

**Continuous improvement and employee
attitudes in a manufacturing concern**

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Excellence
Can be attained if you...

Care more
Than others think is wise.

Risk More
Than other think is safe

Dream more
Than others think is practical

Expect more
Than others think is possible

(Claude Thomas Bissell)

Abstract

Title: Continuous improvement and employee attitudes in a manufacturing concern.

Keywords: Continuous improvement, cultural quality values, key soft factors, Lean Manufacturing, job satisfaction, employee commitment, intentions to quit, work success, continuous improvement implementation

Continuous improvement as a business philosophy and quality management strategy has become the choice of many organisations world-wide. It is a concept filled with the promise for excellence in quality, customer service distinction and business efficiencies. Continuous improvement philosophies like Lean Manufacturing, promote tools, techniques and a culture of quality values that have the potential to create a dynamic business environment, capable of seizing opportunity, predicting failures and surpassing competition. Why then, are these organisations that are so vehemently pursuing continuous improvement initiatives with concerted efforts not reaping the rewards that have been successfully achieved by a monumental few great organisations?

According to the literature study, failure to implement continuous improvement (CI) programs successfully stems from a lack of focus on the soft side of continuous improvement efforts. The soft issues that are considered vital to successful implementation include an employee's quality cultural values and an organisations soft key success factors for CI implementation. This study focused on how these soft variables have an impact on employee attitudes such as job satisfaction, employee commitment, intentions to quit and work success.

The theoretical research conducted in this study focused on continuous improvement cultural values and the key soft success factors for CI implementation impact on work related attitudes like job satisfaction, employee commitment, intentions to quit and work success. The empirical study was conducted on 149 employees in a multi-national manufacturing company. A questionnaire was distributed throughout the entire company to verify how the theoretical and empirical data compared.

The study concluded that the specific cultural value of shared vision and goals was a significant predictor of all four work related attitudes, whilst other cultural values of

purpose and continuous improvement also proved to be significant predictors. The study concluded that key soft success factors like leadership, training and development and job security were significant predictors of employee commitment, whilst communication and job security were significant predictors of job satisfaction. Thus, work related attitudes like employee commitment is greater when employees identify and exhibit favourable quality cultural values and also when employees perceive that their organisation possess essential key soft factors for successful CI implementation. Incorporating these findings into recommendations will allow for organisations implementing CI programs, to develop the soft issues of CI that have a beneficial impact on work related attitudes that lead to successful and sustainable continuous improvement efforts.

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GLOSSARY OF TERMS

CI	Continuous improvement
FPS	Ford production System
JIT	Just in Time
LM	Lean Manufacturing
TPS	Toyota Production System
TQM	Total Quality Management

CHAPTER ONE

NATURE AND SCOPE OF THE STUDY

1.1 Introduction

This dissertation is concerned with the relationship between Continuous Improvement (CI) cultural values, soft key success factors for CI implementation and the impact of these variables on work-related attitudes such as job satisfaction, employee commitment, intentions to quit and work success of employees in a manufacturing concern of a multinational company. This chapter provides the background and problem statement of this study. The research objectives and the importance of the study are also presented. The research methodology is explained, limitations of the study are highlighted and the contents of each chapter are discussed.

1.2 Background

Organisations need to change the manner in which they create and deliver value in their offerings, otherwise failure is inevitable. The business environment of today is exposed to dynamic continuous changes and greater than ever competition. In order for organisations to succeed it has become imperative for organisations to look for every opportunity to improve their business results. Progressive companies are constantly in search of business excellence. Shukla (1993:80) describes excellence as a concept of surpassing the standard and directing a lot of energy into achieving continuous improvement, and in doing so achieve new heights on a continuous basis that form the basis for excellence.

Bhuiyan and Baghel (2005:761) define CI as a “culture of sustained improvement targeting the elimination of waste in all systems and processes of an organisation”. CI is defined by Sim and Rogers (2009:38) as “any methodology or program that continually strives to improve any and all processes through an increase in quality, delivery, productivity or customer satisfaction and a decrease in lead time, cycle time,

cost or scrap". CI can therefore be defined as a methodology that identifies all kinds of wastes in an organisation and applies continuous improvement philosophy and principles to reduce and prevent such wastes. CI as a concept gained leverage as organisations recognised the need to improve on a larger scale, this need led to the development of a number of CI methodologies which were based on the basic concept of quality and continuous improvement to improve efficiencies, reduce waste, and improve quality (Bhuiyan & Bhagel, 2005:762). These same authors advocate that Lean Manufacturing (LM) and Six Sigma are amongst today's best known CI methodologies. Bhuiyan and Bhagel (2005) recognised that modern CI programs originated from the Total Quality Management (TQM) movement.

