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AN APPROACH TO IMPROVING QUALITY MANAGEMENT IN SMALL MANUFACTURING FIRMS IN THE WESTERN CAPE, SOUTH AFRICA

by

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DECLARATION

I, Zinzi Nxopo, hereby declare that the contents of this dissertation represent my own unaided work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed Znxopo **Date** 14 November 2011

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ABSTRACT

The clothing industry in South Africa is historically well established and caters from basic and low cost products to high-fashion tailormade garments. In 1995, the top five retail chains (Edgars, Wooltru, Pepkor, Foschini and OK) accounted for 58 percent of clothing retail sales. Research on quality management has shown that quality management programmes are not effectively utilised within small clothing manufacturing firms in the Western Cape, The result of this - poor goods and services - has been highlighted. This leads to useful insight into critical aspects pertaining to customer satisfaction and quality service delivery.

The research problem researched within the ambit of this dissertation reads as follows: "Quality management programmes are not effectively utilised within small clothing manufacturing firms in the Western Cape, resulting in poor goods and services being produced".

The primary research objectives of this study are the following:

- To identify key drivers underpinning complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery.
- To identify the benefits of using quality management tools and techniques, used currently by small clothing manufacturing firms.
- To determine if small clothing manufacturing firms have a strategic focus on the quality of a product that they produce.
- To identify a mechanism that can be deployed to promote the application of a quality management system.
- To identify the benefits of implementing quality management systems within a small clothing manufacturing firm.

Reciprocally, the research question, which forms the crux of the research, reads as follows: "What mechanisms can be deployed to promote the application of quality management systems in the Western Cape, thus leading to an improvement of goods and services?"

The application of quality management tools and techniques, such as statistical quality control and quality function deployment, has been researched in the small clothing manufacturing sector. The research leads to an improvement in the current state pertaining to quality management programmes not being effectively utilised within small clothing manufacturing firms. Mechanisms to be deployed to promote the application of quality management systems will also be identified, possible solutions found to customer complaints and problem areas addressed. In addition, the research leads to improved quality of goods and services being produced resulting in satisfied customers.

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GLOSSARY OF TERMS

Quality Management Systems:	Is defined as a set of policies, processes and procedures required for planning and execution (production/development/service) in the core business area of an organisation. (Dale, 2001:241).
International Organisation for Standardisation (ISO):	A non-governmental organisation, established to promote the development of standardisation and related activities in the world, with a view to facilitating the international exchange of goods and services. (Dale, 2001:243).

CHAPTER 1: SCOPE OF THE RESEARCH

1.1 INTRODUCTION

The South African clothing industry can be termed historically conservative; opting for survival more than the maximisation of profits (Altman, 1993:33). The industry has been criticised as being too inflexible in its quality and production methods; unresponsive to the changing global environment; unwilling to invest in capital goods, as reflected in the low levels of such investment; and unable to improve quality inefficiencies. The management structure of the industry is regarded as top heavy and expensive, while managers and owners do not dynamically contribute to innovation and renewal, and fail to grasp South Africa's market access arrangements (DTI, 2005:10) and (Barnes, 2005:7). This industry is furthermore not attracting 'new blood' because of the perceptions that clothing manufacturing in South Africa is a 'sunset industry'.

Apart from the clothing manufacturers, the other sectors that are becoming role players that have been identifiable since the mid-1990s, are the clothing retailers. As the clothing value chain is regarded as a buyer-driven chain, the retailers are the most important participants in the clothing value chain. Power is located at the end of the value chain, as the retailers determine the orders and the prices, causing a problem in service delivery and customer satisfaction (Altman, 1993:15). In South Africa, small manufacturing firms, especially in the clothing sector, do not have access to quality management programmes as utilised in large manufacturing and retail firms (Altman, 1993:16).

The mechanisms to be deployed to promote the application of quality management systems will eliminate the need for small clothing manufacturing companies to be dependent on large manufacturing companies and retailers, thus contributing to these companies being self-sufficient and independent. The quality of products and services are the most important factors considered by retailers when acquiring garments from the clothing industry (Dunn, 2000:40). The decentralised nature of production in small clothing manufacturing firms

makes it difficult for the customers to control the quality of work, which often results in a high rejection rate of completed garments. Quality management provides small clothing manufacturing firms with procedures that can be followed to ensure that the garments produced meet customer specification. Manning (1993:25), reported that it is essential for small clothing manufacturing firms to have developed quality management programmes to be able to produce quality products and services.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

It is clear, as the world economy continues to move toward increased integration because of advances in communications technology, growth in developing countries, and reductions in trade barriers, that some of the greatest opportunities for small businesses will derive from their ability to participate in the global market place (Alvarez, 1999:10).

The clothing industry in South Africa is historically well established and caters from basic and low cost products to high-fashion tailor-made garments. The creation of an additional employment opportunity in this labour-intensive industry is relatively cheap, and cost less than R10 000 in the early 1990s (Altman, 1989:5). While clothing expenditure as a proportion of private consumption has been falling since the mid-1970s, domestic demand has increased, in particular at the lower end where South African clothing manufacturers are not competitive. The recent employment losses in the clothing industry have been mainly caused by import penetration, and not by productivity improvements. Moreover, a powerful retail sector limits the distribution of profits through the pipeline, possibly hindering new investment. In 1995 the top five retail chains Edgars, Wooltru, Pepkor, Foschini and OK accounted for 58 percent of clothing retail sales (Altman, 1993:5).

Small clothing firms that promote the application of quality management systems are more successful, and are in a better position to gain an understanding of key customer needs, and shares organisational learning more effectively (Hendricks &

Singhal, 1996:415). The firms that do not know the mechanism that can be deployed to promote the application of quality management systems to avoid poor products and services to be produced, should study quality models, concepts, and tools developed and popularised by Deming (1986:15), and Juran (1989:13). In order to understand quality initiatives, one must first understand what quality is. Deming (1986:15), was one of the first to talk about meeting or exceeding customers' expectations and requirements, that are determined or modified through continuous communication between customers, front-line associates, and management. Juran (1989:13), believes that quality transposes into fitness for use.

1.3 STATEMENT OF THE RESEARCH PROBLEM

According to Watkins (2008:35), (citing Cooper and Schindler 2006), statement of the research problem pertains to a problem within the research environment, and forms the primary focus of the research. In respect of the above background, the focus of this dissertation is to provide insight on small clothing manufacturing firms who are not utilising quality management programmes effectively, resulting in poor goods and services being produced. The research problem to be specifically focused on within the ambit of this dissertation reads as follows: "Quality management programmes are not effectively utilised within small clothing manufacturing firms in the Western Cape, resulting in poor goods and services being produced".

1.4 THE RESEARCH QUESTION

The research question to be researched within the ambit of this study, reads as follows: "What mechanisms can be deployed to promote the application of quality management systems in the Western Cape, thus leading to an improvement of goods and services?"

1.5 INVESTIGATIVE (SUB-) QUESTIONS

The investigative questions to be researched in support of the research questions read as follows:

- What quality management tools and techniques can small clothing manufacturing firms use to improve quality management?
- What are the major causes of the poor production of goods and services?
- Which mechanisms can be deployed to promote the application of quality management systems?
- What are the key drivers of complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery?
- What are the benefits of implementing quality management systems within a small clothing manufacturing firm?

1.6 PRIMARY RESEARCH OBJECTIVES

The primary research objectives of this dissertation are the following:

- To identify the key drivers underpinning complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery.
- To identify the benefits of using quality management tools and techniques, currently used by small clothing manufacturing firms.
- To determine if small clothing manufacturing firms have a strategic focus on the quality of the product that they produce.
- To identify the mechanisms that can be deployed to promote the application of quality management systems.
- To identify the benefits of implementing quality management systems within a small clothing manufacturing firm.

1.7 THE RESEARCH PROCESS

The research process provides an insight into the process of 'how' the research will be conducted, from developing the proposal to submitting the dissertation. According to Watkins (2008:39), (citing Remenyi, Williams, Money and Swartz

2002), explain that the research process consists of eight specific phases, which will also be applied to this research study. The phases are:

- Reviewing the literature.
- Formalising a research question.
- Establishing the methodology.
- Collecting evidence.
- Analysing the evidence.
- Developing conclusions.
- Understanding the limitations of the research.
- Producing management guidelines or recommendations.

1.8 RESEARCH DESIGN AND METHODOLOGY

According to Watkins (2008:42), (citing Yin 1994), a research design can be defined as, "…the logical sequence that connects the empirical data to a study's initial research question, and ultimately, to its conclusions. Colloquially, a research design is an action plan from getting here to there, where 'here' may be defined as the set of questions to be answered, and 'there' are some conclusions about the questions."

Case study research will form part of the primary research paradigm in this dissertation with small clothing manufacturing firms in Western Cape. Some of the salient aspects of case study research described by (Yin, 1994) cited by Watkins (2008:46-47), are listed below for ease of reference:

- A case study is an empirical enquiry that investigates a contemporary phenomenon with its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.
- Case study research aims, not only to explore certain phenomena, but also to understand them in a particular context.
- 'How' and 'why' questions are explanatory, and likely to be used in case study research.
- A case study illuminates a decision or set of decisions –why they were taken, how they were implemented, and with what result.

- The case study as a research strategy comprises an all-encompassing method, with the logic of design incorporating specific approaches to data collection and data analysis. In this sense, the case study is neither a data collection tactic nor merely a design feature alone, but 'a comprehensive research strategy'.
- Case study research uses multiple methods of collecting data, which may be both qualitative and quantitative.
- A case study is typically used when contextual conditions are the subject of research.

According to Watkins (2008:47), (citing Collis and Hussey 2003), case studies are often described as 'exploratory research used in areas where there are few theories or a deficient body of knowledge'. In addition, the following types of case studies can be identified:

- **Descriptive case studies:** Where the objective is restricted to describing current practice.
- **Illustrative case studies:** Where the research attempts to illustrate new, and possibly innovative, practices adopted by particular companies.
- **Experimental case studies:** Where the research examines the difficulties in implementing new procedures and techniques in an organisation and evaluates the benefits.
- **Explanatory case studies:** Where the existing theory is used to understand and explain what is happening.

Watkins (2008:47), (citing Yin 1994), emphasises the following five components of a research design, which are especially important for case studies:

- **Study questions:** The case study strategy is most likely to be appropriate for 'how' and 'why' questions, which calls for the initial task being to clarify precisely the nature of the study questions.
- **Study propositions:** A study proposition directs the attention to something that should be examined within the scope of the study. For greater clarity, the proposition points to the, 'reason for the study'.

- **Unit of analysis:** Should the case study involve a specific person being studied, say a person with a rare medical problem, the individual being studied is the primary unit of analysis. The tentative definition of the unit of analysis is related to the way in which the initial research questions were formulated.
- **Linking data to propositions:** A number of ways are open to students to link data to propositions. An approach suggested by Yin is that of 'pattern matching', whereby several pieces of information from the same case may be related to some theoretical proposition.
- **Criteria for interpreting findings:** If the different 'patterns' are sufficiently contrasting, the findings can be interpreted in terms of comparing at least two rival propositions.

1.9 DATA COLLECTION DESIGN AND METHODOLOGY

Questionnaires will serve as the data collection methodology, as it falls within the broader definition of 'survey research' or 'descriptive survey'. Watkins (2008: 67), (citing Remenyi *et al.* 2002), defines the concept of 'survey' as: ". . . the collection of a large quantity of evidence, usually numeric, or evidence that will be converted to numbers, normally by means of a questionnaire". A questionnaire consists of a list of questions compiled in order to elicit reliable responses from a chosen sample, with the aim of determining what the participants do, think or feel. There are two approaches in structuring questions, namely, positivistic (structured 'closed' questions) and phenomenological (unstructured 'open-ended questions). The sample frame consists of 30 small clothing manufacturing firms in the Western Cape, whereas the sample is drawn from employees.

1.10 DATA VALIDITY AND RELIABILITY

According to Watkins (2008:67), (citing Collis and Hussey 2003), 'validity' is concerned with the extent to which the research findings accurately represent what is happening, or, more specifically, whether the data is a true picture of what is being studied. According to Watkins (2008:67), (citing Cooper and Schindler

2006), three major forms of validity can be identified; namely 'content validity', 'criterion-related validity' and 'construct validity'.

Reliability (also referred to as 'trustworthiness'), is concerned with the findings of the research (Collis and Hussey, 2003) cited by (Watkins 2008:68). The findings can be said to be reliable if you or anyone else repeated the research and obtained the same results. There are three common ways of estimating the reliability of the responses to questions in questionnaires or interviews, namely:

- Test re-test method, which will be applied to this research study, the
- Split halves method, and the
- Internal consistency method.

1.11 ETHICS

In the context of research, according to Watkins (2008: 69), (citing Saunders, Lewis and Thornhill 2001), ". . . ethics refers to the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it". The following ethics will be observed in the research study:

- **Informed consent:** Participants will be given the choice to participate or not to participate, and furthermore be informed in advance about the nature of the study.
- **Right to privacy:** The nature and quality of participants' performances will be kept strictly confidential.
- **Honesty with professional colleagues:** Findings will be reported in a complete and honest fashion, without misrepresenting what has been done, or intentionally misleading others as to the nature of it. Data will not be fabricated to support a particular conclusion**.**
- **Confidentiality/Anonymity:** Confidentiality or anonymity will be offered to participants.

1.12 RESEARCH ASSUMPTIONS

According to Watkins (2008:71), (citing Leedy and Ormrod 2001), provide the following explanation of assumptions, which could not be improved upon, and is thus cited verbatim: "Assumptions are what the researcher takes for granted. But taking things for granted may cause much misunderstanding. What we may tacitly assume, others may have never considered. If we act on our assumptions, and if in the final result such actions make a big difference in the outcome, we may face a situation we are totally unprepared to accept. In research we try to leave nothing to chance, in the hope of preventing any misunderstanding. All assumptions that have a material bearing on the problem should be openly and unreservedly set forth. If others know the assumptions a researcher makes, they are better prepared to evaluate the conclusions that result from such assumptions. To discover your own assumptions, ask yourself: What am I taking for granted with respect to the problem? The answer will bring your assumptions into clear view".

The following assumption applies to the research:

- A quality management system could serve as the primary mechanism to prevent poor services and products from being produced.
- The interviewees will not be defensive in truthfully answering the questions to determine the weaknesses that result from quality programmes not being effectively utilised, resulting in poor goods and services being produced.

1.13 RESEARCH CONSTRAINTS

According to Watkins (2008:73), (citing Collis and Hussey 2003),'limitations' identify weaknesses in the research, while 'de-limitations' explain how the scope of the study was focused on only one particular area or entity, as opposed to, say, a wider or holistic approach. The research constraints pertaining to this proposal are as follows:

1.13.1 Limitations

- Certain individuals may have undergone quality management training and may be biased in their answers in the survey.
- The unavailability of small clothing manufacturing firm owners when needed for interviews.

1.13.2 De-limitations

- The research is limited to the small clothing manufacturing firms in the Western Cape.

1.14 SIGNIFICANCE OF THE PROPOSED RESEARCH

The significance of this research lies embedded in the fact that the mechanisms which will be identified will promote the application of quality management systems, thus leading to an improvement of goods and services. The formulation of a quality culture within small clothing manufacturing firms has the potential:

- To improve and optimally utilise current quality tools and techniques to enhance a quality culture within small clothing manufacturing firms.
- To establish a quality management system as a beneficial mechanism to benefit all small clothing manufacturing firms and to promote their improvement in goods and services produced.
- To implement a proper quality management system in small clothing manufacturing firms to place them in a global competitive market. This will help them to sustain, and not fail, within two years of the inception stage.
- To support small clothing manufacturing firms in utilising quality management programmes to avoid the production of poor goods and services.
- To identify the benefits of implementing quality management systems within a small clothing manufacturing firm.

1.15 CHAPTER AND CONTENT ANALYSIS

The following chapters and content analysis will be applicable to the research study:

- **Chapter 1 – Scope of the research:** A high level background will be provided, of the scope of the research taking place within small clothing manufacturing firms in the Western Cape. The research process will be explained and the research design and methodology elaborated upon.
- The research constraints will be listed, and a high level overview provided of the chapter and content analysis of the dissertation. The chapter will be concluded with a list of primary research objectives.
- **Chapter 2 – Holistic perspective of the research environment:** The small clothing manufacturing business environment, quality management for small clothing manufacturing firms and the legislation governing the small clothing manufacturing sector in Western Cape will be elaborated upon. Specific focus will be levelled on external and internal factors, which impact small clothing manufacturing firms globally, and in South Africa. This focus will in particular be centred on the deployment of a mechanism to promote the application of quality management systems, including quality tools and techniques that can be used by small clothing manufacturing firms and the impact that it has to enhance or drive an improvement of goods and services being produced by small clothing manufacturing firms in Western Cape.
- **Chapter 3 – Quality Management within small manufacturing firms (A literature review):** An in depth literature review will be inducted on the concept of quality management in small clothing manufacturing firms.
- **Chapter 4 – Data collection design and methodology:** The survey environment will be elaborated upon and the de-limitations of the survey listed. The approach to data collection will be explained and the target population defined. The measurement scales to be used in the survey, and the survey design, will be explained in detail.
- **Chapter 5 – Data analysis and interpretation of results:** Gleaned from the survey conducted within the ambit of Chapter 4, will be analysed in detail and interpreted in terms of the primary theme of the dissertation. In addition,

the results from the survey will be related to the literature review conducted within the ambit of Chapter 3.

- **Chapter 6 – Conclusion:** The research will be concluded. The research problem, research hypothesis, investigative questions and key research objectives will be revisited and final conclusions drawn. In addition, recommendations will be made to mitigate the research problem.

CHAPTER 2: BACKGROUND TO THE RESEARCH ENVIRONMENT: A HOLISTIC PERSPECTIVE

2.1 INTRODUCTION TO THE RESEARCH ENVIRONMENT

The clothing and textile sector is an important part of the Western Cape in the economy, being the single most significant source of industrial employment in the province (DTI, 2005:31). The province is the biggest producer of clothing in the country, and the second biggest producer of textiles. Nationally, the South African clothing industry recorded sales of around R11 billion in 2001 (Wesgro, 1998a:1) and the South African textiles industry received sales of a further R11 billion in the same year (Wesgro, 1998b:5). However, it is a sector that is currently in rapid decline. Nationally, the clothing, textile, footwear and leather industry lost 21 000 jobs in 2003, with about 6 000 of those lost in the Western Cape (Kadalie, 2005a:6), and there is concern that if it continues to decline at its current rate the industry could disappear by 2012.

While the industry is unlikely to disappear in its entirety, because local retailers will always require to access the local producers in order to meet the need for the market (Todd, 2005:11). Many commentators agree that the industry does face the prospect of becoming so small that it is an insignificant player, by local or international standards Barnes (2005:10) and Kipling (2005:15). This will have a significantly detrimental effect on the lives of hundreds of thousands of Western Cape residents.

There are several structural issues that make the Western Cape's clothing and textile sector uncompetitive, both locally and in the export market, including comparatively high labour costs and inflexible labour legislation, lack of investment, poor innovation, lack of skills development, and lack of access to finance. Most quality management programmes are not effectively utilised within small clothing manufacturing firms in the Western Cape, resulting in poor goods and services being produced. These problems are intensified by the fact that the

domestic clothing and textile industry is under attack on a dual front: from massively increased imports of cheap Chinese products, as well as from a loss of export markets, because of the dominance of cheap Chinese products in those markets as well (Naumann, 2005:30).

2.2 BACKGROUND TO THE RESEARCH ENVIRONMENT

The textile and clothing industries are among the most widely distributed of all economic sectors, in that the sector provides vital commodities that no country can do without, while also being labour intensive, relatively easy to establish and, in most product segments, also highly dependent on low-cost labour (Naumann, 2005:31).

Global trade in apparel and textiles has increased sixty-fold during the past 40 years, and in 2003 represented about 5.4 percent of world merchandise exports United Nations Conference on Trade and Development (UNCTAD, 2005:1). The labour-intensive apparel exports have grown more rapidly than textile exports, and today apparel accounts for more than half (57 percent) of the total (UNCTAD, 2005:1). Forty years ago the industrialised countries dominated global exports in this area, although, today, developing countries produce half of the world's textile exports and nearly three quarters of the world's apparel exports (UNCTAD, 2005:1). According to Ernst, Ferrer and Zult, (2005:16), a range of factors influence the competitiveness of textile and clothing industry, which impacts on a country's ability to position itself within the global clothing and textile landscape.

2.3 OVERVIEW OF THE WESTERN CAPE ECONOMY

The Western Cape is divided into a single metropolitan area with five district municipalities. Cape Town generates approximately 78 percent of the province's Gross Geographic Product (GGP), and contributes approximately 11 percent of the national economy (City of Cape Town, 2009:16). The Western Cape is strategically located along east-west and north-south sea routes, with two world-class harbours, Cape Town and Saldanha, Western Cape Department of Economic

Development and Tourism (DEDAT, 2006:9). The Western Cape's infrastructure is relatively well developed, compared to most of the other provinces, but much less impressive when compared on a global scale (DEDAT, 2006:13).

The city has a relatively diverse economy, with approximately 93 percent of its businesses being small, although they contribute 50 percent of the total output and 40 percent of the formal employment (City of Cape Town, 2009:16). The province has a relatively skilled pool of labour available and the education levels are, on average, better than other provinces. The Western Cape's economy has a broad base, and diversity in its more promising sub-sectors, industries or "niches" (DEDAT, 2006:13). The regional gross domestic product (RGDP) statistics of the Western Cape indicate that the province again posted an above-average growth rate in real output of 5.8 percent in 2007, whereas the South African GDP growth averaged 5.1 percent (Provincial Treasury, 2009:25). The four core sectors of the Western Cape's economy (agriculture, manufacturing, trade and financial as well as business services) are each well diversified, reducing the risk of over-dependence on any single industry (DEDAT, 2006:13).

2.4 WESTERN CAPE MANUFACTURING INDUSTRY

The Western Cape economy, along with KwaZulu-Natal, and to some extent Gauteng, has traditionally had a vibrant clothing and textile sector. It contributes in the region of 1.4 percent of total the manufacturing employment in South Africa (Barnes, 2005:6), with about 50 000 people employed in textiles and about 100 000 employed in clothing (Stanford, 2004:4). If the clothing and textile sector were lost to foreign competition, this would have a considerable negative effect on the already serious unemployment situation in South Africa, particularly the Western Cape.

There are various reasons why the Western Cape's clothing and textile sector is under threat from rising imports and falling exports. These include a regulated labour market, leading to relatively costly labour and higher unit prices, low capital expenditure on new assets, and competitive weaknesses, such as long lead

times, poor delivery reliability and poor quality. South African motor industry's argument could be that, no matter what protectionist policies are put in place, nothing can be done to save the Western Cape and textile sector from China's low labour costs and superior efficiency (Vlok, 2006, 227).

2.5 CHARACTERISTICS OF THE LOCAL CLOTHING AND TEXTILE SECTOR

The Western Cape's clothing industry began to grow in importance around 1910-1915, when there was a large influx of Jewish immigrant tailors from Latvia and Lithuania, which had strong clothing industries (Kipling, 2005:10). These immigrants were supported by existing skills amongst the local Cape Malay population, who also had a long history in tailoring. The industry experienced another peak after 1945, and finally during the 1970s, after which it has declined, at first slowly and later more rapidly (Kipling, 2005:10).

