a lot more precisely than it is currently the case.

However, as illustrated by Pettersson and Segerstedt (2012, p. 2) "measuring an accurate SCC (supply chain cost) can be difficult. One reason for the difficulties in measuring SCC is that companies' accounting systems are not adjusted to SCC measurements.

According to Christopher (1998), conventional accounting systems group costs into broad aggregated categories which do not allow the detailed analysis needed to identify the true costs of servicing customers".

According to the same author: "the system should reflect the flow of materials. It should be capable of identifying the costs that result from providing customer service in the marketplace. The system should also be capable of making cost and revenue analyses for customer types, market segments and distribution channels". (Christopher 1998 in Pettersson and Segerstedt (2012, p. 2).

Christopher (1998) further summed up the discontent of "conventional cost accounting" in regards to the management of supply chain logistics in the following points:

- "There is general ignorance of the true cost of servicing different customers, channels or market segments;
- Costs are captured at too high a level;
- Full cost allocation still reigns supreme;
- Conventional accounting systems are functional rather than output oriented;
- Companies understand product costs, but not customer costs" (Pettersson and Segerstedt (2012, p. 2).

As an alternative to the conventional accounting system, activity based costing was recommended by Christopher (1998). This is more so as many organisations nowadays bear the vast majority of their expenditures externally, due to the global outsourcing trend. Examples are computer electronics, clothing, automobiles, furniture and many other industrial supply chains as well as telecommunications, customer call centres and many other services. It is only natural then that the vast majority of prospects for cost savings lie in that external supply chain environment (Christopher and Gattorna, 2005).

Any attempt to develop a better future measurement system should thus aim besides the potential benefits of cost savings and eventual higher profits to target the implementation of practices and processes that do not hinder accurate cost performance metrics and which do not either overestimate or underestimate the total supply chain cost. Such a system is yet to be designed and put into practice and only seems possible with the full and transparent real time integration of all supply chain functions and processes inclusive of customers.

In the findings by Hoole (2005 in Pettersson and Segerstedt, 2012) "the total supply chain cost can vary by 5-6% of annual revenues between companies in the same industrial sector. This is based on a benchmarking of more than 500 supply chains". Hoole likewise discovered that more "mature supply chains are reducing costs more quickly than those with less mature supply chains" (p. 2).

Later, in 2007, Huber and Sweeney carried out "a survey among 776 Irish firms and found that 59% of companies do not know their total Supply Chain Cost" (Pettersson and Segerstedt, 2012, p.2).

The main emphases in the above researches have been cost savings, functional unit divergences and the sway to pursue fresh consumers. In another study carried out by Byrne and Heavey (2006 in Pettersson and Segerstedt, 2012, p.2) it is accentuated how the power of enhanced sharing of information and "forecasting techniques can lead to total supply chain cost savings of up to 9.7%. Furthermore, Christopher and Gattorna (2005) discussed supply chain cost savings as a result of creative pricing strategies combined with efficient Supply Chain Management. The supply chain cost savings can provide opportunities for increased profits".

In their 2005 article on supply chain cost management and value based pricing, Christopher and Gattorna likewise stressed the importance of supply chain alignment from which cost savings prospects can be discovered and better profits derived as a result of strategic collaboration. A lot earlier before them, Scott and Westbrook in 1991 (in

Christopher and Gattorna, 2005, p. 117) stated that "supply chain mapping can enable the identification of opportunities for reducing inventory and hence cost".

According to Christopher and Gattorna, (2005, p. 117) "most inventory seems to lie at the interfaces between organisational entities in the chain. In fact, there is duplication of inventory". It is stocked for safety reasons as information is not shared in real time. However, once this barrier is overcome, excess inventory is reduced too. Visibility plays a major role in this endeavour, and one such tool that is becoming adopted is CPFR or the collaborative planning, forecasting and replenishment, which is making some inroads into overcoming this hurdle in real time communication.

As shown by the results of the study by Kim et al (2006 in Bartlett et al, 2007) on enhancing supply chain performance through better visibility, "the exchange of high quality information between partners improves the channel coordination and improves the overall responsiveness of the partnership and ultimately market performance". In the new global supply chain environment, for a supply chain network to be successful, this exchange has to include customers too.

2.5.4.1 Customer Cost Perspectives:

It is becoming crucial for suppliers to understand how customers view cost or a purchase price. To gain something is to give or take away from something or someone. Suppliers should thus be asking themselves the following questions: what our products and services give and take away from consumers? What other choices or alternatives do our consumers have? According to Zeithaml (1988) customers view price as a sacrifice required in obtaining a good or a service. Zeithaml further divided price into three different elements. These are: perceived non-monetary price, objective price and sacrifice. Other researchers such as Jacoby and Olson (1977 in Zeithaml, 1988) differentiated between perceived price (determined by a customer) and objective price (real asking price). Consumers likewise use different concepts to remember or recall prices. While some customers may remember the real asking price as it is, others may

only recall it as being low-priced or high-priced. Still another group of consumers may not have any perception or knowledge of price whatsoever.

Dickson and Sawyer (1985 in Zeithaml, 1988) believe that consumers have a lot less attentiveness, understanding and price knowledge than is needed for them to be more precise in their product / service price orientation. According to Dickson and Sawyer (1985 in Zeithaml, 1988, p.10) the percentage of customers who in fact physically observe prices of basic food and drink items such as butter, cereals, coffee and toothpaste "at the point of purchase ranged from 54.2 to 60.6%. Among the groups of consumers not checking prices in these studies, a large proportion (from 58.5 to 76.7% in the four product categories) stated that price was just not important".

These findings indicate different levels of awareness, mental complexities, importance and priorities that different groups of consumers assign to price observation at least when it comes to basic food and drink items. It has also been observed that different demographic segments differ in their price alertness. The most price sensitive consumers, according to these studies are older, married, mainly stay at home females.

Higher alertness to prices is more expected in more expensive products or services such as white goods, television sets, home entertainment systems, vehicles and holiday packages than in the basic food and drink items (Zeithaml, 1988).

It is also important to stress that money does not represent the only sacrifice that customers perceive. Economics research field recognises and supports the notion that other cost considerations such as search, effort, time and intuitive factors also play a significant role in the cost equation (Leibowitz, 1974; Down, 1961; Leuthold, 1981; Zeithaml and Berry, 1987 in Zeithaml, 1988). Those supply chain network organisations that enhance their understanding of their customers' cost perspectives are going to be at a true advantage over those who do not.

Therefore, the aim of this thesis process is to evaluate and produce a coherent joint model which will methodically map and thus provide a performance assessment and monitoring tool for supply chain organisations functional units within the researched organisations and others willing to put this model into action. In essence, the proposed model through the mapping process will precisely help the organisations' functional units identify which of the units has gaps in either any or all of the following product and/or service value attributes, namely; in the expected level of service, quality, cost and/or speed of delivery, the type of gaps that these functional units may have, their weight and consequences, and perceived / expected and real outcomes before and after the model's application.

2.5.5 Speed of Delivery Time of Goods and Services in a Supply Chain Context:

The word "speed" according to Hornby (2005, p.1471) of Oxford University Press, stands for "the rate at which somebody or something moves or travels; the rate at which something happens or is done, the quality of being quick or rapid, or the performance at an expected rate or level."

On the other hand, the word "delivery" represents an act of taking "goods to the people they have been sent to; the act of giving a speech, talk or other official statement; the act of doing what has been promised to be done, or expected to be produced or provided" Hornby (2005, p.404).

Supply chain management's main function is to improve the competitiveness of a network inclusive of all of its member organisations. It is quite a complex task, which depends on many factors and considerations, problem identification, devotion and motivation, strategies, design, innovation, cultural and structural issues, implementation of procedural, process, scientific and technological resolutions, and time or speed of delivery being one of the most critical segments in determining its efficiency and effectiveness.

According to Li and O'Brien (1999, p. 148) "Lead-time performance is indicated by the gap between required lead time given by customers and expected lead time. Delivery promptness is described by the gap between required maximum delivery delay and expected delivery delay".

Speed of delivery or time, according to Stalk (1998, p.41) is "a strategic weapon and the equivalent of money, productivity, quality and even innovation". It is also "a more critical competitive yardstick than traditional financial measurements (p. 44)". Good management of time as an indispensable and crucial resource enables companies to reduce final costs and as a result offer better product/service varieties, penetrate into more markets and improve the technological infrastructure for its products and services, thereby achieving greater competitiveness in due course and winning over a larger number of customers. Management thus must incorporate the monitoring of time consumption into every aspect of an enterprise's functions and activities.

In a contrasting case scenario, as indicated a long time ago by Stalk (1988, p. 45): "Traditional manufacturing requires long lead times to resolve conflicts between various jobs or activities that require the same resources. The long lead times, in turn, require sales forecasts to guide planning. But sales forecasts are inevitably wrong; by definition they are guesses, however informed. Naturally, as lead times lengthen, the accuracy of sales forecasts declines. With more forecasting errors, inventories balloon and the need for safety stocks at all levels increases. Errors in forecasting also mean more unscheduled jobs that have to be expedited, thereby crowding out scheduled jobs. The need for longer lead times grows even greater and the planning loop expands even more, driving up costs, increasing delays, and creating system inefficiencies."

Most imminent management response in this case would be to request more accurate forecasts and even longer lead times, which exacerbates the problems even further. One way out is to continuously reduce the amount of lead time by creating shorter but adequate forecasts to meet demand.

In the context of today's supply chain networks, long lead times are hardly ever acceptable as time-based competition intensifies at a much faster speed than ever before in human history. What this means for supply chain stakeholders is that all sides' concerns need to be continually addressed and factored into from the time products and services are designed, made available and distributed throughout the supply chain with the customer, the speed to reach them and most importantly, their expectation and satisfaction, being constantly in mind. The only way possible to realise such outcomes is through constant communication channels and feedback of the entire supply chain network and customers on a regular basis. While this may be a costly proposition for a start-up business relationship, it is argued that long term dividends would far outweigh the initial and ongoing maintenance costs of such a system and practice.

Whether we like it or not, time as one of the most important constant variables connecting every part of a system at every facet of a business has grown into the most prevalent performance measurement metric.

The impact of time on supply chain performance outcomes has been well documented by various authors in supply chain literature, starting with the pioneering work of Forrester (1958) who "established a model of time's impact on an organisation's performance using industrial dynamics – a concept originally developed for shipboard fire control systems. Forrester tracked the effects of time delays and decision rates within a simple business system consisting of a factory, a factory warehouse, a distributors' inventory, and retailers' inventory" (Stalk, 1988, p. 45).

Forrester back in those days measured time delays in weeks and had considered fixed forecasts in case of a stable demand. If unpredicted variations occurred, then the system would go out of balance trying to respond. However, its response would most often be distorted by time and imprecise forecasts. One example is "a lengthy delay between the event that creates new demand and the time when the factory finally receives the information. The longer that delay, the more distorted is the view of the market. Those

distortions reverberate throughout the system, producing disruptions, waste and inefficiency (Stalk, 1988, p. 46)".

In such cases, Stalk (1988) states two choices for companies who want to escape such outcomes: firstly, companies could produce according to forecast or secondly "reduce the time delays in the flow of information and product through the system. Because time flows throughout the system, focusing on time-based competitive performance results in improvements across the board (p. 46)". It should eventually become part of its general strategy.

However, when it comes to productivity in the manufacturing sector, according to a study by Schmenner (1987, 1988 in Holmstrom, 1994, p.92) who "studied the effect of different improvement strategies on productivity" and concluded that, neither "investment in automation and new production technology, efforts to motivate employees through gain sharing, implementation of new computer-based information and planning systems nor management reorganisation, factory size, type of industry and nationality could be significantly associated with productivity improvements, while a reduction of throughput time was the only statistically significant strategy to improve productivity and "the only consistent distinctions that could explain differences in productivity gains were those associated with JIT (just in time), i.e. reducing throughput time, improving quality, lower inventories and participative management. Inventories are by themselves an indicator of throughput time".

Buzzel and Bradley (1987 in Holmstrom, 1994, p.92) further reinforced "the argument that speed, when indicated by low levels of inventories, improves profitability, which is also supported by statistics collected in the PIMS debate database." Speed, also according to Holmstrom (1995, p.185) "reduces uncertainty and improves efficiency of resource allocation".

Two decades later, Blackburn (2012), examined differences in speed based competition in global supply chains concluding in favour of limiting time based competition. His

arguments are based on “the existence of limits to speed for all processes” based on “the law of physics which imposes limits on the speed and physical processes” just as “economics principles establish limits for business processes” (p. 396). Blackburn (2012) further stressed that quicker processes are wanted “up to the tipping point at which the marginal benefits from additional time reduction equals the marginal cost of the additional speed. This marginal value of time effectively defines the limits of time-based competition for a process”. These limitations are not stagnant, as they become adjusted due to technological advances, competition forces, and consumer choices. However, their existence is factual (p. 396).

For instance, consumer responsiveness can be enhanced through the investment in faster technologies and other resources, however, “the limiting value for that investment is often determined by the value customers place on their waiting time” for a particular service or product (Blackburn, 2012, p.396).

It is evident from global economic activities that supply chains have in fact turned out to be a lot longer and consequently slower. This is due to the movement of complete industries in a quest for cheaper manufacturing costs, resulting in lengthier and more time consuming supply chains. Blackburn (2012, p. 397) likewise posed this very relevant question: “if time is so valuable, then why are supply chains so long? If supply chains evolved like most other processes, they would be getting shorter and faster, but in general they have not. As inventory in the pipeline and in safety stocks rises, and the cost of carrying these inventories must soar.”

The solution in this imposed environment is that supply chains become speedier to compensate for these increases in costs. But we should also ask ourselves: how fast is fast enough and what is the cost of this extra speed? Is the extra speed and extra cost going to be justified by exceeding the benefits previously provided?

The answers will depend on the type of product or service in question. According to Blackburn (2012, p. 397), in products where “speed is particularly important in the asset

recovery, such as consumer electronics which experience rapidly deteriorating demand and loss of market value over time, firms should invest heavily in speed of product recovery. However, firms whose products experience relatively stable demand will have lower marginal value of time, implying lower benefits to speed of recovery. These firms face stricter limits on time-based competition and should design their reverse supply chain to reduce cost, rather than time."

In global supply chains, this interrelationship between cost and time often poses challenges as they are sometimes at odds with each other. A good example is an importer of retail goods who can freely import from his/her group of worldwide supply chains. In case of a choice of a national supplier, lead times would be short, however costs might be high. On the other hand, in case where a supplier from another country is chosen, lead times are much lengthier as restocking items becomes slower from a longer and more distant supply chain, inventory expenditure is also higher, however component production expenditure is generally lower. According to Blackburn (2012, 397), "a time-based (or quick response) strategy would imply sourcing closer to home for faster replenishment".

To resolve these issues of time-cost conflict, Blackburn (2012) considered marginal value of time for functional products whose demand is relatively stable and found that the benefits from faster lead times by producing closer to the firm's customers were outweighed by costs of production offshore inclusive of shipping, customs, distribution, currency conversion and all the other associated importing costs.

This finding provides sufficient validity for the global trend and "the growth of global supply chains as time-based competition in reverse" in functional goods, where time seems to be less valued than cost due to an improving quality of offshore manufactured products, with substantially "lower manufacturing costs and few economic barriers to lengthening the supply chain to tap those sources. Inventory costs alone are not an effective bulwark against the offshoring of functional products, and the low marginal cost of increases in time has effectively limited time-based competition (Blackburn, 2012,

p.403).” It further reinforced Fischer’s (1997 in Blackburn, 2012, p. 403) “recommendation that the supply chains for functional products should be designed more for cost efficiency than speed”. This small marginal time value offers some justification for the global increase in outsourcing.

Blackburn’s (2012, p. 403) article, however, examined only “the effects of lead-time changes on inventory costs in supply chains”, however, many additional supply chain costs such as “coordination, disruption risk, obsolescence” and integration costs exist too, which are equally if not more worthy of close research attention and detailed examination. Blackburn (2012) likewise suggested further research into “the value of time, scaled to unit product cost for innovative products as costs of obsolescence and markdowns become more dominant, raising the value of time-based response“(p. 403).

That is where this research becomes important, in the identification of the differences (gaps) between suppliers’ perceptions of customers’ expectations and the actual customers’ experiences in the expected speed of delivery of the goods or services to the customer and thus uncovering the value that customers place on time together with its comprehensible differentiation and impact on the expected level of service, cost and quality.

2.5.6 Chapter Summary:

The literature review chapter introduced the research phenomenon of unwanted supply chain performance from which new phenomena namely, the alleged differences between suppliers’ perceptions of customers’ expectations and the actual customers’ experiences in the expected level of service, quality, cost and speed of delivery were exposed. The link between knowledge and strategic deficiencies and supply chain gaps in the expected level of service, quality, cost and speed of delivery has been examined and evaluated in the context of the already published research approaches and their achievements or lack of it.

While no similar proposition to the one proposed in this thesis project could be found in the literature, an alternative concept that aims to identify the alleged gaps between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery and their causes in supply chain context has been prepared and presented.

Chapter 3: Research Methodology

3.1 Introduction:

This chapter depicts and rationalises the methodology that was utilised in order to pursue the research problem in this thesis. The components outlined and described in this chapter include: methodology, the theoretical framework, research philosophy and design, research approach, research methods, mixed methodology, research process and strategy and research process and data collection.

The researcher developed a set of hypotheses which were modified and verified with a focus group. From the modified hypotheses, the researcher developed two research instruments (questionnaires). The data was then collected through a select sample of customers and suppliers in conference room setting. IBM SPSS statistical software package was utilised to analyse data, obtained information and records. Finally, targeted population sample was tested according to survey results to verify whether the developed hypotheses were to be accepted or rejected and whether the developed model may have empirical validity.

3.2 Research Methodology:

Methodology can be defined as the plan of actions while methods are the techniques or procedures used to gather and analyse data related to some research question or hypotheses (Levy 2006). Based on the characteristics and assumptions of the two principal methodologies, quantitative methodology and qualitative methodology, have emerged in the social sciences (Creswell 2003). The former methodology is based on positivism, while the latter builds on interpretivism/realism.

According to Burrell and Morgan (1979, p. 6), "quantitative methodology is essentially a nomothetic methodology drawn upon systematic protocol and technique. In contrast, qualitative methodology is an ideographic methodology, which 'stresses the importance of letting one's subject unfold its nature and characteristics during the process of investigation". As such, it is more fluid in process (Tsoukas 1989). Some authors appear to favour one methodology over the other.

However, the following table shows that both methodologies have their respective strengths and weaknesses. In essence, while quantitative methodology is used when testing already constructed theories, qualitative methodology provides descriptions of people's understandings of a phenomenon. Furthermore, quantitative methodology may lack generalisation as researchers may be too general or abstract in describing any phenomenon of interest. Qualitative methodology also can be criticised as researchers' personal bias which may affect results.

Table 1: Strengths and weaknesses of quantitative and qualitative methodologies

Methodologies	**Strengths**	**Weaknesses**
Quantitative	- Testing already constructed theories about how phenomena occur; - Allow generalisations when research has been replicated on different populations; - Useful for obtaining data that allow quantitative predictions to be made; - Eliminates the confounding influence of many variables allowing assessments of cause and effect relationships;	- The researchers' theories and categories that are used may not reflect local constituencies' understandings; - The researcher may miss out on phenomena occurring; because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation (i.e. confirmation bias);

	- Results are relatively independent of the researcher; - Useful for studying large numbers of people;	- Knowledge produced may be too general and abstract for direct application to local contexts, settings, and individuals;
Qualitative	- Provides description and understanding of people's personal experiences of phenomena; - Can describe in detail phenomena that are situated in local contexts; - Useful for understanding how participants interpret 'constructs' - Responsive to local situations, conditions, and stakeholders' views; - Responsive to changes that occur during the conduct of a study - Useful for studying a limited number of cases in depth.	- It is more difficult to make quantitative predictions, and test theories and hypotheses; - It takes more time to collect and analyse data compared to quantitative research; - Results are more easily influenced by the researcher's personal biases and idiosyncrasies; - Knowledge produced may not generalise to other people or settings.

Source: Adapted from Johnson & Onwuegbuzie (2004, p. 20)

The differences between the two methodological approaches are often perceived as differences in the quality of social research. This has resulted in a classic debate about which methodology is better (Sarantakos 1993, p. 55).

This, in turn, according to Sieber (1973, p. 1335) in Johnson & Onwuegbuzie (2004), created two traditional research cultures, "one professing the superiority of deep, rich observational data and the other the virtues of hard generalisable data" (p. 14).