Klefsjo, Bergquist and Garvare (2008:121) define TQM as a "continuously evolving management system consisting of core values, methodologies and tools, the aim of which is to increase external and internal customer satisfaction with a reduced amount of resources". Womack and Jones (1996:10) describe Lean Manufacturing as the continuous application of 5 principles: Define Value as Perceived by the Customer, Identify the Value Stream, Make the Value Stream Flow, Flow at the Pull of the Customer and Strive for Perfection. Antony (2004:303) describes six sigma as "the implementation of a measurement-based strategy that focuses on process improvement and variation reduction".

Ultimately, the objective of LM, TQM and Six Sigma are very similar; they all have the same origin, and aim at minimising waste through improvements whilst improving customer satisfaction and financial results (Anderson, Eriksson & Tortensson, 2006:282). The critical link between these different quality management concepts is CI. We have therefore made use of literature pertaining to LM, TQM and Six Sigma whilst investigating the concept of continuous improvement in this research study.

The popularity of these methodologies has been made famous by a few, very successful companies like Toyota, Xerox and Motorola. TQM, Six Sigma and LM programs (CI programs) have been widely adopted by firms in order to compete in a challenging global environment. There is little doubt that these programs have the potential to create a phenomenal success within a business. CI initiatives are the most practical answer to sustained growth and competitive advantage; successful CI

companies have proven this. Most quality management literature mentions Toyota as the ultimate CI success story. According to Ahrens (2006:12) Toyota has been extremely open about its practices, however only a few organisations have been successful at imitating Toyota. Why then is the transformation to a CI Enterprise such a challenging experience? The former chairman of Toyota, Mr Fujio Cho stated in an interview with John Shook, the chairman of the Lean Enterprise Institute (LEI) that the key to lean leadership were simply, “Go see”, “Ask why?” and lastly “Show respect”. According to Shook, the first two concepts are fairly easy to apply, but the third requires a social skill that cannot be taught or enforced (Shook, 2011). According to Wee (2009), lean implementation failures are not due to failure to grasp tools and techniques but failure in change management. Therefore the success of CI programs requires a balance of both tools and culture. Literature states that lean implementation in a traditional environment are faced with an enormous culture change and can be regarded as one of the most difficult obstacles to overcome.

The success rates of lean implementations are estimated at less than 10% (Bhasin, 2012:403; Oakland and Tanner, 2007:572). One of the key major determinants of CI programs success is organisational culture (Detert, Schroeder & Mauriel, 2000; Kujala & Lilrank, 2004; Prajogo & McDermott, 2005). Companies focusing on both the soft-side of lean (the culture) and hard-side (tools and techniques) shows greater success in overall lean transformations (Badurdeen, Wijekoon & Marksberry, 2010:47). CI programs have too much focus on training people in tools and techniques but too little focus on understanding the human aspects like culture (Dahlgaard-Park & Dahlgaard, 2006:263). Organisational culture is defined as “general pattern of mindsets, beliefs and values that members of the organisation share in common, and which shape the behaviours, practices and artefacts of the organisation which are easily observable (Prajogo *et al.*, 2005:1101) as derived from Schein and Sathe (1985).

1.3 Problem Statement

Many companies worldwide are implementing CI programs with very poor success rates. Too many companies focus only on the hard tools of continuous improvement

programs in order to facilitate change for improvement. There is too little focus on the people aspect such as quality cultural values for CI and other soft key success factors like leadership and communication for CI implementation. These factors have been identified by researchers as key variables in the success of continuous improvement programs.

This study will therefore seek to investigate the relationship between quality cultural values of goals, customer focus, long term view, continuous improvement, employee involvement, collaboration, data-based decision making, system focus, quality at cost, purpose and urgency and how they impact work related attitudes of job satisfaction, employee commitment, intention to quit and work success. This study will also seek to investigate the relationship between other key soft implementation factors of leadership, training, job security, implementation of continuous improvement and communication and how they impact work related attitudes of job satisfaction, employee commitment, and intention to quit and work success. The research intends to show that implementation success through achieving high cultural quality values and high soft key success factors of CI implementation can improve positive work related attitudes. This will be done through a theoretical and empirical analysis. The theoretical analysis will consist of a literature study regarding lean manufacturing and lean implementation, quality cultural values, soft key success factors for CI implementation and employee attitudes such as job satisfaction, employee commitment, intentions to quit and work success. The empirical study will be conducted using a questionnaire to attain employees' perception on their quality cultural values, soft key success factors for CI implementation that their organisations exhibit and general work related attitudes.