During the period of its development, the industry operated largely under conditions of international isolation, first through force of distance from competition when transport was a lot slower than it is today, and later through a national government strategy of import substitution industrialisation (Naumann, 2005:30). While such isolation and import substitution enabled the industry to grow, they resulted in a heavy bias towards the domestic market, and therefore prevented the industry from achieving the economies of scale (Barnes, 2005:7).

After South Africa's reintroduction to international markets in the early 1990s, the government undertook to liberate trade so that local industry could become internationally competitive. This involved reducing and rationalising tariffs, scrapping import surcharges and abolishing several quantitative restrictions (Soko, 2005a:40).

2.6 BENEFITS OF CLOTHING AND TEXTILE SECTOR

Despite the numerous challenges facing the Western Cape's clothing and textile industry, it does also have strengths that can be used in the quest to enhance competitiveness. These include high capacity utilisation with average utilisation rates of 85 percent between 1990 and 2003 (Barnes, 2005:4). This is enhanced by the availability of cheap, reliable, utilities like electricity, as well as the proximity of the industry to its main domestic customers (Soko, 2005b:45). The prevalence of small-and micro-enterprise CMTs in the province helps to keep costs down, while providing flexibility around response times for retailers (Kadalie, 2005a:11). There is also good integration with international suppliers and customers, as well as established export capabilities that can be built upon (Kadalie, 2005a:11). The fact that such a large portion of the industry operates within Metropolitan Cape Town leads itself to the establishment of clusters that would further strengthen competitiveness in the export market, although this has not yet been fully exploited.

There are several firms that are well established in the industry, with good organisational skills within them, while some companies are known for producing high quality products, especially in the area of tailored products, like men's suits (Kadalie, 2005a:11). There is a strong focus on fashion, and some strong designs skills, supported by courses at tertiary educational institutions around Cape Town, which help to develop the high-end tailored products niche (Kadalie, 2005a:11).

2.7 SWOT ANALYSIS FOR THE WESTERN CAPE CLOTHING SECTOR

The SWOT analysis conducted in the Western Cape clothing sector by Morris, Barnes, and Esselaar (2004:8) returned the following results, which are elaborated upon below:

- **Strengths:** Reliable telecommunications and public services reduce costs and shorten lead times. Firms are good at adhering to international labour and social standards. Utility costs are cheap compared with those of other

countries. The industry enjoys some government support, such as the Duty Credit Certificate Scheme (DCCS). Firms in this region are closer to major export markets than firms in other provinces. Firms that presently make up the industry have already proven their capabilities by surviving the trade liberalisation of the 1990s. The firms have well-established relationships with buyers in Western Europe and North America.

- **Weaknesses:** Many firms rely on weak currency to be competitive in the export markets. The volatility of the rand makes this a disadvantage. Labour rates and ancillary labour costs are high, compared to other regions. Telecommunications and public services can be unreliable. The manufacturing process is inefficient. Employees lack training, and there are not enough trained people to replace those who retire**.** The industry has a negative attitude toward change, investment, and risk-taking. Clothing manufactures have poor bargaining power with retailers.
- **Opportunities:** Given that South Africa has higher costs, lower economies of scale, and longer lead times than its competitors, it should concentrate on products that have longer lead times, and for which higher costs are acceptable. That is, South African firms should focus on better quality products for more specialised niche markets. South Africa should exploit middle-income markets such as Japan, the Middle East, Australia, the Russian Federation, and Asia, which are all experiencing massive increases in demand for apparel. The development of a "Cape" or "South African" brand of clothing and fabrics, with an African feel, could help to increase exports.
- **Threats:** Global competition will increase owing to trade liberalisation, as the Multifibre Arrangement is phased out, because China is a major threat. Low-cost imports are a threat to local industry suppliers that compete with those imports in the domestic market. South Africa's inflexible labour market constrains formal employment growth and inhibits competitiveness. The lack of trust and cooperation between clothing producers and textile producers hinders the ability of firms to compete effectively.

2.8 THE WESTERN CAPE CLOTHING STATISTICAL DATA

The Western Cape contributes around 14.5 percent of the country's GDP, with only 10.1 percent of the country's total population Department of Trade and Industry (DTI, 2005:30). The province does, however, suffer from the highest levels of social and economic inequality in the country (Soko, 2005b:43), as well as an unemployment rate of 26 percent (Soko, 2005b:43). This unemployment figure is significantly higher than the figure of 16.9 percent proposed by the DTI (2005:30), but in either case, although it is one of the lowest rates in the country, unemployment in the Western Cape is high.

The clothing industry, more so than the textile industry, has the potential to provide jobs for unskilled people of the Western Cape, as it is not only labour intensive but also reliant upon relatively low-skilled workers. According to Barnes (2005:6), 82.2 percent of workers in the clothing sector are semi-or unskilled, while 13.4 percent have mid-level skills and only 4.4 percent of jobs require high-level skills.

There are close to 1 000 companies in the Western Cape clothing industry, made up of both large companies and a great number of small and micro enterprises operating as cut-make-trim (CMT) operations (Wesgro, 2002a:1). As of June 2004 there were 827 clothing firms in South Africa registered with the Clothing Industry Bargaining Council, with 327 of those located in the Western Cape (Barnes, 2005:5), with the result that more than half of the bargaining council employees are located in the Western Cape (Soko, 2005b:37). Around 40 clothing companies in the Western Cape employ more than 200 people (Wesgro, 2002a:1). In addition to these, there are in excess of 450 CMTs, which employ over 60 percent of the workers in the industry (Soko, 2005b:37). While these companies are spread around the province, the vast majority of the Western Cape's clothing industry output, (80 percent) originates from companies operating within the greater Cape Town area (Wesgro, 2002a:1).

It is estimated that about 80 000 people are employed in clothing and textiles in the Western Cape, and with a multiplier effect of 1:5 that means around 400 000 people are reliant on the industry for their survival (Kadalie, 2005b:6); i.e. almost 10 percent of the province's 4.5 million population (DTI, 2005:30). The industry in the province is also of national importance, contributing around 35 percent of gross geographic value added for textiles, clothing and leather, larger than both KwaZulu-Natal (34 percent) and Gauteng (14 percent).

According to Wesgro (2002a:2) clothing and textiles are important for the province's exports, and the sector is considered a priority sector. However, the majority of the Western Cape clothing exports are basic items like t-shirts and jeans, which compete on price, rather than quality. There is a diversity of fabrics used across the provinces. Higher-value added fabrics such as wool tend to be used mainly in the Western Cape. Even though the sector is concentrated mainly in the Western Cape and KwaZulu – Natal, there are some major differences between the industries in these two provinces, as outlined in Table: 2.1.

Table 2.1: A comparison of the Western Cape and KwaZulu-Natal clothing sectors (**Sourc**e: Barnes, 2005:5).

Western Cape	**KwaZulu-Natal**
Firms are concentrated in the Cape Town metropolitan area.	Firms are located in the metropolitan areas of Durban and outlying non-metropolitan areas.
The industry consists of full-line manufacturers and a large number of CMTs.	The industry is mainly comprised of CMTs.
Firms are subject to a comparatively high cost structure i.e. wages.	Firms are subject to a lower cost structure.
Firms produce mainly for the higher end of the market (fashion wear).	Firms produce mainly for the lower end of the market and wholesalers (men's shirts, pyjamas, school wear).
Most firms are South African owned.	Many firms are foreign owned- Chinese, Taiwanese, Indonesian and Singaporean.
Firms focus on domestic markets due to their higher value position and proximity to retail offices.	The industry's lower cost structure has meant that firms in this region have greater export focus.

While clothing and textile represented 6.1 percent of total manufacturing sales turnover in 1995, this declined to four percent in 2004 (DTI, 2005:20). Since 1996 formal clothing employment has declined year-on-year, with 2005 levels representing a deterioration of 51 707 employees, or 34.6 percent. Figure 2.1 below displays the other major sectors in the regional economy.

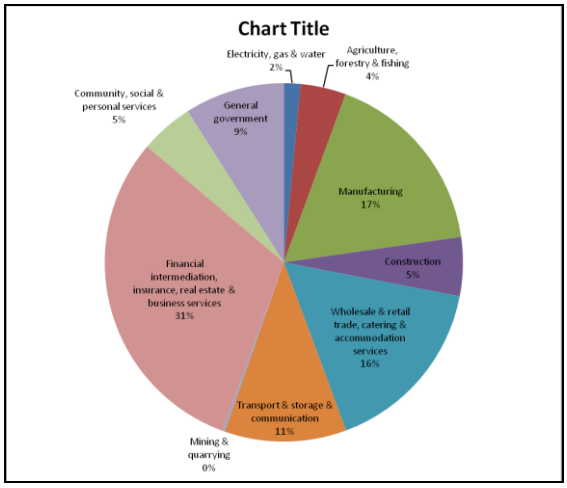

Figure 2.1: Sectoral Contribution to Western Cape GDP-R (%), 2008. (**Source:** Provincial Treasury, 2009:27).

The main contributors to the manufacturing sector are food, beverages and tobacco (24.8 percent), petroleum products, chemicals, rubber and plastic (20.4 percent) and metals, metal products, machinery and equipment (13.8 percent) (Provincial Treasury, 2009:28) refer to Figure 2.2.

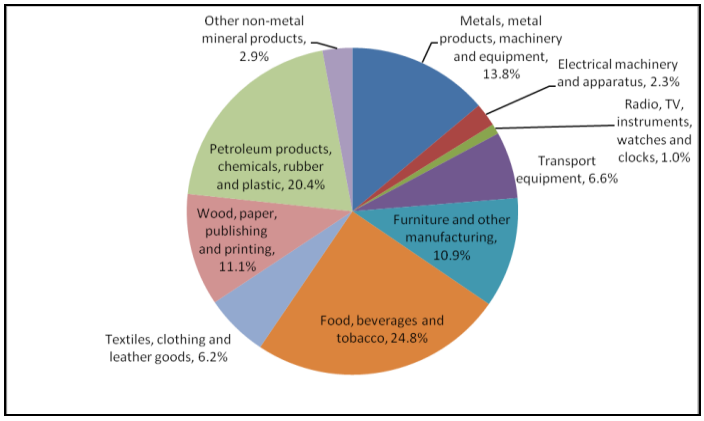

Figure 2.2: Comparison of the Western Cape manufacturing sector, 2008. **(Source:** Provincial Treasury, 2009:29).

2.9 KEY CHALLENGES AND OPPORTUNITIES CONFRONTING THE CLOTHING AND TEXTILE INDUSTRY

The severe challenges faced by the industry have been well documented over the past decade. Increased international competition, following very rapid trade liberation, as well as factors linked to poor innovation, lack of investment, skills development, and access to finance, have posed considerable difficulties, resulting in significant job losses, and the closure, relocation or downsizing of a number of large manufacturers. Most of these key challenges and opportunities have been elaborated upon below:

- **The changing structural environment of companies and the impact on employment relations:** A significant quantity of the goods produced in the clothing industry took place in large and medium sized factories during the early 1990's. There has, however, been a changing trend, which has lead to the destruction of the industry with larger firms subcontracting significant parts of their production to smaller firms, and an increase in change in employment relationships. There has been a strong move within the clothing and textile industry to informalise labour, which has resulted in the outsourcing of labour.
- **The size of the industry:** According to the National Bargaining Council statistics, as of April 2010 there were 965 clothing companies in South Africa (the majority of companies in the Cape Chamber being located in the Western Cape) refer to Table 2.2.

Table 2.2: Companies registered with the National Bargaining Council for the Clothing manufacturing industry. (**Sourc**e: National Bargaining Council for the Clothing Manufacturing Industry, 30 April 2010).

Geographic spread	**2010**
Cape Chamber (Western Cape and Eastern Cape)	308
Kwazulu-Natal (KZN)	349
Northern Chamber (Gauteng)	308
Nationally	965

In 1998 there were 834 companies nationally and this shows that there were fewer companies as compared to 2010. These companies employed more people. Sixty percent of these companies registered with the Bargaining Council, are SMME's. The majority of companies in KZN are generally smaller in size when compared to the other regions (UNCTAD, 2005:33).

In 2004, the South African clothing and textile industries generated sales of R34 billion, which, despite the recent decline, is a significant contribution to total manufacturing output (Vlok, 2006:228). The sales of R34 billion in 2004 were split almost equally between clothing (R16.6 billion) and textiles (R17.4 billion) (DTI, 2005:19). Of the total sales, excluding raw wool, only 12.5 percent of textile output and 9.4 percent of clothing output were exported (DTI, 2005:19). This means that the majority of the sales were generated for the local market (DTI: 2005: 19). The apparel production in South Africa is aimed at three principal markets: The United States; the lower-end domestic market (with some production also destined for the United States); and a mid-level domestic market (with some production destined for the EU (UNCTAD, 2005:33).

Similar to developed economies, South Africa's clothing and textiles retailers yield considerable value chain power (Vlok, 2006:228). The top five retailers account for over 70 percent of formal SA clothing sales, and the industry produces across the product spectrum, although the majority is still at the lower end of the market (Vlok, 2006:228).

- **The state of employment:** The clothing and textile industry is the most labour intensive sector of manufacturing, measured by the number of jobs per unit of capital invested, and is a very important employer, particularly in many poor communities, of low-skilled workers for whom few other opportunities exist (Vlok, 2006:229). The clothing industry has a high labour absorptive capacity and is able to offer employment opportunities for individuals with limited or semi-skilled capabilities.

According to the figures, compiled by the Clothing, Textile, Footwear and Leather Sector Education and Training Authority (CTFLSETA), show that 66.7 percent of workers in the industry are women, which is much higher than the proportion of all workers in the economy as a whole, and the manufacturing sector (Vlok, 2006:230). This means that job losses in the industry have an inconsistent impact on women and women-headed households. An estimated 94 percent of workers in the clothing manufacturing industry are black (i.e. African or Coloured) (Vlok, 2006:230). According to the Bargaining Council the average joining age in the clothing industry is 32 years whilst the average age of workers is 40 years.

Based on the Department of Statistics, employment in manufacturing declined in absolute terms between 1973 and 1990 in the clothing industry, from 126 600 to 112 500, whilst employment in textiles increased from 93 700 to 115 200 over the same period (Matthews, 1983:131). According to the 2005 Employment and Earnings survey, textiles and clothing employed almost 143 000 people in March 2005, and contributed 12 percent in total manufacturing employment (Vlok, 2006:229). Of these, the majority are employed in the clothing sector, i.e. 97 544 vs 45 319 in textiles. Official figures show that total employment has decreased by more than 85 000 since 1996 (DTI, 2005:8).

Table 2.3: Number of employees registered with the National Bargaining Council for the Clothing Manufacturing Industry. (**Source:** National Bargaining Council for the Clothing Manufacturing Industry (Figures as at 30 April 2010).

Geographic spread	**2010**
Cape Chamber (Western and Eastern Cape) (Eastern Cape had approximately 2000 employees in 2010).	25 503
Kwazulu- Natal	20 948
Northern Chamber(Gauteng)	11 517
Nationally	57 968

Western Cape is the largest formal clothing employer with more corporate flavour and more fashion-oriented production. There is an increasing trend

towards formalisation and outsourcing. October (1996:10), writes that the Cape is highly segmented with developed large- and medium-sized firms combined with a weak technological and design capacity. This, as well as the concentration of employment and production, and the absence of institutional forms of co-operation, makes Western Cape clothing industry different from industrial districts in the developed economies. Data on the Western Cape's clothing sector shows the following trends refer to Table 2.4.

Table 2.4: Number of firms and employees in the Western Cape Clothing Industry. (**Source:** Hood, 1999:11).

Date	**No. of Factories**	**No. of Employees**
1990	433	54 267 (highest)
1994	538 (highest)	46 868
May 1998	368	41 230
April 1999	350	38 014
May 1999	350	37 611

The average clothing firm size in Industrial Council members in the Western Cape appears to have picked up, according to Table 2.5 below, through not as high as the highest in 1990. It is noteworthy that, although employment was the highest in 1990, the size of the firms was much smaller in 1994 as compared to 1990.

Table 2.5: Average Firm Size in the Western Cape Clothing Industry. (**Source:** Hood, 1999:11).

Year	**Average Number of Employees per Establishment**
1990	125 (largest)
1994	87 (smallest)
May 1998	112
April 1999	109
May 1999	108

According to Hood (1999:11), the informal clothing manufacturing sector in the Western Cape grew rapidly, in response to the following factors:

- Increasing regulation of the formal sector, encouraged by labour laws and other restrictions.
- A rise in entrepreneurialism.
- Retrenchments in the formal clothing sector.
- Retrenchment in other sectors, notably teaching, where retrenchment packages were used to set up small CMT operations.
- A need for flexibility in working time by working mothers.
- Higher labour and production cost, crippling larger companies and forcing closure of factories.
- Complete labour flexibility; sharply lower wages and costs, no security for workers, no annual leave or sick pay and no income tax.

2.10 EMPLOYMENT IN THE CLOTHING AND TEXTILE INDUSTRY IN SOUTH AFRICA

Although the clothing manufacturing industry contributed less than 5 percent of the national manufacturing output in 2004 (Vavi, 2004:2), it is the most labour-intensive sector (measured by number of jobs per unit of capital invested) and combined with textiles it provided 13.4 percent of total manufacturing employment (Barnes, 2005:6). It contributes to 1.8 percent of overall employment in South Africa. It therefore plays an important role in employment, not only because of its labour absorbent capacity, but also by virtue of its ability to offer entry level jobs for unskilled labour. The clothing and textile industry requires a relatively unskilled labour force, with 82.2 percent of employment in the industry attributed to semi- and unskilled workers, 13.4 percent to mid-level occupations and only 4.4 percent to jobs requiring high-level skills (Barnes, 2005:6).

Vlok (2006:230), estimates 94 percent of the workers in the industry to be black, i.e. African, Indian or Coloured. According to the CFTL Sector Education and Training Authority (SETA), most workers are paid on a weekly basis and they are referred to as ‘blue collar’ workers. In 2005 the legally prescribed minimum

weekly wage for a qualified machinist in 'non-metropolitan' areas was R282.76. The wage rates in the clothing and textile industry are the lowest in the South African manufacturing sectors.

The industry is a very significant employer of women. Figures compiled in 2005 by the SETA show that 66.1 percent of workers in the industry are women. This percentage is much higher than the proportion for all workers in the manufacturing industry, which are 43.7 percent and 33.2 percent respectively.

2.11 THE POSITION OF CLOTHING RETAILERS

Amidst reduced production and employment loss in the period 2002 to 2005, national retailers have shown vast improvements in sales and profits before tax. Table 2.6 and Figure 2.3 show the profit before tax for five major national retailers in South Africa, for the 2002 to 2005 financial years.

Table 2.6: Profit before tax for five national retailers. (**Source:** Vlok, 2006:240).

(R million)	**2002**	**2003**	**2002-2003**	**2004**	**2003-2004**	**2005**	**2004-2005**
Edcon	263	565	115%	1027	82%	1851	80%
Mr Price	193	256	33%	296	16%	411	39%
Foschini	283	513	81%	753	47%	1141	52%
Truworths	452	549	21%	761	39%	980	29%
Woolworths	599	778	30%	937	20%	1112	24%

Given the fact that the increase in retail sales has been accompanied by reduced production and employment loss in the associated domestic manufacturing industry, it was reasonable to attribute the decline in output and employment to the surge in imports from China. Also, these increases in profit before tax were the result of higher margins achieved on the sale of cheaper imported goods.

2.12 COMPETITIVENESS OF THE LOCAL CLOTHING AND TEXTILE INDUSTRY

According to Jones (1997:80), the advances in communication and transportation systems have led to a global economy characterised by a web of linkages in which the players from one system can have influence on those of other systems. Hence, globalisation is the process of increased interconnectedness between people, and the breakdown of barriers and borders between countries. This process necessitated certain changes in the industry in order for it to maintain its competitiveness, as worldwide production activities are increasingly linked. Competitiveness, therefore, not only refers to providing goods for the global markets, but, even more so, also to remain competitive in the local market amidst the influx of goods manufactured in factories worldwide.

According to Netshandama (2001:30), the clothing produced in South Africa is generally of a high quality and is aimed at the middle-or upper-end of the market. Contentions have been that the South African clothing and textile industry cannot compete with industries internationally, on the basis of cheap labour and poor quality products.

Table 2.7: Comparative competitiveness indicators for the clothing textile industries (**Source:** Barnes, 2005:8).

	2002	**2003**	**2002-2003**	**2004**
Output per employee (R'000)	263	565	115%	1027
Total inventory (days)	193	256	33%	296
Customer return rate (%)	283	513	81%	753
Customer delivery reliability (%)	452	549	21%	761
Absenteeism	599	778	30%	937

2.13 CHALLENGES FACING THE INDUSTRY ON COMPETITIVENESS

The South African clothing and textile firms perform poorly in relation to all the above mentioned competitive indicators, except for customer delivery reliability where it is almost the same as international clothing firms. According to Vlok

(2006:241), the industry's competitive challenges stem from the following structural and strategic factors:

- **Investment and technology:** In comparison to competitor nations, investment in capital equipment and the level of technological innovation has been very low in the clothing and textile industries in South Africa. According to Wadula (2006:60) the average age of capital equipment used by textile companies is more than ten years old. The effect of this is that the industry is unable to be dynamic. Vlok (2006:241), identifies the non-existent investment along the value chain as particularly problematic, which resulted as a significant part of the industry remains concentrated in the less sophisticated CMT sector.
- **Skills base:** Globally, 97 percent of textile workers, on average, have an education level equivalent to grades 4-6 in the South African school system. Among the workers in South Africa's manufacturing industries, however, the average is just 55 percent. Furthermore, the capability of management is also a weakness.
- **Innovation and design capacity:** This factor is closely linked to skills development and investment. Apart from some exceptions in certain sub-sectors, the clothing and textile industry performed poorly in innovation and technology enhancement. Vlok (2006:242), advances the perception that the industry is more a follower than a leader, as the reason.
- **Weak value chains:** South Africa is a significant fibre producer in the form of wool and mohair. It also has some cotton production capacity and access to growing capacity in the Southern African region. The lack of investment along the value chain and weak supply chain continued to weaken the value chain. This contributed significantly to the reduction of the industry's competitiveness.
- **Illegal imports:** Illegally imported, and under-invoiced, goods compete unfairly with locally manufactured goods. In 2005 the level of illegal imports was conservatively estimated at between 10 percent and 30 percent of total clothing and textile sales.

Ross and Perry (2000:44), advances two further constraints that South African manufacturers face, from being competitive:

- **Geography:** South Africa is a long way from the world's major markets: the United States of America and the European Union. This restricts South Africa's speed of supply and it also pushes up the cost of transportation of goods.
- **Distortions in economic infrastructure:** South Africa needs to pay higher wages, compared to other developing countries. Companies tried to pay its semi-skilled workers at similar wages other than developing countries. Professionals mainly earn salaries that must be offered to make them stay in an organisation.

2.14 CHARACTERISTICS OF THE SMALL MANUFACTURING SECTOR IN THE WESTERN CAPE

Paramount to a consistently higher growth rate for the Western Cape are more focused efforts by all economic stakeholders (i.e. local business and labour, the public sector, community-based organisations and non-government organisations). In addition, further increases in technology transfers, joint ventures and foreign investment, are prerequisites for sustained higher growth (Cape Town City Council, 1998:30).

Within the secondary sector, the clothing industry is the oldest and the most important in the Western Cape. In terms of the 1997 data there are about 420 manufacturers employing 52 000 people. As the largest generator of employment in the secondary sector in the Western Cape, it provides about 20 percent of all jobs in the province. It also contributes about 10 percent to the regional output value (Wesgro, 2002b:10).