However, while each methodology has its strengths and weaknesses, several authors suggest that the two methodologies can be compatible (Guba & Lincoln 1994; Bamford & Deibler 2004). In line with this view, Newman and Benz (1998, p. 20) argue that 'neither the qualitative research philosophy nor the quantitative research philosophy encompasses the whole of research. Both are needed to conceptualize research holistically.' According to Bond et al. (2004, p.22), "the two types of data should not be seen as distinctly separate. The test is appropriateness." Research method must be chosen on the basis of research data that is needed to answer the research problem. "The research problem comes first, the type of data appropriate to it comes second, and the type of method to generate that data comes third" (p. 22). Even though the research problem in this thesis could employ both methodologies, for the purposes of testing the newly developed supply chain model, this thesis mainly relied on quantitative methodology. Nonetheless, qualitative elements could not be ignored and were incorporated into the survey instrument employed. Thus the two methodologies are going to supplement each other to achieve breadth. This research has for that reason combined elements of both research philosophies.

3.3 Mixed Methodology:

Johnson & Onwuegbuzie defined mixed methodology as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (2004, p. 17).

Using mixed methods can be justified, with social research methodology along three main lines (Morgan 2007): (1) the underlying logic that guides a research design in relation to how theory is connected to data; (2) the relationship between the researcher and the research process; and (3) the inferences made from research results, whether results are context-dependent or generalizable.

In conclusion, it can be argued that there is no 'right' methodology, but the appropriateness of the methods used comes from their suitability to the research question

and objectives that affect the research process and strategy adopted. In this respect, Sarantakos (1993, p. 56) states: "quantitative and qualitative methods are the tools of trade for social scientists, who use them according to the circumstances, that is, according to the research question, the available resources, the research conditions and most of all the type of information required. The two methods are different; they serve different research needs and produce equally useful but different forms of data". In this thesis, research questions have been answered through a combination of quantitative and qualitative inquiries contained and derived from the two types (customer and supplier) questionnaires.

3.4 Research Methods:

As previously mentioned *methodology*, according to Levy (2006, p.371) "is defined as the plan of action (e.g. Grounded Theory) and *method* is the techniques or procedures (questionnaires) used to gather and analyse data related to some research questions or hypotheses". Methodology therefore guides the researcher in the choosing of methods which further outline the approach in which they are applied.

As this is predominantly a quantitative study aimed at testing a newly developed model, a quantitative research method (questionnaire survey) led this research project supplemented by the focus group observation method and face to face interaction during the data collection process. Since the study examined a mix of quantitative and qualitative responses, a discussion and analysis of both types of responses supplemented each other, thus making it a mixed methodological project. The project initially started with a focus group pre-testing of a set of hypotheses and a pre-test questionnaire, which were subsequently modified together with the research model. The following section provides the description and justification for the quantitative survey (questionnaire) method's use in this thesis project in conjunction with unobtrusive self-reported and focus group observations followed by the justification of the grounded theory framework.

3.4.1 Quantitative Survey (Questionnaire) and Respondent Observation:

The final stage of this research project was carried out by the use of a questionnaire survey administered and distributed to a sample pool of customer and supplier respondents. This was a conference room survey. According to Fowler (2002) a survey is a very impersonal data collection technique. It usually includes a researcher controlled questionnaire whose return is administered by either the researcher directly collecting responses or the postal or email service. Questionnaires can also be administered and stored electronically through the internet. These are also some of the cheapest data collection methods available. The same cost advantages apply to the processing and data analysis.

Another very important advantage of a questionnaire survey method of data collection is that it can be sent to any part of the world and thus any targeted population sample (Hussey and Hussey, 1997). It also has the potential to minimise bias as it is quite impersonal and objective, it provides the respondents with the opportunity to remain anonymous, and gives them more flexibility and time to research and find out more about the topic before replying if and when they choose to do so (Holt, 1997).

Some of the disadvantages of this method of data collection are that busy respondents often have no time to devote to answering questionnaires making it a fairly low response method. Thus, researchers are advised to selectively make them as short and simple and as quantitative as is possible while maintaining the integrity of the project (Tan, 2002). For that reason, researchers need to minimise asking open questions and stick to the point. Furthermore, questionnaire surveys do not provide any prospects of obtaining a different or expanded answer apart from the closed answer on it. The information provided in ambiguous responses can seldom be verified and it lacks the face to face evaluation and review. The researcher can never tell if the person to whom the questionnaire has been addressed is the same person that filled it in.

These are all obvious disadvantages, which can be overcome by the use of another methodology such as qualitative interactions or surveys where the researcher is personally present or directly involved in the data collection process (Tan, 2002).

This however to an extent can be overcome by the application of a conference room survey, where the researcher may personally instruct and interact if requested by the respondents and observe the respondents' behaviour, the process, and on the spot collect the filled in questionnaires (Veal, 2005).

As the phenomenon of supply chain gaps is blurred and uncertain and in particular those gaps that relate to suppliers' perceptions of customers' expectations and the actual customers' expectations in the expected level of service, quality, cost and speed of delivery and its impact on supply chain, to gain perspectives on this, in the beginning of the data collection process, an exploratory initial pilot questionnaire was designed and distributed to a focus group in a single session, for its verification and possible modification.

Pilot questionnaires are typically carried out before a more specific research is conducted (Lim and Low, 1992). The aim of the pilot study through a focus group meeting was to examine the coherence, inclusiveness and data collection accuracy of the questionnaire. Though, the author of this research initially prepared and designed all of the survey questions and arranged meetings to be held, focus group discussions were conducted without the researcher's active participation in order to minimise any potential bias Namely, the researcher acted as an observer only and took notes during the process. Focus group opinions were noted down during brainstorming and after the discussions were concluded.

In this thesis, the pilot questionnaire tried to find out how deep this research phenomenon of supply chain gaps in supply chain organisations is and in such a way assist the research direction by making it more focused on the collection of significant data that can be successfully analysed (Ling, 1998). The phenomenon explored in the pilot study was

addressed through the following question: *why supply chain management does not achieve its anticipated outcomes in the supply chain industry?*

In the final stage of the research, two different questionnaires were designed, one for each specific respondent group, namely, supply chain customers and supply chain management. The scale used in the questionnaire was adapted from literature (Alreck and Settle, 2004) while the questions tested in the questionnaire were based on the verified hypotheses and the novel concept of gaps in the expected level of service, quality, cost and speed of delivery to customers in supply chain organisations, developed by the author.

For example, the questionnaire designed for supply chain customers positioned the four phenomena being researched as comparisons between customers' expectations and actual customers' experiences based on the perceptions of performance of the goods' and services' attributes, an approach that allows for individual differences amongst research respondents in the dimensions that indicate the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations (Zeithaml, 1988).

Each questionnaire included an introductory letter describing the area of research and the purpose and benefits of the survey. Instructions were also provided to simplify the filling in of the questionnaire and clarify any potential bias. The researcher was also on hand to immediately discuss any issues arising from the research, thus gaining a much better overview and understanding of the respondents' way of thinking and understanding of the issues being analysed.

The straightforwardness of the process that could be observed in fact unveiled a particular trend in the raising of issues of significance and intriguing concern that individual respondents were raising with the researcher. It further assisted the uncovering of experiential differences in the roles that people perceive as either customers or suppliers and advanced the understanding of their modes of thinking and behaviours

when making supply and demand related decisions of concern to them. Even though, the researcher cannot be completely sure "how honest or accurate people are in responding to questions, the alternative is to observe their behaviour" (Veal, 2005, p. 30).

The qualitative part in this project presented in the form of open ended questions and its relevant answers, either as a list of factors affecting satisfaction levels and recommendations for improvements in all the researched phenomena from both customers' and suppliers' perspectives or any other matters of concern sought to be raised through observation and interaction during the data collection process were analysed separately and in a qualitative manner. The answers were scrutinised for their weight in importance according to the responses provided and the most important issues analysed and discussed in terms of their implications for both, customers and suppliers as well as their managerial and practical repercussions.

The next section introduces the grounded theory framework, its importance in the understanding of the new phenomena being researched and analysed and its justification in this thesis.

3.5 The Grounded Theory Framework:

The theoretical framework that has been chosen for this paper is based on the investigation of the "Grounded Theory Approach", which is an important perspective in the analysis of research data, and especially data that relates to uncovering a new phenomenon. In this research project, this conceptual theoretical framework is led directly by the research questions. It is important to mention that this research expands on the grounded theory of those who already did some work on some supply chain gaps, however evidently inadequate as contribution to the grounded theory in this research thesis has been derived through completely new findings as it is a completely new area of research in the supply chain field. Namely, the contribution to the theory that alleges, perceives and then tests and explains the differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the

expected level of service, quality, cost and speed of delivery to customers in supply chain organisations became evident as a result of this thesis project.

According to the author's belief and research knowledge, a theory grounded in research findings is the most appropriate in meeting the objectives of this research project. It was thus the researcher's intention to provide more evidence or an extension to the grounded theory already operational in a similar context.

This theory had been originally developed by Glaser and Strauss in 1967, and is 'concerned with the generation of theory from research, as opposed to research that tests existing theory'. In the context of this theoretical framework, 'models and theories should be grounded in empirical observations rather than being governed by traditional methodologies and theories' (Veal, 2005, p. 137).

In the context of supply chain operations and its key entrepreneurial functions of each entrepreneur participant, an understanding of "participants' behaviours from their points of view, their interpretations, their dynamics and properties of interactions, contextualised within their worlds – grounded theory advances such underlying principles of inquiry" (Douglas, 2004. p. 61).

"Grounded theory research is methodologically appropriate for researching both the entrepreneurial domains of economic explanation theories and psychological-cognitive-behavioural perspectives" (Douglas, 2004. p. 62).

According to Jones (1987, p.25) "grounded theory works because rather than forcing data within logico-deductively derived assumptions and categories, research should be used to generate grounded theory which fits and works because it is derived from the concepts and categories used by social actors themselves to interpret and organise their worlds".

As stated by Strauss and Corbin (1998, p.12) "this theory differs from other approaches to data analysis in that it allows researchers to start a project afresh, without a "pre-

conceived theory in mind" and he or she starts "with an area of study and allows the theory to emerge from the data". It also according to Patton (1990), allows for the generation of research questions at the start of the research study, from which focus for the analysis of data directly flows.

Locke (2001 in Smith et al. 2002, p.122), reminded us that "the original methodological monograph was written as a polemic against hypothetical-deductive; speculative theory-building and its associated research practices that characterised the sociological context of the time". Glazer's and Strauss's work encouraged researchers to be more imaginative and creative in the development of theories and showed a specific method by which it might be accomplished through both experimentation and empirical testing of the phenomena being researched, analysed and applied.

The central feature in the development of a 'grounded theory' is a 'method of constant comparative analysis in the same way as experimental and statistical methods use the logic of comparison.' The main emphasis in the method is on its process (Smith et al. 2002, p. 122) which "allows obtained data and its analysis to take place almost at the same time, from which the process itself and its research outcome are formed".

Grounded theory is thus in the words of Denzin and Lincoln (1994 in Douglas, 2004, p.59) "a means of explaining how socially constructed experience is created and given meaning".

According to Douglas (2004, p. 60 and 63) 'the emergence of meaning from data, but not data themselves, predicates grounded theory as a systematic research approach to understanding a particular social phenomenon, about which little is known'. The social phenomenon that was researched and tested in this project was the *unwanted supply chain performance* derived from the differences (gaps) between suppliers' provisions of goods and/or services due to suppliers' perceptions of customers' expectations and the

actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations.

Douglas (2004) further argued that "the explanatory power of grounded theory is to develop predictive ability – to explain what is happening and why and what may happen to a business, or an entrepreneur, given incidents that tend towards replicating previous grounded and other interpretivist theories. Naturally, the wider the theoretical sampling frame develops, the more embedded (and grounded) the theory is established, and whilst generalisability in the naturalistic world of enterprise requires circumspection, general theories can emerge from within the qualitative paradigm" (p. 63).

In this context, this research project aimed to show why and what may happen to supply chain organisations, given the application or a lack of proper mapping and identification of gaps and factors causing them, in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

3.6 Research Philosophy:

According to Headley and Choi (1992), gap analysis could be employed to identify the failure of some management programs. However, Headley and Choi (1992) did not use gap analysis for supply chain management programs. One possible reason is that the field of gap analysis is still in its infancy. This means that the use of gap analysis models to identify the different kinds of defects (gaps) such as *supply chain gaps* has not been developed yet.

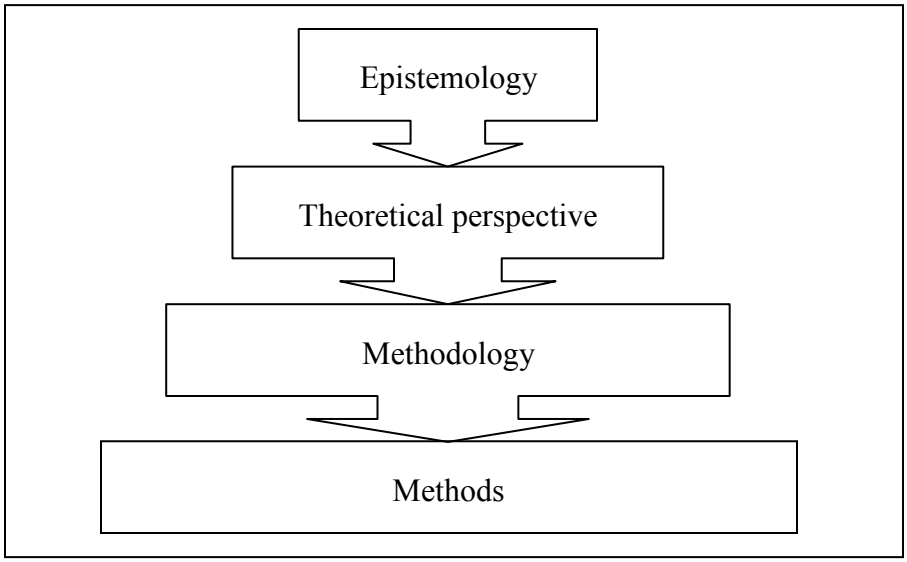
However, Creswell (2003) and Newman and Benz (1998) argue that any methodological decision could be influenced by a particular research philosophy. Therefore, it is necessary to explain the research philosophy. In general, most research programs are underpinned by philosophical assumptions which dispose social scientists towards adopting various paradigms, methodologies and research tools in the pursuit of their inquiries into social phenomena (Karami et al. 2006). Kuhn argues that ”paradigm refers to an entire set of beliefs, values, techniques, and so on, shared by members of a given community” (1962, p. 162).

Theoretical viewpoint or perspective according to Crotty (1998 in Levy, 2006, p.374) is illustrated as: “the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria methods and linking the choice and use of methods to the desired outcomes”.

Guba & Lincoln on the other hand, describe a research paradigm as “the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways” (1994, p. 105). While ontology bears on the degree of subjectivity versus objectivity, an epistemology determines the type of knowledge that can be obtained about the phenomena being studied (Cornford & Smithson 1996).

Philosophers of science and methodologists have been engaged in a longstanding epistemological debate about how best to conduct research (Karami et al. 2006). Levy (2006) states that there are four elements that control research design. The following figure shows that method choices and methodological selection in any research should relate to a theoretical perspective that underpins the research.

Table 2: Philosophical framework



Source: Crotty (1998 in Levy, 2006, p.372)

This theoretical perspective in turn relates to an epistemology that governs all the other three elements. Several authors argue that there are many and diverse theoretical perspectives that have historically influenced the direction, structure and process of research in the social sciences (Crotty 1998; Guba & Lincoln 1994; Levy 2006). However, two research paradigms are dominant in the literature and have provided the basis for various methodologies. The debate has centred on the relative value of two fundamentally different competing schools of thought or paradigms, the logical positivist approach and the phenomenological/realist (interpretive science) inquiry (Shaw 1999), shown in the following table.

Table 3: Key features, strengths and weaknesses of positivism and realism paradigms

Theme	**Positivism paradigm**	**Realism paradigm**
Basic beliefs	The world is external and objective;	The world is socially constructed and subjective;
	Observer is independent;	Observer is part of what is observed;
	Science is value-free;	Science is driven by human interests;
Researcher	Focus on facts;	Focus on meanings;

should	Look for causality and fundamental laws;	Try to understand what is happening;
	Reduce phenomena to simplest elements;	Look at the totality of each situation;
	Formulate hypotheses and test them;	Develop ideas through induction from data;
Strengths	It can provide wide coverage of a range of situations; It can be fast and economical where statistics are aggregated from large samples;	Data-gathering methods seen more as natural than artificial; Ability to look at change processes over time; Ability to understand people's meaning; Ability to adjust to new issues and ideas as they emerge; Contribute to theory generation;
Weaknesses	The methods used tend to be rather inflexible and artificial; They are not very effective in understanding processes or the significance that people attach to actions; They are not very helpful in generating theories.	Data collection can be tedious and requires more resources; Analysis and interpretation of data may be more difficult; Harder to control the pace, progress and end-points of research process; Policy makers may give low credibility to results from a qualitative approach.

Table source: Amaratunga et al. (2002, p. 17)

A positivist epistemology addresses the need for independence of the observer from the subject being observed, and the need to formulate hypotheses for subsequent verification (Remenyi 1998). The phenomenological approach tries to understand and to explain a phenomenon by inductively and holistically understanding human experience in context-specific settings (Amaratunga et al. 2002). The concept of a phenomenological approach

is central to the notion of didacticism, which claims that generalisations can be made from a finite set of events in the past to predict future events (Karami et al. 2006).

It has been argued that within a research design, the issue becomes not whether one has uniformly adhered to prescribed principles of either logical positivism or phenomenology as each has strengths and weaknesses depending on the point of understanding the discipline, but whether one has made sensible methodological decisions, given the purpose of the study, the questions being investigated, and the resources available (Easterby-Smith at al. 2001).

In this study, the realism paradigm highlights the phenomenon of supply chain management failure. However, the positivism paradigm is employed in investigating a gap analysis model of gaps that affect supply chain performance outcomes. As such, this adapted philosophy is compatible with the research problem which aimed to investigate the role of gaps in the expected level of service, quality, cost and speed of delivery to customers in enhancing supply chain management success. This in turn introduced the importance of developing a theoretical perspective to conceptualise gap analysis in supply chain management.

3.7 Research Design:

This section introduces *research settings*, *sampling frames* and *research subjects* adopted in this project.

3.7.1 Research Settings:

This thesis project's aim was to test a novel supply chain model. Data collection process was carried out in a conference room setting via a direct interplay of participants and the researcher. Though settings in which both quantitative and qualitative research is occasionally conducted may pose some limitations (Eisenhardt and Graebner, 2007; Eisenhardt, 1989), the researcher needs to be adequately prepared to foresee and address

such limitations, whether they be in relation to any research aspect (e.g. functioning of particular equipment, seminar room reservation, introductory research letter distribution, confirmation of research participation by research subjects etc). In this project, data was collected mainly via survey instruments (questionnaires) completion and the researcher's self-reported observation as well as participatory discussion relating to any issues arising from the questions being raised in the questionnaires for either, customer or supplier respondents. The researcher at all times maintained a distance from the respondents during the filling in of the questionnaire and only at respondents' request replied to an issue or a necessary clarification being raised, thus upholding professional forms of interaction and codes of conduct as regards all research steps and upholding the highest communications principles in all forms of interaction.

3.7.2 The Sampling Frame and Research Subjects:

As this research project relates to the testing of a novel supply chain model targeting the differences perceptions that suppliers have of customers' expectations and the customers' actual experiences and a likely impact on supply chains' performance, research data and information were assured through the participation of a select pool of conference room participants experienced with the issues facing both supply chain customers and suppliers. The size of the population selected were 20 supplier and 40 customer (participant informants), who see the issues or the phenomena being researched from different angles or perspectives (Eisenhardt and Graebner, 2007). The choice of research informants has been sufficiently diverse and representative for the testing of the model.

No project of this significance has been found to have ever been conducted in the field of supply chain differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery to customers and its impact on supply chains. The research subjects in this sample population have a good understanding of supply chain issues affecting both consumers and suppliers.

The participants in this project came from a mixture of consumers and professionals aware and well informed of the issues facing today's supply chains. It allowed the researcher to provide an overall picture of the developments in the phenomena being researched and analysed. The exact number of participants was chosen upon consultations with the principal supervisor and independent professional business consultants for the purposes of being sufficiently representative to test the developed model and producing a valid research contribution and achieving its own objectives and further academic and supply chain industry practice ramifications and effectiveness.

3.8 Research Approach:

There are different classifications used to define the research approach (Kindon et al. 2007; Wellington & Szczerbinski 2007). Galliers et al. (2006) divides the research approach into a description of the general style of the research venture, and a methodology that combines the use of a set of distinct methods and techniques.