1.4 Research objectives

The *primary objective of this study* is to do a theoretical and an empirical investigation into quality cultural values and soft key success factors for CI implementation and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success. The *secondary objectives of this study* are to:

- To determine the relationship between quality cultural values and soft key success factors for CI implementation and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.
- To determine the impact of quality cultural values on work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.
- To determine the impact of soft key success factors for CI implementation on work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.

1.5 Research Purpose

The research aims to contribute towards understanding how work related attitudes are affected by an individual's quality cultural values and thereby impacting CI implementation. The research aims to contribute towards understanding how work related attitudes are impacted on by an organisations soft key implementation factors and thereby impacting on CI implementation. Limited research has been done to understand how an individual's quality cultural quality values contribute towards work-related attitudes and its impact on CI implementation success. The research aims to help organisations in understanding that both the soft and hard side of CI implementation is required for successful implementation.

1.6 Assumptions and limitations

The assumptions to this research are as follows; the participants were willing to share their knowledge and were honest in the information they provided. The hard tools of CI implementation will be successful in this regard if the organisational quality culture values were rated high. The company consisted of 312 employees and only 149 employees responded, therefore the study only covers only 48% of the population.

1.7 Research Methodology

The research method consists of a literature study and an empirical study.

1.7.1 Literature Study

The literature study incorporates the following topics, lean manufacturing origin and principles, lean manufacturing implementation, quality cultural values, soft key success factors for CI implementation. The work related attitudes of job satisfaction, employee commitment, intentions to quit and work success will be discussed by focusing on their definition, the consequences of each outcome and lastly each outcomes relationship to continuous improvement. The available literature will be in the form of published articles, published conferences, books, and the internet (e-Books, Google scholar, NWU e-library).

1.7.2 Empirical study

This research uses the qualitative design approach to undertake the implementation of this research in order to meet the objectives. A non-experimental research design using a cross sectional design was used in this study. A cross-sectional survey collects data to make inferences or take snapshots about a population. Cross-sectional surveys can be conducted using any mode of data collection e.g. telephone interviews, mailed questionnaires, etc. The survey was designed to gauge employees' perspective on their quality cultural values, the employee's perception of the organisations soft key success factors for CI implementation and lastly employees perception towards work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.

The reason for the use of the survey is that it is capable of retrieving information from large samples of the population. It requires minimal investment to develop and administer. Surveys can also extract information about attitudes that are difficult to establish using observation techniques (Glasow, 2005:2). Given the nature of the study regarding employee attitudes the survey method was regarded as the most

appropriate tool to conduct this research. The population of the company consists of a total of 313 employees which includes salaried and hourly staff. The sampling frame was the entire population. It is estimated that nearly all employees have been exposed to continuous improvement training or continuous improvement projects. It was therefore viable to include all staff members in the sampling frame.

1.7.3 Measuring instruments

The questionnaire was structured into three sections namely Section One – Demographics, section two – participation in lean events and section Three – Cultural values, other soft key success continuous improvement factors and employee attitude. Section 3 uses a five-point Likert scale to assess perceived importance: strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The scale measured 76 items in total. *Quality cultural values* were assessed by using a measuring instrument developed by Detert, Schroeder, and Cudeck (2002) that measured nine quality cultural values. Changes were made to the original version which measured culture in schools, by adapting questions to refer to a company perspective. Two additional quality cultural variables of purpose and urgency were included in the measurement of cultural quality values and were adapted from a book by Miller (2011) on Lean culture. *The other key success factors variables for CI implementation* were used from a survey developed by Sim and Rogers (2009) to establish soft barriers to Lean implementation. *Employee attitudes measures* questions were developed specifically for this study to measure employee attitudes.

Quality cultural values

Quality cultural values consisted of eleven dimensions in total, with three items per dimension. The dimensions of the these variables include; goals, data-based decision making, continuous improvement, customer focus, long term view, employee involvement, quality at same cost, collaboration, system focus, purpose and urgency.

- *Goals*- This instrument measures the participant's understanding and alignment of his or her own goals to that of the overall goals and vision of the company. An

example of one of the items on this scale included, “The Company’s overall vision and goals guide my day to day work in my department”. ($\alpha=0.73$).