2.15 CONCLUSION

In this chapter a holistic perspective has been provided of the issue relating to the research environment. The research environment was explained in detail and some

of the areas which needed to be addressed were highlighted. The small clothing manufacturing business environment, quality management for small clothing manufacturing firms and the legislation governing the small clothing manufacturing sector in Western Cape has been elaborated upon. Specific focus was levelled on external and internal factors, which impact small clothing manufacturing firms globally, and in South Africa

In Chapter 3, a literature review will be undertaken on the research objectives as well as the research problem. An in depth literature review will be mainly inducted on the concept of quality management in clothing small manufacturing firms.

CHAPTER 3: QUALITY MANAGEMENT: A LITERATURE REVIEW

3.1 INTRODUCING QUALITY MANAGEMENT

According to Watkins (2008:33), (citing Gill and Johnson 1997), Saunders, Lewis and Thornhill (2000:42), are of the opinion that reviewing the literature is essential. This statement in particular, as a project assessment criteria usually require one to demonstrate awareness of the current state of knowledge of a particular subject, its limitations and how the research will fit into the wider context. In addition, the literature review demonstrates the depth (quality and quantity) of academic reading the student has undertaken, prior to embarking on the formulation of the research proposal.

This section of the study will provide the reader with an overview of the literature pertaining to the subject of quality management within small clothing manufacturing firms in the Western Cape. Emphasis will be placed on the mechanisms to be deployed to promote the application of quality management system in the Western Cape, resulting in an improvement of goods and services. The following headings will be elaborated upon, and form part of the literature review:

- Introducing quality management.
- The concept of quality.
- Defining quality management in small clothing manufacturing firms.
- The leading contributor to quality management in small clothing manufacturing firms.
- ISO 9000 certification.
- Benefits of ISO 9000 certification.
- The role of government in the clothing and textile sector in South Africa.
- Small manufacturing firms defined.
- Supplier quality management.
- Quality management defined.

- Benefits of a quality management system.
- Quality Management tools and techniques.
- Defining the customer.
- The meaning of customer satisfaction.
- Customer focus concept.
- Service concept defined.
- Product quality concept.
- Service quality concept.
- The servqual technique.
- Conclusion.

The clothing and textile industry is not homogenous. It consists of organised and disorganised segments (formal/informal), characterised by technological unevenness, and by uneven development of ways of utilising labour. The clothing and textile industry does not exist in isolation, and is influenced by the manufacturers' response to the changing requirements of their principal customers, the market determinants of firm level success, the retailers and how they respond to changes in customer demand and how domestic household textile manufacturers meet the changing demands of retailers (DTI, 2010:64).

The clothing and textile industry has been in distress for some time, due to factors such as the strength and volatility of the rand, under-invoicing, lack of quality of goods and services, legal and illegal imports (especially from China), competitiveness factors, skills deficit and limited economies of scale in parts of textiles (DTI, 2010:64). Textile firms have been increasingly confronted with cheap imports through trade liberalisation, rising costs and pressures in terms of lower prices and more stringent quality demands.

The South African clothing and textile industry was built up under isolation, with the domestic market driving production. As such, the industry was never able to achieve scale economies, which refer to the reduction in unit cost as a company expands. The period between 1970 and 1990 was characterised by the recognition that import control and tariff protection measures were becoming unhelpful to the

growth of the economy (Netshandama, 2001:41). Between 1989 and late 1993 the South African economy sank into its longest recession. Attempts to rescue the industry were based on the new global definition of competitiveness. The clothing and textile industry had to be opened to the global economy (Altman, 1994:15). The apparent rationale was that opening the economy to global competition would spin the local industry into action, based on an urgent need to raise productivity, quality and service to global standards. However, this was not supported by practical, direct measures or state policy mechanisms, according to Netshandama (2001:42). Structural problems, such as the lack of training, skills, education, outdated machinery and technology in the clothing and textile industry required urgent attention.

Notwithstanding the movement away from import control and tariff protection measures in the rest of the economy, the level of state protection in the clothing and textile industry remained the highest of all the manufacturing sub-sectors. In 1993, textile and apparel still enjoyed protective tariff three times higher than the manufacturing industry in general (Netshandama, 2001:44). The clothing and textile industry in South Africa is concentrated in specific provinces: KwaZulu-Natal, Gauteng and the Western Cape. Within these provinces it is further concentrated in specific geographic areas. In the smaller towns, such as Worcester, Isithebe, King Williams Town, Newcastle, Ladysmith, Paarl, Phuthaditjhaba, Mongwase and Atlantis, the industry is the major employer, or a very substantial employer of labour.

According to Barnes (2005:7), since June 2004 there were 827 clothing manufacturing firms in South Africa, with 327 located in the Western Cape, 239 in the Northern areas, 219 in KwaZulu-Natal and 42 in the Eastern Cape. The industry comprises a number of well-established large firms, SMMEs and home industries. There is also a large cut-make-and-trim (CMT) industry in the Western Cape and KwaZulu-Natal that ranges from large, well-established firms to small home industries. The decline of the formal sector has spurred growth within the informal CMT sector of the industry which, due to their size and smaller production runs, has the advantage of being flexible.

3.2 THE CONCEPT OF QUALITY

Definitions of quality are personal and idiosyncratic. According to Golden, Toombs, Anderson and White (2009:3), in order to understand quality initiatives, one must first understand what quality is. The below concise, clear, and meaningful definitions are arranged by category of focus, namely: manufacturing-based, product-based, customer-based, transcendent and value-based. Besides that, Gavin also mentioned that eight dimensions of quality are: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality.

The concept of "quality" has been contemplated through history and continues to be a topic of intense interest today. Quality presently is addressed in numerous ways and it is the most frequently repeated word among managers and executives in most organisations (Zeithaml, Valerie, Leonard, Berry & Parasuraman, 1996:31). Quality has been described as the single most important concept leading to the economic growth of companies in international markets (Feigenbaum, 1991:25). Quality has been variously defined as value (Feigenbaum, 1991:23), conformance to specifications (Gilmore,1974:16; Levitt,1972:41), conformance to requirements (Crosby, 1979:55), fitness for use (Juran, 1988:13), loss avoidance (Taguchi,1983), cited by (Ross& Perry, 2000:44), and meeting or exceeding customers' expectations.

3.2.1 Manufacturing-based definitions of quality

Quality means conformance to requirements (Crosby, 1979:55). Quality is the degree to which a specific product conforms to a design or specification engineering specifies the product characteristics and the more closely manufacturing can conform to those requirements, the better the quality of the product. According to Rao, Carr, Dambolena, Kopp, Martin, Rafii and Schlesinger (1996:57-58), this definition has the advantages of providing objectively measurable quality standards and of reducing the cost of quality. The disadvantage of this measure is lack of concern for the customer's preferences.

3.2.2 Product-based definitions of quality

The product-based approach identifies specific feature or attributes that can be measured to indicate higher quality. This approach provides objective measures of quality. Its disadvantage is that it assumes that the absence, or presence, of an attribute implies higher quality. This approach provides objective measures of quality (Rao *et al*., 1996:58).

3.2.3 Customer –based definitions of quality

Quality is fitness for use (Juran, 1988:40). Quality is meeting customer expectations. The Quality Improvement Process is a set of principles, policies, support structures, and practices designed to continually improve the efficiency and effectiveness of our way of life. According to Marcu (2010: **Online**), quality is all about achieving customer satisfaction when selling merchandise that does not come back to the company and a customer who does.

The user-based definition equates customer satisfaction with quality. Customer satisfaction reflects the attitude of the customer. An organisation adopting this view of quality needs to accurately identify the target market, ferret out its needs, design, construct, and deliver the appropriate product. For success, all of the functions contributing to the value of the product have to be involved. The benefit expected is increased market share. However, customer satisfaction may not be achieved for reasons that have nothing to do with the quality of the product (Rao *et al.,* 1996:58).

3.2.4 Transcendent definitions of quality

Quality is achieving, or reaching, the highest standard, as against being satisfied with a low standard. However, according to Rao *et al*. (1996:58), these items may not represent quality to everyone, and this lack of objectivity creates a problem for the worker, in a business environment, who is striving for quality.

3.2.5 Value-based definitions of quality

Quality is the degree of excellence at an acceptable price, and the control of variability of an acceptable cost. In this definition one attribute of value is quality. The purchase decision involves trading off the quality against the price. Because many of the attributes of quality are subjective assessments, the approach is not effective in introducing objective criteria. Unfortunately, most of these definitions are subjective. Although the manufacturing and product-based approaches are the most objective, both fail to account sufficiently for customer preferences. The user-based approach relies solely on the consumer's input, but methods for obtaining this input are unreliable and unable to predict changes of preference (Rao *et al.,* 1996:58).

3.3 DEFINING QUALITY MANAGEMENT IN SMALL CLOTHING MANUFACTURING FIRMS

The evolution of the business environment over the past four decades has resulted in a need for improvement in business practices (Anderson and McAdam, 2004:465). However (Dale, van der Wiele, Williams 2001:241-248), assume that although more emphasis has been placed on quality management in small clothing manufacturing firms over the last twenty years, some companies have not addressed their quality management issues. Quality management is an essential element of the successful strategic management of service firms (Robledo, 2001:22), yet research into quality practices within small clothing manufacturing firms proves to be limited. It has been suggested that implementation levels of quality management within small businesses is unclear, as quality practices have been adopted in certain firms, however, the number who have adopted formal quality management tools and techniques is lower than in large firms. This is often because quality is treated as a separate element of small business, and not an issue which is embedded in all business activities.

Quality management has been shown to enhance organisational performance for both product and service organisations (Powell, 1995:15-16). Quality

management processes work differently, depending on the product versus service nature of the firm and associated production processes. This provides basic support for the argument that organisations that have good internal quality management systems are in a better position to adopt customer orientation (Johnson & Gustafsson, 2000:12). In small clothing manufacturing firms, both employee management and process orientation have their effects on customer satisfaction through a firms' customer orientation.

Quality processes are considered to be a necessary prerequisite for delivering quality products /services and satisfying customer needs (Deming: 1986:35). Organisations can be viewed as systems of interlinked processes, and the effectiveness of organisational processes essentially determines the quality of products and services. All the attempts that the organisation makes should be targeted at positioning within the organisation well -defined, state of the art processes, and then continuously improving them by eliminating waste and sources of customer dissatisfaction. This involves extensive data collection, analysis, and feedback systems that help isolate problems, direct employee attention and resolve identified problems (Beer & Eisenstat, 1996:597; Dooley & Flor, 1998:157; Grant, Shani & Krishnan, 1994:25-26; Reger, Gustafson, Demarie & Mullane, 1994:419; Sitkin, Sutcliffe & Schroeder, 1994:537).

There is also evidence to suggest that small clothing firms believe that quality standards are part of a rite to trade in certain sectors and that they can even act as a "tariff" to international trading (Murphy, 1999:1). This may well have facilitated the implementation of ISO 9000 within small firms for the wrong reasons. There are many small manufacturing firms that do not take up ISO 9000. This can be perhaps be linked to the fact that many small firms are resource constrained, in as much as they may not have sufficient personnel to implement, and subsequently monitor, quality standards. As small firms grow, the systemisation of basic organisational process may enhance their capacity for growth. Where implemented well, ISO 9001, or ISO 9002 has typically added to structure, discipline, quality control and traceability. This more structured,

organised framework may be a necessary element to facilitate a small firm's potential for further growth, and the pursuit of excellence.

The impact of the international quality management standard ISO 9000 on small manufacturing firms is problematical. There have been many debates during the period when ISO 9000 was being revised, concerning the value, relevance and implementation of the new standard (Andell, 1999:8; Grant, 1999:10; Glass, 1999:9; Hutchins, 1999:10). There have been few papers and articles concerning quality standards, generally in the context of small manufacturing firms, and especially with regard to the revision (West, Cianfrani & Tsiakals, 1999:100-101).

3.4 THE LEADING CONTRIBUTOR TO QUALITY MANAGEMENT IN SMALL MANUFACTURING FIRMS

According to Golden *et al*. (2009:3), managers who wish to implement quality initiatives should study quality models, concepts, and tools developed and popularised by Deming (1986:30), Juran (1988:49), Crosby (1979:82), Ishikawa (1989:70), and other quality gurus. Quality gurus have made a significant impact on the world through their contributions to improving, not only business, but all organisations, including state and national governments, military organisations, educational institutions, healthcare organisations, and many other establishments and organisations.

3.4.1 W. Edwards Deming's Fourteen Points for Quality Management

W. Edwards Deming was accepted as the world's pre-eminent authority on quality management. Deming gained credibility because of his influence, pertaining to quality, on Japanese and American industries. He placed great importance and responsibility on management, at individual and company level, believing management to be responsible for 94 percent of quality problems (Foster, 2004: 92). Deming's contributions included:

- Fourteen points for management,
- the seven deadly diseases, and

- continual, never-ending improvement.

Deming's fourteen points (Deming, 1986:17):

- **Point 1 – Create constancy of purpose:** Create constancy of purpose for continual improvement of products and services, allocating resources to provide for long-range needs, rather than only short-term profitability , with a plan to become competitive, to stay in business, and to provide jobs.
- **Point 2 – Adopt a new philosophy:** We are in a new economic age. We can no longer live with commonly accepted levels of delays, mistakes, defective materials, and defective workmanship. Transformation of Western management style is necessary to halt the continued decline of industry.
- **Point 3 – Cease mass inspection:** Cease dependence on mass inspection to improve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place. Require statistical evidence of built-in quality in both manufacturing and purchasing functions.
- **Point 4** – **Terminate awarding business on the basis of price tag:** Instead, minimise total cost. Move toward a single supplier for any one item, based on a long-term relationship of loyalty and trust.
- **Point 5 – Constantly improve the system:** Improve constantly, and permanently, the system of production and services, to improve quality and productivity, and thus constantly decrease costs. Institute innovation of product, service, and process. It is management's job to work continually on the system (design, incoming supplies, maintenance, improvement of equipment, supervision, training, retraining, and so on).
- **Point 6 – Institute training on the job:** People must have the necessary training and knowledge to do their job. New skills are required to keep up with changes in materials, methods, product design, machinery, techniques, and service.
- **Point 7 – Improve leadership:** The aim of supervision should be to help people, machines, and gadgets to do a better job. Supervision of management is in need of overhaul as well as supervision of production workers.

- **Point 8 – Drive out fear:** Encourage effective two-way communication and other means to drive out fear throughout the organisation, so that everybody may work effectively and more productively for the company.
- **Point 9 – Break down barriers between departments:** People in different areas, such as research, design, sales, administration, and production, must work in teams to tackle problems that may be encountered with products and service.
- **Point 10 – Eliminate slogans:** Eliminate the use of slogans, posters, and exhortations of the workforce, demanding zero defects and new levels of productivity, without providing methods. Such exhortations only create adverse relationships. The bulk of causes of low quality and low productivity belong to the system, and thus lie beyond the power of the workforce.
- **Point 11 – Eliminate work standards:** Eliminate work standards on the factory floor. Eliminate management by objectives. Eliminate management by numbers and numeric goals. Substitute leadership.
- **Point 12 – Remove barriers to pride:** Remove barriers to rob workers of their right to pride in the quality of their work. The responsibility of supervisors must be changed from sheer numbers to quality.
- **Point 13 – Institute education and self-improvement:** This is more generalised education than training on the job. Organisational learning requires a structure that reinforces and rewards learning.
- **Point 14 – Put everybody to work:** Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

3.4.2 W. Edwards Deming's Seven Deadly Diseases for Quality Management

Deming's 14 points for management apply anywhere, to small organisations as well as to large ones, to the service industry as well as to manufacturing. They apply to a division within a company (Institute for Manufacturing, 2010: **Online**): Deming's Seven Deadly Diseases (Walton, 1990:98):

- Lack of constancy of purpose.
- Emphasis on short-term profits.

- Evaluation of performance, merit rating, or annual review.
- Mobility of management.
- Running a company on visible figures alone.
- Excessive medical costs for employee health care.
- Excessive costs of warrantees.

3.5 ISO 9000 CERTIFICATION

After the quality system documents have been established, the firm should implement its quality systems. In order to understand whether these documents can be effectively implemented, the firm should conduct quality audits and management reviews, thoroughly assessing its quality systems. Such an assessment can identify the suitability of the quality systems for the firm, and their conformance to the requirements of the ISO 9000 standard (e.g., ISO 9001, 2, or 3). As a result, the quality systems can be improved. Finally, the firm may prepare and plan for ISO 9000 certification. Note that the firm is operating in a dynamic environment. Many factors can affect the changes of the firm's operations. Therefore, the firm must keep its quality systems continuously changing and improving Dale, *et al* (241-248).

3.6 BENEFITS OF ISO 9000 CERTIFICATION

Goetsch and Davids (2002:285), comment that the market place is increasingly becoming a place where a recognised quality management system is a prerequisite to do business. These authors also comment that not all the pressure to conform to ISO is coming from the customer, but that companies also face internal management pressures for implementing sound quality management systems. According to Mitra (1993:32), the quality management systems are implemented specifically to improve the company's long-term profitability, competitiveness and sustainability. In general, ISO 9000 is currently seen as a management tool for continuously enhancing productivity and competitiveness, and thus increasing company profits. In most companies there is a lack of understanding and of defining the benefits of implementing quality management systems, and this is an

obstacle to wider adoption of ISO certification (Mitra, 1993:33). However, with the ISO certification process becomes the added obstacle of the perceived high cost of implementing and maintaining the system.

3.6.1 Quality and Productivity

Mitra (1993:30), states that making a product right the first time lowers manufacturing costs and improves productivity. As quality results in a reduction of reworks and replacement parts, personnel have more time available to manufacture additional defect-free units, and hence increase overall output, resulting in an improvement in productivity.

Quality improvements, resulting from implementation of a quality management system to improve the process quality, lead to more efficient and simplified operations. This leads to further improvements in productivity in an organisation. Mitra (1993:30-31), also notes that improvements in quality also result in an increase in market share and an improved competitive position due to increased customer satisfaction levels and an improved cost/price ratio.

3.7 THE ROLE OF GOVERNMENT IN THE SMALL MANUFACTURING SECTOR IN SOUTH AFRICA

The South African Government suggested that the small clothing manufacturing sector, with the help of government support, would be capable of fulfilling these objectives, and as a result has introduced a number of supply-side measures to promote this formerly neglected sector. The overall objective is to create an enabling environment, and to level the playing field (South Africa, 1995:10), in terms of national, regional and local policy frameworks for small business development. More specifically, policy measures are aimed at:

- Addressing the obstacles and constraints that small clothing manufacturing firms face, to promote faster growth.
- Enhancing their capacity to comply with the challenges of globalisation and an internationally competitive economy.

- Strengthening their cohesion to increase the leverage of policy measures.

The mechanisms used for small business support involve institutional and regulatory reforms. Ntsika Enterprise Promotion Agency and Khula Finance Limited (apart from the National Small Business Council and the Centre for Small Business Promotion) have been established to act as intermediaries to address small manufacturing firms' constraints, such as access to finance and information. The Department of Trade and Industry (DTI) itself administers programmes aimed at increasing small manufacturers' competitiveness, such as co-financing the acquisition of new technology. Regulatory reforms include the recent procurement reform with an affirmative small manufacturing firms' participation programme (South Africa, 1997:15). South Africa's manufacturing sector has been under scrutiny, due to the decline in the sector, in particular as declining quality management programmes are not effectively utilised resulting in poor goods and services being produced.

3.8 SMALL MANUFACTURING FIRMS DEFINED

Small manufacturing firms are the backbone of most national economies, representing between 30 and 60 percent of the gross domestic product (Johannson, 2005:487). Furthermore, small manufacturing firms often account for 95 percent of enterprises and 60 to 70 percent of employment in most economies (Ministry of Economic Development, 2005:7). However, Frempong (2007:5), emphasises the importance of defining small manufacturing firms, in order to determine their effectiveness.

The most urgent problem facing South Africa today is the absence of sustained economic growth and job creation, which are essential to reduce poverty and improve living conditions. Small manufacturing firms have been recognised as a major source of employment and income in many countries in the world. They contribute substantially to growth, competitiveness, and employment. Furthermore, they tend to be labour intensive, and can often meet the demands of international competition, more flexibly. Small clothing manufacturing firms dominate economic activity in South Africa. A number of these small

manufacturing firms do not use quality management as a strategic foundation for generating a competitive advantage (Reed, Lemak and Mero, 2000:5-10) and improving firm performance (Hendricks & Singhal, 1997: 1258-1259).

3.9 SUPPLIER QUALITY MANAGEMENT

Supplier quality management can be defined as the set of supplier-related quality management practices for improving suppliers' quality of products and services. This is exemplified by firm-supplier partnership, product quality as the criterion for supplier selection, participation in suppliers, communication with suppliers, understanding of supplier performance, and supplier quality audit (Mann, 1992: 29; Zhang, 2000a:129). In modern industrial production, the interdependence of buyers and suppliers has increased dramatically. The supplier becomes an extension of the buyer's organisation, to a certain extent. A revolution in the relationship between buyers and suppliers has emerged in the form of supplier partnership (Gryna, 2001:336). According to the review by Hackman and Wageman (1995:309-310), developing partnerships with suppliers is one of the major TQM implementation practices.

Deming (1986:12) strongly recommended working with the supplier as a partner in a long-term relationship of loyalty and trust, to improve the quality of incoming materials and to decrease costs. A long-term relationship between purchaser and supplier is necessary for the best economy. Deming (1986:12) suggested that firms select their suppliers on the basis of quality, rather than solely on price. According to Deming (1986:12), price has no meaning without a measure of the quality being purchased.

The firm must change its focus from lowest initial cost of material purchased to lowest total cost. Firms should try to minimise average total cost for inspection of incoming materials. According to Gryna (2001:336), it is an effective practice to optimise quality costs when a purchasing decision is made. To the purchasing price, the buyer must add a whole array of quality-related costs: Incoming inspection, materials review, production delays, downtime, extra inventories,

internal failure costs, and external failure costs. The lowest purchasing price does not always result in the lowest total costs. Deming (1986:12), recommended that firms work directly with suppliers to ensure that their materials are of the highest possible quality. Firms should participate directly in supplier activities related to quality, such as supplier improvement projects and supplier training (Mann, 1992:28; and Zhang, 2000a:130). Evaluating suppliers is an important activity to assure the dependable high quality of incoming materials in the firm (Feigenbaum, 1991:22). Supplier rating is a technique to provide supplier assessment. Each supplier is measured against another specific supplier or group of suppliers, for price, quality, delivery, and other important performance measures. Supplier performance rating involves an objective appraisal of one supplier's performance, which can feed back to that supplier. In the case of a poor quality situation, such information can be used by the supplier to formulate corrective action. Supplier quality rating also provides a quantitative summary of supplier quality over a period of time (Gryna, 2001:336). Incoming material control is very important for supplier quality management. Specifications and standards should be established as criteria for acceptance of raw materials, parts, and components.

Techniques such as acceptance sampling inspection and 100 percent inspection can be used to provide acceptance at most economical levels (Feigenbaum, 1991:23). Firms need to have detailed information about supplier quality information, such as drawings, specifications, and other necessary data. It is also very important to establish a supplier information feedback system, which can be used for giving feedback to suppliers about their product performance. Such information may be used to further improve supplier performance. A purchasing system includes three key activities: specification of requirements, selection of a supplier, and contract management. The overall quality objective is to meet the needs of the firm with a minimum of incoming inspection or later corrective action (Feigenbaum, 1991:24). Supplier quality audit is an organised evaluation of supplier capabilities to furnish materials of the necessary quality and quantity, and is an important basis for initial supplier selection and ongoing supplier quality surveillance (Feigenbaum,1991:24). Surveillance can take several forms:

Inspection of product, meetings with suppliers to review quality status, audits of elements of the supplier, review of Statistical Process Control (SPC) data, and witnessing of specific operations or tests. What one firm buys from another is not just material, it buys something more important, namely, engineering and capability. These requirements of a supplier must be established long before it produces any material.