Several authors report many approaches describing research style. Morrison and George (1995) argue that there are four research styles: formulative, evaluative, descriptive and developmental. Under this classification, this study is formulative, where a gap analysis model of supply chain outcome discrepancies has been formulated using a deductive approach through historical and theoretically accumulated knowledge set forth in the literature.

This study can also be described as evaluative as it involves a development of scientific method by generating hypotheses and evaluating them in an experimental supply chain context. It can be argued that this study can be descriptive in that it explores areas of supply chain management failure and performance. As the expected results may contribute to enhancing management theory in general and supply chain management and knowledge management contexts in supply chain firms in particular, this study can be seen as developmental.

Conford and Smithson (1996) divide research styles into constructive, nomothetic and idiographic. Constructive style refers to conceptual and technical development. Nomothetic style includes formal-mathematical analysis. Idiographic style represents case studies and action research. This study conforms to both constructive and nomothetic styles where a formulated gap analysis model has been developed and a survey questionnaire has been produced to identify supply chain gaps in the expected level of service, quality, cost and speed of delivery to customers and their likely impact on performance.

From a different view, Galliers et al. (2006) classify research styles into two broad approaches: scientific and interpretivist. The scientific/empirical approach, that is based on the basic assumptions of the positivism paradigm where a prior theory is tested through an analytic approach. On the other hand, the interpretivist approach would see a phenomenon as something that cannot be generalised or developed to theoretical standards. For this study, however, a scientific style has been adopted as the gap analysis approach in supply chain management theory was formulated and studied within several sectors, and a new formation of linking supply chain management success/failure with the management of possible gaps in the expected level of service, quality, cost and speed of delivery has been suggested.

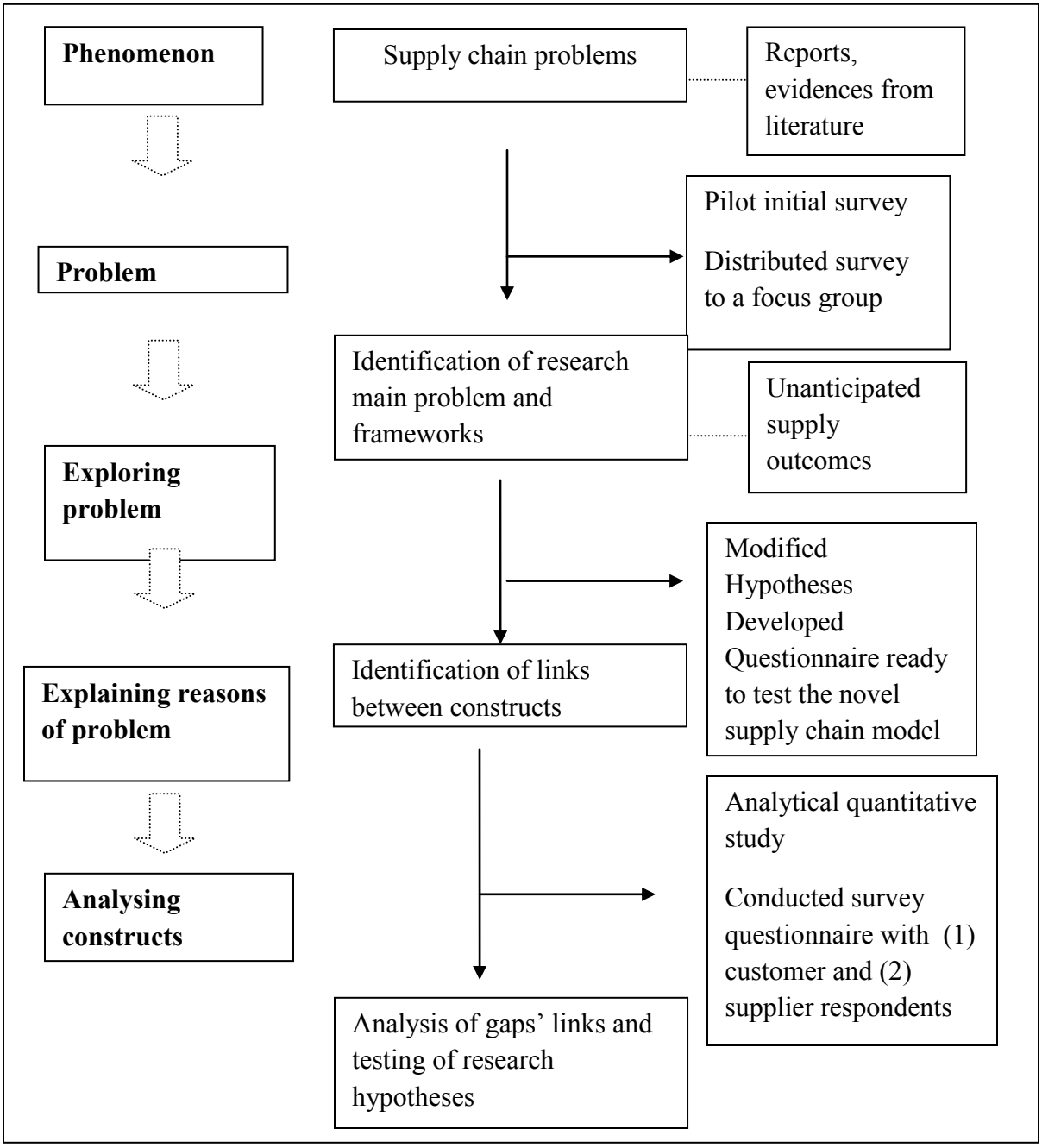
3.9 Research Process and Strategy:

According to Yin (1994), a research strategy should be chosen as a function of the research situation. Based on the development of research questions and objectives, this research is interested in studying a phenomenon related to *unwanted* supply chain performance outcomes in its industry. This phenomenon is later described as 'supply chain performance gaps' and is suggested as a reason for four sets of defects (gaps); in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in supply chain organisations.

As a consequence, it reflects the research question, *how can supply chain firms tolerate any possible gaps while advancing a supply chain management approach with the main goal to boost company / chain's effectiveness?*

The following figure shows the proposed process.

Figure 4: Research process



The research process flows in three main sequential stages *where findings from each stage format the strategy of the stage that follows*. Stage 1 comprises of an initial pilot survey using a survey distributed to a focus group. This *exploratory phase* aimed also to identify how pervasive supply chain-related problems are in the supply chain industry.

Upon suggestions for changes, relevant modifications were made to the hypotheses in stage 2. After the modification process had been completed, the new questionnaire was designed according to the changes made to the hypotheses. The objective of the questionnaire was to test the novel model developed in this thesis. By employing a survey instrument (questionnaire), insights into the proposed possible links between gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and their likely causes in global supply chain organisations were developed. The aim was to identify links between the four main research constructs, namely gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and their likely causes. This likewise helped the development of the research questions and hypotheses that assisted in identifying likely critical gaps while adopting a supply chain management approach.

Following this step, an analytical quantitative study was adopted in stage 3. This third stage was conducted through a distribution of a survey questionnaire to two groups: (1) customers, and (2) supplier respondents. This stage sought to obtain the groups' perceptions with respect to the degrees of expected (planned) and actual (delivered) experiences in mapped activities, revealed supply chain gaps, and supply chain performance indicators. Analysing the results gave insights into possible critical gaps and possible links among them.

A mixed methodology was suggested in this research. Greene et al. (1989) argued that there are five purposes for mixing qualitative and quantitative methods of research in one project or study. These are triangulation, complementarity, development, initiation and expansion.

The effectiveness of triangulation is based on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another (Greene et al. 1989, p.259). Greene et al. further describe: Complementarity as one which 'seeks elaboration, enhancement, illustration, clarification, of the results from one method with the results from another'. Development uses the 'results from one method to help develop

or inform the other method'. Initiation 'seeks the discovery of paradox and contradiction'. Finally, the aim of expansion is to widen the scope of inquiry by 'using different methods for different inquiry components' (1989, p. 259).

3.10 Research Ethics:

The key ethical consideration that concerns this research project relates to the preservation of anonymity and confidentiality of the participating respondents, which was a conditional factor before they committed to the participation in the project.(Frey and Fontana, 1994).

3.11 Research Process and Data Collection:

As this is mixed quantitative-qualitative research project, it was expected that it would be loaded with a lot of information and data (Eisenhardt and Graebner, 2007). The research was subdivided into separate sections as regards different research attributes being examined and then analysed. The knowledge that needed to be mapped was identified once quantitative and qualitative data were collected and entered into the IBM SPSS statistical package software. Mean values for both expected (planned) and actual (experienced) attributes being tested in conjunction with a t-test, frequencies and cross-tabulation analysis were used to either reject or accept the hypotheses based on the most overwhelming answers provided by the respondents. Decisions about what critical knowledge needed to be mapped were also drawn from the results.

According to the research process outlined in the previous section, a *sequential explanatory strategy* is adopted in this research. Creswell (2003) identifies three key parameters that define the purpose, content and structure of mixed methods/strategies: implementation, priority and integration. Implementation of quantitative and qualitative methods involves data collection in a sequential or concurrent manner, with priority given to one method over the other or both having equal status. A mixed methods research design requires that the two types of data should be mixed or integrated at one or

several stages during the research process depending on whether one follows a sequential or concurrent strategy.

This study starts by adopting, after an initial survey, a modified approach to explore the research phenomenon with respect to the supply chain industry. Focus group's suggestions regarding the phenomenon being researched also aimed at improving the initial survey instrument were adopted before the final instruments (questionnaires) ready for distribution to the sample population were produced in order to seek their opinions on reasons for supply chain discrepancies and linkages to gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers.

Following this step, a quantitative analytical questionnaire was designed to analyse and identify areas of *supply chain gaps* while adopting a supply chain management approach. The following paragraphs describe highlights of the research process followed at each stage.

Research process stage 1: An exploratory pilot and questionnaire design test

Stage 1 of the data collection process aimed to explore a phenomenon related to problems associated with supply chain performance outcomes. It has been documented that several authors and reports highlighted defects in supply chains and showed hazardous results of these defective chains. Nevertheless, complaints arise from time to time regarding problems related to the management of supply chains (Lazarevic 2003). However, it was unclear what areas of supply chains suffer from defects and need more attention.
In the supply chain domain as well, it was unclear how deep this phenomenon regarding differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery and its impact on supply chain performance went. To gain perspectives on this, an exploratory initial survey was designed and distributed to a focus group.

The aim of this exploratory phase was to investigate how pervasive the research phenomenon is, which has been stated as *why supply chain management does not achieve its anticipated outcomes in the supply chain industry?*

Research process stage 2: Modification of the model and survey instrument

Expanding the findings from stage 1, stage 2 aimed to adopt any suggested changes that could improve the survey instruments before the commencement of testing of a novel supply chain model with a target sample population. This stage was necessary in order to streamline the relevant sections and all individual questions that would enhance an understanding of the possible links between supply chain gaps in the expected level of service, quality, cost and speed of delivery of products and/or services to customers and their likely causes and supply chain performance.

In this phase, the design of modified survey instruments (questionnaires) upon suggestions from focus group members who have knowledge of supply chain management processes took place.

Research process stage 3: An analytical quantitative study

Following the suggestions from the previous stages, a quantitative study was adopted in this stage. This stage aimed to present an analysis of links between research constructs: supply chain gaps in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers and their likely causes and supply chain performance. The objective of this stage, then, was to test the hypotheses developed after stage 2 based on a statistical investigation through a sample population of respondents.

This stage therefore aimed to identify possible critical gaps in the supply chain industry with respect to supply chain management and supply chain performance and possible casual relations among them. To identify these gaps, two survey questionnaires were developed and distributed to two groups of conference room respondents: (1) customer

and (2) supplier respondents. Found discrepancies among the two groups' responses identified the gaps previously described. Using statistical means between constructs led to testing the developed hypotheses.

Questionnaire surveys' analysis has been used to test that the hypotheses undertaken justify and confirm the grounded theory employed.

Even though this study intends to combine both quantitative and qualitative methods, it is predominantly a quantitative research project. Quantitative surveys such as questionnaires are relatively cheap and provide good opportunities for random as well as targeted population samples. They are also amongst primary methods claiming some statistical accuracy (Kind et al. 1998).

Qualitative research on the other hand is particularly strong in 'understanding the processes and perceptions involved in a particular empirical context because it focuses on people's understanding and interpretations, rather than finding external causes or laws for behaviour' (Ticehurst and Veal, 2000, p. 95 in Pratt, 2005, p. 22).

Clegg et al (2001) likewise claim that "understanding the dynamics of an organisation's social processes is necessary for understanding the link between the internal and external forces and factors that influence integration" (p.26).

According to Tuchman (1998, p. 38) "qualitative data is more likely to let the researcher see how a social world seemed and felt to a variety of its members.
However, combined with quantitative methods, they are more likely than either qualitative or quantitative-based approaches alone to reveal process".

Furthermore, Strauss and Corbin (1990) argued strongly in favour of a mix of research methodologies, "particularly where little is known about the area of study", such as the evaluation and adoption of supply chain management systems model aimed at bridging the differences (gaps) between suppliers' perceptions of customers' expectations and the

actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in global supply chain organisations and improving supply chain performance (Pratt, 2005, p. 21).

Strauss and Corbin further claim that a mix of quantitative and qualitative methods "can uncover and understand what lies behind any phenomena about which little is known" by providing intricate details (1990, p. 19). The phenomena that were examined in this research were supply chain gaps in the expected level of service, quality, cost and speed of delivery of goods/or services to customers in supply chain organisations and their likely causes and impact on supply chain performance outcomes.

3.12 Chapter Summary:

This chapter depicted the methodological steps pursued in this thesis project. It started with the description of two different philosophical perspectives, its approaches, weaknesses and strengths and justification for a mixed approach. The choice of the theoretical framework, methodology and methods used in this project were in fact decided by the research questions and research objectives which have driven the research process. Various stages of the research process, research design, settings, survey instrument, sampling frame and subjects were also described concluding with the detailed explanation of the stages involved in data collection.

Chapter 4: Development of the Hypotheses

4.1 Overview of the statement of the hypotheses:

It is quite a complex matter to supply the highest quality customer service unless the service providers know clearly what their customers expect from a particular form of service or product thereof. Information that is needed to assist such a quest can be obtained through various types of surveys. The proposed types of survey in this research questionnaires which are made up of both quantitative and qualitative elements.

As previously mentioned, customer expectations are beliefs held by customers regarding a particular product or service which serve as points of references or comparison standards that they compare products or services' performance against. Customers' evaluation of a particular product or service is a by-product of the expected with the actual performance outcome (Parasuramaran et al. 1985).

The importance of identification of differences (supply chain gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery for the management of supply chain organisations and their likely impact on organisations' performance are the main aims of these hypotheses. To investigate the above problem, it was necessary to formulate and if necessary modify the hypotheses. Reaching this stage it was envisaged that six hypotheses were to be used to support or otherwise the research problem as follows: The six hypotheses are introduced and explained below.

As depicted in the text above, expected service levels are interlocked with both suppliers' and customers' expectations. While suppliers expect to serve and match their customers'

expectations successfully, customers expect that the purchase transaction will provide them with the expected outcome or experience. Hence, the first hypothesis is developed.

Based on the work of Zeithaml et al. (1988, 1993), Parasuraman et al. (1985), Peck (2005), Hwang (2002), Lee et al. (2007) and Schmitt (2011), and as mentioned on page 35, the factors that could impact on the expected level of service are: proximity of distance between suppliers, warehouses or distribution centres and retail outlets to customers, availability of expected quality products and/or services in a timely manner, the way the service is delivered, suppliers' service capabilities, supply chain system and structural design decisions (minimum number and locations or warehouses/distribution centres and the decision on the demand of stock at the plant), suppliers' contractual stock delivery obligations and government and other business entity restrictions. Therefore, this hypothesis is supposed to test the relationship between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service to be delivered to the customer.

H^1 It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the **expected level of service** to be delivered to the customer.

Based on the research work by Parasuraman et al. (1985, 1988, 1991), Shemwell et al. (1998), Seth and Deshmukh (2005), Seth et al. (2006), Shahin and Samea, 2010), Lehtinen and Lehtinen (1991), Haywood – Farmer (1988), Gronroos (1984, 1988), Dabholkar et al. (2000), Johnston (1995), Philip and Hazlett (1997), Rosen and Karwan (1994), Ghobadian (1994), Ennew et al. (1993), Marsha and Adlakka (1992) and Groocock (2000), Foster and Gallup, 2002) and as mentioned on page 41 and page 42, the factors that could impact on service quality are: perceived and actual differences in reliability, responsiveness, tangibles, empathy and assurance and all of the other quality dimensions as mentioned by the above authors on pages 41-42, the differences in service delivery where the same person facilitates a poorer quality provision of the apparent same

service to a different client or customer, design associated gaps information or feedback associated gaps, implementation associated gaps, communication associated gaps, the difference between consumer's expectations and management's perceptions of service quality, the difference between management's perceptions of consumer's expectations and service quality specification, i.e. improper service-quality standards, the difference between service quality specifications and service actually delivered, i.e. the service performance gap, the difference between service delivery and the communications to consumers about service delivery, i.e. whether promises match delivery, the difference between consumer's expectation and perceived service, management perception versus service quality strategy and policy, service quality strategy and policy versus service specifications, service specifications versus ideal standards, service specifications external communication, customers' perceptions versus management perceptions, the discrepancy between management perceptions and service quality strategy, customers' perceptions versus employee perceptions, the discrepancy between employee's perceptions and management perceptions of customer, lack of coordination between various functions of the third party logistics provider, lack of organizational shared vision, poor management procedures and policies, improper communication between functions, poor planning and lack of facilities, rigid hierarchical system, poor communication mechanism, poor work culture, inadequate wage structure, customer/supplier balance of power, generalizable legal definition regarding customers' rights to products of merchantable quality and lowered prices due to cost pressures. Therefore, this hypothesis is supposed to test the relationship between suppliers' perceptions of customers' expectations and the actual customers' experiences in the quality of the goods and/services to be delivered to the customer.

H^2 It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the **quality** of the goods or services to be delivered to the customer.

Based on the research work of Christopher (1998), Christopher and Gattorna (2005), Sterman (2005), Hwang (2002), Schmitt (2011), Kim and Park (1985), Padmanabhan and Vrat (1990), Stank et al. (2001) and Pettersson and Segerstedt (2012), and as mentioned on page 46-47, factors that could impact on supply chain cost are: inefficiencies resulting into inventory write offs, excess capacity, layoffs, bankruptcies, zero interest financing, employee discounts for all, cash back incentives, factors such as price cuts, business financing, logistics costs, costs to attract and retain customers, skilled and non-skilled staff, infrastructure and asset maintenance costs, product/process workflow and information flow costs, contractual and trading relationship costs, risk management and operational, institutional, political, economic, social, legal, environmental and pathological costs among others, cost measurement based on calculated standard method as opposed to actual cost method represented by the sum of all manufacturing costs, administration costs, warehouse costs, distribution costs, capital costs and installation costs representing total supply chain cost, distance of travel, travel time limit, number and type of available vehicles, travel time constraints, speed, vehicle capacity, location of distribution/supply centres, transport information, traffic congestion, non-functional or damaged goods, goods returned for rework, the current level backordered, backorder duration, the length of a shortage, the amount of stock transported according to the warehouse pick up order and actual demand (difference between the target point of inventory and current stock plus previously placed but overlooked customer orders), changes in demand, penalty and ordering costs, increased inventory to prevent customer switching costs and supply and demand uncertainty, expected cost and cost variance via risk pooling (centralised) and risk diversification (decentralised) inventory management system. Therefore, the following hypothesis is supposed to test the relationship between suppliers' perceptions of customers' expectations and the actual customers' experiences in the cost of the goods and/services to be delivered to the customer.

H^3 It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the **cost** of the goods or services to be delivered to the customer.

Based on the work by Forrester (1958), Holmstrom (1994), Blackburn (2012), Li and O'Brien (1999), Stalk (1998), Sterman (2005) and Taylor and Fearne (2009), and as mentioned on page 50, factors that could impact on supply chain speed of delivery are: dynamics of supply chain structures (operational and behavioural factors), lack of a single forecast system by the entire chain, time delays in production, order fulfilment, transportation, processing delays, demand forecasting procedures, order batching to take advantage of scale economics or quantity discounts, rational responses to product shortages (phantom orders), demand variability and price fluctuations caused by promotions, horizontal and vertical integration, competition among and within firms, the availability of information to each organisation and department and incentives faced by each decision maker, mental models of the decision makers, their attitudes, attributions about other actors, and the heuristics and routines they use to interpret information they have and make decisions such as production, capacity and pricing, oversimplification of the environment, failure to account for feedback effects and its processes, accumulation and underestimation of time delays, failure to account for key stock and flow structures (including the discrepancy between aimed and present inventory levels, not taking into account those orders previously requested by customers, however not yet delivered) and rationality slow learning, amplification or misalignment of demand and supply, its oscillation and phase lag or delay, bullwhip effect stimulated by quantity discounts and poor production systems and inconsistencies with information and data handling procedures. Thus, the following hypothesis is supposed to test the relationship between suppliers' perceptions of customers' expectations and the actual customers' experiences in the speed of delivery of the goods and/services to be delivered to the customer.