- *Customer Focus* – This instrument measures the participant’s perception of the importance of the customer when relating to company performance, company strategy and quality products. An example of one of the items on this scale included, “I believe that standards for company performance should be determined by external customers”. ($\alpha=0.56$).
- *Long term vision* – This instrument measures a participant’s understanding and acceptance of a company adopting a long term vision. An example of one of the items on this scale included, “I believe that our company should be long-term focused”. ($\alpha=0.52$).
- *Continuous improvement* - This instrument measures the participant’s adoption of continuous improvement tools and philosophy. An example of one of the items on this scale included, “I use CI concepts/tools to improve the way I work”. ($\alpha=0.71$).
- *Employee involvement* - This instrument measures the participant’s engagement and promotion of employee involvement. An example of one of the items on this scale included, “I encourage employee involvement in my department”. ($\alpha=0.25$).
- *Collaboration* - This instrument measures the participant’s involvement and the degree of promoting teamwork. An example of one of the items on this scale included, “I encourage teamwork in my department and with other departments”. ($\alpha=0.66$).
- *Data base decision making* - This instrument measures the participant’s practice of using data for decision making and problem solving purposes. An example of one of the items on this scale included “If I propose a change I bring data to support my decision”. ($\alpha=0.79$).
- *System Focus* - This instrument measures the participant’s perception of fault finding in a problem situation, where one should look for a cause in a system or process first as opposed to a person. An example of one of the items on this scale included, “When someone is performing poorly I try to identify where the system is failing him or her”. ($\alpha=0.77$).
- *Quality at same cost* - This instrument measures the participant’s perception that creating quality and improvements does not necessarily cost money. An example

of one of the items on this scale included, "Improving the quality of my work does not require additional money". ($\alpha=0.78$).

- *Purpose* - This instrument measures the participant's perception of their own contribution to the company. An example of one of the items on this scale included, "I contribute to the purpose of the company". ($\alpha=0.81$).
- *Urgency* - This instrument measures the participant's perception to his or her quick reaction to solving problems and initiating solutions. An example of one of the items on this scale included, "When I identify an improvement I implement it immediately". ($\alpha=0.68$).

Other key soft success factors for CI Implementation

The other key soft success factors variables for CI implementation consisted of five dimensions containing four items per dimension and included dimensions of; business reasons for implementation, leadership, training, communication and job security.

- *Understanding of Business reasons for CI Implementation.* This instrument measures the participant understands of the benefits that CI can contribute to a company. An example of one of the items on this scale included, "Our Company uses continuous improvement tools to compete in the global environment". ($\alpha=0.67$).
- *Leadership commitment.* This instrument measures the participant's perception of leadership's role and commitment in CI initiatives. An example of one of the items on this scale included, "Management ensures that CI is used to increase our company performance". ($\alpha=0.86$).
- *Training and development.* This instrument measures the participant's perception of whether the tools and training they receive for CI are adequate to use at work to make improvements. An example of one of the items on this scale included, "The Company provides me adequate training to be productive during improvement events". ($\alpha=0.86$).
- *Communication.* This instrument measures the participant's perception of whether communication is effective during implementation and whether the promotion of CI work done by employees is conveyed adequately. An example of one of the

items on this scale included, “Our Company works hard at sharing best practices throughout all its divisions on CI”. ($\alpha=0.84$).

- *Job security*. This instrument measures the participant’s perception of whether the company values employees and whether they believe that CI brings job security. An example of one of the items on this scale included, “CI has increased our job security”. ($\alpha=0.86$).

Employee Attitudes

This part included four dimensions containing; Job satisfaction (7 items), Employee commitment (5 items), Intentions to quit (3 items) and Work success (8 items).

- *Job satisfaction* - This instrument measures the participant’s satisfaction and fulfilment they receive from their jobs. An example of one of the items on this scale included. “In most ways my job is close to my ideal”. ($\alpha=0.67$).
- *Employee commitment* - This instrument measures the participant’s commitment and loyalty they feel towards the company. An example of one of the items on this scale included. “I feel that it is worthwhile to work hard for this organisation”. ($\alpha=0.86$).
- *Intention to quit* - This instrument measures the participant’s feelings towards intentions to leave the company. An example of one of the items on this scale included. “I often consider quitting my job”. ($\alpha=0.87$).
- *Work success* - This instrument measures the participant’s perception of his or her work success and reputation at work. An example of one of the items on this scale included. “I do my work well enough to be complimented for it by my superiors”. ($\alpha=0.84$).