3.10 QUALITY MANAGEMENT DEFINED

Quality Management (QM) can be defined as a holistic management philosophy that strives for continuous improvement in all functions of an organisation. QM can be achieved only if the quality concept is used in all organisational processes, starting from the acquisition of resources to customer service after the sale. Many studies have found a positive relationship between the use of QM practices and small firm performance when a cross-section of industries is studied (Douglas & Judge, 2001:158-159; Easton & Jarrell, 1998:253-254; Hendricks & Singhal, 1996:416). QM practices can improve business performance by improving operational performance, thus reducing costs and through marketing by increasing sales and market share (Sousa & Voss, 2002:91). QM practices can reduce waste and improve efficiency, increasing return on assets and profitability (Handfield, 1993: 289). QM can increase sales and market share. A reputation for delivering high quality products and services can decrease demand elasticity, enabling a small firm to charge higher prices and earn higher profits.

3.11 BENEFITS OF A QUALITY MANAGEMENT SYSTEM

The main objective of any company, whether large, small or micro, is to provide an acceptable rate of return on its investment in capital and labour (i.e. profit). In most companies, and in particular in small medium and micro orginisations, this financial objective is measured in the short term (Mitra, 1993:12).

Accoding to Mitra (1993:12-14), it is clearly stated that improvements derived from implementing QMS cannot be realised immediately. However, the

implementation of QMS leads to a long-term return on investment that is not only higher, but also more sustainable. This discrepancy between the short-term financial measurement and the long-term cost savings associated with implementing QMS, leads senior staff, in most companies, to doubt the financial benefits that can be derived by implementing QMS. Ross and Perry (2000:361) also noted that management is generally confused about the trade-off between cost and quality. Mitra (1993:13), states that implementing QMS results in:

- Improvement in product and service quality,
- Production system improvements,
- Productivity improvements,
- Cost reductions in material and labour,
- Reduction in cycle times and improved delivery,
- Maintaining an "improvement" culture,
- Background and privacy statement,
- General company information (i.e. number of employees, management and organisational structure),
- Level of integration of the Quality Management System,
- Level of QMS support received from industry bodies or other institutions, and
- Challenges that impact on the SMMEs decision to implement a QMS.

3.12 QUALITY MANAGEMENT TOOLS AND TECHNIQUES

Quality tools play a key role in an organisation-wide approach to continuous improvement, and their use is a vital component of any successful improvement process (Dale *et al.* 2001:241). The PDCA Cycle is composed of four basic stages: Plan, do, check, and act (Deming, 1986:11). It continues forever, in a cycle of never-ending improvement. The seven Quality Control (QC) tools are: Pareto analysis, cause and effect analysis, stratification analysis, scatter diagram, check sheet, Histogram, and process control chart (Ishikawa, 1989:71). The seven new tools are: relations diagram, affinity diagram, systematic diagram, matrix diagram, matrix data analysis, process decision programme chart, and arrow diagram. Statistical Process Control (SPC) is the application of statistical methods to the measurement and analysis of variation in a process, and can judge

the quality of processes. Such information can be used for process control and improvement (Dale *et al.*, 2001:241; Zhang, 2000a:129-130).

Quality is widely recognised as one of the most important disciplines/strategies, or competitive priorities for organisational development (Sharma & Kodali, 2008:599-601). Quality management tools and techniques are practical methods, skills, means or mechanisms that can be applied to particular tasks, to facilitate positive changes and improvements (Fotopoulos & Psomas, 2009:564-565). Examples of quality management tools and techniques include: benchmarking, cross functional teams, SPC, brainstorming, quality function deployment, and Design of Experiment (DOE). Past studies have reported that the application of QM practices in small and medium enterprises, improved their overall performance by a combination of 'hard' QM factors, such as benchmarking and quality measurement, continuous improvement, and efficiency improvement; and 'soft' QM factors, consisting of top management philosophy and supplier support, employee training and increased interaction with employees and customers (Gaddene & Sharma, 2009:865-867).

Kassim and Abdullar (2008:275), in their study of Total Quality Management (TQM) practices within small manufacturing in Malaysia, found that there is logic and structure to high performance businesses and the application of TQM, as the award-winning companies perform better than their closest rivals. Being one of the oldest sectors in the history of industrial development, the clothing industry is often referred to as a traditional industry. The clothing sector is a diverse and heterogeneous industry whose products are used by virtually everybody. The clothing industry can be seen as a supply chain comprising a number of discrete activities (Nordas, 2004:2). It is a global industry which has production activities.

The clothing and textile industry is not homogenous, consists of organised and unorganised segments characterised by technological unevenness, and by uneven development of ways of utilising labour. The clothing and textile industry does not exist in isolation and is influenced by the manufacturers' response to the changing requirements of their principal customers, the market determinants of

firm level success, and the retailers and how they respond to changes in customer demand, and how domestic household textile manufacturers meet the changing demands of retailers.

3.13 DEFINING THE CUSTOMER

Eagle and Brennan (2007:44), are of the opinion that, ". . . people who pay for a service are customers". From the definition it is evident that anyone who pays for a good or bad service is seen as a 'customer'.

3.14 THE MEANING OF CUSTOMER SATISFACTION

Customer satisfaction is defined as the degree to which a firm's customers continually perceive that their needs are being met by the firm's products and services (Anderson & McAdam, 2004:465). According to the literature review by Anderson and McAdam (2004:466-483), at least two different conceptualizations of customer satisfaction can be distinguished: Transaction-specific and cumulative. From a transaction-specific perspective, customer satisfaction is viewed as a post-choice evaluative judgment of a specific purchase occasion. Customer satisfaction is a function of perceived performance and expectations. If the performance falls short of the expectations, the customer is dissatisfied. If the performance matches the expectations, the customer is satisfied. If the performance exceeds the expectations, the customer is highly satisfied or delighted (Naumann, 2005:31).

Besides quality of products and services, customer satisfaction can also be influenced by price (Fornell, Johnson, Anderson, Cha and Bryant, 1996:12). If customers' perception of benefits match price exactly, customers will be satisfied. If the benefits are viewed to be less than the price, then customers will feel they are not getting their money's worth and will indicate very low levels of satisfaction (Naumann, 2005:31). In fact, customer satisfaction is not static, but continues to evolve in an upward spiral. The diversity of product offerings has conditioned customers to have higher and higher expectations (Naumann,

2005:31). The customer's opinions of products and services may change very rapidly, the change toward a negative direction occurring considerably faster and more easily than increasing customer satisfaction. A great deal of work must be done in order to increase customer satisfaction, but only one failure may cause dissatisfaction.

It has been said that measuring customer satisfaction cannot be very difficult. Some people believe that you are either 'satisfied' with the service you receive or you are 'dissatisfied'. If you get what you want, then you are satisfied, if you do not, you are dissatisfied. Naumann, (2005:31), also states that if it was easy, then obtaining people's opinions about how satisfied they are with products and services they receive from an orgainisation should be a relatively straightforward matter.

Customer satisfaction, according to Schiffman and Kanuk (2007:561), is the individual's perception of the performance of the product or service in relation to his or her expectations. As noted earlier, customers will have significantly different expectations of exactly the same product. A customer, whose experience falls below expectations, will be dissatisfied. The opposite reaction is experienced if a customer's expectations are exceeded. (Schiffman & Kanuk, 2007:561).

Customer satisfaction, according to Buttle (1997:937), is a pleasurable fulfilment response. Furthermore, Buttle is of the opinion that, "...customer satisfaction is the customer's fulfilment response to a consumption experience, or some part of it". Dissatisfaction is an unpleasurable fulfilment response. The 'experience, or some part of it' component of the above definition allows the satisfaction evaluation to be directed at any or all elements of the customer's experience. This can include the product, service, process and any other components of the experience. Customer satisfaction has recently drawn much more attention than ever before. According to (Fornel *et al*., 1996:12), not only do many firms continually monitor customer satisfaction at the firm level, but some countries also make the effort to measure customer satisfaction on a nationwide basis (e.g., Sweden, US, Japan, Singapore, and EC countries).

Customer satisfaction should be one of firms' key performance measures (Naumann, 2005:31). The attainment and maintenance of satisfactory levels of customer satisfaction is today fundamental determination for business health, growth, and economic viability (Feigenbaum, 1991:25). The Malcolm Baldridge National Quality Award (MBNQA, 1999:40), a case in point, considers customer-focused results the most important. For the European Quality Award (EFQM) (1999:25), customer satisfaction is the most important in terms of points assigned. According to (Fornell *et* al., 1996:15), customer satisfaction is a new type of market-based performance measure for firms. It provides an important measure of the firms' past and current performance, as well as future financial health. Customer satisfaction represents a new means of evaluating performance for the modern firm and the modern economy. Marketing scholars and practitioners have long recognised that customer satisfaction is an important and central concept, as well as an important goal of all business activities. Dean and Bowen (1994:392) believed customer satisfaction to be the most important requirement for long-term organisational success. In fact, whereas a firm can exist because the firm has customers, it is very clear that no customers means no business.

3.15 CUSTOMER FOCUS CONCEPT

Customer focus can be defined as the degree to which a firm continuously satisfies customer needs and expectations. A successful firm recognises the need to put the customer first in every decision made (Phillips, Chang, and Buzzell 1983:26). The key to quality management is maintaining a close relationship with the customer in order to fully determine the customer's needs, as well as to receive feedback on the extent to which those needs are being met. The customer should be closely involved in the product design and development process; with input at every stage so that there is less likelihood of quality problems once full production begins (Flynn, Schroeder and Sakakibara, 1994:339). Deming (1986:12) suggested that the customer is the most important part of the production line; products should be aimed at the needs of the customer. Obtaining customer complaint information is to seek opportunities to improve product and service quality. Quality complaints have different problems that require different actions. Based on customer complaint information, it is important to identify the "vital

few" serious complaints that demand in-depth study, in order to discover the basic causes and to remedy those causes (Gryna, 2001:336). To improve customer focus efforts, customer complaints should therefore be treated as top priority. Records and analyses of customer complaint reports from the field furnish useful product-control information. Such information reflects the effectiveness of control programmes, and highlights those nonconformities upon which more aggressive corrective action must be initiated (Feigenbaum, 1991:24).

Obtaining customer satisfaction information is essential for pursuing customer focus efforts. Intensive examination of finished products, from the viewpoint of the customer, can be a useful predictor of customer satisfaction. Such information includes data on field failures and service-call rates, and analysis and reporting of customer attitude trends regarding product quality. Such information is valuable for new product development (Feigenbaum, 1991:25). The results of customer satisfaction surveys can be used to take immediate action on customer complaints, identify problems requiring generic corrective action, and provide a quantitative measurement of customer satisfaction.

Customer satisfaction may very well predict the future success or failure of a firm (Kanji & Asher, 1996:20). Thus, it is very important to find customer satisfaction and perception of quality. The insights gained can clearly help the firm improve quality. In-depth marketing research can identify suddenly arising customer needs. The attainment of quality requires the performance of a wide variety of identification activities of quality tasks, such as the study of customers' quality needs, design review, and field complaint analysis (Gryna, 2001:336). To achieve quality, it is essential to know what customers need, and provide products that meet their requirements. According to the review results from Hackman and Wageman (1995:309-310), obtaining data about customers is one of the most commonly used TQM implementation practices. Deming (1986:12), suggested that firms understand what the customer needs and wishes, now and in the future, so that products and services can be designed to satisfy those needs and wishes. In order to pursue customer focus, firms should always provide warranties on their products sold to customers. Thus, customers will reduce their risk in buying

products. In addition, firms should pay sufficient attention to customer services. In a word, pursuing customer focus efforts should be a long-term business strategy; it is never ending.

3.16 SERVICE CONCEPT DEFINED

The definition of service concept is a fundamental part of the strategic advantage seeking process of service design, service development and service innovation (Goldstein, Johnston, Duffy & Rao, 2002:121; Tax& Stuart, 1997: 105). Because it is different from physical goods, it is more difficult to define service. Services comprise a lot of heterogeneous activities. They become more complex and defining the services becomes more and more difficult. Service is a product which occurs to satisfy consumer needs, and it does not have a material characteristic. At the same time, it is possible to define service as an economical activity which obtains time, place, shape and psychological benefits. Edvardsson and Olsson (1996:140), see the service concept as a detailed description of what is to be done for the customer, and how this is to be achieved.

Service quality researchers argue that service quality and product quality are systematically different in nature, due to the inherent intangibility, inseparability of production and consumption, heterogeneity, and perishability that characterise services (Zeithaml, Parasuraman & Berry, 1990:111).

3.17 PRODUCT QUALITY CONCEPT

Product quality is one of the most important factors for a manufacturing firm to be successful in, in the world market. It is argued that a quality image, once obtained, can improve a firms' ability to compete, as well as its long-term opportunity for success. Feigenbaum, stated that business strategy development must place a high priority on product quality, which is a crucial hinge for business success or failure in todays' quality performance oriented markets. Product quality has become a major business strategy (Feigenbaum, 1991:25). Ahire, Golhar & Waller, (1996:23), suggested that improving product quality is the

prime objective of a firms' quality management efforts, and product quality be used as a primary indicator of the firms' quality efforts. Increasingly, firms are recognising the strategic importance of product quality (Anderson and McAdam 2004:472-473). Product quality is increasingly viewed as a strategic asset to improve a firms' global competitiveness (Steingard & Fitzgibbons, 1993: 27-28). The literature review by Anderson *et al.*, (1994:473), showed that product quality has often been cited as the highest competitive priority, an issue of strategic importance and survival, and a means of competitive performance. The Japanese quality revolution opened the way for Japan to become an economic superpower.

Many definitions of "quality" exist Deming (1986:12), defined it as 'satisfying the customer, not merely to meet his expectations, but to exceed them.' His philosophy thus starts and finishes with the customer. Gryna (2001: 336) defined quality as 'customer satisfaction or fitness for use'. Quality is judged by the customer or user, thus the aim is to satisfy the customer. Crosby (1979:36) defined quality as 'conformance to requirements' thus making quality tangible, manageable, and measurable. Feigenbaum (1991:23) defined quality as 'the total composite product and service characteristics of marketing, engineering, manufacturing, and maintenance through which the product and service in use will meet the expectations of the customer'. Terms, such as reliability, serviceability, and maintainability make up the composite of product and service quality. He argued that quality is a multi-dimensional entity, and there are balances between various individual quality characteristics. Quality is dynamic in nature because customers' expectations are subject to change. Ishikawa (1985:73) defined quality as 'the development, design, production and service of a product that is most economical, most useful, and always satisfactory to the consumer.' The two components of quality (Gryna, 2001:337), are listed in Table 3.1.

Table 3.1: A comparison between the two quality components (**Source**: Gryna, 2001:337).

Manufacturing Industries	Service Industries
Performance	Accuracy
Reliability	Timelines
Durability	Completeness
Ease of use	Friendliness and courtesy
Serviceability	Anticipating customer needs
Aesthetics	Knowledge of server
Availability of options and expandability	Aesthetics
Reputation	Reputation

Quality is a judgment by customers or users of a product or service; it is the extent to which the customers or users believe the product or service surpasses their needs and expectations. In the ISO 9000 series standards, quality is defined as 'the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs' (ISO 8402, 1994:10). Reeves and Bednar (1994:419), compared various quality definitions in their paper. On the basis of their literature review, quality can be defined as excellence, value, conformance to specifications, fitness for use, loss avoidance, and meeting and/or exceeding customers' expectations. They also compared the strengths and weaknesses of these quality definitions in their paper. Thus, based on the author's extensive literature review, quality is defined as conformance to specifications in this study. Thus, product quality is defined as conformance to product specifications. The major strengths of this definition are that, it is relatively straightforward to use a conformance to specifications definition to measure quality.

Firms' can assess whether their quality conforms to the established specifications. As the world's economy becomes more internationalised, conformance to specifications is increasingly important. If customers' needs and expectations are governed by specific requirements or standards, conformance to specifications is the most appropriate and easily measured definition of quality. Thus, the more subjective definitions of excellence, value, and meeting and/or exceeding customers' satisfaction become unnecessary (Reeves & Bednar, 1994:420).

3.18 SERVICE QUALITY CONCEPT

Quality service does not occur by itself. It is not a work-ethic that one anticipates exists in every person who occupies front-line staff positions. Furthermore, it is not something that one expects all the employees of an organisation to have; it requires certain specific management action. More specifically, for customer service to be successful, it must be managed successfully. This means that, if an organisation is going to accomplish success in the delivery of quality service, whether it delivers a service or manufactures and sells products, the entire customer service process must be effectively managed (Martin & Fraser, 2002:477).

According to Martin and Fraser (2002:477), the perspective of the organisation varies from the way the organisation views its organisational flow, to the way the consumer views the organisation's command. Service excellence starts with the staff that is in direct contact with the customers, and services their needs first. The fact remains that customers are the lifeblood of any business (Martin & Fraser 2002:478). As a result, it is important to show them how appreciated their patronage is to the organisation.

3.18.1 Influencing factors on quality of service

Everyday each and every customer is faced with situations that can affect their views of a particular product or service, in particular as emotional and rational factors shape opinions. Lovelock & Wright (1999:32), observed that consumer behaviour and experiences are inter-linked. If customers need to be physically present during service delivery, then they must enter the relevant 'service factory' and spend time there, while the service is being performed. In many instances, they will be expected to become active participants in the creation and delivery of the service. Even if they only need to come to the service site to drop off or pick up an item which is in need of service, they still have to spend time travelling to and from the site and waiting for service. In both instances, their satisfaction will be influenced by factors such as:

- Encounters with service personnel.
- Appearance and features of service facilities- both exterior and interior.
- Interactions with self-service equipment (if deemed essential to the delivery of service).
- Characteristics and behaviour of the customers.

3.18.2 Benefits of service quality

Firms that have a higher market share and better perceived quality then competitors can earn financial returns significantly higher than those of firms with a smaller market share and inferior quality (Kotler, Bowen & Makens, 1996:362). The benefits of service quality assist managers in understanding the value of the quality of service delivered. There are quite a number of benefits of service quality, and each are elaborated upon below:

- **Retaining Customers:** High quality builds loyal customers and creates positive word-of-mouth. It is an important factor in the purchase decision. It determines customer satisfaction, which affects repeat business and word-of-mouth. Studies have shown that it costs four to six times as much to create a customer as it does to maintain an existing one. A satisfied customer will also spread a recommendation by word-of-mouth. On average, one satisfied client will tell five others, while a dissatisfied client will tell ten or more people (Kotler *et al*., 1996:362). Just to balance the positive word-of-mouth with negative word-of-mouth, two or more customers must leave feeling good about the service, for every person who feels the quality of the service is poor.
- **Avoidance of price competition:** A supplier (be it service or product supplier) with a reputation for good quality products and service is in a much stronger competitive position than one with a reputation for inconsistent or poor quality. The supplier with the good image can count on positive word-of-mouth and repeat customers to bring in new business (Kotler *et al*., 1996:363). Suppliers often fail to concentrate on what the customer really wants.

- **Retention of good employees:** Employees appreciate working in operations that are well run and produce quality products. One of the most noted reasons why employees quit their jobs, according to (Kotler *et al*., 1996:363), is due to the lack of quality in an organisation. When an organisation has good quality, it can retain good employees.
- **Reduction of costs:** Costs associated with quality include internal and external costs, and costs associated with quality service systems. Internal costs are those which are associated with correcting problems discovered by the organisation, before the product reaches the customer. External costs are associated with errors that customers experience. A quality service system does not come without costs. However, these are usually less than those associated with the internal and external costs resulting from poor-quality service. Examples of the costs of a quality system are customer service audits, training, management meetings with employees and customers and, finally, the introduction of new technology. These costs can be viewed as investments in the future of the company (Kotler *et al*., 1996:364).

3.19 THE SERVQUAL TECHNIQUE

The SERVQUAL technique was designed to measure the gap between 'customer expectations of service' and their perceptions of the 'actual service delivered' (Schiffman & Kanuk 2007:561). The SERVQUAL technique uses the following five individual dimensions to measure customers' expectations and perceptions:

- **Tangibles:** This is the supplier's physical facilities, equipment and appearance of staff. Buttle (1997:937), states that in addition to the appearance of physical facilities, and the organisation's equipment and personnel, communication materials are also important.
- **Reliability:** This is the supplier's ability to perform the service dependably and accurately.
- **Responsiveness:** This is characterised by the willingness of staff to help customers and provide prompt service.
- **Assurance:** This is the knowledge and courtesy of staff and their ability to convey trust and confidence.

- **Empathy:** This relates to the degree of caring, individualised attention that the hospitality and travel organisation's staff provides to its customers.

These dimensions, as identified by (Schiffman & Kanuk 2007:561), are divided into two groups, namely the 'outcome dimension' (which focuses on the reliable delivery of the core service), and the 'process dimension' (which focuses on how the core service is delivered). The process dimension relates to the employees' responsiveness, assurance and empathy in handling customers, and the service's tangible aspects. Perceptions of high service quality and high customer satisfaction lead to higher levels of purchase intensions and repeat buying. When service evaluations are low, customer relationships are more likely to weaken, resulting in defection to a competitor (Schiffman & Kanuk 2007:562).

3.20 CONCLUSION

In this chapter an in depth literature review has been inducted mainly on the concept of quality management in small clothing manufacturing firms. A literature review was undertaken on the research objectives as well as the research problem.

In Chapter 4, the survey environment will be elaborated upon and the de-limitations of the survey will be listed. The approach to data collection will be explained and the target population will be defined. The measurement scales to be used in the survey, and the survey design, will be explained in detail. The investigative questions that were researched in support of the research questions formed part of the four sections in the respondents' survey. These four sections are elaborated upon below:

- Section A: Quality Management Systems Application.
- Section B: Quality Management Tools and Techniques.
- Section C: Causes of the poor production of goods and services.
- Section D: Quality Management Implementation.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

According to McDaniel and Gates (2005:617), two kinds of research exist, namely, 'pure' or basic research and 'applied' research. Pure research is aimed at expanding a theory or validating an existing theory, while applied research, on the other hand, is aimed at solving specific problems. The authors state further that virtually all marketing research which has been done is re-presented in applied research. In this study, applied research will be used to solve the problem at hand. Research is a systematic process of collecting and logically analysing information or data for a specific purpose. The researcher will collect data and analyse it for the specific purpose of achieving the objectives of the study. This study will focus more on quality management and research will be executed in the clothing and textile sector within the Western Cape.

4.2 RESEARCH DESIGN

According to Trustin, Ligthelm, Martins and Van Wyk (2005:749), research design is the plan to be followed to realise the research objectives. In Churchill and Iacobucci (2002:1006), it is stated that, "…a research design is the framework or plan of the study, and research designs can be classified into basic types, exploratory, descriptive or casual". These aspects are elaborated upon below:

- Exploratory research is the discovery of ideas and insights into the problem, and possible alternatives.
- Descriptive research is concerned with determining the frequency with which something happens. Aaker, Khumar and Day (2004:774), go further and state that descriptive research embraces a large portion of descriptive research.
- Casual research is concerned with determining cause and effect relationships, and is done by using experiments.

In this study both exploratory and descriptive research will be used to reach the objectives of the study.