H^4 It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the **speed of delivery** of the goods or services to be delivered to the customer.

Based on the work of Sterman (2005), Peck (2005), Houghton et al. (2003), Latour (2001) and Luvisen and Bendixen (2010) and as mentioned on pages 31-33, three groups of factors that could impact on the differences between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer are: instability factors, vulnerabilities and risk factors and modes of mental behaviour of decision makers in the supply chain. To fully answer the hypothesis below, it is necessary to sub-divide it into its constituent elements. Thus, the following hypothesis is further sub-divided into three sub-hypotheses which are supposed to test the relationship between the alleged causes of differences in suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of the goods and/services to be delivered to the customer.

H^5 It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon **by three groups of factors (instability factors, vulnerability and risk factors and modes of mental behaviour of decision makers in the supply chain**.

As already stated, the above hypothesis has been sub-divided into its three constituent sub-hypotheses. The first such sub-hypothesis deals with the first group of factors, namely; **instability factors**. Based on the work of Sterman (2005) and Peck (2005), **instability factors** such as capital, production, labour market and labour skill shortages, volumes of goods produced, unstable profit margins, income, network relationships, complexity, divided loyalties, disproportionate production, weak levels of customer service, needless resource investment, competition, deteriorated working conditions and supplier/customer and labour-management relationships and other associated factors could impact on the causes of differences or gaps between suppliers' provision of goods

and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer. Thus the following sub-hypothesis has been developed.

H^{5a} It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by **instability factors**.

The second sub-hypothesis deals with the second group of factors, namely: vulnerabilities and risk factors. Based on the work of Peck (2005), Houghton et al. (2003), Latour (2001) and Luvisen and Bendixen (2010) **supply chain vulnerabilities and risk factors** could impact on the causes of differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer. Supply chain vulnerabilities and risk factors operate at several levels: value stream/product or process level (workflows and information flows such as fiscal or business "inefficiencies or sub-optimal supply chain performance including the inability to react swiftly to volatility in demand and the changing needs of the market place, inaccessibility of plausible and trustworthy information, lack of information sharing, trust and cooperation), asset and infrastructure dependencies level (fixed and mobile assets such as high dependence on specific communications, distribution and transportation infrastructure, failure of communications links – information processing, equipment, call centres and the like, malfunction of production equipment, inaccessibility of production sites, field or facilities and distribution outlets and loss of experienced workforce), organisations and inter-organisational network level (contractual and trading relationships issues such as power reliance, power inequality or misbalance among partner companies, opportunism by either powerful customers or suppliers, failure of a single supplier, monopolies and

oligopolies, change in industry structure and customer/supplier power balance due to mergers, acquisitions or strategic alliance partnerships and loss of control and visibility due to outsourcing), and the environmental level (social and natural environment impacted by political, economic, technological, social, legal, environmental, geological, pathological and meteorological factors such as industry and economic restructuring as a result of the creation of demand for new and obsoleteness of existing products, lack of supply chain visibility, cooperation, coordination, integration, creation and start-up of new models and channels producing new and enhanced reliance among networks, companies and associated infrastructures, labour strikes, protests, product/service boycotts, inflation, unemployment, high living costs, man-made computer viruses, earthquakes, accidents, acts of terrorism and other related factors. Therefore, the sub-hypothesis that follows has been developed to test the mentioned causal relationship.

H^{5b} It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by **vulnerability and risk factors**.

The third sub-hypothesis deals with the third group of factors. Based on the work of Peck (2005) and Sterman (2005), modes of mental behaviour of decision makers in the supply chain could impact on the causes of differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer. These factors include but are not limited to decision makers' attitudes, attributions about other actors, and the heuristics and routines they use to interpret information they have and make decisions such as production, capacity and pricing, unanticipated side-effects or consequential risks to supply chain processes, arising from specific managerial decisions, requirements and industry trends such as demand for shorter lead times, outsourcing and increasing use of

global sourcing and supply, as well as "off-set" (politically determined counter trade agreements), industry structures, complexity of supply chains and the restrictions enforced by the safety-critical nature of the products besides other associated factors. Thus, the following sub-hypothesis has been developed.

H^{5c} It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by **modes of mental behaviour of decision makers in the supply chain**.

The final hypothesis relates to the impact that the expected level of service, quality, cost and speed of delivery may have on suppliers' performance outcomes. To assess the impact, necessary measurement and metrics need to be established and implemented. According to Gunasekaran et al. (2004, p. 333), "performance measurement and metrics have an important role to play in setting objectives, evaluating performance, and determining future courses of actions". Since the four attributes in this thesis are a mainly of intangible nature, intangible performance measurement values and metrics need to be applied.

"Measurement in its most general sense can be regarded as some form of mapping from a set of objects, events or properties, into some subset of the real numbers (Bond et al. 2004, p. 37)", whereas metrics are benchmarks against which a particular value is measured. Benchmarking, according to APICS (1998 in Soni and Kodali, 2010, p. 48) "is defined as the continuous process of measuring the company's products, services, costs and practices against those of competitors or firms that display the "best in class" achievements". As introduced in the abstract and discussed separately, this thesis intends to use process mapping or mapping techniques to identify sources of discrepancies (gaps) and their associated causes and then analyse those gaps for each attribute (expected level of service, quality, cost and speed of delivery) in terms of the number and type of gaps

identified against the performance level set by the supply chain organisation and its functional units. In addition, this thesis will examine relevant gaps in knowledge and strategic decisions or a lack of them that may impact on suppliers' perceptions of customers' expectations and the actual customers' experiences in the key product/service value attributes in question, namely, the expected level of service, quality, cost and speed of delivery of goods/and or services. These need to be neutralised or completely eliminated.

According to Allee (2008, p. 6), "intangible assets include relationships, employee know-how and competency, the effectiveness of the organisation's work groups and structure, the efficiency of the organisation's production and service processes, and the level of trust between the people or organisations forming the relationships. Trust is an expression of high degrees of social capital, both within the organisation and externally expressed as reputation and brand. Tangible assets are financial resources and other capital-based resources that are controlled by the firm".

A supply chain measurement model by Closs and Mollenkopf (2004, p.38) suggests *customer service performance measurements* to focus on "customer value-added including customer satisfaction, product flexibility, and delivery speed, *cost management* to focus on the functional and integrated logistics and supply chain cost components via total landed logistics cost, *quality* measurement via customer loyalty, based on the logic that superior service attracts and keeps key customers, and dependability, responsiveness, order flexibility and delivery flexibility".

External time performance, which is "directly perceived by the customers and articulated into: time to develop a new product (time to market), delivery speed and reliability, and system times (supplying, manufacturing and distribution lead times) is conditioned in the final analysis of the delivery times to the customers" (De Toni and Tonchia (2001, p.64).

Other measures relating to inventory capability are typically "order completeness (percentage of requested product actually shipped), fill rate (percentage or items available

for picking) or both, whereas cycle time refers to the time elapsed between receipt and delivery of a customer's order. Cycle time measures include both the length and the reliability of the order cycle" (Maltz and Maltz, 1998, p. 104).

Although, cited authors in this project have mentioned various metrics for measuring supply chain performance, besides which product flexibility and reliability, the explicit types of measurement that were proposed in this thesis measured perceived and actual values of the four attributes, namely, expected levels of service, quality, cost and speed of delivery. In fact, the author developed the following supplier performance measurement values and metrics. These are: customer satisfaction with the level of service, level of product/service quality provided, level of customer loyalty retained, speed of delivery achieved, customer cost satisfaction level, service staff performance level and overall impact on company reputation. Thus, the following hypothesis has been developed to test the above relationships.

H^6 It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer **impact on the performance** of supply chain organisations.

Chapter 5: Data Analysis and Results

5.1 Introduction:

Data obtained during the data collection process is presented and analysed in this chapter. This research project utilised survey instruments (questionnaires) with the aim to test the newly developed supply chain model through its six hypotheses. The two questionnaires were designed for two groups of respondents, namely, customers and suppliers (see Appendices 1 and 2). The customer questionnaire was comprised of seven sections, whereas the supplier questionnaire contained an additional eighth section, whose aim was to test supplier expected and actual performance outcomes. Customer questionnaire consisted of 55 questions, whereas supplier questionnaire contained 60 questions. Both types of questionnaires included a mix of quantitative and qualitative elements.

5.2 Questionnaire Layout:

All segments of the questionnaires' were designed with the hypotheses in mind at all times. Each section of the two questionnaires in a parallel form targeted individual attributes being researched and aimed to test each hypothesis in order to prove or disapprove of it. The first section of the customer questionnaire was comprised of seven questions, of which five were quantitative and two qualitative in nature. The five questions were designed to measure customers' expected and actual levels of service satisfaction followed by two open ended questions asking customers to list the factors that contributed to their overall satisfaction and their recommendations of what could have done to better serve or match their expectations.

The second section targeted customers' judgment on the six selected quality dimensions in relation to their expected and actual quality of products and/or services received from a supplier. Likewise, it concluded by asking for the list of satisfaction factors that most

contributed and recommendations on what could have been done better by the supplier to match their expectations.

The third section representing the cost attribute was comprised of three yes/no responses, one satisfaction rating and three open ended questions. These questions tested customers' judgments of the advertised and finally incurred cost, volume of discount and their recommendations to suppliers.

The fourth section measured customers' responses regarding expected and actual speed of delivery, its impact on their decision to use the supplier in the future or not and relevant recommendations for improvements.

Sections five, six and seven tested customers' attitudes and loyalty levels towards instability, risk and vulnerability factors and factors affecting modes of mental behaviour of decision makers in the supply chain and concluded with relevant recommendations. The supplier questionnaire targeted the same attributes through the same corresponding sections with slightly modified questions to suit the supplier profile and ended with section eight that was designed to measure selected supplier's expected and actual performance outcomes based on the values and metrics derived from the tested model. Thus, it was made possible to compare the responses from the two questionnaires through the corresponding data variables, and to note, analyse and evaluate any significant differences or gaps.

Tables 5.1 and 5.2 below describe the two questionnaires utilized in this thesis project.

Table 5.1 Customer questionnaire description

Section	Questions	Hypothesis Tested	Measured Values	Measure Used
1	1-7	H1	Expected and actual levels of service Level of service attributes, satisfaction factors and recommendations	5 point Likert scale and nominal
2	8-15	H2	Expected and actual quality received Quality dimensions, satisfaction factors and recommendations	5 point Likert scale and nominal
3	16-22	H3	Expected cost and volume discount evaluation, final cost satisfaction rating and recommendations	Nominal and 5 point Likert scale
4	23-27	H4	Expected speed of delivery evaluation, satisfaction rating with the actual speed, its impact and recommendations	Nominal and 5 point Likert scale
5	28-34	H5a	Perceived loyalty related to instability factors impacting on all research attributes	Nominal
6	35-47	H5b	Perceived loyalty related to risk and vulnerability factors impacting on all research attributes	Nominal
7	48-55	H5c	Perceived loyalty related to modes of mental behaviour of decision makers in the supply chain impacting on all research attributes	Nominal

Table 5.2 Supplier questionnaire description

Section	Questions	Hypothesis Tested	Measured Values	Measure Used
1	1-6	H1	Planned and delivered level of service, Level of service dimensions' ratings and recommendations	5 point Likert scale and nominal
2	7-13	H2	Planned and delivered quality, quality dimensions' satisfaction ratings and recommendations	5 point Likert scale and nominal
3	14-20	H3	Expected cost and volume discount evaluation, final cost satisfaction rating and recommendations	Nominal and 5 point Likert scale
4	21-24	H4	Expected speed of delivery evaluation, planned and actual speed of delivery satisfaction rating and recommendations	Nominal and 5 point Likert scale
5	25-32	H5a	Attitudes towards instability factors impacting on all research attributes	Nominal
6	33-45	H5b	Attitudes towards vulnerability factors impacting on all research attributes	Nominal
7	46-53	H5c	Attitude towards modes of mental behaviour of decision makers in the supply chain impacting on all research attributes	Nominal
8	54-60	H6	Expected and actual levels of supplier performance based on supplier's satisfaction rating	5 point Likert scale

This chapter is going to analyse and evaluate the results from these questionnaires in order to test each hypothesis.

5.3 Rate of Response:

The population sample chosen to test the novel model was 60 respondents of whom 20 supplier and 40 customer respondents. All of the questionnaires were personally distributed and collected by the researcher in a conference room setting, which brings the total response rate to 100 percent.

5.4 Hypotheses Testing:

In order to test each hypothesis, appropriate tests needed to be carried out and its results examined. To accomplish the objectives set for this thesis project, each section in the survey questionnaire which in fact corresponds to each hypothesis has been investigated. Each individual hypothesis was then tested with the most appropriate type of test in accordance with the research questions and the hypothetical statement.

The first four sections and thus the validity of the first four hypotheses were tested by using a mix of scale and nominal measures. Namely, the quantitative parts of the first four sections were tested using group statistics and independent samples test, whereas the qualitative part was tested by examining the frequencies.

The fifth, sixth and seventh section of the questionnaire were utilised to test hypotheses 5a, 5b and 5c respectively with the use of frequencies that measured the highest attitudinal responses on both respondent sides when testing the hypotheses' validity.
The last section in the questionnaire, section eight used paired samples statistical test to test the supplier performance for comparative and significant differences in the expected versus actual performance outcomes.

The onus of the testing process has been on a method of continuous comparative analysis of emergent data and its relation and impact on the research questions and the developed hypotheses, as stated by central principles in the development of a grounded theory.

5.4.1 Hypothesis One:

Hypothesis one assumes differences in supplier's perceptions and customers' actual experiences in the expected level of service to customers.

The hypothesis statement is as follows:

H1: It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the expected level of service to be delivered to the customer.

To test the hypothesis, it was necessary to merge data into a combined data file. The combined data file provided a platform for comparative analysis and subsequent discussion and conclusions drawn from it.

Section one in both surveys examined expected (planned) and actual (delivered) levels of service dimensions to customers in supply chain organisations. In order to test hypothesis one, group statistics and independent samples test were carried out for this purpose in the quantitative segment of the section. The qualitative part of section one examined level of service frequencies for the two qualitative questions.

Table 5.3 outlines combined data results for both expected and actual mean values obtained from the group statistics test and t – test and Sig. (2-tailed) results obtained through the independent samples test.

Table 5.3 Comparison of mean, t-test and Sig. (2-tailed) results

Group Statistics and Independent Samples Test	Customer Mean	Supplier Mean	t-test	Sig. 2-tailed
Level of customer service received (expected)	4.90	5.00	-2.082	.044
Level of customer service received (actual)	3.43	3.95	-3.068	.004
Product / service availability (expected)	4.88	5.00	-2.360	.023
Product / service availability (actual)	3.05	4.60	-8.873	.000
Supplier's capability to satisfy (expected)	4.90	5.00	-2.082	.044
Supplier's capability to satisfy (actual)	3.08	4.25	-6.830	.000
Product/service accessibility (expected)	4.88	5.00	-2.360	.023
Product/service accessibility (actual)	3.10	4.15	-4.792	.000
Product/service range (expected)	4.85	5.00	-2.623	.012
Product/service range (actual)	3.06	4.20	-6.705	.000

It can be seen that customers' expectations are somewhat lower than suppliers' perceptions of what customers expect of them in the expected level of service category, which is shown by the mean values. In all level of service dimensions tested, suppliers have a constant perception that customers expect very satisfactory outcomes, indicated by the mean value of 5, being the highest value on the 5-point Likert scale. On the other hand, customers' expectations are somewhat lower as represented by the mean value of 4.90 for the expected level of service, 4.88 for expected product/service availability or 4.85 for expected product/service range.

Furthermore, suppliers' actual delivered service evaluation recognises underperformance and a constantly higher mean value than their customers in all of the examined actual service dimensions category too. Though differences (gaps) exist in every evaluated dimension, the highest gap on the supplier side occurred in the level of service delivered with expected mean value of 5 and actual mean value of 3.95.

When comparing actual mean values between suppliers and customers, the highest gap occurred in the product/service availability dimension with supplier mean value of 4.60 and customer mean value of 3.05, which is very significant.

Mean values also demonstrated the level of importance that both examined groups of respondents paid towards each tested dimension. Whereas suppliers' paid equal importance to all of their level of service expected dimensions, customers paid most attention to the level of service received (mean of 4.90) and supplier's capability to satisfy their needs (mean of 4.90) with slightly lower expectations for the other service dimensions.

The same conclusion can be drawn by examining t-test and sigma Sig. (2-tailed) results. As is demonstrated, the variable showing the level of service received (expected) t value of -2.082 and its 2-tailed significance of 0.044 as well as its actual t value of -3.068 and its 2-tailed significance of 0.004 are below 0.05, which support the hypothesis. The same significance levels can be observed in the other variables too representing the other level of service dimensions and their associated t values and Sig. (2-tailed) results.

From this comparative analysis, as every dimension examined supports the hypothesis, a conclusion can be drawn that there are significant differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service to be delivered to the customer.

The expected level of service frequencies, highlight the most important issues to both customers and suppliers, which is an important consideration in the analysis of the results, however are not sufficient enough on its own to support or reject the hypothesis being tested. That is why quantitative results led this research project.

Customers listed various factors that contributed to their overall levels of satisfaction amongst which the most frequent were:

1) satisfactory service, staff effort and friendliness (5% of the total responses);
2) availability, accessibility and range (2.5%);
3) cleanliness and good relaxing atmosphere (2.5%);
4) close proximity to supply location (2.5%);
5) convenience and accessibility (2.5%);
6) good parking (2.5%);
7) excellent, fast and friendly service (2.5%);
8) good assortment, however could improve (2.5%);
9) staff trying to impress with alternative products/services (2.5%) and
10) staff involvement in problem solving (2.5%).

The most repeated recommendations that customers provided in relation to the improvement of the expected level of service concerned:

1) the need for better training of service staff in order to better resolve customer issues, an improvement in access to service locations and product choice (5% of the total responses) and;
2) a recommendation for a closer working relationship with customers that would significantly assist supplier performance (5%), with various other recommendations given less importance.

On the other hand, suppliers were asked to provide recommendations on how to improve expected levels of service and the most repeated recommendations that they provided in relation to the improvement of the expected level of service concerned:

1) better product/service range, more shelf space, better visibility, parking facilities and access (20% of the total responses);
2) better physical locations and online access to services/products (10%);
3) better understanding of customer expectations and experiences with the same products and/or services (10%) and
4) an improvement in capabilities and a more efficient service system to solve customer needs (10%).

By looking at the above recommendations, the obvious differences (gaps) in customer and supplier attitudes towards issues of importance to them are evident. Gaps in customer knowledge and customer strategy can also be observed from the above results indicating a need for a much more thorough preparedness, a more comprehensive and deeper customer knowledge which will inevitably influence a better strategic direction that suppliers may need to take. In the results just examined, suppliers also recognized the need to better understand customers' expectations and experiences which corresponds with the recommendation by customers that a closer working relationship with them is significantly improve supplier performance.
This is another set of factors which supports the hypothesis tested in this section.

5.4.2 Hypothesis Two:

Hypothesis two assumes differences in supplier's perceptions and customers' actual experiences in the quality of goods and/or services to customers.

The hypothesis statement is as follows:

H2: It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the quality of goods and/or services to be delivered to the customer.

Section two in both surveys examined expected (planned) and actual (delivered) quality dimensions. In order to test hypothesis two, group statistics and independent samples test were carried out. The quantitative part was mainly relied on, while the qualitative part evaluated quality dimension for frequencies in the responses provided.

Table 5.4 outlines combined data results for both expected and actual mean values acquired from the group statistics test and t-test and Sig. (2-tailed) results attained through the independent samples test.