1.7.4 Statistical Analysis

The statistical analysis was carried out by means of the SPSS-program. Cronbach alpha coefficients were determined to assess the reliability of the measuring instruments. Pearson product-moment correlation was used to identify the relationships between the variables. A cut-off point of 0.30 (medium effect) was set for the practical significance of correlation coefficients (Cohen, 1988). A step-wise multiple regression analysis was conducted to determine the proportion of variance in

the dependent variables of (job satisfaction, employee commitment, intentions to quit and work success) that is predicted by the independent variables of (cultural values of CI and other key success factors for CI implementation). The effect size in the case of multiple regressions is given by the formula (Steyn, 1999): $f^2 = R^2/1-R^2$. The following parameters were used: 0.01 (small effect), 0.1 (medium effect) and 0.35 (large effect) were set for practical significance of f^2 (Steyn, 1999).

1.8 Chapter Overview

This study will include the following chapters;

Chapter one: Introduction and outline of research project. The intention of this chapter will be to advise the reader the background of the research project, the problem statement and the research objectives.

Chapter two: Literature review – Lean Manufacturing and implementation programs, cultural quality values, key soft factors for CI implementation and employee attitudes such as job satisfaction, employee commitment, intention to quit and work success. The literature review will provide a theoretical overview of published works pertaining to lean manufacturing and implementation programs.

Chapter three: Research design and methodology. This chapter will explain the framework that was used in this research to design the research instrument, the sample population selection methods and how the research instrument was distributed to the sample. This chapter will also discuss the techniques used in the analysis of the data captured.

Chapter four: Analysis and Interpretation of survey results. The research results from the empirical study will be discussed in this chapter. This section aims to provide answers to the research questions in order to augment the findings found in literature.

Chapter five: Conclusions, recommendations and areas for future research. This chapter will summarise the results found in the research and will be able to correlate the impact of quality culture values, soft key success CI factors against employee attitudes. Recommendation will be made to the company researched to improve the gaps in continuous improvement culture to achieve a better success rate at CI implementation programs.

1.9 Chapter summary

This chapter provided the background and problem statement of this study. The research objectives and the importance of the study were also presented. The research methodology was explained, limitations of the study were highlighted and the contents of each chapter were discussed. The next chapter covers the literature review related to Continuous Improvement (CI) cultural values, soft key success factors for CI implementation and the impact of these variables on work-related attitudes such as job characteristics, employee commitment, intentions to quit and work success of employees.

CHAPTER TWO

LITERATURE REVIEW

“Our production cycle is 33 hours from iron ore to an automobile, compared to 12 days which we thought record breaking.” (Henry Ford)

2.1 Introduction

The literature review examines the principles of Lean manufacturing, key success factors required for its implementation and employee attitudes. Deming described the Continuous Improvement (CI) philosophy as consisting of “Improvement initiatives that increase successes and reduce failures” (Bhuiyan & Bhagel, 2005:761). In general all CI programs contain this fundamental purpose. Bhuiyan & Bhagel, (2005) reveal that CI initiatives of the past related to work improvement efforts, whilst modern day CI programs are related to “organised and comprehensive methodologies” that transformed into the concept of the Total Quality movement (TQM). They state that the concept is based on a “basic quality or process improvement, or both in order to reduce waste, simplify the production line and improve quality”.

Summers (2000:14), describes Total Quality Management (TQM) as a “management approach that places emphasis on continuous process and system improvement as a means of achieving customer satisfaction to ensure long-term company success”. Anderson *et al.*, (2006:282) describe quality management as a management revolution where a paradigm shift takes place to comprehensively improve the total organisation. All work is seen as a ‘process’, and TQM is a continuous improvement process for individuals, groups and whole organisations. What makes TQM different from other management processes is the concentrated focus on continuous improvement (Hsun & Pin, 2005:356). Amongst the best known quality programs at the frontier of continuous improvement initiatives are lean manufacturing, six sigma, the balanced scorecard and lean six sigma. “Lean is the most influential new paradigm in manufacturing, and has expanded beyond the original application of

shop floor of vehicle manufacturers...” (Financial Post as cited by Hines, Holweg, & Rich, 2004:1006). Lean manufacturing carefully implemented can undoubtedly form the roadmap to global manufacturing excellence (Papadopoulou & Ozbayrak, 2005:786).

Keeping in line with research report, Lean Manufacturing (LM) will be used for this chapter’s theoretical framework. Traditionally businesses focused on profit maximisation as a determinant of success. Globalisation has since proved that profits alone cannot sustain growth and competitiveness. A critical point of LM is value creation (Hines *et al.*, 2004:997). LM focus is on value creation, it centres on waste elimination and customer focus which ultimately results in cost reduction and customer value. Value creation can therefore be seen as a holistic business strategy that leads to traits that can achieve sustainability, competitiveness and growth. Lean Manufacturing is the quality management philosophy that has been adopted by the multi-national manufacturing company undertaken in this research study.