4.3 THE CHOICE OF SAMPLING METHOD

Watkins (2008:55), (citing Emory and Cooper 1995), defines two methods of survey sampling, namely:

- The convenience sample, whereby a limited number of elements, smaller than the chosen population, are chosen (typically randomly) in such a manner as to accurately represent (without bias) the total population.
- The census approach, where an attempt is made to survey every element within the population.

The census approach was chosen for this survey, as this approach works best when the total number of population elements is sufficiently small, and there is a strong measure of diversity amongst the population elements.

4.4 THE TARGET POPULATION

With any survey, it is necessary to clearly define the target population, which (Collis and Hussey, 2003) cited by (Watkins, 2008:56), defines as follows:

"A population is any precisely defined set of people or collection of items which is under consideration".

The 'sampling frame' defined by Vogt (1993:56), (cited by Collis and Hussey 2003: 150-160), as 'a list or record of the population from which all the sampling units are drawn'. For this survey, 30 employees randomly selected from clothing and textile small manufacturing firms in the Western Cape represent the sampling frame.

The target population was specifically chosen in order to validate the practicality of the concepts as presented here. The risk of bias, which cannot be statistically eliminated, is recognised by the author, based on the very definition of the target population, as well as the number of respondents selected.

4.5 DATA COLLECTION

According to Watkins (2008:52), (citing Emory and Cooper 1995), three primary types of data collection (survey) methods can be distinguished, namely:

- Personal interviewing.
- Telephone interviewing.
- Self-administered questionnaires/surveys.

Primary data, or evidence, will be collected using self-administered questionnaires, which fall within the ambit of a broader definition of 'survey research' or 'descriptive survey'. A positivistic approach suggests structured 'closed' questions, while a phenomenological approach suggests unstructured 'open-ended' questions. In this research a positivistic approach will be used. The evidence collected could suggest ways in which the organisation could improve the implementation strategy. The data collection method used in the survey, falls within the context of a survey, defined by (Hussey and Hussey, 1997) cited by (Watkins, 2008:164), as:

"A sample of subjects being drawn from a population and studied to make inferences about the population"

More specifically, the survey conducted in this dissertation falls within the ambit of the 'descriptive survey'. The data collection method used fell within the ambit of both the definitions attributed to the concepts 'survey' and 'field study'. 'Survey', according to Gay and Diebl (1992:238), is an attempt to collect data from members of a population in order to determine the current status of that population, with respect to one or more variables, while Kerlinger (1986:372), defines 'field study' as non-experimental scientific inquiries aimed at discovering the relations and interactions among variables in real structures. As in the case of most academic research, the collection of data forms an important part of the overall dissertation content.

4.6 MEASUREMENT SCALES

The survey will be based on the well-known Lickert scale, whereby respondents were asked to respond to questions or statements (Parasuraman, 1991:410) in order to determine consensus, probability and importance. The Lickert scale was chosen due to its ability to be used in both respondent-centred (how responses differ between people) and stimulus-centred (how responses differ between various stimuli) studies, most appropriate to glean data in support of the research problem in question (Emory and Cooper, 1995) cited by (Watkins, 2008:162). According to Watkins (2008:162), (citing Emory and Cooper 1995), the advantages in using the Lickert scale are:

- Easy and quick to construct.
- Each item meets an empirical test for discriminating ability.
- The Lickert scale is probably more reliable than the Thurson scale, and it provides a greater volume of data than the Thurson differential scale.
- The Lickert scale is also treated as an interval scale.

According to Watkins (2008:163), (citing Remenyi, *et al.*, 1995), interval scales facilitate meaningful statistics when calculating means, standard deviation and Pearson correlation coefficients. To generate a significant amount of data, other means, such as rated responses and numeric scales, will also be used.

4.7 SURVEY DESIGN

Watkins (2008:140), (citing Collis and Hussey 2003), are of the opinion that, 'if research is to be conducted in an efficient manner, and make the best of opportunities and resources available, it must be organised'. Furthermore, if it is to provide a coherent and logical route to a reliable outcome, it must be conducted systematically, using appropriate methods to collect and analyse the data. A survey should be designed in accordance with the following stages:

- **Stage one:** Identify the topic and set some objectives.
- **Stage two:** Pilot a questionnaire to find out what people know, and what they see as the important issues.

- **Stage three:** List the areas of information needed and refine the objectives.
- **Stage four:** Review the responses to the pilot.
- **Stage five:** Finalise the objectives.
- **Stage six:** Write the questionnaire.
- **Stage seven:** Re-pilot the questionnaire.
- **Stage eight:** Finalise the questionnaire.
- **Stage nine:** Code the questionnaire.

With the process of survey design, the author has identified the following variables as being pertinent to the investigation:

- Dependent variables.
- Controlled variables.
- Uncontrolled variables.

The statements and questions within the survey have been designed with the following principles in mind:

- Avoidance of double-barrelled questions and statements.
- Avoidance of double-negative questions and statements.
- Avoidance of prestige bias.
- Avoidance of leading questions and statements.
- Avoidance of the assumption of prior knowledge.

The descriptive survey was used, as it has characteristics to indicate how many members of a particular population has certain characteristics **(**Hussey and Hussey, 1997) cited by (Watkins, 2008:66). Particular care was taken to avoid bias in the formulation of the questions. The data collection method used in the surveys, falls within the context of 'a survey'. The survey conducted in this dissertation falls within the ambit of the 'descriptive survey'. Furthermore, the survey will be conducted through questionnaires.

4.8 RESPONDENT BRIEFING

Prior to distributing the questionnaire to respondents, the researcher provided each respondent with detailed information pertaining to the questions. The questions were made clear and the objectives of each well understood. In addition, overviews of the dissertation objectives were provided. The letter that was given to the respondents is shown as evidence in Annexure G.

4.9 THE VALIDATION SURVEY QUESTIONS

The author has developed survey questionnaires to determine the level of understanding of the requirements of the QMS being implemented. Questions were prepared and piloted to ensure they reflected a high degree of 'validity' (Babbie, 2005) cited by (Watkins, 2008:164). Questionnaires used for the survey are contained within the ambit of Chapter 5. Results from the survey obtained will be analysed in terms of descriptive and inferential statistics. The sample questionnaire is shown as evidence in Annexure H.

4.10 CONCLUSION

The survey environment has been elaborated upon and the de-limitations of the survey listed. The approach to data collection has been explained and the target population has been defined. The measurement scales to be used in the survey, and the survey design.

In Chapter 5, the research data will be analysed and interpreted.

CHAPTER 5: DATA ANALYSIS AND INTERPRETATION OF RESULTS

5.1 INTRODUCTION

According to De Vos (2002:339), data analysis is "the process of bringing order, structure and meaning to the mass of collected data". The aim of this study is to determine what mechanisms can be deployed to promote the application of a quality management system in small clothing manufacturing firms in the Western Cape, focusing on the following research questions:

- What quality management tools and techniques can small clothing manufacturing firms use to improve quality management?
- What are the major causes for the poor production of goods and services?
- Which mechanisms can be deployed to promote the application of quality management systems?
- What are the key drivers for complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery?
- What are benefits of implementing quality management systems within a small clothing manufacturing firm?

In this chapter the data obtained from the completed questionnaires will be presented and analysed. In most social research the analysis entails three major steps, done in the following order:

- Cleaning and organising the information that was collected, which is called the data preparation step;
- Describing the information that was collected (Descriptive Statistics); and
- Testing the assumptions made through hypothesis and modelling (Inferential Statistics).

The responses to the questionnaire, developed by the researcher for the purpose of obtaining information whether quality management programmes are effective or not, within small clothing manufacturing firms in the Western Cape, resulting in

poor goods and services being produced, have been analysed with the use of Statistical Package for the Social Sciences (SPSS) software.

5.2 METHOD OF ANALYSIS

5.2.1 Validation of survey results

A descriptive analysis of the survey results returned by the research questionnaire respondents is reflected below. The responses to the questions obtained through the questionnaires are indicated in summative table format for ease of reference. Data validation is the process of ensuring that a programme operates on clean, correct and useful data. The construct validation, however, can only be taken to the point where the questionnaire measures what it is supposed to measure. Construct validation should be addressed in the planning phases of the survey, and when the questionnaire is developed. This questionnaire is supposed to measure mechanisms that can be deployed to promote the application of a quality management system in the Western Cape, which would lead to an improvement of goods and services.

5.2.2 Data format

The respondents' data was received through questionnaires which were coded and captured on a database that was developed on Microsoft Access. These questionnaires from respondents' were captured twice and then the two datasets were compared to make sure that the information was captured correctly. When the database was developed, use was made of rules with respect to the questionnaire, which set boundaries for the different variables (questions). For instance, the Likert scale is used as follows:

- 'Strongly disagree' is coded as 1.
- 'Disagree' is coded as 2.
- 'Undecided' is coded as 3.
- 'Agree' is coded as 4.
- 'Strongly agree' is coded as 5.

A boundary is captured on Microsoft Access, as less than 6. This means if the number 6, or more than 6, is captured, an error will show until a number less than 6 is captured. This was imported into the SPSS-format through the SPSS Access module. This information, which was double checked for correctness, is then analysed by the researcher and analysed for the purpose of this chapter.

5.2.3 Preliminary analysis

The Cronbach Alpha test (as shown in paragraph 5.6), illustrates the reliability of the statements in the questionnaire posed to the respondents of the survey of small clothing manufacturing firms in the Western Cape. It is measured by using a Uni-variate descriptive analysis and is performed on all the original variables. This is done for the purpose of displaying frequencies, percentages, cumulative frequencies, cumulative percentages, means, standard deviations, range, median, mode etc. These descriptive statistics are discussed in paragraph 5.7 and 5.7.1(See also computer printouts in Annexure C).

5.3 INFERENTIAL STATISTICS

Inferential statistics are concerned with inferences that population indices can be made out of on the basis of the corresponding indices obtained from samples drawn randomly from the populations. In this section inferential statistics that will be used are:

- **Cronbach Alpha test:** It is an index of reliability associated with the variation accounted for by the true score of the "underlying construct". Construct is the hypothetical variables that are being measured (Cooper and Schindler, 2001) cited by (Watkins, 2008:164). Another way to put it would be that Cronbach's Alpha measures how well a set of items (or variables) measures a single uni-dimensional latent construct. When data has a multidimensional structure, Cronbach's Alpha will usually follow. A commonly accepted rule for describing internal consistency using Cronbach's alpha is as follows:

  Table 5.1: Cronbach's Alpha Test table describing internal consistency rules**. (Source:** Nunnally, 1978:245)

Cronbach's Alpha	Internal Consistency
$\alpha \geq .9$	Excellent
$.9 \alpha \geq .8$	Good
$.8 \alpha \geq 7$	Acceptable
$.7 \alpha \geq 6$	Questionable
$.6 \alpha \geq 5$	Poor
$.5 \alpha$	Unacceptable

- **Chi-square tests for nominal data:** The Chi-square (two-sample) tests are the most widely used non-parametric test of significance that is useful for tests involving nominal data, but it can be used for higher scales as well, such as cases where persons, events or objects are grouped in two or more nominal categories, such as 'yes-no', or cases A, B, C or D. The technique is used to test for significant differences between the observed distribution of data among categories and the expected distribution based on the null hypothesis. It has to be calculated with actual counts, rather than percentages **(**Cooper and Schindler, 2001) cited by (Watkins, 2008:164).
- **The Spearman correlation coefficient:** Is defined as the Pearson correlation coefficient between the ranked variables. In statistics, the Pearson product-moment correlation coefficient typically denoted by R is a measure of the correlation (linear dependence) between two variables X and Y, giving a value between +1 and −1 inclusive. It is widely used in the sciences as a measure of the strength of linear dependence between two variables.
- **The Wilcoxon signed-rank test:** Is a non-parametric statistical hypothesis test used when comparing two related samples or repeated measurements on a single sample, to assess whether their population means differ (i.e. it is a paired difference test). It can be used as an alternative to the paired student's t-test when the population cannot be assumed to be normally distributed, or the data is on the ordinal scale.
- **The SPSS software:** It computes a P-value (Probability value) that measures statistical significance when comparing variables with each other, determining the relationship between variables, or determining the association between variables. Results will be regarded as significant if the

P-values are smaller than 0.05, because this value presents an acceptable level on a 95 percent confidence interval ($p \leq 0.05$). The P-value is the probability of observing a sample value as extreme as, or more extreme than, the value actually observed, given that the null hypothesis is true. This area represents the probability of a Type 1 error that must be assumed if the null hypothesis is rejected (Cooper & Schindler, 2001) cited by (Watkins, 2008:169).

- **The P-value:** Is compared to the significance level (α) and on this basis the null hypothesis is either rejected or not rejected. If the P value is less than the significance level, the null hypothesis is rejected (if P value $<\alpha$, reject null). If the P value is greater than, or equal to the significance level, the null hypothesis is not rejected (if P value $\geq\alpha$, don't reject null). Thus, with α=0.05, if the P value is less than 0.05, the null hypothesis will be rejected. The P value is determined by using the standard normal distribution. The small P value represents the risk of rejecting the null hypothesis.

A difference has statistical significance if there is good reason to believe the difference does not represent only random sampling fluctuations. Results will be regarded as significant if the P-values are smaller than 0.05, because this value is used as cut-off point in most behavioural science research.

5.3.1 Assistance to researcher

The conclusions made by the researcher, are validated by the statistical report. Help is given to interpret the outcome of the data. The final report written by the researcher was validated and checked by the statistician to exclude any misleading interpretations. All inferential statistics are discussed in paragraph 5.8.

5.4 SAMPLE

The target population are employees, who are employed in 30 small clothing manufacturing firms in the Western Cape. This was identified as a convenient sample employees and a target population.

5.5 ANALYSIS

Descriptive analysis is the description or summary of the data that was obtained through the respondents' questionnaire. Therefore descriptive statistics will be given for each variable, and only the respondents who completed the entire questionnaire will be utilised in the inferential statistics.

5.5.1 Questionnaire /Statement description

The questionnaire statements are shown in Table 5.2, with each variable name and the different sections of the questionnaire. It is important to note that these variables are based on the total sample. Refer to Table 5.2 below.

Table 5.2: Question/Statement numbering in the questionnaire for further reference.

Question / Statement	Variable Name
Section A: Quality Management Systems Application	
1. The company has a quality policy in place.	A1
2. Top management shows commitment to quality.	A2
3. The company has a quality manual.	A3
4. The company objectives are communicated to staff.	A4
5. The company measures quality performance.	A5
6. The company measures production performance.	A6
7. The company quality policy is communicated to each employee.	A7
8. The company measures defects.	A8
9. Customer satisfaction is measured within the company.	A9
10. The company is ISO accredited.	A10
Section B: Quality Management Tools and Techniques	
11. The company uses benchmarking as a quality tool and technique to enhance quality.	B11
12. The company uses cross functional teams as a quality tool and technique to enhance quality.	B12
13. The company uses statistical process control (SPC) as a quality tool and technique to enhance quality.	B13
14. The company uses brainstorming as a quality tool and technique to enhance quality.	B14
15. The company uses quality function deployment as a quality tool and technique to enhance quality.	B15
16. The company uses design of experiment deployment as a quality tool and technique to enhance quality.	B16
Section C: Causes of the poor production of goods and services.	
17. Product quality is important in the company.	C17
18. Management is aware of the benefits that can be achieved through offering good products and service to the customer.	C18
19. Management provides necessary training and resources to support employees to produce quality products.	C19
20. Guidance is available to employees in selecting a pattern when making garments.	C20
21. The company seeks customer views in order to enhance the quality of the products.	C21
Section D: Quality Management Implementation	
22. Customer requirement was the reason for implementing a quality system.	D22
23. Improving quality of the product was the reason for implementing a quality system.	D23
24. Improving management process was the reason for implementing a quality system	D24
25. Marketing of the company was the reason for implementing a quality system	D25

5.6 RELIABILITY TESTING

Reliability is concerned with the findings of the research and it relates to the credibility of the findings. In this research reliability tests (Cronbach's Alpha Coefficient) were conducted on the groups of questions/statements (the different measuring instruments in this case) posed to the employees of the 30 small clothing manufacturing firms.

The results of the Cronbach Alpha Coefficients for the raw variables are shown in Tables 5.3-5.6 and Annexure A. It shows the correlation between the respective item and the total sum score (without the respective item) and the internal consistency of the scale (Coefficient Alpha) if the respective item were to be deleted. By deleting the items (statements) one by one, each time deleting the statement with the highest Cronbach Alpha value, the Alpha value will increase. This, however, was not necessary as the measuring instruments are reliable.

Table 5. 3: Cronbach's Alpha Coefficient for all the items in **Section A**

Statements (Test all statements without current one's input)	**Variable nr.**	**Correlation with total**	**Cronbach's Alpha Coefficient**
Section A: Quality Management Systems Application			
1. The company has a quality policy in place.	A1	0.9858	0.9807
2. Top management shows commitment to quality.	A2	0.9816	0.9808
3. The company has a quality manual.	A3	0.8456	0.9849
4. The company objectives are communicated to staff.	A4	0.9587	0.9816
5. The company measures quality performance.	A5	0.9644	0.9814
6. The company measures production performance.	A6	0.9491	0.9819
7. The company quality policy is communicated to each employee.	A7	0.9605	0.9815
8. The company measures defects.	A8	0.9698	0.9812
9. Customer satisfaction is measured within the company.	A9	0.9700	0.9812
10. The company is ISO accredited.	A10	0.6099	0.9906
Conbach's Coefficient Alpha for standardised variables			**0.98323**
Cronbach's Coefficient Alpha for raw variables			**0.9844**

Table 5.4: Cronbach's Alpha Coefficient for all the items in **Section B**

Statements (Test all statements without current one's input)	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
Section B: Quality Management Tools and Techniques			
11. The company uses benchmarking as a quality tool and technique to enhance quality.	B11	0.8490	0.9564
12. The company uses cross functional teams as a quality tool and technique to enhance quality.	B12	0.8696	0.9529
13. The company uses statistical process control (SPC) as a quality tool and technique to enhance quality.	B13	0.8818	0.9519
14. The company uses brainstorming as a quality tool and technique to enhance quality.	B14	0.8613	0.9542
15. The company uses quality function deployment as a quality tool and technique to enhance quality.	B15	0.9103	0.9488
16. The company uses design of experiment deployment as a quality tool and technique to enhance quality.	B16	0.9074	0.9504
Cronbach's Coefficient Alpha for standardised variables			**0.9629**
Cronbach's Coefficient Alpha for raw variables			**0.9600**

Table 5.5: Cronbach's Alpha Coefficient for all the items in **Section C**

Statements (Test all statements without current one's input)	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
Section C: Causes of the poor production of goods and services.			
17. Product quality is important to the company.	C17	0.9594	0.9592
18. Management is aware of the benefits that can be achieved through offering good products and service to the customer.	C18	0.9597	0.9591
19. Management provides necessary training and resources to support employees to produce quality products.	C19	0.9485	0.9609
20. Guidance is available to employees in selecting a pattern when making garments.	C20	0.8460	0.9766
21. The company seeks customer views in order to enhance the quality of the products.	C21	0.8853	0.9708
Cronbach's Coefficient Alpha for standardised variables			**0.9721**
Cronbach's Coefficient Alpha for raw variables			**0.9722**

Table 5.6: Cronbach's Alpha Coefficient for all the items in **Section D**

Statements (Test all statements without current one's input)	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
Section D: Quality Management Implementation			
22. Customer requirement was the reason for implementing a quality system.	D22	0.7918	0.9757
23. Improving quality of the product was the reason for implementing a quality system.	D23	0.9567	0.9267
24. Improving management process was the reason for implementing a quality system	D24	0.9473	0.9304
25. Marketing of the company was the reason for implementing a quality system	D25	0.9059	0.9431
Cronbach's Coefficient Alpha for standardised variables			**0.9591**
Cronbach's Coefficient Alpha for raw variables			**0.9579**

The Cronbach's Alpha Coefficients for each item are more than 0.70 the acceptable level according to Nunnally (1978**:** 245) for each of the measuring instruments, and thus prove to be reliable and consistent for all the items in each scale.

5.7 DESCRIPTIVE STATISTICS

Descriptive statistics is the discipline of quantitatively describing the main features of a collection of data. Descriptive statistics are distinguished from inferential statistics, in that descriptive statistics aims to summarise a data set, rather than use the data to learn about the population. The descriptive statistics for all the categorical variables, with the frequencies in each category and the percentage out of the total number of questionnaires, are shown in Table 5.7. Note that the descriptive statistics are based on the total sample. These descriptive statistics are also shown in Annexures B & C. Due to the voluminous nature of the descriptive statistics table; for ease of reference, it has been placed in Annexure I.

The descriptive statistics shown in Table 5.7 are given for the purpose of indicating the direction of the responses. If the mean is high and is close to 5 then most of the respondents agreed to the statement.

Table 5. 7: Descriptive statistics – Mean, Median, Standard Deviation and Range for survey.

Variable	N	Mean	Std Dev	Median	Range
Section A: Quality Management Systems Application					
1. The company has a quality policy in place.	30	2.07	1.6386	1.00	4.00
2. Top management shows commitment to quality.	30	2.13	1.7367	1.00	4.00
3. The company has a quality manual.	30	1.90	1.4704	1.00	4.00
4. The company objectives are communicated to staff.	30	2.27	1.7407	1.00	4.00
5. The company measures quality performance.	30	2.10	1.6474	1.00	4.00
6. The company measures production performance.	30	2.17	1.7036	1.00	4.00
7. The company quality policy is communicated to each employee.	30	2.03	1.6291	1.00	4.00
8. The company measures defects.	30	2.13	1.6344	1.00	4.00
9. Customer satisfaction is measured within the company.	30	2.17	1.7237	1.00	4.00
10. The company is ISO accredited.	30	1.53	1.0417	1.00	4.00
Section B: Quality Management Tools and Techniques					
11. The company uses benchmarking as a quality tool and technique to enhance quality.	30	2.13	1.5025	1.00	4.00
12. The company uses cross functional teams as a quality tool and technique to enhance quality.	30	1.97	1.4016	1.00	4.00
13. The company uses statistical process control (SPC) as a quality tool and technique to enhance quality.	30	1.73	1.2299	1.00	4.00
14. The company uses brainstorming as a quality tool and technique to enhance quality.	30	2.10	1.4468	1.00	4.00
15. The company uses quality function deployment as a quality tool and technique to enhance quality.	30	1.77	1.2507	1.00	4.00
16. The company uses design of experiment deployment as a quality tool and technique to enhance quality.	30	1.70	1.1492	1.00	4.00
Section C: Causes of the poor production of goods and services					
17. Product quality is important to the company.	30	2.47	1.7167	2.00	4.00
18. Management is aware of the benefits that can be achieved through offering good products and service to the customer.	30	2.43	1.7357	1.50	4.00
19. Management provides necessary training and resources to support employees to produce quality products.	30	2.23	1.7157	1.00	4.00
20. Guidance is available to employees in selecting a pattern when making garments.	30	2.13	1.6554	1.00	4.00
21. The company seeks customer views in order to enhance the quality of the products.	30	2.17	1.5992	1.00	4.00
Section D: Quality Management Implementation					
22. Customer requirement was the reason for implementing a quality system.	30	2.00	1.5974	1.00	4.00
23. Improving quality of the product was the reason for implementing a quality system.	30	2.20	1.6897	1.00	4.00
24. Improving management process was the reason for implementing a quality system.	30	2.13	1.5025	1.00	4.00
25. Marketing of the company was the reason for implementing a quality system	30	2.07	1.4606	1.00	4.00

5.7.1 Uni-variate graphs

Uni-variate graphs involve the examination across a single variable. The statements were sorted, from the statement where the respondents mostly agree, to the statement they least agree with. Section A: Quality Management System Application, the responses to the questions are rated and shown below in Figure 5.1.