Table 5.4 Comparison of mean, t-test and Sig. (2-tailed) results

Group Statistics and Independent Samples Test	Customer Mean	Supplier Mean	t-test	Sig. 2-tailed
Supplier reliability (expected)	4.95	5.00	-1.433	0.160
Supplier reliability (actual)	3.08	4.65	-8.846	0.000
Product / service quality (expected)	4.98	5.00	-0.704	0.323
Product / service quality (actual)	3.23	4.40	-6.652	0.000
Service staff attitude towards customer concerns (expected)	5.00	5.00		
Service staff attitude towards customer concerns (actual)	3.03	4.15	-6.195	0.000
Service efficiency (expected)	4.98	5.00	-0.704	0.484
Service efficiency (actual)	2.70	3.80	-5.045	0.000
Service feedback (expected)	4.98	5.00	-0.704	0.484
Service feedback (actual)	2.65	3.45	-2.874	0.006
Overall level of satisfaction (expected)	4.98	5.00	-0.704	0.323
Overall level of satisfaction (actual)	2.70	3.90	-6.826	0.000

Comparing both expected and actual customer and supplier mean values, a similar pattern as in the testing of expected level of service dimensions can be observed. Namely, suppliers' perceptions of customers' expectations regarding quality of products and/or services still hold top mean values of 5.00, 5 being the highest value. However, both customer and supplier perceptions in relation to quality are much closer to each other than was the case with the expected level of service, as a result of which a gap between the two groups is smaller. The evidence is shown through customer mean values of 5.00 in service staff attitude towards customer concerns dimension variable and mean of 4.98 in four of the other five remaining quality dimensions. Thus, it can be said that quality seems to hold the top position in the value proposition when compared to other value attributes. Its importance, for that reason should never be underestimated as quality products/services are recognized for what they are while pursuing quality outcomes.

In the actual delivered quality variables, suppliers' performance shows its own expectation gaps as well as evident gaps in the delivery expected and experienced by customers. These can also be classified or categorised as service quality experience gaps.

The highest of those supplier expectation gaps occurred in the service feedback dimension where customer expected mean was 5.00 and the actual mean value only 3.45. The highest service quality experience gap on the other hand occurred in the same service feedback dimension evaluation with an expected mean of 4.98 and the actual mean value of only 2.65.

These results can also be utilised to find out what quality dimensions customers and suppliers alike pay more attention to. As can be noted, suppliers pay equal expectation attention to all of the dimensions with the mean value 5.00, though underperforming differently in all of them. Customers on the other hand, pay almost equal attention to all of the quality dimensions, being almost identical with suppliers when it comes to quality expectations at 4.98 compared with the supplier mean value of 5.00. However, the differences or gaps appear mainly in the actual provision of goods and/or services to be delivered to customers. For example actual mean for supplier reliability on the suppliers' side is 4.65, while on the customers' side only 3.08, being the highest quality gap in the test sample. Equally, all of the other customer actual quality dimensions' mean values are significantly lower than their suppliers' actual mean values.

The same conclusion can be drawn by evaluating t-test and Sig. (2-tailed) data results
As already mentioned, while expected variables that were examined do not show significant differences, all of them overwhelmingly demonstrate significant results in the actual or experiential segments of the product/service provision process. Results for t-test and Sig. (2-tailed) in the table above prove such conclusions.

In the frequencies test, customers listed various factors that affected their overall levels of satisfaction amongst which the most frequent were:

1) it is quite a poor service (5% of all responses);
2) dissatisfied with most service attributes (2.5%);
3) good service and feedback, staff attitude, products reliable (2.5%); and
4) staff tried hard to satisfy amongst other comments (2.5%).

The most repeated recommendations that customers provided in relation to the improvement of quality concerned:

1) very inefficient service, poor quality (5% of all responses);
2) a full revamp of service and product quality (2.5%);
3) better communication, feedback improvement and service efficiency needed;
4) better service delivery communication and product quality standards (2.5%);
5) closer customer/supplier working relationship, understanding of needs and capabilities (2.5%);
6) customer needs to be better understood and respected; (2.5%);
7) improvement in service quality, efficiency, coordination and timely feedback (2.5%) and
8) lack of professionalism, poor staff attitude, inefficient service, no feedback (2.5%).

On the other hand, suppliers were asked to provide recommendations on how to improve quality of their products and/or services and the most repeated recommendations that they provided in relation to the improvement of quality concerned:

1) staff training to improve customer service professionalism, feedback and overall efficiency (15% of all responses);
2) an improvement in cooperation levels among service staff (5%);
3) an improvement in quality practices overall (5%);
4) an improvement in work culture to support cooperation (5%) among other recommendations.

While there are evident differences between what customers expected and suppliers actually delivered, their combined attitudes recognised the need for improvements along similar lines, however actual and significant discrepancies exist.

The above quantitative analysis in the comparison of mean, t-test and Sig. (2-tailed) results have demonstrated divisions between expected and actual (experienced) variables being split 50/50 either way. According to Nunnally (1978), reliability of 0.50 (50%) and 0.60 (60%) are sufficient to prove that similar results can be replicated or arrived at by others. The same view is supported by Easterby-Smith et al. (2002, p.53) who are of the view that reliability is to be judged by three major questions:

a) "Will the measures produce the same results on other occasions?
b) Will similar observations be reached by other observers? and
c) Is there a transparency in how sense was made from the raw data?"

When cumulative results of differences in frequencies are added to the data set for the entire section one which is designed to test hypothesis one, the total surpasses the threshold 0.50 mark needed to support the hypothesis. If one was to conclude that actual quality delivery variables are equal or even more important than the expected quality variables, and if the above rule is upheld, then the hypothesis is supported.

5.4.3 Hypothesis Three:

Hypothesis three assumes differences in supplier's perceptions and customers' actual experiences in the cost of goods and/or services to customers.

The hypothesis statement is as follows:

H3: It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the cost of goods and/or services to be delivered to the customer.

Section three in the two surveys is slightly different due to the differences in customer and supplier profiles however, the factors examined are still the same.
Namely, it examined a number of numeric and string cost variable values. In order to test hypothesis three, group statistic, independent samples and frequencies tests were carried out.

Table 5.5 outlines combined data results for both customer and supplier mean values acquired from the group statistics test and t-test and Sig. (2-tailed) results attained through the independent samples test.

Table 5.5 Comparison of cost mean, t-test and Sig. (2-tailed) results

Group Statistics and Independent Samples Test	Customer Mean	Supplier Mean	t-test	Sig. 2-tailed
Is the price you paid the exact advertised price you expected to pay?	1.43		0.182	0.856
Did you charge your customer the exact advertised price he/she expected to pay?		1.40	0.182	0.856
Did you receive volume discount?	1.50		3.789	0.000
Did you offer volume discount?		1.10	3.789	0.000
If Yes, are you satisfied with the discount?	1.55		-2.177	0.039
Is your customer satisfied with the discount?		2.11	-2.177	0.039
Rate Advertised Cost	3.73	4.95	-6.592	0.000
Rate Final Cost	2.40	3.70	-3.583	0.002

What can be observed from the above table, are statistically significant differences in four of the five questions asked. Namely, the results of both customer and supplier mean values and t-test values and Sig. 2-tailed end results show statistically significant values of less than 0.05 which in the overwhelming majority of data support the hypothesis.

In the first question asked as shown in the frequencies table below, 42% of all respondents answered with a negative response (total 60 / 25 made up of (17+8)=42), which produced Sig. 2-tailed value of 0.856 does not show a significant difference.

Is the price you paid the exact advertised price you expected to pay?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	23	57.5	57.5	57.5
	NO	17	42.5	42.5	100.0
	Total	40	100.0	100.0	

Did you charge your customer the exact advertised price he/she expected to pay?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	12	60.0	60.0	60.0
	NO	8	40.0	40.0	100.0
	Total	20	100.0	100.0	

In the question on whether volume discount was received, 50% of all 40 customers responded with a negative reply, compared with only 10% of negative replies on the suppliers' side. Of those customers who received a discount, 55% were dissatisfied, while suppliers thought that only 5.3% were dissatisfied. An overwhelming 52.6% suppliers responded with the not sure/do not know reply option, when asked whether they thought that their customers were satisfied with the discount offered.

In relation to the advertised price, only 30% of customers were very satisfied, 35% somewhat satisfied, compared to the 95% very satisfied and only 5% somewhat satisfied suppliers. However, most importantly, with the final cost, customers were only very satisfied in 5% of the cases, and very dissatisfied in 25% of the cases, compared to the 45% very satisfied and only 5% very dissatisfied suppliers.

In relation to the reasons for not being charged the price that was expected, the following customer responses yielded the highest scores:

1) Bad pricing, missing price tags, messy product arrangement (12.5% of all responses);
2) Unclear and confusing display of prices (7.5%) and
3) Hidden costs not advertised (5%).

Of the responses received by suppliers, the following reasons were mostly mentioned:

1) Change in demand for product/service (10% of all responses);
2) Insufficient pricing information, changed pricing due to a more accurate price measure (5%);
3) Penalty cost / holding storage fees (5%);
4) Promotional pricing cut off early due to unexpected demand (5%);
5) Special request by customer willing to pay extra (5%) and
6) Unplanned increased transit, transportation and customs clearance fees (5%).

In response to the question why discount was not offered, most customers replied with:

1) Discount was not on offer (10% of all responses) and
2) Supplier discontinued discount policy some time ago (10%).

Suppliers, on the other hand offered the following answers:

1) Forgot to offer discount (5% of all responses) and
2) Quantity was too small for a discount (5%).

In the final part of the section, customers offered the following recommendations:

1) Quality products and services will attract quality buyers happy to spend more and more (27.5% of all responses);
2) Supplier practices and price information need a revamp as they are misleading (22.5%);
3) Suppliers should spend less money on promotion and more on quality products and services (17.5%);
4) When people feel reaped off, they will tell tenfold as many people to reject that firm (10%) and
5) Clear price labeling (7.5%).

These results support hypothesis three and demonstrate very significant differences (gaps) in expectations as well as the actual experiences in the cost of goods and/or services to be delivered to customers.

5.4.4 Hypothesis four:

Hypothesis four assumes differences in supplier's perceptions and customers' actual experiences in the speed of delivery of goods and/or services to customers.

The hypothesis statement is as follows:

H4: It is hypothesised that there are differences (gaps) between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the speed of delivery of goods and/or services to be delivered to the customer.

Section four in the two surveys examined a number of numeric and string variable values. In order to test hypothesis four, group statistic, independent samples and frequencies tests were carried out.

Table 5.6 outlines combined data results for both customer and supplier mean values acquired from the group statistics test and t-test and Sig. (2-tailed) results attained through the independent samples test.

Table 5.6 Comparison of speed of delivery mean, t-test and Sig. (2-tailed) results

Group Statistics and Independent Samples Test	Customer Mean	Supplier Mean	t-test	Sig. 2-tailed
Did you receive products/services in the expected (promised) time?	1.48		0.912	0.365
Did you deliver products/services in the expected (promised) time?		1.35	0.912	0-365
Rate expected speed	4.90	5.00	-2.082	0.044
Rate actual speed	3.30	3.65	-7.32	0.467
If you are not satisfied, will it impact on your decision to look for another supplier?	1.20			

The above table shows that only expected speed demonstrated statistically significant results with a Sig. (2-tailed) value of 0.044, which is lower than 0.05. The results also present performance gaps in the expected and actual speed of delivery, which need to be analysed further through frequencies.

Table 5.7 Did you receive products/services in the expected (promised) time?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	21	52.5	52.5	52.5
	NO	19	47.5	47.5	100.0
	Total	40	100.0	100.0	

Table 5.8 Did you deliver products/services in the expected (promised) time?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	13	65.0	65.0	65.0
	NO	7	35.0	35.0	100.0
	Total	20	100.0	100.0	

As can be observed from customers' responses, 47.5% of all respondents received their promised products/services later than promised or expected, compared to 35% cases recognised by the suppliers. The majority of customers (52.5%), however, did receive their goods and/or services in the promised timeframe, compared to the 65% figure of those who received supplies in the promised timeframe as quoted by the suppliers.

While all of the suppliers expected to deliver their products/services in a very satisfactory manner, 90% of all customers expected the same, whereas 10% expected somewhat satisfactory results.

Table 5.9 Customer rating of actual speed of delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very dissatisfied	9	22.5	22.5	22.5
	Somewhat dissatisfied	8	20.0	20.0	42.5
	Somewhat satisfied	8	20.0	20.0	62.5
	Very satisfied	15	37.5	37.5	100.0
	Total	40	100.0	100.0	

Table 5.10 Supplier rating of actual speed of delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very dissatisfied	6	30.0	30.0	30.0
	Somewhat dissatisfied	1	5.0	5.0	35.0
	Very satisfied	13	65.0	65.0	100.0
	Total	20	100.0	100.0	

However, when actual (experienced) speed of delivery was evaluated, only 37.5% of all customers were very satisfied, compared with 65% very satisfied suppliers. Levels of dissatisfaction also differed, with 22.5% very dissatisfied and 20% somewhat dissatisfied customers, which brings the cumulative dissatisfaction level to 42.5%. On the other hand, 30% of all suppliers were very dissatisfied and 5% somewhat dissatisfied with the actual speed of delivery. Due to these results, 62.5% of all customers answered positively when asked whether their dissatisfaction levels would influence their decision to look for an alternative supplier which is shown in the table below. Of all customer respondents, 25 responded, which is equal to 62.5%. This relative frequency figure was arrived at by dividing the number of responses (25) by the sample size of 40.

Table 5.11 If you are not satisfied, will this impact on your decision to look for an alternative supplier?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	20	50.0	80.0	80.0
	NO	5	12.5	20.0	100.0
	Total	25	62.5	100.0	
Missing	System	15	37.5		
Total		40	100.0		

In relation to the reasons for a late delivery, the most frequently provided answers by customer respondents were:

1) Delays in transit, customs clearance papers and certificates late release (5% of all responses);
2) Lack of stock, failure to account for orders previously requested by customers (5%);
3) Slow order fulfilment, transportation delays (5%).
4) Late despatch due to order batching and bulk orders sent (5%)

Suppliers, on the other hand mostly quoted the following reasons:

1) Inventory previously ordered by others took priority, no container space available (5% of all responses);
2) More time in transit than expected, transport mode change, certificates and clearance time (5%):
3) Our single supplier failed to supply, looked for alternative supplier (5%);
4) Processing and transit delays, procrastination to despatch (5%);
5) Production order fulfilment delay, order batching to save on transportation cost (5%) and

6) Production inefficiency and information inconsistency with our key supplier (5%).

The final section evaluated customer and supplier recommendations on what could be done better. Thus, customers suggested as follows:

1) Kept word will be heard far, broken word even further (25% of all responses);
2) Better production forecast and delay anticipation management needed (20%);
3) Good business practices have no alternatives (17.5%); and
4) We should have been informed from day one of any delays and not held in the dark (10%).

Similarly, suppliers offered these recommendations:

1) Delivery procedure needs to be clearer, timely customer communication needs to improve (5% of all responses);
2) Improve processing and delivery efficiency (5%);
3) Improve time forecast for the entire process from production to final delivery (5%);
4) Inventory data handling consistency, ensure adequate transport availability (5%);
5) Set up multiple supply arrangement based on actual demand and minimum cost (5%) and
6) Streamline fast information sharing system, demand adherence to agreed production (5%).

Although suppliers recognised that improvements were crucial in all of the above mentioned categories, discrepancies nonetheless prevailed in the expected and actual delivered results. The cumulative effect of all of the above results suggest that there is some evidence to support hypothesis four in that there are differences (gaps) between suppliers provision of goods and/or services due to their perceptions of customers' expectations and the actual customers' experiences in the speed of delivery of the goods or services to be delivered to customers.

5.4.5 Hypothesis 5a:

Hypothesis 5a assumes that the differences in supplier's perceptions and customers' actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to delivered to customers could be impacted upon by instability factors.

The hypothesis statement is as follows:

H5a: It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by instability factors.

Instability factors found in the literature were examined in the two surveys in a matrix crosstab format. In order to test hypothesis 5a, multiple response variable sets were first defined and crosstabs tests were carried out.

Each attribute being analysed, namely the expected level of service, quality, cost and speed of delivery in the customer survey were cross-tabbed against each cause or factor of instability and assessed within the whole sample against each of those causes of instability. The aim was to test which instability factors customers pay more or less attention to when deciding on the level of loyalty to their suppliers in case of crises or instabilities.

The same attributes were also examined on the suppliers' side, however with the aim to find out how much of an impact they thought that these causes may have on their ability to satisfy their customers' expected levels of service, quality, cost and speed of delivery. All causes of instability were cross-tabbed and answers evaluated in order to find out what factors suppliers pay more or less attention to.

An example can be seen below where both customer and supplier samples were tested for levels of importance of the following causes of instability. Namely, a lack of commitment by suppliers, which was cross-tabbed with the expected level of service shows that only 7.7% of all customers would stay loyal to their supplier in case of a lack of commitment by the supplier. In case of unstable profit margins, 18.3% of customers would remain loyal for a period of a couple of months as specified in the survey's question, while 8.5% would stay with the supplier if unstable business relationships were affecting expected customer levels of service. In contrast, 28.8% of all suppliers thought that a lack of commitment could impact on their ability to provide expected levels of service. In case of unstable profit margins though, only 3.4% believed that it could impact on their capability to provide expected levels of service in a specified couple of months' period, thus demonstrating, one may say high levels of confidence. Unstable business relationships were also seen as matters of some concern, with 15.3% positive responses to the question.

Table 5.12 Customer Service and Instability Factors Cross-tabulation

			Instability factors and customer service		
			Lack of commitment by suppliers and customer service	Unstable profit margins and customer service	Unstable business relationships and customer service
Sample ID	Customer Sample	Count	11	26	12
		% within sample	7.7%	18.3%	8.5%
	Supplier Sample	Count	17	2	9
		% within sample	28.8%	3.4%	15.3%
Total		Count	28	28	21

Table 5.12 Customer Service and Instability Cross-tabulation

			Instability factors and customer service		
			Divided loyalties among supply chain partners / customer service	Disproportionate production (more than needed) / customer service	Needless resource investment and customer service
Sample ID	Customer Sample	Count	17	40	36
		% within sample	12.0%	28.2%	25.4%
	Supplier Sample	Count	11	0	0
		% within sample	18.6%	0.0%	0.0%
Total		Count	28	40	36

Customers likewise saw differently from suppliers when divided loyalties among supply chain partners, disproportionate production and needless resource investment were matters of concern to the expected customer service levels where 12%, 28.2% and 25.4% respectively expressed levels of loyalty. Suppliers, on the other hand in 18.6% of the responses that divided loyalties among supply chain partners can impact on their ability to provide the expected levels of service, while none of the suppliers even assumed that disproportionate production and needless resource investment could impact on the provision of the expected customer service.

Table 5.13 Quality and Instability Factors Cross-tabulation

			Instability factors and quality		
			Lack of commitment by suppliers and quality	Unstable profit margins and quality	Unstable business relationships and quality
Sample ID	Customer Sample	Count	0	0	0
		% within sample	0.0%	0.0%	0.0%
	Supplier Sample	Count	7	14	8
		% within sample	16.7%	33.3%	19.0%
Total		Count	7	14	8

			Instability factors and quality		
			Divided loyalties among supply chain partners / quality	Disproportionate production (more than needed) / quality	Needless resource investment and quality
Sample ID	Customer Sample	Count	4	13	7
		% within sample	16.7%	54.2%	29.2%
	Supplier Sample	Count	8	1	4
		% within sample	19.0%	2.4%	9.5%
Total		Count	12	14	11

In relation to the association of quality of products and/or services and a lack of commitment by suppliers, unstable profit margins and unstable business relationships, not a single customer decided to stay loyal to the supplier, while substantial differences can be noted when divided loyalties among supply chain partners, disproportionate production and needless resource investment were concerned, with disproportionate production being the least concerning factor with 54.2% of respondents expressing their loyalties. Suppliers, as can be observed likewise expressed least concern (2.4%) when disproportionate production was considered.

Table 5.14 Cost and Instability Factors Cross-tabulation

			Instability factors and cost		
			Lack of commitment by suppliers and cost	Unstable profit margins and cost	Unstable business relationships and cost
Sample ID	Customer Sample	Count	0	0	0
		% within sample	0.0%	0.0%	0.0%
	Supplier Sample	Count	4	16	8
		% within sample	5.7%	22.9%	11.4%
Total		Count	4	16	8

Similar results to quality are visible in relation to comparisons between cost and a lack of commitment by suppliers, unstable profit margins, unstable business relationships and customer/supplier relationship instabilities (see second table below) with all of the

customers rejecting loyalty to suppliers. Suppliers, in contrast recognised varying degrees of impact in the same situations with slightly more positive expectations.

Table 5.14 Cost and Instability Factors Cross tabulation

			Instability factors and cost		
			Divided loyalties among supply chain partners / cost	Disproportionate production (more than needed) / cost	Needless resource investment and cost
Sample ID	Customer Sample	Count	5	4	4
		% within sample	38.5%	30.8%	30.8%
	Supplier Sample	Count	12	12	16
		% within sample	17.1%	17.1%	22.9%
Total		Count	17	16	20

Equally low levels of loyalty can be detected in the case of divided loyalties among supply chain partners, disproportionate production and needless resource investment with the majority rejecting to stay loyal, however, still a considerable 38.5%, 30.8% and 30.8% of respondents respectively deciding to continue using the supplier for a while.