2.2 Lean Manufacturing

2.2.1 Lean Origins

1885	1913	1955-1990	1993-...
Craft Production	Mass Production	Toyota Production System	Lean Enterprise
Machine then harden Fit on assembly Customization	Parts inter-changeability Moving production line Production engineering “Workers don’t like to think”	Worker as problem solver Worker as process owner enabled by: -- Training -- Upstream quality -- Minimal inventory -- Just-in-time Eliminate waste Responsive to change	“Lean” applied to all functions in enterprise value stream Optimization of value delivered to all stakeholders and enterprises in value chain
Highly skilled workforce Low production rates High cost	Unskilled labor High production rates Low cost Persistent quality problems Inflexible models	Low cost Improving productivity High quality product	Low cost Improving productivity High quality product Greater value for stakeholders
“Lean” is elimination of waste and efficient creation of enterprise value			

Figure 1 Lean Origins

Source: (www.saiie.co.za/ocs/index.php/saiie/2009/paper/download/50/46)

2.2.2 The roots of the Lean Concept

“The machine that changed the world” is a book written by James Womack, Daniel Jones and Daniel Roos. These authors are attributed to coining the term “Lean Manufacturing”. Womack and Jones as summarised by Campbell, Eng and Anderson (2001:1) identified that craft production, mass manufacturing and the Toyota production system have been the inputs into Lean Manufacturing.

CRAFT Manufacturing Era

The manufacture of cars originated in the late 1800's. Each car was unique and needed to meet the specifications of each buyer. They were built one by one, by a workforce that was highly skilled in design (craftsmen), using easy, flexible tools. Every car was also different depending on the skills and building techniques of the assembler. These cars were expensive to build and incurred many defects as each one was unique by design. The “craft” manufacturing era was almost completely eliminated by the second era of manufacturing of Mass Manufacturing Era (Campbell *et al.*, 2001:2)

MASS Manufacturing Era

The Mass Manufacturing Era was initiated by Henry Ford, and was later improved on by Alfred P. Sloan. Campbell *et al.*, (2001:2) argue that the most important component of mass manufacturing was not the concept of the assembly line, but rather the concept of interchangeable parts. It was designed as such that parts manufactured with tight enough tolerances would not need filing or fitting by skilled craftsmen. This therefore eliminated the need for skilled employees. The new procedure would be to simply attach one part to the next. This concept therefore led to that of the assembly line, and revolutionised the car manufacturing business. Features of mass manufacturing include: (Campbell *et al.*, 2001:2)

- Each assembly line could only do one product
- The manufacturer tried to make as many identical products as possible
- Companies typically had poor relationships with parts suppliers – bidding, games, etc.

- Lower production cost was always the goal, but the goal for quality was “Good Enough”
- Another goal was to sell products, not gain customers
- The system generated huge inventories of parts and finished products
- If faults occurred, it could be a long time before they were found – after hundreds or thousands of units had been finished
- Mass manufacturing was very slow to respond to consumer wishes – and sometimes ended up with huge stockpiles of cars no one wanted to buy.
- Large “rework” areas of plants were usually required, to try to fix problems at the end of the assembly line.

LEAN Manufacturing Era: The Toyota Production System

“This I call Just In Time: Unless we establish a method far superior to Ford’s, we will never beat Ford.” (Kiichiro Toyoda)

The Lean manufacturing era initiated from the Toyota Production System (TPS) which is frequently referred to as Just in Time (JIT) Production. Serious competition and a lack of resources after World War II led to the Toyota Motor Company undertaking a study of the Ford production System (FPS). Taiichi Ohno former executive vice president of Toyota was given the task of developing an efficient system for the manufacture of automobiles in Japan. After learning extensively from Henry Ford’s assembly lines, he customised the process to suit the needs of the Japanese markets which required a lower volume of cars. This resulted in the formation of the world famous Toyota Production System (Bhuiyan, 2005:763). The system is designed to maintain a continuous flow of product while being able to adapt to flexible changes in demand. This philosophy of flow resulted in the concept of “Just in time” (JIT) production. JIT resulted in other complementary elements such as small production lot, set-up time reduction, Kanban systems, etc. (Bhuiyan & Bhagel, 2005) assessed that as a result of these systematic techniques, there is a reduction in all forms of waste, scrap and inventory, which leads to improved quality and decreased costs.

The Toyota Production System Principles

Liker (as cited by Dahlgaard - Park & Dahlgaard, 2006:15) in his book entitled the Toyota Way identified the 14 management principles behind the Toyota Production system (Table 1). Liker (2004) then categorised these principles into four concepts that lead to the formation of the Toyota Production System.