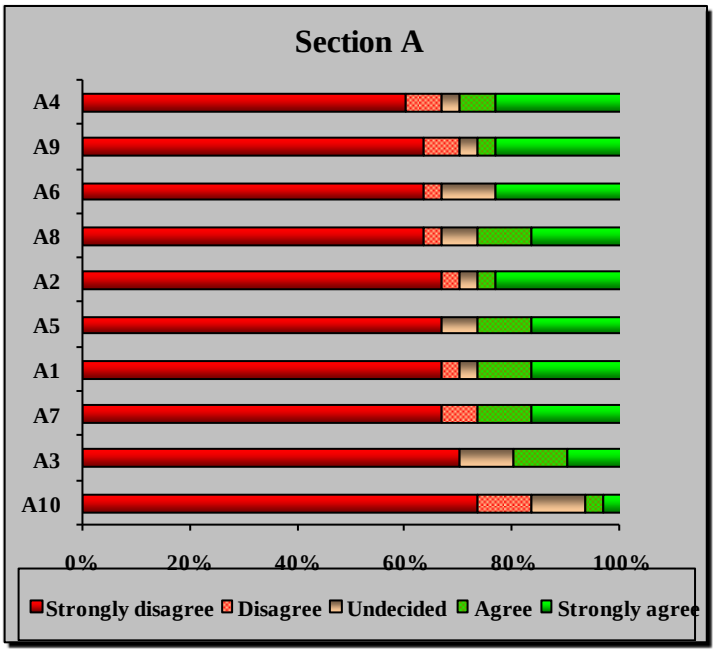

Figure 5. 1: Quality Management System Application.

The respondents mostly 'disagree' to 'strongly agree' with the following statements:

- The company is ISO accredited. (83.3 percent disagree, to strongly disagree).
- The company has a quality manual. (80.percent disagrees, to strongly disagree).
- The company quality policy is communicated to each employee. (73.3 percent disagree, to strongly disagree).
- The company has a quality policy in place. (70.0 percent disagree, to strongly disagree).
- The company measures quality performance. (66.7 percent disagree, to strongly disagree).

- Top management shows commitment to quality. (70.0 percent disagree, to strongly disagree).
- The company measures defects. (66.7 percent disagree, to strongly disagree).
- The company measures production performance. (66.7 percent disagree, to strongly disagree).
- Customer satisfaction is measured within the company. (70.0 percent disagree, to strongly disagree).
- The company objectives are communicated to staff. (66.7 percent disagree, to strongly disagree).

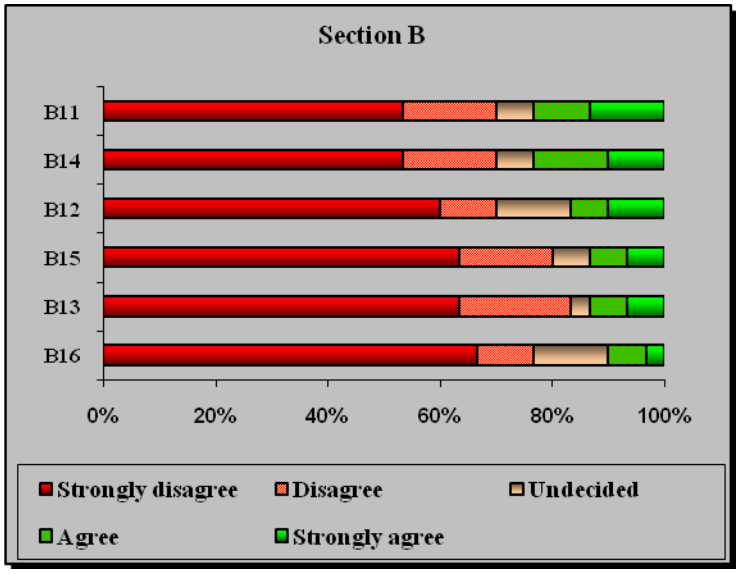

Figure 5. 2: Quality Management Tools and Techniques

Section B: Quality Management Tools and Techniques, the responses to the questions are rated and shown in Figure 5.2. The respondents mostly disagree, to strongly agree with the following statements:

- The company uses design of experiment deployment as a quality tool and technique to enhance quality (76.7 percent disagree, to strongly disagree).
- The company uses statistical process control (SPC) as a quality tool and technique to enhance quality (83.3 percent disagree, to strongly disagree).
- The company uses quality function deployment as a quality tool and technique to enhance quality (80.0 percent disagree, to strongly disagree).
- The company uses cross functional team as a quality tool and technique to enhance quality (70.0 percent disagree, to strongly disagree).

- The company uses brainstorming as a quality tool and technique to enhance quality (70.0 percent disagree, to strongly disagree).
- The company uses benchmarking as a quality tool and technique to enhance quality (70.0 percent disagree, to strongly disagree).

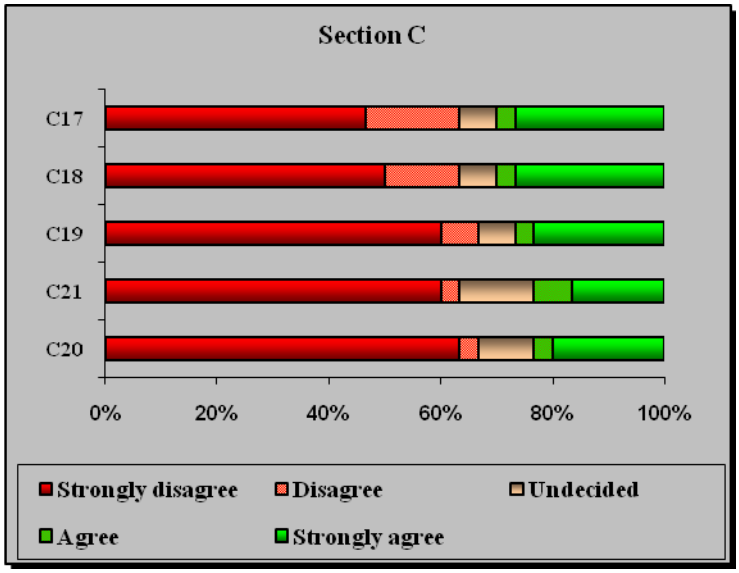

Figure 5. 3: Causes of poor production of goods and services

Section C: Causes of poor production of goods and services, the responses to the questions are rated and shown in Figure 5.3. The respondents mostly disagree, to strongly agree with the following statements:

- Guidance is available to employees in selecting a pattern when making garments (66.7 percent disagree, to strongly disagree).
- The company seeks customer views in order to enhance the quality of the products (63.3 percent disagree, to strongly disagree).
- Management provides necessary training and resources to support employees to produce quality products (66.7 percent disagree, to strongly disagree).
- Management is aware of the benefits that can be achieved through offering good products and service to the customer (63.3 percent disagree, to strongly disagree).
- Product quality is important in the company. (63.3 percent disagree, to strongly disagree).

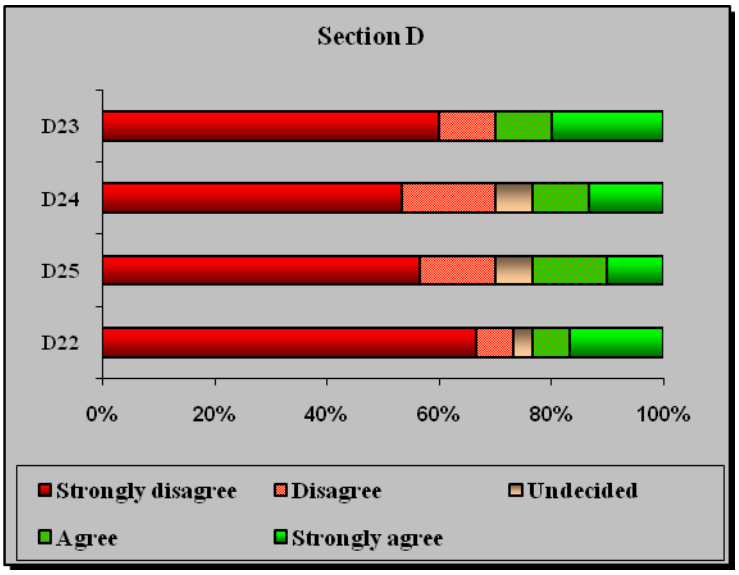

Figure 5. 4: Quality Management Implementation

Section C: Quality Management Implementation, the responses to the questions are rated and shown in Figure 5.4. The respondents mostly disagree, to strongly agree with the following statements:

- Customer requirement was the reason for implementing a quality system (73.3 percent disagree, to strongly disagree).
- Marketing of the company was the reason for implementing a quality system (70.0 percent disagree, to strongly disagree).
- Improving management process was the reason for implementing a quality system (70.0 percent disagree, to strongly disagree).
- Improving quality of the product was the reason for implementing a quality system (70.0 percent disagree, to strongly disagree).

5.8 INFERENTIAL STATISTICS

The hypothesis being tested, by using the Chi-square test, will be as follows:

- H0 = There is no difference between the respondents who disagree, to strongly disagree and the respondents who agree, to strongly agree in respect of each statement.
- H1 = There is a difference between the respondents who disagree, to strongly disagree and the respondents who agree, to strongly agree with respect to

each statement. Computer print-outs regarding these tests can be found in Annexure D.

The following latent variables have been created by calculating the sum of the responses of the statements that represent each construct (grouping of statements that represent on measurement):

- QM Systems Application =A1+A2+A3+A4+A5+A6+A7+A8+A9+A10;
- QM Tools and Techniques =B11+B12+B13+B14+B15+B16;
- Causes of poor produced goods / services =C17+C18+C19+C20+C21;
- QM Implementation =D22+D23+D24+D25.

The correlation coefficients are then calculated to determine whether there is a relationship between the different measurements. The results displaying statistically significant correlation between two latent variables are given and the computer printouts of all the correlation coefficients are shown in Annexure E.

The average of each of these latent variables is also calculated in order to compare the different latent variables by using the Wilcoxon sign rank for paired variables. The statistically significant differences are then shown and all the comparisons are shown in Annexure F.

5.8.1 Comparisons of the proportions

Table 5.8, shows that statistically and significantly more respondents disagree, to strongly disagree, than agree, to strongly agree with all the statements in the questionnaire. For the data and interpenetration also refer to Annexure F which is the Wilcoxon paired sign rank test. Due to the fact that some of the cells, when comparing the proportions, have an expected count of less than five, the groups who agree, and strongly agree are aggregated to one group “agree, to strongly agree” and the groups who disagree and strongly disagree are aggregated to one group “ disagree, to strongly disagree”.

Table 5.8: Statistically significant Chi-square test for equal proportions

Question / Statement	Sample Size	Chi-Square	DF	P-value
Section A: Quality Management Systems Application				
1. The company has a quality policy in place.	30	20.6000	2	<0.0001***
2. Top management shows commitment to quality.	30	20.6000	2	<0.0001***
3. The company has a quality manual.	30	18.6000	2	<0.0001***
4. The company objectives are communicated to staff.	30	18.2000	2	0.0001***
5. The company measure quality performance.	30	16.8000	2	0.0002***
6. The company measures production performance.	30	15.8000	2	0.0004***
7. The company quality policy is communicated to each employee.	30	6.5333	2	0.0106*
8. The company measures defects.	30	16.8000	2	0.0002***
9. Customer satisfaction is measured within the company.	30	20.6000	2	<0.0001***
10. The company is ISO accredited.	30	33.8000	2	<0.0001***
Section B: Quality Management Tools and Techniques				
11. The company uses benchmarking as a quality tool and technique to enhance quality.	30	19.4000	2	<0.0001***
12. The company uses cross functional teams as a quality tool and technique to enhance quality.	30	18.2000	2	0.0001***
13. The company uses statistical process control (SPC) as a quality tool and technique to enhance quality.	30	34.2000	2	<0.0001***
14. The company uses brainstorming as a quality tool and technique to enhance quality.	30	19.4000	2	<0.0001***
15. The company uses quality function deployment as a quality tool and technique to enhance quality.	30	29.6000	2	<0.0001***
16. The company uses design of experiment deployment as a quality tool and technique to enhance quality.	30	25.4000	2	<0.0001***
Section C: Causes of the poor production of goods and services.				
17. Product quality is important to the company.	30	14.6000	2	0.0007***
18. Management is aware of the benefits that can be achieved through offering good products and services to the customer.	30	14.6000	2	0.0007***
19. Management provides the necessary training and resources to support employees to produce quality products.	30	16.8000	2	0.0002***
20. Guidance is available to employees in selecting a pattern when making garments.	30	15.8000	2	0.0004***
21. The company seeks customer views in order to enhance the quality of the products.	30	12.6000	2	0.0018**
Section D: Quality Management Implementation				
22. Customer requirement was the reason for implementing a quality system.	30	23.4000	2	<0.0001****
23. Improving quality of the product was the reason for implementing a quality system.	30	4.8000	2	0.025*
24. Improving management process was the reason for implementing a quality system	30	19.4000	2	<0.0001****
25. Marketing of the company was the reason for implementing a quality system	30	19.4000	2	<0.0001****

Statistically significant at level 0.05

Statistically significant at level 0.01

Statistically significant at level 0.001

5.8.2 Correlation coefficients

Correlation coefficients are useful because they indicate a predictive relationship that can be exploited in practice. The Spearman rank correlation measures the extent to which, as one variable increases, the other variable tends to increase. Table 5.9 shows the Spearman rank correlation coefficients, and Figure 5.5 shows the scatter plot matrix for the latent variables of the diagonal, as well as a histogram and a kernel density fit for the data on the diagonal cells of the matrix. It is shown that all these latent variables are correlated. This indicates that there are linear dependencies between the latent variables for the small manufacturing firms in this survey:

- **Section A:** Quality management system application.
- **Section B:** Quality management tools and techniques.
- **Section C:** Causes of poor production of goods and services.
- **Section D:** Quality management implementation;

Table 5.9: Correlation coefficients for latent variables.

Latent variable	A	B	C	D
A	1.000	0.7890 <0.0001***	0.7904 <0.0001***	0.8786 <0.0001***
B	0.7890 <0.0001***	1.000	0.6429 <0.0001***	0.6780 <0.0001***
D	0.7890 <0.0001***	0.6429 <0.0001***	1.000	0.8824 <0.0001***
E	0.7890 <0.0001***	0.6780 <0.0001***	0.8824 <0.0001***	1.000

*** *Statistically significant at level 0.001*

5.8.3 Scatter plot matrix for latent variables

Scatter plot matrix shows the bi-variate relationship between a set of metric variables. It is shown below in Figure 5.5. It shows the distribution through a histogram, the actual correlation coefficient, and loess regression line which assists in determining any non-linearity in the relationship. It answers so many important questions all at once.

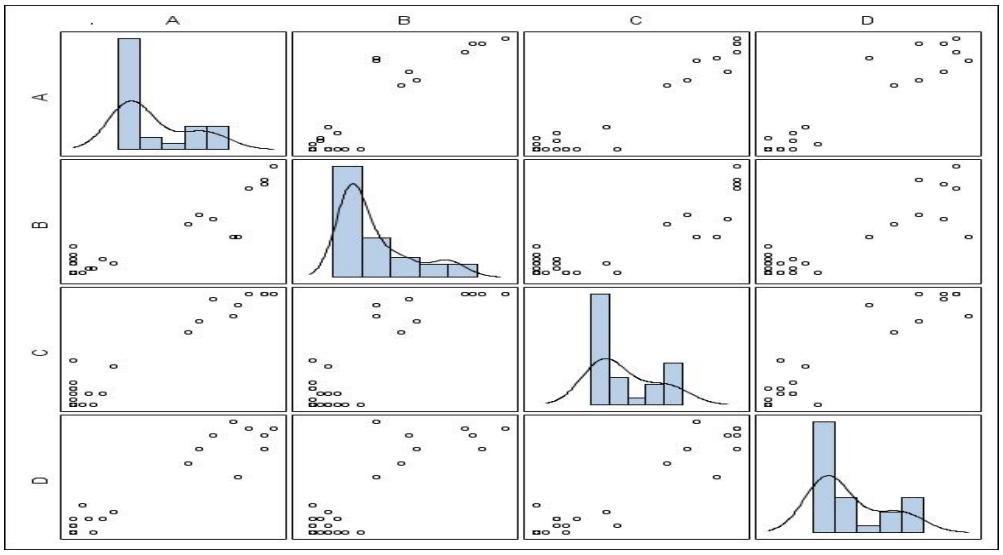

Figure 5. 5: Scatter plot matrix for latent variables

5.8.4 Comparison of latent variables

Latent variables are variables that are not directly observed but are rather inferred through a mathematical model from other variables that are observed, directly measured or compared**.**

5.8.5 Wilcoxon Sign rank test

It is a distribution-free test of the equality of the location parameters of two identical distributions. It is an alternative to the two-sample *t*-test for non-normal populations. The sign only makes use of the plus and minus signs of the differences between the observation and the median (or the plus and minus signs of the differences between the observation in the paired case). This is shown below in Table 5.10.

Table 5.10: Wilcoxon sign rank tests for the comparison of latent variables

Latent variable mean difference	B Sign rank	C test statistic	D P-value
A: Mean	-0.2367	-2.367	-0.0500
Signed Rank	26.5	-68.5	-21.0
P-Value	0.2975	0.0015**	0.3748
B : Mean		-0.3867	-0.2000
Signed Rank		-81.0	-42.5
P-Value		0.0102*	0.1725
C: Mean			0.1867
Signed Rank			52.0
P-Value			0.0214*

* *Statistically significant at level 0.05*

After calculating the average score for each latent variable, as follows:

- AM= (A1+A2+A3+A4+A5+A6+A7+A8+A9+A10)/10;
- BM= (B11+B12+B13+B14+B15+B16)/6;
- CM= (C17+C18+C19+C20+C21)/5;
- DM= (D22+D23+D24+D25)/4.

The comparison of these variables was conducted by using the Wilcoxon sign rank test.

It can thus be seen that there were differences between AM and CM; between BM and CM and between DM and CM. This indicates that the latent variable AM, BM and DM is statistically significantly smaller than CM; which means that the respondents disagree, to strongly disagree more with the statements in the latent variable AM, BM and DM than they did for the statements in the latent variable CM.

5.9 CONCLUSION

Gleaned from the survey conducted within the ambit of Chapter 5, data has been analysed in detail and interpreted in terms of the primary theme of the

dissertation. In addition, the results from the survey are related to the literature review conducted within the ambit of Chapter 3.

In Chapter 6, the research will be concluded. The research problem, research hypothesis, investigative questions and key research objectives will be revisited and final conclusions drawn. In addition, recommendations will be made to mitigate the research problem.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

In this chapter, the research contained within the ambit of this research project will be concluded and final analogies drawn. The research problem will be re-visited to determine if the problem was mitigated as a result of the research. Reciprocally, the research question and associated investigative questions will be re-visited to determine whether the research contained within the ambit of the dissertation produced not only feasible, but also viable, answers to the posed research questions.

The research design and methodology will be evaluated retrospectively in terms of the actions undertaken within the ambit of the dissertation. The key research objectives will be re-stated and key findings which culminated as a result of the research, listed. The chapter will include recommendations to the target organisation to improve its customer satisfaction and loyalty, ultimately determining business success. The chapter will be concluded with recommendations made as a result of the research.

6.2 THE RESEARCH PROBLEM REVISITED

The research problem as it was in Chapter 1 of this research reads as follows:
"Quality management programmes are not effectively utilised within small clothing manufacturing firms in the Western Cape, resulting in poor goods and services being produced"

6.3 THE RESEARCH QUESTION REVISITED

The research question, as it was stated in Chapter 1 of this research, reads as follows: "What mechanisms can be deployed to promote the application of quality

management system in the Western Cape thus leading to an improvement of goods and services?"

6.4 THE INVESTIGATIVE QUESTIONS REVISITED

The following investigative questions were researched in support of the research question:

- What quality management tools and techniques can small clothing manufacturing firms use to improve quality management?
- What are the major causes of the poor production of goods and services?
- Which mechanisms can be deployed to promote the application of quality management systems?
- What are the key drivers for complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery?
- What are benefits of implementing quality management systems within a small clothing manufacturing firm?

6.5 THE RESEARCH DESIGN AND METHODOLOGY

Case study research was the primary research method, as the analysis.

6.6 KEY RESEARCH OBJECTIVES

The following are the primary objectives of this study:

- To identify key drivers underpinning complaints in small clothing manufacturing firms in the Western Cape, in terms of service delivery.
- To identify the benefits of using quality management tools and techniques used currently by small clothing manufacturing firms.
- To determine if small clothing manufacturing firms have a strategic focus on the quality of a product that they produce.
- To identify the mechanisms that can be deployed to promote the application of quality management systems.

- To identify the benefits of implementing quality management systems within a small clothing manufacturing firm.

6.7 DISCUSSIONS AND CONCLUSIONS ON DATA INTERPRETATION

6.7.1 Section A- Quality Management Systems Application

As for the research results obtained through this survey of the application of quality management systems the following analogies can be drawn:

- The small clothing manufacturing firms do not have quality policies in place.
- The top management does not show commitment to quality.
- The companies do not have quality manuals.
- The companies' quality policies are not communicated to each employee.
- The companies' objectives are not communicated to the staff.
- The companies are not ISO accredited.
- The companies do not measure quality performance.
- The companies do not measure defects.
- The companies do not measure production performance.
- Customer satisfaction is not measured within the companies.

6.7.2 Section B- Quality Management Tools and Techniques

As for the results obtained through the statements on quality management tools and techniques, the following analogies can be drawn from this research. "Most of the small clothing manufacturing firms do not use the following as a quality tool and technique to enhance quality:

- Design of experiment deployment.
- Statistical process control (SPC).
- Quality function deployment.
- Cross functional teams.
- Brainstorming.
- Benchmarking.

6.7.3 Section C- Causes of the poor production of goods and services

As for the results obtained through the statements on the causes of poor production of goods and services, the following analogies can be drawn from this research:

- Guidance is not available to employees in selecting a pattern when making garments.
- The companies do not seek customer views in order to enhance the quality of the products.
- Management do not provide the necessary training and resources to support employees to produce quality products.
- Management is not aware of the benefits that can be achieved through offering good products and services to the customer.
- Product quality is not important in most of the companies.

The results obtained through the statements on quality management implementation are as follows:

- Customer requirement was not the reason for implementing a quality system.
- Marketing of the company was not the reason for implementing a quality system.
- Improving management process was not the reason for implementing a quality system.
- Improving quality of the product was not the reason for implementing a quality system.

6.7.4 Section D- Quality Management Implementation

It seems that the results obtained through the statements on quality management implementation are as follows:

- Customer requirement was not the reason for implementing a quality system.

- Marketing of the company was not the reason for implementing a quality system.
- Improving management process was not the reason for implementing a quality system.
- Improving quality of the product was not the reason for implementing a quality system.

There is a dependency between the quality management system application, the quality management tools and techniques, the causes of the poor production of goods and services and quality management implementation. The quality management system application, the quality management tools and techniques and the quality management implementation are more negatively perceived than the causes of the poor production of goods and services by the respondents of small clothing manufacturing firms.