The overwhelming majority of suppliers however believed that cost could not be impacted upon by the above factors as shown by 17.1%, 17.1% and 22.9% or responses considering the above factors to be impacting.

Table 5.14 Cost and Instability Factors Cross-tabulation

			Instability factors and cost	Total
			Customer/supplier relationship instabilities and cost	
Sample ID	Customer Sample	Count	0	13
		% within sample	0.0%	
	Supplier Sample	Count	2	70
		% within sample	2.9%	
Total		Count	2	83

The fourth attribute that that underwent analysis was speed of delivery and its impact by instability factors as shown in the cross-tabulation tables below.

Table 5.15 Speed of Delivery and Instability Factors Cross-tabulation			Instability factors and speed of delivery		
			Lack of commitment by suppliers and speed of delivery	Unstable profit margins and speed of delivery	Unstable business relationships and speed of delivery
Sample ID	Customer Sample	Count	12	14	18
		% within sample	8.6%	10.1%	12.9%
	Supplier Sample	Count	15	4	10
		% within sample	32.6%	8.7%	21.7%
Total		Count	27	18	28

Of all the respondents, only 8.6%, 10.1% and 12.9% would stay loyal to their suppliers if speed of delivery was impacted by a lack of commitment by suppliers, unstable profit margins and unstable business relationship respectively, indicating an overwhelming and very significant majority of those who would most likely look for alternative suppliers.

On the other hand, 32.6% of suppliers saw a lack of commitment as an impacting factor, while only 8.7% of them viewed unstable profit margins as an important consideration in relation to the speed of delivery.

Table 5.15 Speed of Delivery and Instability Factors Cross-tabulation

			Instability factors and speed of delivery		
			Divided loyalties among supply chain partners / speed of delivery	Disproportionate production (more than needed) /speed of delivery	Needless resource investment and speed of delivery
Sample ID	Customer Sample	Count	19	40	36
		% within sample	13.7%	28.8%	25.9%
	Supplier Sample	Count	13	0	0
		% within sample	28.3%	0.0%	0.0%
Total		Count	32	40	36

Moreover, comparative differences can be noticed in the percentages of those expressing loyalty in cases of divided loyalties among supply chain partners (13.7%), disproportionate production (28.8%) and needless resource investment (25.9%) in contrast to the suppliers' total lack of concern in relation to disproportionate production and needless resource investment and 28.3% of them considering divided loyalties among supply chain partners as an impacting factor.

Table 5.15 Speed of Delivery and Instability Factors Cross-tabulation

			Instability factors speed of delivery	Total
			Customer/supplier relationship instabilities and speed of delivery	
Sample ID	Customer Sample	Count	0	139
		% within sample	0.0%	
	Supplier Sample	Count	4	46
		% within sample	8.7%	
Total		Count	4	185

The seventh factor that was considered in relation to speed of delivery, namely customer/supplier relationship instabilities were rejected outright by all customer respondents, whereas 8.7% of supplier respondents thought that these may impact on their ability to deliver.

The final question in the analysis of hypothesis 5a related to recommendations on how the most impacting effects could be ameliorated.

The most frequent responses suggested:

1) Better planning and understanding of instability factors and their impact on product and services (10% of all responses);

2) Better communication and feedback, closer working relationship to enhance mutual understanding and minimise instabilities (8.3%);

3) More contingency planning and practical implementation (5%) and

4) Preparing customers in advance for instabilities through carefully designed strategies (3.3%).

The above results show that considerable difference or gaps exist between customers and suppliers in the way that they think about particular issues of importance to them. While customers were primarily concerned with quality and cost and customer/supplier relationship instabilities in general, suppliers were mainly concerned with customer/supplier relationship instabilities, unstable profit margins and a lack of commitment on their behalf, however not to the same high extent as customers were when quality and cost were affected. These results provide some evidence in support of hypothesis 5a and indicate that knowledge and strategic discrepancies and a lack of adequate understanding of each other's concerns and subsequent preparation to overcome those factors exist and are partly to blame for such outcomes.

Hypothesis 5b:

Hypothesis 5a assumes that the differences in supplier's perceptions and customers' actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to delivered to customers could be impacted upon by risk and vulnerability factors.

The hypothesis statement is as follows:

H5b: It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by risk and vulnerability factors.

Risk and vulnerability factors found in the literature were examined in the two surveys in a matrix crosstab format. In order to test hypothesis 5b, multiple response variable sets were first defined and cross-tabulation tests were carried out.

Each attribute that was analysed, namely the expected level of service, quality, cost and speed of delivery in the customer survey were cross-tabbed against each cause or factor of risk and vulnerability and assessed within the whole sample against each of those causes of risk and vulnerability. The aim was to test which of those factors customers pay more or less attention to when deciding on the level of loyalty to their suppliers in risky or vulnerable situations.

The same attributes were also examined on the suppliers' side, however with the aim to find out how much of an impact they thought that these causes may have on their ability to satisfy their customers' expected levels of service, quality, cost and speed of delivery. All risk and vulnerability causes were cross-tabbed and answers evaluated in order to find out what factors suppliers pay more or less attention to.

Table 16 Customer Service and Risk Factors Cross-tabulation			Risk factors and customer service		
			Fiscal/business inefficiencies and customer service	Inability to react to volatility in demand and customer service	Lack of information sharing and cooperation and customer service
Sample ID	Customer Sample	Count	20	29	32
		% within sample	5.9%	8.6%	9.5%
	Supplier Sample	Count	4	12	4
		% within sample	2.5%	7.6%	2.5%
Total		Count	24	41	36

In the results above, it can be noted that 5.9%, 8.6% and 9.5% of all customer responses stated loyalty to their supplier in case of a fiscal inefficiency, inability to react to demand and lack of information sharing and cooperation respectively, which indicates that the overwhelming majority would not be loyal in those circumstances. However, when asked of their opinions, suppliers paid a fairly insignificant attention to these factors (2.5%, 7.6% and 2.5% respectively) in relation to their ability to provide the expected level of service.

Table 16 Customer Service and Risk Factors Cross-tabulation

			Risk factors and customer service		
			High dependence on specific communication and customer service	Loss of experienced workforce and customer service	Opportunism by customers or suppliers and customer service
Sample ID	Customer Sample	Count	36	9	9
		% within sample	10.7%	2.7%	2.7%
	Supplier Sample	Count	16	20	9
		% within sample	10.1%	12.7%	5.7%
Total		Count	52	29	18

High dependence on specific communication, distribution and transportation infrastructure, loss of experienced workforce and opportunism by customers or suppliers played a varied level of importance in customers' minds, with the two latter factors being highly concerning at only 2.7% loyalty expressed. Suppliers, on the other hand painted a less worrying picture as only 10.1%, 12.7% and 5.7% in this respective order considered the above factors to be impacting.

Table 16 Customer Service and Risk Factors Cross-tabulation

			Risk factors and customer service		
			Failure of a single supplier and customer service	Labour strikes and customer service	Product / service boycotts and customer service
Sample ID	Customer Sample	Count	8	34	40
		% within sample	2.4%	10.1%	11.9%
	Supplier Sample	Count	20	16	15
		% within sample	12.7%	10.1%	9.5%
Total		Count	28	50	55

			Risk factors and customer service		
			Man-made computer viruses and customer service	Accidents and customer service	Acts of terrorism and customer service
Sample ID	Customer Sample	Count	40	40	40
		% within sample	11.9%	11.9%	11.9%
	Supplier Sample	Count	16	13	13
		% within sample	10.1%	8.2%	8.2%
Total		Count	56	53	53

The most concerning risk and vulnerability factors to customers in relation to a possible impact on the expected level of service were:

1) Failure of a single supplier (2.4% loyalty expressed of all responses);
2) Loss of experienced workforce (2.7%);
3) Opportunism by powerful customers or suppliers (2.7%) and
4) Fiscal and business inefficiencies (5.9% loyalty expressed).

Suppliers however, expressed most concerns in relation to these potential risk or vulnerability causes:

1) Loss of experienced workforce (12.7% of all responses);
2) Failure of a single supplier (12.7%);
3) High dependence on specific communications, distribution and transportation infrastructure, labour strikes and man-made computer viruses (10.1% respectively);
4) Product/service boycotts (9.5%) and
5) Accidents and acts of terrorism (8.2%).

Listed below are cross-tabulation results for quality when measured against potential risk and vulnerability causes.

Table 5.17 Quality and Risk Factors Cross-tabulation table

Quality Crosstab Results	Customers	Suppliers
Fiscal/business inefficiencies and quality	0.00%	11.9%
Inability to react to volatility in demand and quality	1.2%	0.00%
Lack of information sharing and cooperation and quality	9.9%	9.6%
High dependence on specific communications and quality	16.0%	8.9%
Loss of experienced workforce and quality	9.9%	14.8%
Opportunism by customers or suppliers and quality	0.00%	3.0%
Failure of a single supplier and quality	0.00%	14.8%
Labour strikes and quality	2.5%	3.7%
Product/service boycotts and quality	11.1%	3.0%
Man-made computer viruses and quality	11.1%	11.1%
Accidents and quality	21.0%	8.9%
Acts of terrorism and quality	17.3%	10.4%

This cross-tabulation shows the most concerning causes of potential risk or vulnerability for both customers and suppliers. The most concerning factors for the customers were:

1) Fiscal business inefficiencies (0.00% tolerance or loyalty of all responses);
2) Opportunism by powerful customers or suppliers (0.00% loyalty);
3) Failure of a single supplier (0.00% loyalty) and
4) Labour strikes (2.5% loyalty).

Suppliers, on the other hand were primarily concerned with.

1) Loss of experienced workforce (14.8% of all responses);
2) Failure of a single supplier (14.8%);

3) Fiscal business inefficiencies (11.9%);
4) Man-made computer viruses and acts or terrorism at 11.1% and 10.4% concern respectively and
5) Lack of information sharing, trust and cooperation (9.6%).

The table below shows the next attribute that was evaluated, namely, cost factors for both groups of respondents.

Table 5.18 Cost and Risk Factors Cross-tabulation table

Cost Crosstab Results	Customers	Suppliers
Fiscal/business inefficiencies and cost	0.0%	11.6%
Inability to react to volatility in demand and cost	0.0%	5.2%
Lack of information sharing, trust and cooperation and cost	0.0%	8.7%
High dependence on specific communications and cost	5.2%	10.5%
Loss of experienced workforce and cost	10.3%	11.6%
Opportunism by powerful customers or suppliers and cost	0.0%	8.7%
Failure of a single supplier and cost	0.0%	11.6%
Labour strikes and cost	0.0%	4.1%
Product/service boycotts and cost	17.2%	3.5%
Man-made computer viruses and cost	20.7%	7.6%
Accidents and cost	22.4%	8.7%
Acts of terrorism and cost	24.1%	8.1%

The most impacting causes of cost concern for customers were related to:

1) Fiscal and business inefficiencies (0.0% loyalty of all responses);
2) Inability by suppliers to react to volatility in demand (0.0%);
3) Lack of information sharing, trust and cooperation (0.0%);
4) Opportunism by powerful customers or suppliers (0.0%);
5) Failure of a single supplier (0.0%);
6) Labour strikes (0.0%) and high dependence on specific communications (5.2).

On the other hand, suppliers were primarily worried about the factors below:

1) Fiscal and business inefficiencies (11.6% of all responses);
2) Loss of experienced workforce (11.6%);
3) Failure of a single supplier (11.6%) and
4) High dependence on specific communications, distribution and transportation infrastructure.

The final attribute that was cross-tabbed, speed of delivery showed these levels of customer loyalty and supplier degree of concern in relation to the assessed risk or vulnerability factors and their impact on suppliers' ability to provide the expected speed of delivery.

Table 5.19 Speed of delivery cross-tabulation

Speed of Delivery Crosstab Results	Customers	Suppliers
Fiscal/business inefficiencies and speed of delivery	7.2%	6.8%
Inability to react to volatility in demand and speed	11.2%	8.7%
Lack of information sharing, trust and cooperation and speed	11.2%	7.2%
High dependence on specific communications and speed	4.0%	8.7%
Loss of experienced workforce and speed of delivery	3.2%	9.7%
Opportunism by powerful customers or suppliers and speed	4.7%	6.8%

Failure of a single supplier and speed of delivery	1.1%	9.7%
Labour strikes and speed of delivery	14.4%	8.7%
Product/service boycotts and speed of delivery	4.0%	8.7%
Man-made computer viruses and speed of delivery	12.6%	7.7%
Accidents and speed of delivery	14.4%	8.7%
Acts of terrorism and speed of delivery	12.2%	8.7%

The only qualitative query that supplemented the assessment of this hypothesis was a question on what could be done to ameliorate the most impacting effects.

Most frequent recommendations that flowed from the query were:

1) Proper contingency measures need to be ready for implementation (15% of all responses);
2) Suppliers should instil prevention mechanisms and employ alternative scenario plans as needed (13.3%);
3) Necessary implementation of all contingency resources in a timely manner (10%) and
4) Risk analysis could screen most impacting factors and plans executed to neutralise risk (8.3%).

All of the above cumulative differences (gaps) between suppliers' and customers' perceptions regarding the same causes of risk and vulnerabilities suggest that there is some evidence to support hypothesis 5b.

Hypothesis 5c:

Hypothesis 5c assumes that the differences in supplier's perceptions and customers' actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to customers could be impacted upon by modes of mental behaviour of decision makers in the supply chain.

The hypothesis statement is as follows:

H5c: It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer could be impacted upon by modes of mental behaviour of decision makers in the supply chain.

Modes of mental behaviour of decision makers in the supply chain found in the literature were examined in the two surveys in a matrix crosstab format. In order to test hypothesis 5c, multiple response variable sets were first defined and cross-tabulation tests were carried out.

Each attribute that was analysed, namely the expected level of service, quality, cost and speed of delivery in the customer survey were cross-tabbed against each cause or factor influenced by modes of mental behaviour of decision makers in the supply chain and assessed within the whole sample against each of those factors. The aim was to test which of those factors customers pay more or less attention to when deciding on the level of loyalty to their suppliers in situations affected by those factors.

The same attributes were also examined on the suppliers' side, however with the aim to find out how much of an impact they thought that these causes may have on their ability to satisfy their customers' expected levels of service, quality, cost and speed of delivery.

All of the factors were cross-tabbed and answers were evaluated in order to find out what factors suppliers pay more or less attention to.

Table 5.20 Modes of behaviour and customer service cross-tabulation

Customer Service Crosstab Results	Customers	Suppliers
Poor decisions caused by manager's attitudes & routines they use to interpret information and customer service	4.1%	32.5%
Poor production, capacity and pricing decisions and customer service	0.0%	35.0%
Unanticipated side-effects from managerial decisions and customer service	18.1%	0.0%
Industry demand for shorter lead times and customer service	20.2%	0.0%
Outsourcing and use of global sourcing and customer service	20.7%	32.5%
Politically determined counter trade and customer service	18.1%	0.0%
Restrictions enforced by product safety & customer service	18.7%	0.0%

The above cross-tabulation table shows clear differences (gaps) between customer and supplier respondent groups in this sample. As results demonstrate, customers expressed the least tolerance and thus the lowest levels of loyalty in cases where the expected customer service was to be affected by poor production, capacity and pricing decisions (0.0% loyalty of all responses) and poor decisions caused by manager's attitudes and routines they use to interpret information (4.1%). Suppliers, in contrast showed the biggest however, not as high a concern as customers did, in the segment addressing poor production, capacity and pricing decisions (35% of all responses), poor decisions caused by manager's attitudes and outsourcing and use of global sourcing (32.5%) respectively. The other potential factors were however, completely dismissed by the supplier respondent group.

Table 5.21 Modes of behaviour versus quality cross-tabulation

Quality Crosstab Results	Customers	Suppliers
Poor decisions caused by manager's attitudes & routines they use to interpret information and quality	0.0%	14.5%
Poor production, capacity and pricing decisions and quality	0.0%	21.7%
Unanticipated side-effects from managerial decisions and quality	13.9%	9.6%
Industry demand for shorter lead times and quality	33.3%	4.8%
Outsourcing and use of global sourcing and quality	30.6%	22.9%
Politically determined counter trade and quality	2.8%	7.2%
Restrictions enforced by product safety & quality	19.4%	19.4%

A similar pattern of differences can likewise be seen in quality related decisions on both sides. The least tolerance and loyalty levels by customers were assigned to poor decisions caused by manager's attitudes and poor production, capacity and pricing decisions (0.0% of all respondents respectively) and politically determined counter trade (2.8%), whereas supplier respondents paid most attention to outsourcing and use of global sourcing (22.9%) and poor production, capacity and pricing decisions (21.7% of responses).

Table 5.22 Modes of behaviour versus cost cross-tabulation

Cost Crosstab Results	Customers	Suppliers
Poor decisions caused by manager's attitudes & routines they use to interpret information and cost	0.0%	9.9%
Poor production, capacity and pricing decisions and cost	0.0%	18.0%
Unanticipated side-effects from managerial decisions and cost	16.7%	7.2%
Industry demand for shorter lead times and cost	41.7%	16.2%
Outsourcing and use of global sourcing and cost	25.0%	18.0%
Politically determined counter trade and cost	0.0%	12.6%
Restrictions enforced by product safety & cost	16.7%	18.0%

In the cost related category, customers were to the same maximum extent concerned with poor decisions caused by manager's decisions, poor production, capacity, and pricing decisions and whereas previously not so extremely concerned politically determined counter trade factors (0.0% loyalty of all responses). The least unease by customers was assigned to industry demand for shorter lead times (41.7% loyalty). Suppliers expressed biggest concerns in relation to poor production, capacity, and pricing decisions, outsourcing and restrictions enforced by product safety (18.0% of all responses respectively to each factor or 54% cumulatively).

Table 5.23 Modes of behaviour versus speed of delivery cross-tabulation

Speed of Delivery Crosstab Results	Customers	Suppliers
Poor decisions caused by manager's attitudes and routines they use to interpret information and speed of delivery	0.0%	10.5%
Poor production, capacity and pricing decisions and speed	0.0%	15.1%
Unanticipated side-effects from managerial decisions and speed of delivery	28.0%	7.0%
Industry demand for shorter lead times and speed	17.4%	23.3%
Outsourcing and use of global sourcing and speed	7.6%	20.9%
Politically determined counter trade and speed	23.5%	3.5%
Restrictions enforced by product safety and speed	23.5%	19.8%

Another similar pattern unfolded in relation to customers' greatest concerns in the speed of delivery cross-tabulation test. Namely, poor decisions caused by manager's attitudes and routines they use to interpret information and poor production, capacity, and pricing decisions were consistently assigned no loyalty at all at (0.0% of all responses), whereas suppliers were mostly worried about industry demand for shorter lead times (23.3%) and outsourcing and use of global sourcing (20.9% of all responses).

When customers were asked about the impact that the above conditions may have on their choice in deciding to use a particular supplier, the most frequent answers provided were:

1) The factors relating to quality and cost would impact significantly and immediately (17.5% of all responses);
2) Quite a significant impact in my supplier choice (15%);
3) These are very critical choice making factors (15%);

4) It would depend on our most immediate business needs and relationship tolerance levels (15%) and
5) They would tremendously impact on our choice of a supplier (12.5%).

In order to ameliorate the most impacting effects, suppliers most frequently suggested these recommendations:

1) Better understanding of customer issues and needs, better resource plans and good management practice (25% of all responses);
2) Adequate preparation and timely execution of pre-emptive contingency plans as needed (20%);
3) Better planning and understanding of human factors and their impact on products and services (15%) and
4) All factors need to be clearly defined, examined and resolved with contingencies in place (15%).

All of the factors examined above and their cumulative differences (gaps) between suppliers' and customers' perceptions regarding the modes of behaviour of decision makers in the supply chain suggest that there is some evidence to support hypothesis 5c.

Hypothesis 6:

Hypothesis 6 assumes that the differences in supplier's perceptions and customers' actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to customers impact on the performance of supply chain organisations.

The hypothesis statement is as follows:

H6: It is hypothesised that the differences or gaps between suppliers' provision of goods and/or services due to suppliers' perceptions of customers' expectations and the actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to the customer impact on the performance of supply chain organisations.

To test hypothesis 6 and in it supplier performance for comparative and significant differences (gaps) in the expected versus actual performance outcomes, paired samples statistical test was carried out.