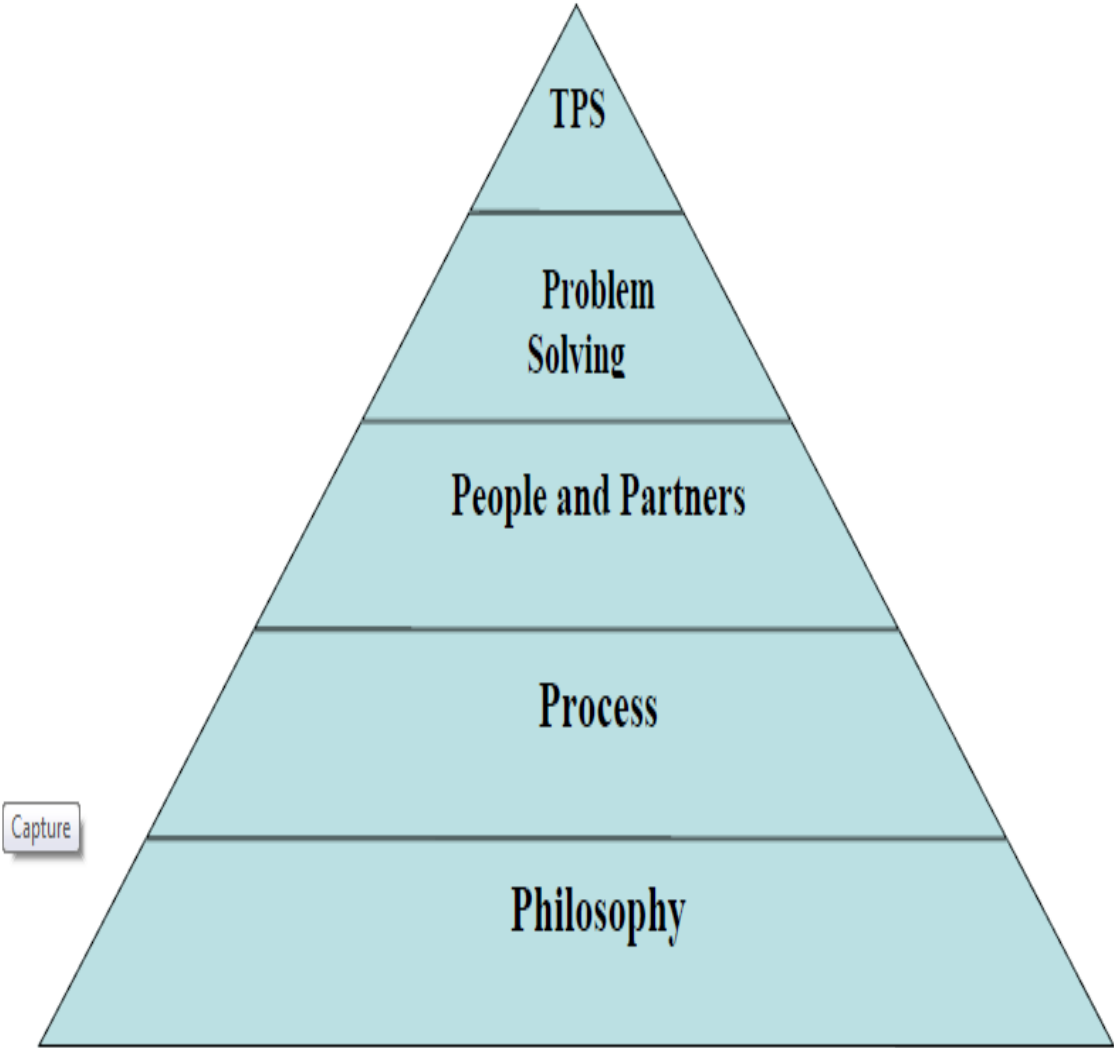


Figure 2 *The "4P" Model of the Toyota Production*

Source: Dahlgaard and Dahlgaard-Park (2006:15)

Table 1: *The 14 Management principles of the Toyota Production System*

Philosophy (Long Term Thinking)	1. Base management decisions on a long-term philosophy, even at the expense of short term financial goals
Process (Eliminate Waste)	2. Create process “flow” to surface problems 3. Use pull systems to avoid overproduction 4. Level out the workload 5. Stop when there is a quality problem 6. Standardise tasks for continuous improvement 7. Use visual controls so no problems are hidden 8. Use only reliable thoroughly tested technology
People and Partners Respect, Challenge, and Grow them	9. Grow leaders who live the philosophy 10. Respect, develop and challenge your people and teams 11. Respect, challenge, and help your suppliers
Problem Solving (Continuous Improvement and learning)	12. Continual organisational learning through Kaizen 13. Go see for yourself to thoroughly understand the situation 14. Make decisions slowly by consensus, thoroughly considering all options

Source: Dahlggaard and Dahlggaard-Park (2006:15)

The Toyota Production System was ultimately given the term of “Lean Manufacturing”.