6.8 RECOMMENDATIONS

Leadership, according to Juran and Gryna (1993:116), is one of the basic elements of specific approaches to strategic quality management to develop quality goals and strategies. The role of leaders in small clothing manufacturing firms is significant and is a major force behind quality improvement. They play an important role, especially where there is not enough capital to establish a quality management system in the organisation. Based on the research results, in small clothing manufacturing firms, leadership does not define the mission of the organisation; they do not create a clear quality value, policy and strategies. Most of the managers have only experience and do not effectively utilise quality management programmes, resulting in poor goods and services being produced. The following are the recommendations for small clothing manufacturing firms to implement a Quality Management strategy:

- Implementing a quality strategy is not only about the documents it also involves the employees therefore, employee involvement is essential. With regards to the report of the statistical analysis, the management of small

clothing manufacturing firms do not delegate authority and responsibility to the employees, and the communication between the management and employees is not open. Thus, the employees do not have the opportunity to address the quality problems. Many small clothing manufacturing firms lack the awareness of quality management and do not realise that it is the primary element of the firms' sustainability.

- Customer focus leads to a unique competitive advantage in small clothing manufacturing firms. A company that is customer driven is fundamentally different from a company that is not. Therefore, customer focus is vital for the continuous process of improvement in small manufacturing firms. The implementation of a good quality strategy influences the development and sustainability of a business from a long term view.
- There are a number of quality management approaches that can be applied to Western Cape small clothing manufacturing firms, such as total quality management (TQM), continuous improvement, etc. Deming's PDSA model is one of the popular and excellent approaches that should be adopted by many small clothing manufacturing firms in the Western Cape. It has contributed significantly to the success of quality management process during the past two decades. Therefore, this study recommends that small clothing manufacturing firms should try to implement the PDSA model to improve their quality management.

The PDSA cycle for quality management in small firms is explained in the following phase:

- **Plan phase:** According to the statistical results, in the small clothing manufacturing firms, the plan part, including the leadership, creates clear quality values, policies and strategies, based on the information flow from the customers. The main point of this step is to develop a plan for improving quality as a process in small clothing manufacturing firms.
- **Do phase:** The small clothing manufacturing firms delegate authority and responsibility clearly, and execute the plan, to take action.

- **Study phase:** Evaluate feedback from the customer by the communication to confirm or to adjust the plan, and establish processes in place for new products and services to ensure quality in small clothing manufacturing firms.
- **Act phase:** Summarise from the previous three steps, and establish the changes and processes in place for new products/services to ensure quality in the small clothing manufacturing firms.

Although owners or managers in small clothing manufacturing firms are generally experts in the product or service they produce, they usually have neither education nor the skills required to manage a business. According to the data analysis, one of the barriers is that they do not know how to delegate authority and responsibility. Therefore, the role of leadership commitment in small clothing manufacturing firms is significant.

Based on the data analysis, communication between the management and employees is not open, and employees have difficulty in even working together as a team, to achieve the goals of quality improvement, which are the advantages of a small clothing manufacturing firm. However, there is not a quality department in these small clothing manufacturing firms because of lack of capital, and the employees are not well trained in the quality philosophy, which are the barriers to small clothing manufacturing firms, regarding the implementation of quality solutions.

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Annexure A : Cronbach Alpha Coefficients

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
A1	30	2.06667	1.63861	62.00000	1.00000	5.00000	A1
A2	30	2.13333	1.73669	64.00000	1.00000	5.00000	A2
A3	30	1.90000	1.47040	57.00000	1.00000	5.00000	A3
A4	30	2.26667	1.74066	68.00000	1.00000	5.00000	A4
A5	30	2.10000	1.64736	63.00000	1.00000	5.00000	A5
A6	30	2.16667	1.70361	65.00000	1.00000	5.00000	A6
A7	30	2.03333	1.62912	61.00000	1.00000	5.00000	A7
A8	30	2.13333	1.63440	64.00000	1.00000	5.00000	A8
A9	30	2.16667	1.72374	65.00000	1.00000	5.00000	A9
A10	30	1.53333	1.04166	46.00000	1.00000	5.00000	A10

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.984430
Standardized	0.983294

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
A1	0.985794	0.980720	0.983460	0.979377	A1
A2	0.981603	0.980845	0.976976	0.979579	A2
A3	0.845607	0.984938	0.848281	0.983543	A3
A4	0.958724	0.981607	0.953753	0.980302	A4
A5	0.964399	0.981387	0.961004	0.980077	A5
A6	0.949089	0.981888	0.948007	0.980481	A6
A7	0.960548	0.981515	0.955883	0.980236	A7
A8	0.969716	0.981227	0.968073	0.979857	A8
A9	0.969993	0.981220	0.965583	0.979935	A9
A10	0.609942	0.990633	0.611676	0.990561	A10

The CORR Procedure

Pearson Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	A1	A2	A3	A4	A5
A1	1.00000	0.99038	0.81863	0.96072	0.95552
A1		<.0001	<.0001	<.0001	<.0001
A2	0.99038	1.00000	0.82911	0.95742	0.94736
A2	<.0001		<.0001	<.0001	<.0001
A3	0.81863	0.82911	1.00000	0.81914	0.81571
A3	<.0001	<.0001		<.0001	<.0001
A4	0.96072	0.95742	0.81914	1.00000	0.96444
A4	<.0001	<.0001	<.0001		<.0001
A5	0.95552	0.94736	0.81571	0.96444	1.00000
A5	<.0001	<.0001	<.0001	<.0001	
A6	0.93467	0.92462	0.83282	0.93802	0.97681
A6	<.0001	<.0001	<.0001	<.0001	<.0001
A7	0.96794	0.97340	0.80757	0.92092	0.92383
A7	<.0001	<.0001	<.0001	<.0001	<.0001
A8	0.97511	0.97755	0.80926	0.93249	0.91700
A8	<.0001	<.0001	<.0001	<.0001	<.0001
A9	0.97259	0.98294	0.82310	0.93856	0.94112
A9	<.0001	<.0001	<.0001	<.0001	<.0001
A10	0.62492	0.56930	0.62137	0.54645	0.59079
A10	0.0002	0.0010	0.0002	0.0018	0.0006

Pearson Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	A6	A7	A8	A9	A10
A1	0.93467	0.96794	0.97511	0.97259	0.62492
A1	<.0001	<.0001	<.0001	<.0001	0.0002
A2	0.92462	0.97340	0.97755	0.98294	0.56930
A2	<.0001	<.0001	<.0001	<.0001	0.0010
A3	0.83282	0.80757	0.80926	0.82310	0.62137
A3	<.0001	<.0001	<.0001	<.0001	0.0002
A4	0.93802	0.92092	0.93249	0.93856	0.54645
A4	<.0001	<.0001	<.0001	<.0001	0.0018
A5	0.97681	0.92383	0.91700	0.94112	0.59079
A5	<.0001	<.0001	<.0001	<.0001	0.0006

A6	1.00000	0.89249	0.92057	0.90613	0.60885
A6		<.0001	<.0001	<.0001	0.0004
A7	0.89249	1.00000	0.96957	0.98031	0.55812
A7	<.0001		<.0001	<.0001	0.0014
A8	0.92057	0.96957	1.00000	0.95878	0.62518
A8	<.0001	<.0001		<.0001	0.0002
A9	0.90613	0.98031	0.95878	1.00000	0.56333
A9	<.0001	<.0001	<.0001		0.0012
A10	0.60885	0.55812	0.62518	0.56333	1.00000
A10	0.0004	0.0014	0.0002	0.0012	

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
B11	30	2.13333	1.50249	64.00000	1.00000	5.00000	B11
B12	30	1.96667	1.40156	59.00000	1.00000	5.00000	B12
B13	30	1.73333	1.22990	52.00000	1.00000	5.00000	B13
B14	30	2.10000	1.44676	63.00000	1.00000	5.00000	B14
B15	30	1.76667	1.25075	53.00000	1.00000	5.00000	B15
B16	30	1.70000	1.14921	51.00000	1.00000	5.00000	B16

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.959979
Standardized	0.962892

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
B11	0.848965	0.956380	0.842572	0.959899	B11
B12	0.869611	0.952890	0.861309	0.957910	B12
B13	0.881777	0.951877	0.888639	0.954987	B13
B14	0.861326	0.954195	0.862591	0.957774	B14
B15	0.910262	0.948787	0.918999	0.951709	B15
B16	0.907412	0.950380	0.913290	0.952328	B16

The CORR Procedure

Pearson Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	B11	B12	B13	B14	B15	B16
B11	1.00000	0.93555	0.71034	0.77096	0.75110	0.74291
B11		<.0001	<.0001	<.0001	<.0001	<.0001
B12	0.93555	1.00000	0.75483	0.76696	0.76257	0.76429
B12	<.0001		<.0001	<.0001	<.0001	<.0001
B13	0.71034	0.75483	1.00000	0.81006	0.92206	0.89292
B13	<.0001	<.0001		<.0001	<.0001	<.0001
B14	0.77096	0.76696	0.81006	1.00000	0.81370	0.82752
B14	<.0001	<.0001	<.0001		<.0001	<.0001
B15	0.75110	0.76257	0.92206	0.81370	1.00000	0.95721
B15	<.0001	<.0001	<.0001	<.0001		<.0001
B16	0.74291	0.76429	0.89292	0.82752	0.95721	1.00000
B16	<.0001	<.0001	<.0001	<.0001	<.0001	

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
C17	30	2.46667	1.71672	74.00000	1.00000	5.00000	C17
C18	30	2.43333	1.73570	73.00000	1.00000	5.00000	C18
C19	30	2.23333	1.71572	67.00000	1.00000	5.00000	C19
C20	30	2.13333	1.65536	64.00000	1.00000	5.00000	C20
C21	30	2.16667	1.59921	65.00000	1.00000	5.00000	C21

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.972240
Standardized	0.972065

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
C17	0.959391	0.959156	0.958431	0.959091	C17
C18	0.959728	0.959093	0.958390	0.959097	C18

C19	0.948479	0.960910	0.947669	0.960789	C19
C20	0.845959	0.976611	0.846230	0.976458	C20
C21	0.885262	0.970797	0.885285	0.970497	C21

Pearson Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	C17	C18	C19	C20	C21
C17	1.00000	0.98289	0.93346	0.82674	0.87503
C17		<.0001	<.0001	<.0001	<.0001
C18	0.98289	1.00000	0.96070	0.81930	0.85511
C18	<.0001		<.0001	<.0001	<.0001
C19	0.93346	0.96070	1.00000	0.82641	0.86507
C19	<.0001	<.0001		<.0001	<.0001
C20	0.82674	0.81930	0.82641	1.00000	0.79891
C20	<.0001	<.0001	<.0001		<.0001
C21	0.87503	0.85511	0.86507	0.79891	1.00000
C21	<.0001	<.0001	<.0001	<.0001	

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
D22	30	2.00000	1.59741	60.00000	1.00000	5.00000	D22
D23	30	2.20000	1.68973	66.00000	1.00000	5.00000	D23
D24	30	2.13333	1.50249	64.00000	1.00000	5.00000	D24
D25	30	2.06667	1.46059	62.00000	1.00000	5.00000	D25

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.957942
Standardized	0.959123

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
D22	0.791756	0.975715	0.790217	0.977582	D22
D23	0.956660	0.926727	0.958196	0.928538	D23

D24	0.947304	0.930424	0.947574	0.931755	D24
D25	0.905857	0.943096	0.905842	0.944241	D25

Pearson Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	D22	D23	D24	D25
D22	1.00000	0.80484	0.79020	0.72419
D22		<.0001	<.0001	<.0001
D23	0.80484	1.00000	0.95348	0.93053
D23	<.0001		<.0001	<.0001
D24	0.79020	0.95348	1.00000	0.92288
D24	<.0001	<.0001		<.0001
D25	0.72419	0.93053	0.92288	1.00000
D25	<.0001	<.0001	<.0001	

Annexure B : Descriptive statistics: Frequency Tables

A1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Disagree	1	3.33	21	70.00
Undecided	1	3.33	22	73.33
Agree	3	10.00	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	42.6667
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

A2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Disagree	1	3.33	21	70.00
Undecided	1	3.33	22	73.33
Agree	1	3.33	23	76.67
Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	45.3333
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

A3	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Strongly Disagree	21	70.00	21	70.00
Undecided	3	10.00	24	80.00
Agree	3	10.00	27	90.00
Strongly Agree	3	10.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 32.4000

DF 3

Pr > ChiSq <.0001

Sample Size = 30

A4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	18	60.00	18	60.00
Disagree	2	6.67	20	66.67
Undecided	1	3.33	21	70.00
Agree	2	6.67	23	76.67
Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 33.6667

DF 4

Pr > ChiSq <.0001

Sample Size = 30

A5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Undecided	2	6.67	22	73.33
Agree	3	10.00	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 28.4000

DF 3

Pr > ChiSq <.0001

Sample Size = 30

A6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	1	3.33	20	66.67
Undecided	3	10.00	23	76.67
Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 26.0000

DF 3

Pr > ChiSq <.0001

Sample Size = 30

A7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Disagree	2	6.67	22	73.33
Agree	3	10.00	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 28.4000

DF 3

Pr > ChiSq <.0001

Sample Size = 30

A8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	1	3.33	20	66.67
Undecided	2	6.67	22	73.33
Agree	3	10.00	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	36.6667
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

A9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	2	6.67	21	70.00
Undecided	1	3.33	22	73.33
Agree	1	3.33	23	76.67
Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	39.3333
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

A10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	22	73.33	22	73.33
Disagree	3	10.00	25	83.33

Undecided	3	10.00	28	93.33
Agree	1	3.33	29	96.67
Strongly Agree	1	3.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 54.0000

DF 4

Pr > ChiSq <.0001

Sample Size = 30

B11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	16	53.33	16	53.33
Disagree	5	16.67	21	70.00
Undecided	2	6.67	23	76.67
Agree	3	10.00	26	86.67
Strongly Agree	4	13.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 21.6667

DF 4

Pr > ChiSq 0.0002

Sample Size = 30

B12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	18	60.00	18	60.00
Disagree	3	10.00	21	70.00
Undecided	4	13.33	25	83.33
Agree	2	6.67	27	90.00
Strongly Agree	3	10.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 30.3333

DF 4

Pr > ChiSq <.0001

Sample Size = 30

B13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	6	20.00	25	83.33
Undecided	1	3.33	26	86.67
Agree	2	6.67	28	93.33
Strongly Agree	2	6.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 37.6667

DF 4

Pr > ChiSq <.0001

Sample Size = 30

B14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	16	53.33	16	53.33
Disagree	5	16.67	21	70.00
Undecided	2	6.67	23	76.67
Agree	4	13.33	27	90.00
Strongly Agree	3	10.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 21.6667

DF 4

Pr > ChiSq 0.0002

Sample Size = 30

B15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	5	16.67	24	80.00
Undecided	2	6.67	26	86.67
Agree	2	6.67	28	93.33
Strongly Agree	2	6.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 36.3333

DF 4

Pr > ChiSq <.0001

Sample Size = 30

B16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Disagree	3	10.00	23	76.67
Undecided	4	13.33	27	90.00
Agree	2	6.67	29	96.67
Strongly Agree	1	3.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 41.6667

DF 4

Pr > ChiSq <.0001

Sample Size = 30

C17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	14	46.67	14	46.67
Disagree	5	16.67	19	63.33
Undecided	2	6.67	21	70.00
Agree	1	3.33	22	73.33
Strongly Agree	8	26.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	18.3333
DF	4
Pr > ChiSq	0.0011

Sample Size = 30

C18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	15	50.00	15	50.00
Disagree	4	13.33	19	63.33
Undecided	2	6.67	21	70.00
Agree	1	3.33	22	73.33
Strongly Agree	8	26.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	21.6667
DF	4
Pr > ChiSq	0.0002

Sample Size = 30

C19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	18	60.00	18	60.00

Disagree	2	6.67	20	66.67
Undecided	2	6.67	22	73.33
Agree	1	3.33	23	76.67
Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 33.6667

DF 4

Pr > ChiSq <.0001

Sample Size = 30

C20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	19	63.33	19	63.33
Disagree	1	3.33	20	66.67
Undecided	3	10.00	23	76.67
Agree	1	3.33	24	80.00
Strongly Agree	6	20.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 38.0000

DF 4

Pr > ChiSq <.0001

Sample Size = 30

C21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	18	60.00	18	60.00
Disagree	1	3.33	19	63.33
Undecided	4	13.33	23	76.67
Agree	2	6.67	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 31.6667

DF 4

Pr > ChiSq <.0001

Sample Size = 30

D22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	20	66.67	20	66.67
Disagree	2	6.67	22	73.33
Undecided	1	3.33	23	76.67
Agree	2	6.67	25	83.33
Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 42.3333

DF 4

Pr > ChiSq <.0001

Sample Size = 30

D23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	18	60.00	18	60.00
Disagree	3	10.00	21	70.00
Agree	3	10.00	24	80.00
Strongly Agree	6	20.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 20.4000

DF 3

Pr > ChiSq 0.0001

Sample Size = 30

D24	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	16	53.33	16	53.33
Disagree	5	16.67	21	70.00
Undecided	2	6.67	23	76.67
Agree	3	10.00	26	86.67
Strongly Agree	4	13.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	21.6667
DF	4
Pr > ChiSq	0.0002

Sample Size = 30

D25	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly Disagree	17	56.67	17	56.67
Disagree	4	13.33	21	70.00
Undecided	2	6.67	23	76.67
Agree	4	13.33	27	90.00
Strongly Agree	3	10.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	25.6667
DF	4
Pr > ChiSq	<.0001

Sample Size = 30

Annexure C: Descriptive statistics: Uni-variate with means & standard deviations where appropriate

The UNIVARIATE Procedure

Variable: A1 (A1)

N	30	Sum Weights	30
Mean	2.06666667	Sum Observations	62
Std Deviation	1.6386145	Variance	2.68505747
Skewness	1.0447618	Kurtosis	-0.7558258
Uncorrected SS	206	Corrected SS	77.8666667
Coeff Variation	79.2877983	Std Error Mean	0.29916871

Basic Statistical Measures

Location		Variability	
Mean	2.066667	Std Deviation	1.63861
Median	1.000000	Variance	2.68506
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A2(A2)

N	30	Sum Weights	30
Mean	2.13333333	Sum Observations	64
Std Deviation	1.73668994	Variance	3.01609195
Skewness	1.00822831	Kurtosis	-0.9198386

Uncorrected SS	224	Corrected SS	87.4666667
Coeff Variation	81.407341	Std Error Mean	0.31707475

Basic Statistical Measures

Location		Variability	
Mean	2.133333	Std Deviation	1.73669
Median	1.000000	Variance	3.01609
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A3 (A3)

N	30	Sum Weights	30
Mean	1.9	Sum Observations	57
Std Deviation	1.47039755	Variance	2.16206897
Skewness	1.23001595	Kurtosis	-0.1288115
Uncorrected SS	171	Corrected SS	62.7
Coeff Variation	77.3893449	Std Error Mean	0.26845664

Basic Statistical Measures

Location		Variability	
Mean	1.900000	Std Deviation	1.47040
Median	1.000000	Variance	2.16207
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0
99%	5.0
95%	5.0
90%	4.5
75% Q3	3.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Variable: A4 (A4)

N	30	Sum Weights	30
Mean	2.26666667	Sum Observations	68
Std Deviation	1.7406565	Variance	3.02988506
Skewness	0.82058387	Kurtosis	-1.2329665
Uncorrected SS	242	Corrected SS	87.8666667
Coeff Variation	76.7936692	Std Error Mean	0.31779894

Basic Statistical Measures

Location		Variability	
Mean	2.266667	Std Deviation	1.74066
Median	1.000000	Variance	3.02989
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1

10%	1
5%	1
1%	1
0% Min	1

Variable: A5 (A5)

N	30	Sum Weights	30
Mean	2.1	Sum Observations	63
Std Deviation	1.64735943	Variance	2.7137931
Skewness	0.96988496	Kurtosis	-0.8989869
Uncorrected SS	211	Corrected SS	78.7
Coeff Variation	78.4456873	Std Error Mean	0.30076531

Basic Statistical Measures

Location		Variability	
Mean	2.100000	Std Deviation	1.64736
Median	1.000000	Variance	2.71379
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A6 (A6)

N	30	Sum Weights	30
Mean	2.16666667	Sum Observations	65
Std Deviation	1.70361347	Variance	2.90229885

Skewness	0.97720568	Kurtosis	-0.8809613
Uncorrected SS	225	Corrected SS	84.1666667
Coeff Variation	78.6283139	Std Error Mean	0.31103584

Basic Statistical Measures

Location		Variability	
Mean	2.166667	Std Deviation	1.70361
Median	1.000000	Variance	2.90230
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A7 (A7)

N	30	Sum Weights	30
Mean	2.03333333	Sum Observations	61
Std Deviation	1.62911724	Variance	2.65402299
Skewness	1.12196751	Kurtosis	-0.5973304
Uncorrected SS	201	Corrected SS	76.9666667
Coeff Variation	80.1205201	Std Error Mean	0.29743475

Basic Statistical Measures

Location		Variability	
Mean	2.033333	Std Deviation	1.62912
Median	1.000000	Variance	2.65402
Mode	1.000000	Range	4.00000

Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A8 (A8)

N	30	Sum Weights	30
Mean	2.13333333	Sum Observations	64
Std Deviation	1.63440031	Variance	2.67126437
Skewness	0.93882961	Kurtosis	-0.9204379
Uncorrected SS	214	Corrected SS	77.4666667
Coeff Variation	76.6125145	Std Error Mean	0.29839931

Basic Statistical Measures

Location		Variability	
Mean	2.133333	Std Deviation	1.63440
Median	1.000000	Variance	2.67126
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4

50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A9 (A9)

N	30	Sum Weights	30
Mean	2.16666667	Sum Observations	65
Std Deviation	1.72373559	Variance	2.97126437
Skewness	0.97944934	Kurtosis	-0.9440151
Uncorrected SS	227	Corrected SS	86.1666667
Coeff Variation	79.557027	Std Error Mean	0.31470962

Basic Statistical Measures

Location		Variability	
Mean	2.166667	Std Deviation	1.72374
Median	1.000000	Variance	2.97126
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: A10 (A10)

N	30	Sum Weights	30
Mean	1.53333333	Sum Observations	46
Std Deviation	1.04166092	Variance	1.08505747
Skewness	2.06267482	Kurtosis	3.76956411
Uncorrected SS	102	Corrected SS	31.4666667
Coeff Variation	67.9344078	Std Error Mean	0.19018039

Basic Statistical Measures

Location		Variability	
Mean	1.533333	Std Deviation	1.04166
Median	1.000000	Variance	1.08506
Mode	1.000000	Range	4.00000
		Interquartile Range	1.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	4
90%	3
75% Q3	2
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: B11 (B11)

N	30	Sum Weights	30
Mean	2.13333333	Sum Observations	64
Std Deviation	1.50248836	Variance	2.25747126
Skewness	0.99931207	Kurtosis	-0.5565201
Uncorrected SS	202	Corrected SS	65.4666667
Coeff Variation	70.4291418	Std Error Mean	0.27431559

Basic Statistical Measures

Location		Variability	
Mean	2.133333	Std Deviation	1.50249
Median	1.000000	Variance	2.25747
Mode	1.000000	Range	4.00000

Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: B12 (B12)

N	30	Sum Weights	30
Mean	1.96666667	Sum Observations	59
Std Deviation	1.40155907	Variance	1.96436782
Skewness	1.19026524	Kurtosis	0.0534616
Uncorrected SS	173	Corrected SS	56.9666667
Coeff Variation	71.2657152	Std Error Mean	0.25588851

Basic Statistical Measures

Location		Variability	
Mean	1.966667	Std Deviation	1.40156
Median	1.000000	Variance	1.96437
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0
99%	5.0
95%	5.0
90%	4.5
75% Q3	3.0