Table 5.24 Comparison of performance mean, t-test and Sig. (2-tailed) results

Paired Samples Statistics Test	Mean	t-test	Sig. 2-tailed
Customer satisfaction with the level of service (expected) Customer satisfaction with the level of service (actual)	5.00 4.00	9.747	0.000
Product / service quality level provided (expected) Product / service quality level provided (actual)	5.00 4.10	6.282	0.000
Level of customer loyalty retained (expected) Level of customer loyalty retained (actual)	5.00 2.55	10.434	0.000
Speed of delivery achieved (expected)	5.00	3.178	0.005

Speed of delivery achieved (actual)	3.65		
Customer cost satisfaction level (expected) Customer cost satisfaction level (actual)	5.00 3.65	4.133	.0.001
Service staff performance level (expected) Service staff performance level (actual)	5.00 3.35	7.095	0.000
Overall impact on company performance (expected) Overall impact on company performance (actual)	5.00 3.40	7.193	0.000

The comparative analysis in this paired sample statistical test showed differences between expected and actual performance mean outcomes. However, to test whether the differences (gaps) were statistically significant, t-test and finally and most importantly Sig. 2-tailed results needed to be analysed. These results confirmed statistically significant differences (gaps) in all of the tested paired performance metrics with every single of the seven tested metrics exhibiting values lower than 0.05. Thus, it can be concluded that hypothesis 6 is supported, meaning that the differences in supplier's perceptions and customers' actual experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to be delivered to customers impact on the performance of supply chain organisations.

Chapter 6: Discussion and Conclusions

6.1 Discussion:

This research study has explored potential areas of significant differences (gaps) in the expected levels of service, quality, cost and speed of delivery between suppliers on one side and customers on the other side as they were considered extremely important elements to be left unchecked in an ever increasing and thus more complex trading environment. Upon analysing supply chain literature and seeing that these issues have not been addressed by the research community in this context, the researcher constructed a model which was tested in this project through a selected population sample. Even though, the sample used in this study may not be as large as samples in other similar studies, its effects and ramifications may still be far reaching and representative of a much larger population.

In order to proceed with the project, realistic objectives had to be set and its parameters outlined. The research questions dictated the process out of which a number of hypotheses were derived and modified. In consultation with the supervisory team, the researcher decided to utilise a survey instrument (questionnaire) to test the novel model developed in this thesis. To produce the questionnaire and make it substantially strong, a focus group was invited to test its content, validity and its capacity to achieve its intended aims. A technique called process mapping had been used in the identification of supply chain differences (gaps), factors that influence and those factors that cause them. The main emphasis in the research was on the process of continuous comparison as suggested by the theoretical framework and supported by the fact that this research was attempting to uncover new knowledge in relation to the "social phenomenon" that needed to be understood and "about which little is known" Douglas (2004, p.60).

Therefore, the survey instrument targeted every attribute, namely expected levels of service, quality, cost and speed of delivery and related them to most of their dimensions

that were identified as factors causing supply chain differences (gaps) uncovered by this research project. Some of these dimensions were assigned numerical values, while some remained completely qualitative. Their cumulative impact, however, has been quite significant as all of the eight tested hypotheses were either fully supported or have provided some evidence that the examined differences or gaps may have a substantial influence on supply chain outcomes. To prove this argument in a completely different empirical setting, this model would have to be carried out on a much larger scale.

The central elements of this research, namely, the expected level of service, quality, cost and speed of delivery have produced varied, however still significant results in relation to their associated hypotheses.

The most important finding from the testing of hypothesis one has been the fact that suppliers perceptions of what customers expected in the expected level of service category were somewhat higher than what customers actually expected. Suppliers also recognised their underperformance due to the expectations being set at the highest provided level on the scale measurement tool that was used in this study and not reaching it. In addition, suppliers recognised both knowledge and strategic deficiencies coming from their lack of better understanding of customers' expectations and their actual experiences with the same or similar products or services. This recognition is also supported by the recommendation provided by customer respondents who suggested that closer working relationships with them can significantly improve supplier performance. Of the five expected level of service dimensions that were tested, product / service availability dimension produced the highest gap, which is besides all of the other tested dimensions statistically significant.

Hypothesis two was tested for any differences (gaps) between expected and actual quality received. A similar pattern was observed as in the testing of the expected level of service. While suppliers' perceptions of customers' expectations of quality were again at the highest possible point on the measurement scale employed, the gap between them and customers was much smaller in this tested value attribute and quality has been recognised throughout this thesis as the key element in the provision of any service or product.

Likewise, customer and supplier respondent groups seemed to be in closer understanding with the expected and actual quality than in any other of the four researched and tested value attributes. It has been the most valued and least arguable point in this research too containing of more dimensions than any of the other elements that were examined. Six of the most appropriate dimensions for this type of project in conjunction with two open ended questions were chosen to test its significance.

The highest gap on both supplier and customer sides occurred in the service feedback category. While both respondent groups had similar expectation levels in the same dimension categories, actual performance results revealed statistically significant differences or gaps.

Hypothesis three that tested differences in the expected and actual cost demonstrated statistically significant gaps in four of the five questions that were asked of respondents. It also revealed suppliers' lack of insight into customers' perceptions and actual satisfaction with the advertised price, the volume discount or the final price.

Hypothesis four examined speed of delivery and revealed somewhat different results than the previous three value attributes. Namely, only expected speed of delivery demonstrated statistically significant results. However, the majority of customers were not delivered their goods and services in the promised timeframe, thus performance gaps were uncovered in both expected and actual speed of delivery categories. These were analysed through frequencies. The cumulative effects of all of the analysed questions suggested some evidence of discrepancies that are important consideration in the provision of speed of delivery.

Hypothesis 5a examined customers' attitudes towards instability factors that may impact on their expected levels of service, quality, cost and speed of delivery. Quality and cost seemed to be the most important concerns to customers, thus in most cases rejecting loyalty where quality and cost were affected. Suppliers on the other hand had slightly more positive views of these factors and were less concerned with them than the

customers. Considerable differences were shown in the way customers and suppliers think of instability factors and the level of importance they assign to them.

Hypothesis 5b examined customers' attitudes towards risk and vulnerability factors as well as suppliers views on these factors and their impact on their ability to provide the expected levels of service, quality, cost and speed of delivery to their customers. Customers' biggest concerns were suppliers' fiscal inefficiencies, opportunism by powerful customers or suppliers, failure of a single supplier scoring no loyalty at all, whereas suppliers' greatest concerns were: loss of experienced workforce and failure of a single supplier, however to a much lower extent. The cumulative effects suggested that risk and vulnerability factors do cause differences among suppliers and customers as some evidence was provided.

Hypothesis 5c explored customers' attitudes towards modes of mental behaviour of decision makers in the supply chain and suppliers' attitudes towards the same factors in the way that these may impact on their ability to provide the expected levels of service, quality, cost and speed of delivery to their customers. Customers' greatest concerns were poor production, capacity and pricing decisions, poor decisions caused by manager' attitudes scoring zero tolerance among customer respondents, whereas suppliers biggest concerns were: poor decisions caused by manager's attitudes and routines used to interpret information and outsourcing and use of global sourcing. Again, suppliers' levels of tolerance of these factors were significantly higher, indicating that they are less concerned with them. This significant gap shows both knowledge and strategic discrepancies as attitudes differ tremendously, which may influence final outcomes in the provision of the expected levels of service, quality, cost and speed of delivery of goods and services to customers.

Finally, hypothesis 6 tested performance outcomes by suppliers. Paired samples statistical test had been utilised for this purpose. Mean, t-test and Sig. (2-tailed) results were compared and conclusions drawn from them. The comparative analysis showed gaps between both expected and actual performance results. These results confirmed

statistically significant differences in all of the tested metrics. This bottom line results suggest that performance can be impacted upon by the differences or gaps between what suppliers perceive and customers actually experience as a result.

6.2 Research Implications and Limitations:

The formation of a new concept in such an important commerce area as supply chain trading does not come without its implications and limitations. The first and most obvious implication is the choice of a population sample and setting so that the research sufficiently serves its objectives. Therefore, to test the model, a sufficient sample had to be selected. The choice was made in consultation with a number of academics, professional researchers and business professionals. Though, the number of respondents may not be as widely representative as other bigger studies, its responses are nonetheless important.

Secondly, settings in organisations in which a project takes place may cause some limitations (Eisenhardt and Graebner, 2007; Eisenhardt, 1989). Since this was a conference room setting, its purpose was to test the model only. In the future, however, it should be tested on a much larger scale as its importance is of global significance.

Thirdly, all of the attributes being researched in this thesis project carried important weight and significance. It is evident from this research that there is no consensus on the definitions of quality, cost, speed of delivery and the expected level of service in a supply chain context, as this is a new field of research and still in its infancy. This is an area of continuous discussion.

Since this research was conducted via a questionnaire survey, it was important to recognise the difficulties usually inherent in conducting them and how these can be handled to produce objective quality research.

Firstly, to achieve objectivity of research, the researcher needed to handle his or her own internal or intrinsic subjectivity effectively as it may impact on the creation of knowledge (Kvale and Brinkmann, 2009, Alvesson and Deetz, 2000). Without accomplished objectivity, there cannot be quality research as it continuously limits it.

Brown and Eisenhardt (1997) recommended peer checks as one possible technique in overcoming subjectivity. Thus, the researcher consulted the supervisory team to check, scrutinize and assess survey evidence and constructs (Kvale and Brinkmann, 2009).

Furthermore, the researcher at all times stayed away from the respondents while the surveys were being filled in, and only approached the respondents at their specific request to clarify an issue that may not have been understood completely.

Secondly, in all forms of data collection, there may be a level of bias. The level of bias may have been influenced by the environment in which the respondent were expressing or voicing their opinions. In some cases, different levels of authority may be concerned by what might be found out either about them or their organisation. That is why, staff members may be inclined to refrain from answering any questions that address such areas of exploration. In this model testing study, however, the respondents did not need to worry about such concerns. Furthermore, sufficient space for individual expression was provided and anonymity guaranteed to all of the participants in order to ensure their participation.

Finally, the most crucial ingredient in any relationship or interaction is trust. This could have been a huge challenge as the researcher was an outsider and outsiders may not understand the culture of an institution and people within it without prior experiences in dealing with them or with similar people in similar positions and circumstances.

The researcher in this project however, had sufficient life experience in dealing with people from all walks of life and from all cultural backgrounds that exist in Sydney, which is the world in a reduced format. However, to reinforce the trust factor, written

guarantees were provided to each participant to assure them of their privacy and complete anonymity. In addition, results of the study were promised to be provided to them, should they request them.

6.3 Recommendations for future research:

To gain something is to give or take away from something or someone. Suppliers should thus be asking themselves the following questions: what our products and services give and take away from consumers? What other readily available choices or alternatives do our consumers have at any one time? To what extent are they creatures of compulsion to our products/services? What determinants make some customers more loyal than others and how can we capture and maintain more of our customers' loyalty? The answers to these questions go beyond this thesis, however they represent crucial and interesting future research themes that would fit in and contribute nicely to the field of supplier perceptions and consumer expectations. It is also proposed that future research could also examine the application of the model in a global setting. Further studies could also be conducted in a global supply chain firm. Globalisation has been accepted as a key driver to innovation (Soliman, 2012b), therefore testing this model in an innovative global supply chain firms could assist the finding of this thesis.

Another important area that has been identified as lacking and being under researched as it relates to the measurement of quality. To minimise or likely bridge potential quality gaps, good quality measurements need to be employed.

Quality measurement in scholarly research so far has greatly been influenced by uni-dimensional ranking scales, tolerating it to be construed in any way the person answering wishes to do so. This kind of rating indicates that quality has many dimensions which usually dilute good research by showing a lack of focus and further stepping away from the concept of quality research. For that reason, Holbrook and Corfman (1985 in Zeithaml, 1988, p. 16) "call for ambiguous quality measures to be replaced with scales based on conceptual definitions of quality." In that context, "quality was defined as a comparison between consumer expectations and perceptions of performance based on its

dimensions, an approach that allows for individual differences across subjects in the attributes that signal quality (Zeithaml, 1988, p. 16). As it can be seen from this thesis research, acceptable quality definitions need to be adapted for each of their relevant product and/or service categories so that relevant quality measurement scales could be confirmed and validated. A better outcome and more precise definitions are only possible with the full inclusion of customers. It is advisable that organisations take this approach in the clarification of definitions with their own customers. Each organisational network should choose a customer pool from a variety of customer segments and consumption levels and any other attributes/dimensions that are deemed important by both suppliers and customers. A definitely better definition can then be produced. These current shortcomings may pose some challenges in the examination of customers' attitudes towards quality, the expected level of service, cost and speed of delivery in this research too. That is why both suppliers and customers are encouraged to provide invaluable contributions in this important quest of a mutually satisfactory definition.

The general role of HRM in supporting the knowledge strategy in the innovation chain has been studied by Soliman (2011b). However, the HRM role in an innovative supply chain a supply firms has not received any noticeable attention and thus it warrants a further examination in a global innovative supply chain firms.

The knowledge and strategic gap analysis in this thesis need to be studied further using the knowledge attributes and the method of innovation knowledge assessment developed by Soliman (2012a).

6.4 Conclusions:

This research is a pioneering mission in itself. It is aiming to explore and analyse differences (gaps) between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in targeted global supply chain organisations in practice as well as in the literature, as much as its research scope,

researcher's resources and capabilities and the timeline allow it. The main focus of exploration and analysis will be the targeted supply chain companies and their associated networks and their existing functional interdependencies as individual and collective members of a chain.

This thesis has identified potential areas where gaps in supply chain operations might exist, however research is needed to identify them together with the factors that cause them which may have a significant impact on inherent individual organisational and network outcomes. It is evident from current research that supply chains are facing increasing difficulties in managing its resources effectively.

Various authors have focused on dealing with some of the identified difficulties however many other causes and reasons for poor performance need to be identified and solutions designed for supply chain companies and networks to be better able to find and utilise appropriate models. Knowledge management programs are charged with this task of bringing together effective knowledge for supply chain functions under a synchronised umbrella and providing adequate support to all member firms with what they need and when they need it.

Although functional issues such as cooperation, coordination, flexibility, and other business facets have received considerable attention, little research has been attempted in the area of supply chain gaps.

Gaps between suppliers' perceptions of customers' expectations and the actual customers' experiences in the expected level of service, quality, cost and speed of delivery of goods and/or services to customers in global supply chain organisations have particularly been overlooked by researchers.

Gaps in the expected levels of service, quality, cost and speed of delivery exist every time when customers' expectations do not become realised. Management's role is to consider their customers' perceptions as well as their actual experiences. In that regard, both

perceptions and actual experiences need to be monitored and any gaps minded, or where possible pre-emptied. Though gaps between products and services will vary amongst themselves, they will also vary among customers and suppliers alike. Management's challenge is to find out their customers' expectations and how those expectations should be delivered to the customers, that is how customers expect to receive them. In cases where customers are lost, it is equally important if not more important to discover what went wrong as is to keep the current customers satisfied and the operations profitable since the reasons for one unhappy or dissatisfied customer may be future reasons for many others.

Realisation of expected services, quality, cost and speed of delivery increase customer satisfaction and supplier profitability resulting in a win-win scenario.

While knowledge remains to play a crucial importance in all supply chain activities and arising complexities become more entangled due to a highly changing global marketplace, there is an increasing need for knowledge management programs to contribute to the supply chain field with appropriate solutions that are effective in bridging inherent supply chain gaps.

Thus, having some knowledge management programs in place is certainly better than having no knowledge management programs at all.

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APPENDIX 1

CUSTOMER QUESTIONNAIRE

Section1 Level of Customer Service

Please rate the supplier's performance for each of the following elements from 2 angles:

1. Expected Level of Service on a 5 point performance scale from **Very Dissatisfied (VD) to Very Satisfied (VS)** and
2. Actual Level of Service on a 5 point performance scale from **Very Dissatisfied (VD) to Very Satisfied (VS).**

Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
1	2	3	4	5

	Expected Level of Service	Actual Level of Service
1. Level of customer service received	_____	_____
2. Product / service availability	_____	_____
3. Supplier's capability to satisfy your needs	_____	_____
4. Product / service accessibility convenience	_____	_____
5. Product / service range	_____	_____

6. Please list or explain the factors that most contributed to your overall level of satisfaction_____

_____

7. If the level of service expected by you was not matched with the level of service received, what could be done to better serve / match your expectations?

_____

_____

Section 2 Level of Quality

Please rate the supplier's performance for each of the following elements from 2 angles:

Very Dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**

	Expected Quality	**Actual Quality Received**
8. Supplier reliability	_____	_____
9. Product/service quality	_____	_____
10. Service staff attitude towards your concerns	_____	_____
11. Service efficiency	_____	_____
12. Service feedback	_____	_____
13. Overall level of satisfaction	_____	_____

14. Please list or explain the factors that most contributed to your overall level of satisfaction

_____

_____

15. If the quality received by you did not match your expected quality, what could be done to better match your expectations?

_____

_____

Section 3 Cost Level

16. Is the price you paid for products and/or services from supplier XYZ the exact (advertised) price you expected to pay?

YES □ NO □

17. If NO, what caused a different price?

_____

_____

18. Did you receive volume discount? YES □ NO □

19. If YES, are you satisfied with the discount received? YES □ NO □

20. If NO, why did you not receive volume discount?_____

_____

Very Dissatisfied 1	Somewhat Dissatisfied 2	Neutral 3	Somewhat Satisfied 4	Very Satisfied 5

Advertised Cost **Final Cost**

21. **Rate Advertised against Final Cost** _____ _____

22. If the incurred (final) cost did not match your expected (advertised) cost, what could be done to better match your expectations?

_____

_____

Section 4 Speed of Delivery Level

23. Did you receive products and/or services from supplier XYZ in the promised (expected) timeframe?

YES □ NO □

24. If NO, what caused a late speed of delivery?_____

_____

Very Dissatisfied 1	Somewhat Dissatisfied 2	Neutral 3	Somewhat Satisfied 4	Very Satisfied 5

Expected Speed of Delivery **Actual Speed of Delivery**

25. **Rate Expected Speed against Actual Speed of Delivery** _____ _____

26. If you are not satisfied with the delivered speed, will this impact on your decision to look for an alternative supplier?

YES □ NO □

27. If the speed of delivery experienced by you was not matched with the speed of delivery expected, what could be done to better match your expectations?

_____

_____

Section 5 Instability Factors

If you knew that the expected customer service level, quality, cost and speed of delivery of products and/or services to you are going to be affected for approximately a couple of months by the following instability factors, **would you stay loyal to your supplier in a situation caused by**:

Instability factors caused by:	**Would you remain loyal if it impacted on Customer Service**	**Would you remain loyal if it impacted on Quality**	**Would you remain loyal if it impacted on Cost**	**Would you remain loyal if it impacted on Speed of Delivery**
28. Lack of commitment by suppliers	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
29. Unstable profit margins	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □

30. Unstable business relationships	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
31. Divided loyalties among supply chain partners	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
32. Disproportionate production (more produced than needed)	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
33. Needless resource investment	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
34. Customer / supplier instabilities	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □

Section 6 Vulnerabilities and risk factors

If you knew that your expected customer service level, quality, cost and speed of delivery of products and/or services to you are going to be affected for approximately a couple of months by the following **vulnerability and risk factors**, **would you stay loyal to your supplier in a situation caused by**:

Vulnerability and risk factors caused by:	**Would you remain loyal if it impacted on Customer Service**	**Would you remain loyal if it impacted on Quality**	**Would you remain loyal if it impacted on Cost**	**Would you remain loyal if it impacted on Speed of Delivery**
35. Fiscal or business inefficiencies	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
36. Inability to react to volatility in demand	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
37. Lack of information sharing and cooperation	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
38. High dependence on specific communications,	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □

distribution and transportation							
39. Loss of experienced workforce	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
40. Opportunism by customers or suppliers	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
41. Failure of a single supplier	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
42. Labour strikes	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
43. Product / service boycotts	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
44. Man-made computer viruses	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
45. Accidents	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
46. Acts of terrorism	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □

47. What could be done to ameliorate the most impacting effects?

_____

_____

Section 7 Modes of mental behaviour of decision makers in the supply chain

If you knew that your expected customer service level, quality, cost and speed of delivery of products and/or services to you are going to be affected for approximately a couple of months by **modes of mental behaviour of decision makers in the supply chain**, **would you stay loyal to your supplier in a situation caused by**:

Factors affecting modes of mental behaviour of decision makers in the supply chain	**Would you remain loyal if it impacted on Customer Service**	**Would you remain loyal if it impacted on Quality**	**Would you remain loyal if it impacted on Cost**	**Would you remain loyal if it impacted on Speed of Delivery**
48. Poor decision making caused by manager's attitudes, information interpretation, heuristics and routines	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
49. Poor production, capacity and pricing decisions	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
50. Unanticipated side-effects arising from specific managerial decisions	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
51. Industry demand for shorter lead times	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □

52. Outsourcing and use of global sourcing and supply	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
53. Politically determined counter trade agreements	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
54. Restrictions enforced by the safety-critical nature of the products	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □

55. If you knew of the above factors, how much of an impact would they have on you when choosing a potential supplier?_____

_____

_____

Your responses are invaluable in helping shape better supply chain practices.

Thank you for filling in this questionnaire!

APPENDIX 2

SUPPLIER QUESTIONNAIRE

Section 1 Level of Customer Service

Please rate your performance for each of the following elements from 2 angles:

1. Planned Level of Service on a 5 point performance scale from **Very Dissatisfied (VD) to Very Satisfied (VS)** and
2. Delivered Level of Service on a 5 point performance scale from **Very Dissatisfied (VD) to Very Satisfied (VS).**

Very dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**

	Planned Level of Service	**Delivered Level of Service**
1. **Level of customer service delivered**	_____	_____
2. **Product/service availability**	_____	_____
3. **Your capability to solve customer needs**	_____	_____
4. **Product/service accessibility convenience**	_____	_____
5. **Product/service range**	_____	_____

6. If the level of service delivered did not match your customers' expectations, what could be done better to satisfy your customers?

_____

_____

_____

Section 2 Quality Level

Please rate your quality performance for each of the following elements from 2 angles:

Very dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**

	Planned Quality	**Delivered Quality**
7. **Your product/service reliability**	_____	_____
8. **Product/service quality**	_____	_____
9. **Service staff attitude towards customer concerns**	_____	_____
10. **Service efficiency**	_____	_____
11. **Service feedback to customers**	_____	_____
12. **Your customer satisfaction level**	_____	_____

13. If the level of quality delivered did not match your customers' expectations, what could be done better to satisfy your customers' expectations?

_____

_____

Section 3 Cost Level

14. Did you charge your customer ABC the exact (advertised) price he/she expected to pay for your goods and/or services?

YES □ NO □

15. If NO, what caused a different price?_____

_____

16. Did you offer volume discount to customer ABC? YES □ NO □

17 If NO, why did you not offer a discount?_____

_____

18. If YES, do you think that your customer is satisfied with the final cost incurred?

YES □ NO □ NOT SURE / DO NOT KNOW □

Very dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**
		Advertised Cost		**Final Cost**

19. **Rate Advertised against Final Cost** _____ _____

20. If the final cost charged by you did not match your customers' perceived cost, what could be done better to satisfy your customers' expectations?

_____

_____

_____

Section 4 Speed of Delivery Level

21. Did you deliver products and/or services to customer ABC in the promised (expected) timeframe?

YES □ NO □

22. If NO, why did you fail to deliver on your promise (expectation)?

_____

_____

_____

Very dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**

	Planned Speed of Delivery	**Delivered Speed**
23. **Rate Delivered against the Planned Speed of Delivery**	_____	_____

24. If the speed of delivery did not match your customers' expectations, what could be done better to satisfy your customers' expectations?

_____

_____

_____

Section 5 Instability Factors

Do you think that the following elements could impact on the expected customer service, quality, cost and speed of delivery of products and/or services supplied by you to your customers?

Instability factors caused by:	Expected customer service level affected	Quality affected	Cost affected	Speed of delivery affected
25. Lack of commitment by suppliers	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
26. Unstable profit margins	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
27. Unstable business relationships	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
28. Divided loyalties among supply chain partners	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
29. Disproportionate	YES □	YES □	YES □	YES □

production (more produced than needed)	NO □	NO □	NO □	NO □
30. Needless resource investment	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
31. Customer / supplier relationship instabilities	YES □ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐	YES ☐ NO ☐

32. What could be done to ameliorate the most impacting effect?

_____

_____

_____

Section 6 Vulnerabilities and risk factors

Do you think that the following elements could impact on customer service, quality, cost and speed of delivery of products and/or services supplied by you to your customers?

Vulnerability and risk factors caused by:	Expected customer service level affected	Quality affected	Cost affected	Speed of delivery affected
33. Fiscal or business inefficiencies	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
34. Inability to				

react swiftly to volatility in demand	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
35. Lack of information sharing, trust and cooperation	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
36. High dependence on specific communications, distribution and transportation	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
37. Loss of experienced workforce	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
38. Opportunism by customers or suppliers	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
39. Failure of a single supplier	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
40. Labour strikes	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
41. Product /	YES □	YES □	YES □	YES □

service boycotts	NO	□	NO	□	NO	□	NO	□
42. Man-made	YES	□	YES	□	YES	□	YES	□
computer viruses	NO	□	NO	□	NO	□	NO	□
43. Accidents	YES	□	YES	□	YES	□	YES	□
	NO	□	NO	□	NO	□	NO	□
44. Acts of	YES	□	YES	□	YES	□	YES	□
terrorism	NO	□	NO	□	NO	□	NO	□

45. What could be done to ameliorate the most impacting effects?

_____

_____

Section 7 Modes of mental behaviour of decision makers in the supply chain

Do you think that weaknesses in the following factors can impact on your ability to deliver expected customer service, quality, cost and speed of delivery of products and/or services to your customers?

Modes of mental behaviour factors caused by:	Expected customer service level affected	Quality affected	Cost affected	Speed of delivery affected
46. Poor decision making by management caused by manager's attitudes, their information interpretation, heuristics and routines	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
47. Poor production, capacity and pricing decisions	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
48. Unanticipated side-effects arising from specific managerial decisions	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
49. Industry demand for shorter lead times	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □
50. Outsourcing and use of global sourcing and supply	YES □ NO □	YES □ NO □	YES □ NO □	YES □ NO □

51. Politically determined counter trade agreements	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □
52. Restrictions enforced by the safety-critical nature of the products	YES NO	□ □	YES NO	□ □	YES NO	□ □	YES NO	□ □

53. What do you suggest could be done to ameliorate the most impacting effects?_____

_____

_____

Section 8 Impact on the performance of suppliers

Please rate your performance for the following metrics from 2 angles.

Very dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
1	**2**	**3**	**4**	**5**

	Expected Level	**Actual Level of Performance**
54. **Customer Satisfaction with the Level of Service**	_____	_____
55. **Level of Product/Service Quality Provided**	_____	_____
56. **Level of Customer Loyalty Retained**	_____	_____
57. **Speed of Delivery Achieved**	_____	_____
58. **Customer Cost Satisfaction Level**	_____	_____
59. **Service Staff Performance Level**	_____	_____
60. **Overall Impact on Company Reputation**	_____	_____

Your responses are invaluable to supply chain industry practices.

Thank you for taking your precious time to fill in this questionnaire.

6.7 Supplier Performance Frequency Tables

Customer satisfaction with the level of service (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Customer satisfaction with the level of service(actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	3.3	10.0	10.0
	Somewhat Satisfied	16	26.7	80.0	90.0
	Very Satisfied	2	3.3	10.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Product/service quality level provided (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Product/service quality level provided (actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	5.0	15.0	15.0
	Somewhat Satisfied	12	20.0	60.0	75.0
	Very Satisfied	5	8.3	25.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Level of customer loyalty retained (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Level of customer loyalty retained (actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	3	5.0	15.0	15.0
	Somewhat Dissatisfied	8	13.3	40.0	55.0
	Neutral	4	6.7	20.0	75.0
	Somewhat Satisfied	5	8.3	25.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Speed of Delivery Achieved (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Speed of Delivery Achieved (actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	6	10.0	30.0	30.0
	Somewhat Dissatisfied	1	1.7	5.0	35.0
	Very Satisfied	13	21.7	65.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Customer Cost Satisfaction Level (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Customer Cost Satisfaction Level (actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	1.7	5.0	5.0
	Somewhat Dissatisfied	6	10.0	30.0	35.0
	Neutral	1	1.7	5.0	40.0
	Somewhat Satisfied	3	5.0	15.0	55.0
	Very Satisfied	9	15.0	45.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Service Staff Performance Level (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Service Staff Performance Level (actual)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	6	10.0	30.0	30.0
	Neutral	3	5.0	15.0	45.0
	Somewhat Satisfied	9	15.0	45.0	90.0
	Very Satisfied	2	3.3	10.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

Overal Impact on Company Performance (expected)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	20	33.3	100.0	100.0
Missing	System	40	66.7		
Total		60	100.0		

Overal Impact on Company Performance (actual)

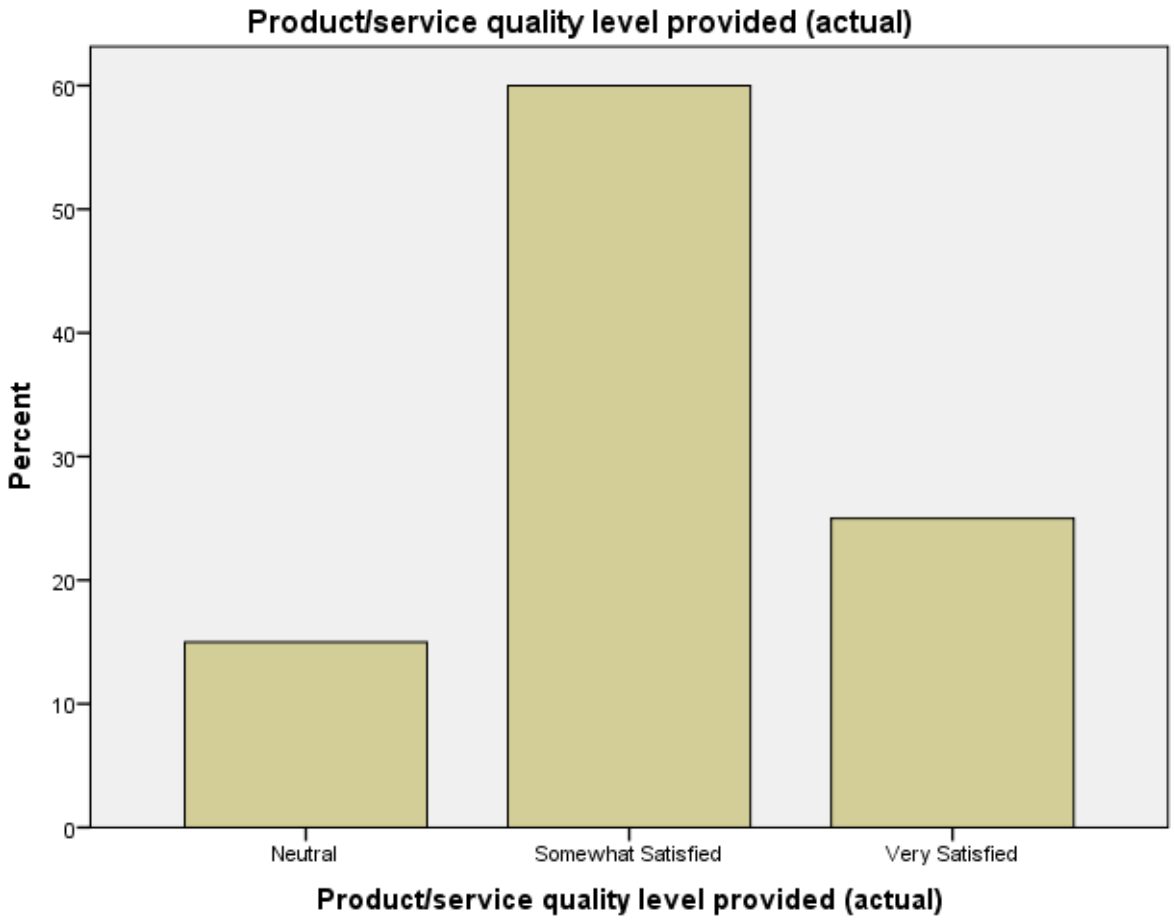
		Frequency	Percent	Valid Percent	Cumulative Percent
	Somewhat Dissatisfied	5	8.3	25.0	25.0
	Neutral	4	6.7	20.0	45.0
Valid	Somewhat Satisfied	9	15.0	45.0	90.0
	Very Satisfied	2	3.3	10.0	100.0
	Total	20	33.3	100.0	
Missing	System	40	66.7		
Total		60	100.0		

6.8 Supplier Performance Bar Charts

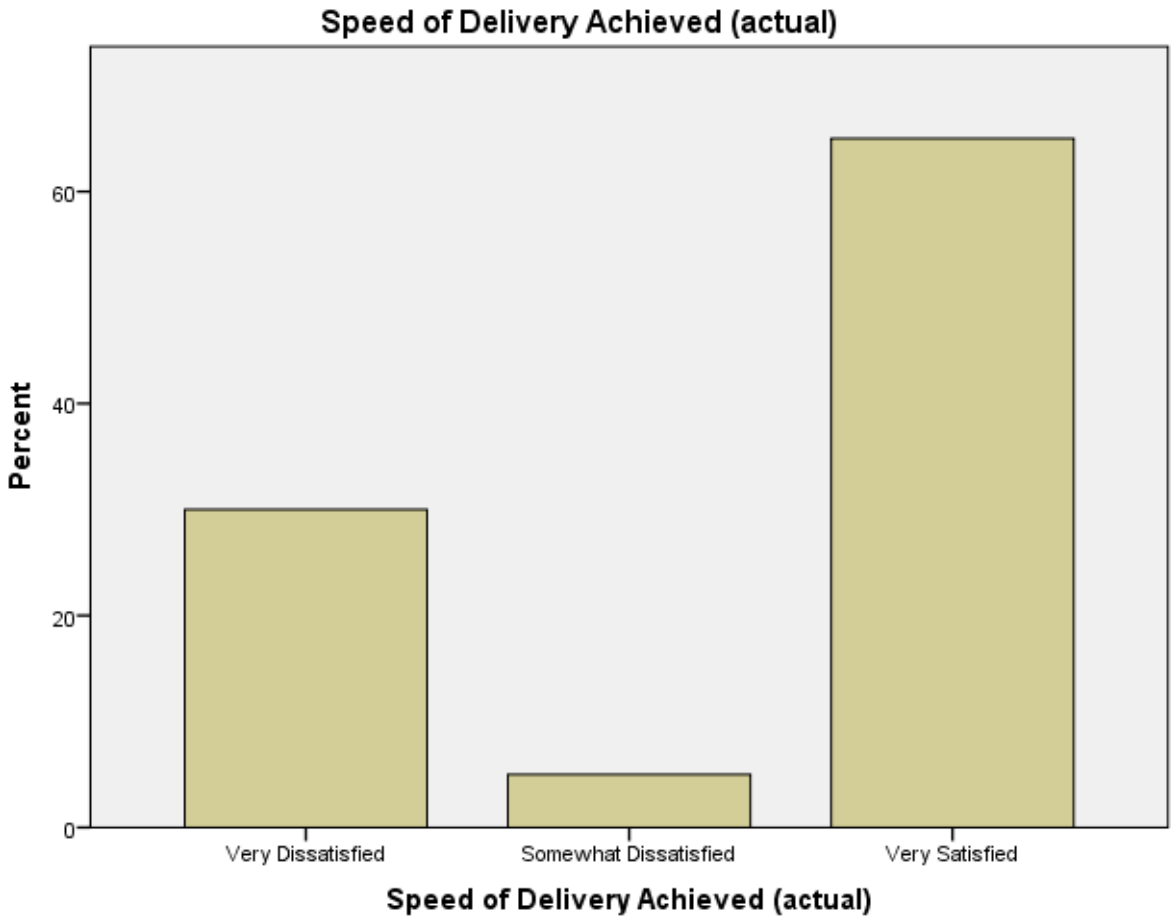
Please note: The following plots are identical with almost the same high level of satisfactions:

1. Customer Satisfaction with the level of service (expected).
2. Customer Satisfaction with the level of service (actual).
3. Product/Service Quality level provided (expected).
4. Product/Service Quality level provided (actual).
5. Level of Customer Loyalty retained (expected).
6. Level of Customer Loyalty retained (actual).
7. Speed of Delivery Achieved (expected).
8. Speed of Delivery Achieved (actual).
9. Customer Cost Satisfaction Level (expected).
10. Customer Cost Satisfaction Level (actual).
11. Service Staff Performance Level (expected).
12. Service Staff Performance Level (actual).
13. Overall Impact on Company Performance (expected).
14. Overall Impact on Company Performance (actual).


Customer satisfaction with the level of service(actual)
Percent
80
60
40
20
0
Neutral
Somewhat Satisfied
Very Satisfied
Customer satisfaction with the level of service(actual)

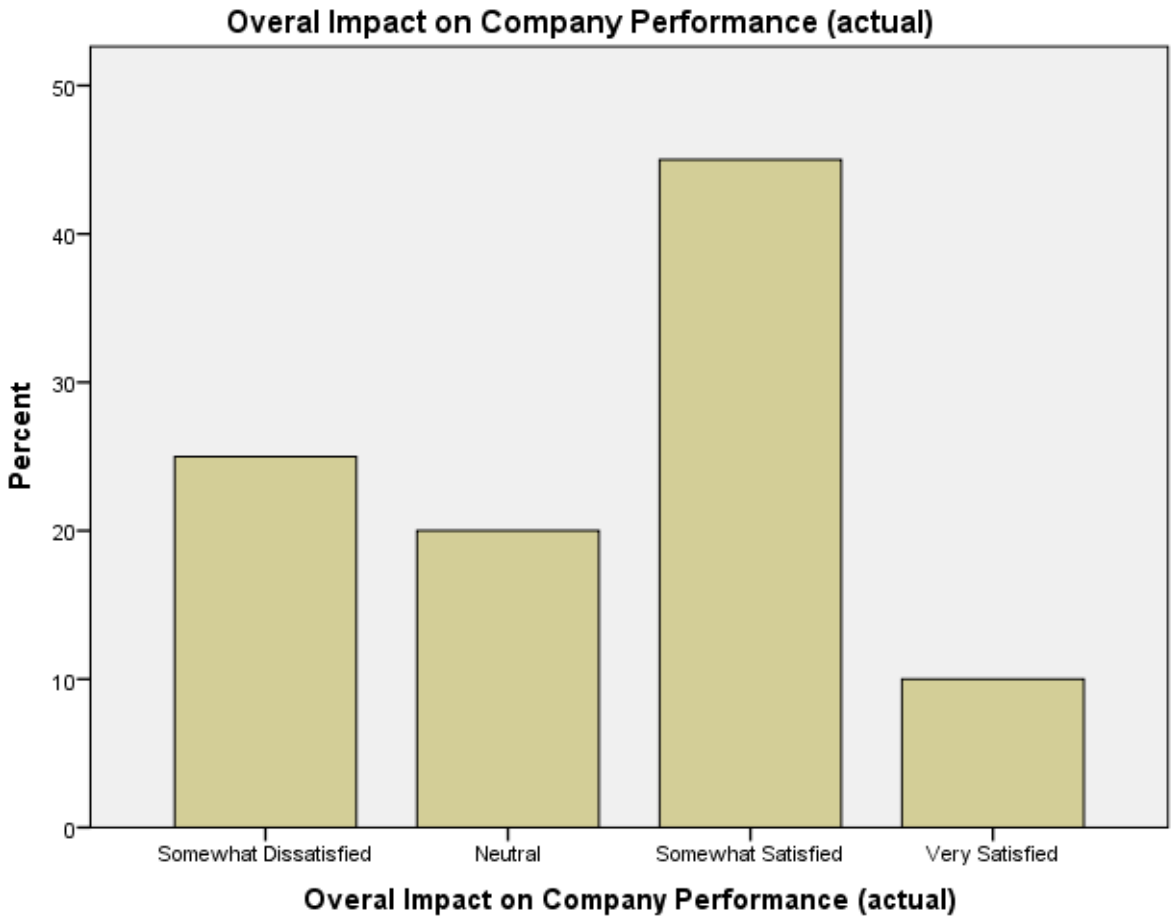

Product/service quality level provided (actual)
Percent
60
50
40
30
20
10
0
Neutral
Somewhat Satisfied
Very Satisfied
Product/service quality level provided (actual)


Level of customer loyalty retained (actual)
Percent
40
30
20
10
0
Very Dissatisfied
Somewhat Dissatisfied
Neutral
Somewhat Satisfied
Level of customer loyalty retained (actual)


Speed of Delivery Achieved (actual)
Percent
60
40
20
0
Very Dissatisfied
Somewhat Dissatisfied
Very Satisfied
Speed of Delivery Achieved (actual)


Customer Cost Satisfaction Level (actual)
Percent
50
40
30
20
10
0
Very Dissatisfied
Somewhat Dissatisfied
Neutral
Somewhat Satisfied
Very Satisfied
Customer Cost Satisfaction Level (actual)


Service Staff Performance Level (actual)
Percent
50
40
30
20
10
0
Somewhat Dissatisfied
Neutral
Somewhat Satisfied
Very Satisfied
Service Staff Performance Level (actual)


Overal Impact on Company Performance (actual)
Percent
50
40
30
20
10
0
Somewhat Dissatisfied
Neutral
Somewhat Satisfied
Very Satisfied
Overal Impact on Company Performance (actual)