50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Variable: B13 (B13)

N	30	Sum Weights	30
Mean	1.73333333	Sum Observations	52
Std Deviation	1.2298958	Variance	1.51264368
Skewness	1.74089567	Kurtosis	2.01380649
Uncorrected SS	134	Corrected SS	43.8666667
Coeff Variation	70.9555269	Std Error Mean	0.22454722

Basic Statistical Measures

Location		Variability	
Mean	1.733333	Std Deviation	1.22990
Median	1.000000	Variance	1.51264
Mode	1.000000	Range	4.00000
		Interquartile Range	1.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	4
75% Q3	2
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: B14 (B14)

N	30	Sum Weights	30
Mean	2.1	Sum Observations	63
Std Deviation	1.44675618	Variance	2.09310345
Skewness	0.98531591	Kurtosis	-0.5386022
Uncorrected SS	193	Corrected SS	60.7
Coeff Variation	68.8931515	Std Error Mean	0.26414033

Basic Statistical Measures

Location		Variability	
Mean	2.100000	Std Deviation	1.44676
Median	1.000000	Variance	2.09310
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0
99%	5.0
95%	5.0
90%	4.5
75% Q3	3.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Variable: B15 (B15)

N	30	Sum Weights	30
Mean	1.76666667	Sum Observations	53
Std Deviation	1.2507469	Variance	1.56436782
Skewness	1.60760455	Kurtosis	1.50832465
Uncorrected SS	139	Corrected SS	45.3666667
Coeff Variation	70.7969945	Std Error Mean	0.2283541

Basic Statistical Measures

Location		Variability	
Mean	1.766667	Std Deviation	1.25075
Median	1.000000	Variance	1.56437
Mode	1.000000	Range	4.00000
		Interquartile Range	1.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	4
75% Q3	2
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: B16 (B16)

N	30	Sum Weights	30
Mean	1.7	Sum Observations	51
Std Deviation	1.14921262	Variance	1.32068966
Skewness	1.516047	Kurtosis	1.30320091
Uncorrected SS	125	Corrected SS	38.3
Coeff Variation	67.6007426	Std Error Mean	0.20981656

Basic Statistical Measures

Location		Variability	
Mean	1.700000	Std Deviation	1.14921
Median	1.000000	Variance	1.32069
Mode	1.000000	Range	4.00000
		Interquartile Range	1.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0

99%	5.0
95%	4.0
90%	3.5
75% Q3	2.0
50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Variable: C17 (C17)

N	30	Sum Weights	30
Mean	2.46666667	Sum Observations	74
Std Deviation	1.71671967	Variance	2.94712644
Skewness	0.65209028	Kurtosis	-1.3827135
Uncorrected SS	268	Corrected SS	85.4666667
Coeff Variation	69.5967435	Std Error Mean	0.3134287

Basic Statistical Measures

Location		Variability	
Mean	2.466667	Std Deviation	1.71672
Median	2.000000	Variance	2.94713
Mode	1.000000	Range	4.00000
		Interquartile Range	4.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	5
50% Median	2
25% Q1	1
10%	1
5%	1
1%	1

0% Min	1

Variable: C18 (C18)

N	30	Sum Weights	30
Mean	2.43333333	Sum Observations	73
Std Deviation	1.73569689	Variance	3.01264368
Skewness	0.67109793	Kurtosis	-1.3889308
Uncorrected SS	265	Corrected SS	87.3666667
Coeff Variation	71.330009	Std Error Mean	0.31689345

Basic Statistical Measures

Location		Variability	
Mean	2.433333	Std Deviation	1.73570
Median	1.500000	Variance	3.01264
Mode	1.000000	Range	4.00000
		Interquartile Range	4.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0
99%	5.0
95%	5.0
90%	5.0
75% Q3	5.0
50% Median	1.5
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Variable: C19 (C19)

N	30	Sum Weights	30
Mean	2.23333333	Sum Observations	67
Std Deviation	1.71571506	Variance	2.94367816
Skewness	0.88413852	Kurtosis	-1.0745799
Uncorrected SS	235	Corrected SS	85.3666667
Coeff Variation	76.8230623	Std Error Mean	0.31324528

Basic Statistical Measures

Location		Variability	
Mean	2.233333	Std Deviation	1.71572
Median	1.000000	Variance	2.94368
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: C20 (C20)

N	30	Sum Weights	30
Mean	2.13333333	Sum Observations	64
Std Deviation	1.65536397	Variance	2.74022989
Skewness	0.99483383	Kurtosis	-0.7930497
Uncorrected SS	216	Corrected SS	79.4666667
Coeff Variation	77.5951863	Std Error Mean	0.30222673

Basic Statistical Measures

Location		Variability	
Mean	2.133333	Std Deviation	1.65536
Median	1.000000	Variance	2.74023
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: C21 (C21)

N	30	Sum Weights	30
Mean	2.16666667	Sum Observations	65
Std Deviation	1.59920957	Variance	2.55747126
Skewness	0.9013281	Kurtosis	-0.8721915
Uncorrected SS	215	Corrected SS	74.1666667
Coeff Variation	73.8096727	Std Error Mean	0.29197439

Basic Statistical Measures

Location		Variability	
Mean	2.166667	Std Deviation	1.59921
Median	1.000000	Variance	2.55747
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1

5%	1
1%	1
0% Min	1

Variable: D22 (D22)

N	30	Sum Weights	30
Mean	2	Sum Observations	60
Std Deviation	1.5974117	Variance	2.55172414
Skewness	1.19643353	Kurtosis	-0.3535601
Uncorrected SS	194	Corrected SS	74
Coeff Variation	79.870585	Std Error Mean	0.29164614

Basic Statistical Measures

Location		Variability	
Mean	2.000000	Std Deviation	1.59741
Median	1.000000	Variance	2.55172
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: D23 (D23)

N	30	Sum Weights	30
Mean	2.2	Sum Observations	66
Std Deviation	1.68972554	Variance	2.85517241
Skewness	0.90425946	Kurtosis	-1.0601514

Uncorrected SS	228	Corrected SS	82.8
Coeff Variation	76.8057065	Std Error Mean	0.30850027

Basic Statistical Measures

Location		Variability	
Mean	2.200000	Std Deviation	1.68973
Median	1.000000	Variance	2.85517
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: D24 (D24)

N	30	Sum Weights	30
Mean	2.13333333	Sum Observations	64
Std Deviation	1.50248836	Variance	2.25747126
Skewness	0.99931207	Kurtosis	-0.5565201
Uncorrected SS	202	Corrected SS	65.4666667
Coeff Variation	70.4291418	Std Error Mean	0.27431559

Basic Statistical Measures

Location		Variability	
Mean	2.133333	Std Deviation	1.50249
Median	1.000000	Variance	2.25747
Mode	1.000000	Range	4.00000

Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	1
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: D25 (D25)

N	30	Sum Weights	30
Mean	2.06666667	Sum Observations	62
Std Deviation	1.46059349	Variance	2.13333333
Skewness	1.01517543	Kurtosis	-0.5269589
Uncorrected SS	190	Corrected SS	61.8666667
Coeff Variation	70.6738784	Std Error Mean	0.26666667

Basic Statistical Measures

Location		Variability	
Mean	2.066667	Std Deviation	1.46059
Median	1.000000	Variance	2.13333
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5.0
99%	5.0
95%	5.0
90%	4.5
75% Q3	3.0

50% Median	1.0
25% Q1	1.0
10%	1.0
5%	1.0
1%	1.0
0% Min	1.0

Annexure D: Comparisons using Chi-square test

A1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	1	3.33	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	20.6000
DF	2
Pr > ChiSq	<.0001
Sample Size = 30	

A2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	1	3.33	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test for Equal Proportions

Chi-Square	20.6000
DF	2
Pr > ChiSq	<.0001
Sample Size = 30	

A3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	3	10.00	24	80.00
Agree - Strongly Agree	6	20.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 18.6000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

A4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	1	3.33	21	70.00
Agree - Strongly Agree	9	30.00	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 18.2000

DF 2

Pr > ChiSq 0.0001

Sample Size = 30

A5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	2	6.67	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 16.8000

DF 2

Pr > ChiSq 0.0002

Sample Size = 30

A6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	3	10.00	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	15.8000
DF	2
Pr > ChiSq	0.0004

Sample Size = 30

A7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	22	73.33	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	6.5333
DF	1
Pr > ChiSq	0.0106

Sample Size = 30

A8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	2	6.67	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 16.8000

DF 2

Pr > ChiSq 0.0002

Sample Size = 30

A9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	1	3.33	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 20.6000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

A10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	25	83.33	25	83.33
Undecided	3	10.00	28	93.33
Agree - Strongly Agree	2	6.67	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 33.8000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

B11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	2	6.67	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	19.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

B12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	4	13.33	25	83.33
Agree - Strongly Agree	5	16.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	18.2000
DF	2
Pr > ChiSq	0.0001

Sample Size = 30

B13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	25	83.33	25	83.33
Undecided	1	3.33	26	86.67
Agree - Strongly Agree	4	13.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 34.2000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

B14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	2	6.67	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 19.4000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

B15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	24	80.00	24	80.00
Undecided	2	6.67	26	86.67
Agree - Strongly Agree	4	13.33	30	100.00

Chi-Square Test

for Equal Proportions

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Chi-Square 29.6000

DF 2

Pr > ChiSq <.0001

Sample Size = 30

B16	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Disagree - Strongly Disagree	23	76.67	23	76.67
Undecided	4	13.33	27	90.00
Agree - Strongly Agree	3	10.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	25.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

C17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	19	63.33	19	63.33
Undecided	2	6.67	21	70.00
Agree - Strongly Agree	9	30.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	14.6000
DF	2
Pr > ChiSq	0.0007

Sample Size = 30

C18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	19	63.33	19	63.33
Undecided	2	6.67	21	70.00
Agree - Strongly Agree	9	30.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 14.6000

DF 2

Pr > ChiSq 0.0007

Sample Size = 30

C19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	2	6.67	22	73.33
Agree - Strongly Agree	8	26.67	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 16.8000

DF 2

Pr > ChiSq 0.0002

Sample Size = 30

C20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	20	66.67	20	66.67
Undecided	3	10.00	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 15.8000

DF 2

Pr > ChiSq 0.0004

Sample Size = 30

C21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	19	63.33	19	63.33

Undecided	4	13.33	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	12.6000
DF	2
Pr > ChiSq	0.0018
Sample Size = 30	

D22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	22	73.33	22	73.33
Undecided	1	3.33	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	23.4000
DF	2
Pr > ChiSq	<.0001
Sample Size = 30	

D23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Agree - Strongly Agree	9	30.00	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	4.8000
DF	1
Pr > ChiSq	0.0285
Sample Size = 30	

D24	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	2	6.67	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	19.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

D25	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disagree - Strongly Disagree	21	70.00	21	70.00
Undecided	2	6.67	23	76.67
Agree - Strongly Agree	7	23.33	30	100.00

Chi-Square Test

for Equal Proportions

Chi-Square	19.4000
DF	2
Pr > ChiSq	<.0001

Sample Size = 30

Annexure E: Correlation coefficients

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
A	30	20.50000	15.06938	10.00000	10.00000	50.00000
B	30	11.40000	7.31838	8.00000	6.00000	30.00000
C	30	11.43333	7.99432	7.00000	5.00000	25.00000
D	30	8.40000	5.89915	5.00000	4.00000	20.00000

Spearman Correlation Coefficients, N = 30

Prob > |r| under H0: Rho=0

	A	B	C	D
A	1.00000	0.78898	0.79035	0.87865
		<.0001	<.0001	<.0001
B	0.78898	1.00000	0.64288	0.67798
	<.0001		0.0001	<.0001
C	0.79035	0.64288	1.00000	0.88240
	<.0001	0.0001		<.0001
D	0.87865	0.67798	0.88240	1.00000
	<.0001	<.0001	<.0001	

Annexure F: Wilcoxon paired sign rank test

Variable: AB

Location		Variability	
Mean	0.150000	Std Deviation	0.59979
Median	0.000000	Variance	0.35975
Mode	0.000000	Range	2.96667
		Interquartile Range	0.33333

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	1.36978	Pr > |t|	0.1813
Sign	M	3.5	Pr >= |M|	0.1671
Signed Rank	S	26.5	Pr >= |S|	0.2975

Variable: AC

Location		Variability	
Mean	-0.23667	Std Deviation	0.40725
Median	-0.05000	Variance	0.16585
Mode	0.00000	Range	2.00000
		Interquartile Range	0.50000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	-3.18302	Pr > |t|	0.0035
Sign	M	-6	Pr >= |M|	0.0075
Signed Rank	S	-68.5	Pr >= |S|	0.0015

Variable: AD

Location		Variability	
Mean	-0.05000	Std Deviation	0.42264
Median	0.00000	Variance	0.17862
Mode	0.00000	Range	2.10000
		Interquartile Range	0.25000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t -0.64798	Pr > |t|	0.5221
Sign	M -2	Pr >= |M|	0.4807
Signed Rank	S -21	Pr >= |S|	0.3748

Variable: BC

Location		Variability	
Mean	-0.38667	Std Deviation	0.76922
Median	-0.13333	Variance	0.59169
Mode	0.00000	Range	3.26667
		Interquartile Range	0.80000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t -2.75327	Pr > |t|	0.0101
Sign	M -4.5	Pr >= |M|	0.0931
Signed Rank	S -81	Pr >= |S|	0.0102

Variable: BD

Location		Variability	
Mean	-0.20000	Std Deviation	0.69570
Median	0.00000	Variance	0.48400
Mode	0.00000	Range	3.66667
		Interquartile Range	0.66667

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t -1.57459	Pr > |t|	0.1262
Sign	M -2	Pr >= |M|	0.5235
Signed Rank	S -42.5	Pr >= |S|	0.1725

Variable: CD

Location		Variability	
Mean	0.186667	Std Deviation	0.50955

Median	0.000000	Variance	0.25964
Mode	0.000000	Range	2.60000
		Interquartile Range	0.30000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	2.006497	Pr > |t| 0.0542
Sign	M	5	Pr >= |M| 0.0309
Signed Rank	S	52	Pr >= |S| 0.0214

Annexure G: Letter to Respondents

Cape Peninsula University of Technology

FACULTY OF ENGINEERING
(Bellville Campus) Ms Z Nxopo
Telephone: +27 +21 959 6600
Fax: +27 +21 959 6073
Email: nxopoz@cput.ac.za
Department: Industrial and Systems Engineering

DEAR RESPONDENT

The following questionnaire is part of an extensive master's study on an approach to improving quality management in small manufacturing firms in the Western Cape. It will be highly appreciated if you, the manager of the business or the employee of the business, would participate in the interview that is aimed at answering the questions as thoroughly as possible. All the information will be treated as **STRICTLY CONFIDENTIAL** and will only be used for academic purposes. Please feel free to contact the researcher in cases of any queries. Researcher: Ms. Zinzi Nxopo; Telephone number: 021 959 6600; Telefax number: 021 959 6073, email: nxopoz@cput.ac.za

Instructions for completion

1. Please read the questions and instructions to answer them carefully.
2. Please answer the questions as objectively and honestly as possible.
3. Please answer based on your experiences as much as possible.
4. Please mark the option which reflects your answer the most accurately by marking an (X) in the space provided.
5. Please answer all the questions as this will provide more information to the researcher so that an accurate analysis and interpretation of the data can be made.
6. You are kindly requested to complete the questionnaire, approval of consent (page 2 of the consent letter) and return it by fax or email between 01 July 2011 to 30 July 2011.

Annexure H: Questionnaire

Cape Peninsula University of Technology

QUESTIONNAIRE CONDUCTED ON AN APPROACH TO IMPROVING QUALITY MANAGEMENT IN SMALL MANUFACTURING FIRMS IN THE WESTERN CAPE

Please mark the following options by making use of (x):

Please answer the following questions as honest as possible by giving each a rating, by referring to the grid below. **Please mark the appropriate block with "X"**

Strongly Disagree	***Disagree***	***Undecided***	***Agree***	***Strongly Agree***
1	**2**	**3**	**4**	**5**

To what extent do you agree or disagree with the following statements listed below:

	Statement					
Section A: Quality Management Systems Application						
1.	The company has a quality policy in place. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
2.	Top management shows commitment to quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
3.	The company has a quality manual. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
4.	The company objectives are communicated to staff. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
5.	The company measures quality performance. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
6.	The company measures production performance. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
7.	The company quality policy is communicated to each employee. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
8.	The company measures defects. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**

9.	Customer satisfaction is measures within the company. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
10.	The company is ISO accredited. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
Statement						
Section B: Quality Management Tools and Techniques						
11.	The company uses benchmarking as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
12.	The company uses cross functional teams as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
13.	The company uses statistical process control (SPC) as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
14.	The company uses brainstorming as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
15.	The company uses quality function deployment as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
16.	The company uses design of experiment deployment as a quality tool and technique to enhance quality. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
Statement						
Section C: Causes of the poor production of goods and services						
17.	Product quality is important in the company. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
18.	Management is aware of the benefits that can be achieved through offering good products and services to the customer. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
19.	Management provides the necessary training and resources to support employees to produce quality products. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
20.	Guidance is available to employees in selecting a pattern when making garments. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
21.	The company seeks customer views in order to enhance the quality of the products. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**

Statement						
Section D: Quality Management Implementation						
22.	Customer requirement was the reason for implementing a quality system. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
23.	Improving quality of the product was the reason for implementing a quality system. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
24.	Improving management process was the reason for implementing a quality system. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**
25.	Marketing of the company was the reason for implementing a quality system. To what extent do you agree or disagree with this statement?	**1**	**2**	**3**	**4**	**5**

Annexure I: Descriptive statistics for all the variables of the survey table

Variables	Categories	Frequency	Percentage out of total
Section A: Quality Management Systems Application			
1. The company has a quality policy in place.	Strongly disagree	20	66.7%
	Disagree	1	3.3%
	Undecided	1	3.3%
	Agree	3	10.0%
	Strongly agree	5	16.7%
2. Top management shows commitment to quality.	Strongly disagree	20	66.7%
	Disagree	1	3.3%
	Undecided	1	3.3%
	Agree	1	3.3%
	Strongly agree	7	23.3%
3. The company has a quality manual.	Strongly disagree	21	70.0%
	Disagree	0	0.0%
	Undecided	3	10.0%
	Agree	3	10.0%
	Strongly agree	3	10.0%
4. The company objectives are communicated to staff.	Strongly disagree	18	60.0%
	Disagree	2	6.7%
	Undecided	1	3.3%
	Agree	2	6.7%
	Strongly agree	7	23.3%
5. The company measure quality performance.	Strongly disagree	20	66.7%
	Disagree	0	0.0%
	Undecided	2	6.7%
	Agree	3	10.0%
	Strongly agree	5	16.7%
6. The company measures production performance.	Strongly disagree	19	63.3%
	Disagree	1	3.3%
	Undecided	3	10.0%

Variables	Categories	Frequency	Percentage out of total
	Agree	0	0.0%
	Strongly agree	7	23.3%
7. The company quality policy is communicated to each employee.	Strongly disagree	20	66.7%
	Disagree	2	6.7%
	Undecided	0	0.0%
	Agree	3	10.0%
	Strongly agree	5	16.7%
8. The company measures defects.	Strongly disagree	19	63.3%
	Disagree	1	3.3%
	Undecided	2	6.7%
	Agree	3	10.0%
	Strongly agree	5	16.7%
9. Customer satisfaction is measured within the company.	Strongly disagree	19	63.3%
	Disagree	2	6.7%
	Undecided	1	3.3%
	Agree	1	3.3%
	Strongly agree	7	23.3%
10. The company is ISO accredited.	Strongly disagree	22	73.3%
	Disagree	3	10.0%
	Undecided	3	10.0%
	Agree	1	3.33%
	Strongly agree	1	3.33%
Section B: Quality Management Tools and Techniques			
11. The company uses benchmarking as a quality tool and technique to enhance quality.	Strongly disagree	16	53.3%
	Disagree	5	16.7%
	Undecided	2	6.7%
	Agree	3	10.0%
	Strongly agree	4	13.3%
12. The company uses cross functional teams as a quality tool and technique to enhance quality.	Strongly disagree	18	60.0%
	Disagree	3	10.0%

Variables	Categories	Frequency	Percentage out of total
	Undecided	4	13.3%
	Agree	2	6.7%
	Strongly agree	3	10.0%
13. The company uses statistical process control (SPC) as a quality tool and technique to enhance quality.	Strongly disagree	19	63.3%
	Disagree	6	20.0%
	Undecided	1	3.3%
	Agree	2	6.7%
	Strongly agree	2	6.7%
14. The company uses brainstorming as a quality tool and technique to enhance quality.	Strongly disagree	16	53.3%
	Disagree	5	16.7%
	Undecided	2	6.7%
	Agree	4	13.3%
	Strongly agree	3	10.0%
15. The company uses quality function deployment as a quality tool and technique to enhance quality.	Strongly disagree	19	63.3%
	Disagree	5	16.7%
	Undecided	2	6.7%
	Agree	2	6.7%
	Strongly agree	2	6.7%
16. The company uses design of experiment deployment as a quality tool and technique to enhance quality.	Strongly disagree	20	66.7%
	Disagree	3	10.0%
	Undecided	4	13.3%
	Agree	2	6.7%
	Strongly agree	1	3.3%
Section C: Causes of the poor production of goods and services.			
17. Product quality is important in the company.	Strongly disagree	14	46.7%
	Disagree	5	16.7%
	Undecided	2	6.7%
	Agree	1	3.3%
	Strongly agree	8	26.7%
18. Management is aware of the benefits that can be achieved through offering good products and	Strongly disagree	15	50.0%
	Disagree	4	13.3%

Variables	Categories	Frequency	Percentage out of total
service to the customer.	Undecided	2	6.7%
	Agree	1	3.3%
	Strongly agree	8	26.7%
19. Management provides necessary training and resources to support employees to produce quality products.	Strongly disagree	18	60.0%
	Disagree	2	6.7%
	Undecided	2	6.7%
	Agree	1	3.3%
	Strongly agree	7	23.3%
20. Guidance is available to employees in selecting a pattern when making garments.	Strongly disagree	19	63.3%
	Disagree	1	3.3%
	Undecided	3	10.0%
	Agree	1	3.3%
	Strongly agree	6	20.0%
21. The company seeks customer views in order to enhance the quality of the products.	Strongly disagree	18	60.0%
	Disagree	1	3.3%
	Undecided	4	13.3%
	Agree	2	6.7%
	Strongly agree	5	16.7%
Section D: Quality Management Implementation			
22. Customer requirement was the reason for implementing a quality system.	Strongly disagree	20	66.7%
	Disagree	2	6.7%
	Undecided	1	3.3%
	Agree	2	6.7%
	Strongly agree	5	16.7%
23. Improving quality of the product was the reason for implementing a quality system.	Strongly disagree	18	60.0%
	Disagree	3	10.0%
	Undecided	0	0.0%
	Agree	3	10.0%
	Strongly agree	6	20.0%
24. Improving management process was the reason for implementing a quality system	Strongly disagree	16	53.3%
	Disagree	5	16.7%

Variables	Categories	Frequency	Percentage out of total
	Undecided	2	6.7%
	Agree	3	10.0%
	Strongly agree	4	13.3%
25. Marketing of the company was the reason for implementing a quality system	Strongly disagree	17	56.7%
	Disagree	4	13.3%
	Undecided	2	6.7%
	Agree	4	13.3%
	Strongly agree	3	10.0%