2.2.3 The Principles of Lean Thinking

Womack and Jones (as cited by Bhuiyan & Bhagel, 2005:761) state that the goal of lean manufacturing is to “incorporate less effort, less inventory, less time to develop products, and less space to become highly responsive to customer demand, while producing top quality products in the most efficient and economical manner possible”. Nordin, Deros, and Wahab (2010:374) suggest that Lean manufacturing is an “integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimising supplier, customer and internal variability”. These sentiments are concurred by Liker (as cited by Bhasin & Burcher, 2006:587),

that Lean Manufacturing is a “philosophy that when implemented reduces the time from customer order to delivery by eliminating sources of waste in the production flow”. The essence of all these definitions that mention attributes like waste, customer, quality, demand and efficiency can be seen in the (core) five lean principles as mentioned below.

The (core) five lean principles of Lean as cited by Anderson *et al.*, (2006:288) are:

- *Understanding customer value.* Only what the customers perceive as value is important.
- *Value stream analysis.* Having understood the value for the customers, the next step is to analyse the business processes to determine which ones actually add value. If an action does not add value, it should be modified or eliminated from the process.
- *Flow.* Focus on organising a continuous flow through the production or supply chain rather than moving commodities in large batches.
- *Pull.* Demand chain management prevents goods from being produced and then moving straight to stock as opposed to a sale, i.e. customer demand pulls finished products through the system. No work is carried out unless the result of it is required downstream.
- *Perfection.* The elimination of non-value-adding elements (waste) is a process of continuous improvement. There is no end to reducing time, cost, space, mistakes, and effort.

Adopting the key principles of Lean manufacturing provides direction to an organisation to focus on the “right stuff” in order to achieve superior quality products, reduced inventories, improved lead times, and increased productivity, lower costs and superior customer service that ultimately creates value for the business. In addition to the five core principles of Lean, the prevailing concept of waste elimination is defined in various elements (Bhasin & Burcher, 2006:58):

- *Overproduction*
 - Producing more than the internal or external customer needs
 - Producing sooner than the internal or external customer needs
- *Delays (waiting time)*

People waiting for: Machinery, Tooling, Raw Materials, Maintenance, etc.

Machinery waiting for: Maintenance, People, Materials, Tooling etc.

- *Transportation*

Moving materials or people over long distances can double or triple handling

- *Processes*

Unnecessary or inefficient processing e.g. removing burrs caused by dull tools

- *Inventories*

Inventory hides problems and causes extra handling, extra paperwork, extra space and extra cost

- *Motions*

Any motion of people or machines which does not add value to the product or service

- *Defective products*

Scrap, rework, customer returns, customer dissatisfaction

2.2.4 Tools of Lean Manufacturing

The adoption of Lean principles requires the implementation of both lean tools and lean culture by an organisation. Lean tools include: Bhasin and Burcher (2006:57)

- *Continuous improvement/kaizen.* The continual pursuit of improvements in quality, cost, delivery and design.
- *Cellular manufacturing.* It is vital to group closely all the facilities required to make a product (or related group of products), in order to reduce wasteful activities.
- *Kanban.* A replenishment system to control inventory levels.
- *Single piece flow needs to be in operation.* This results in reduced inventories, reduction of scrap and improved flow.
- *Process mapping exercise is required.* Understanding minute details of the process allows for improvements to take place.
- *Single minute exchange of dies (SMED).* In order to reduce the lead-time and improve flows it is necessary to eliminate delays in machine change-over times.
- *Supplier development.* The organisation needs to actively develop links with suppliers and working closely with them for mutual benefit.

- *Five S and general visual management.* To create an organised workplace, reduce the clutter and inefficiency of any typical production and office environment.
- *Total productive maintenance (TPM).* This is aimed at improving the reliability, efficiency and capacity of machines through maintenance programs.
- *Value and the seven wastes.* Creating value as required by the customer and eliminating wastes to reduce costs.

It is suggested by Wong, Wong and Ali (2009:528) that lean tools should not be implemented in isolation; as they all support the overall strategy of Lean Manufacturing. Bhasin and Burcher (2006:58) and Nordin, Deros and Wahab (2010:375) agree that it is better to embrace more lean tools rather than practicing one or two isolated ones.

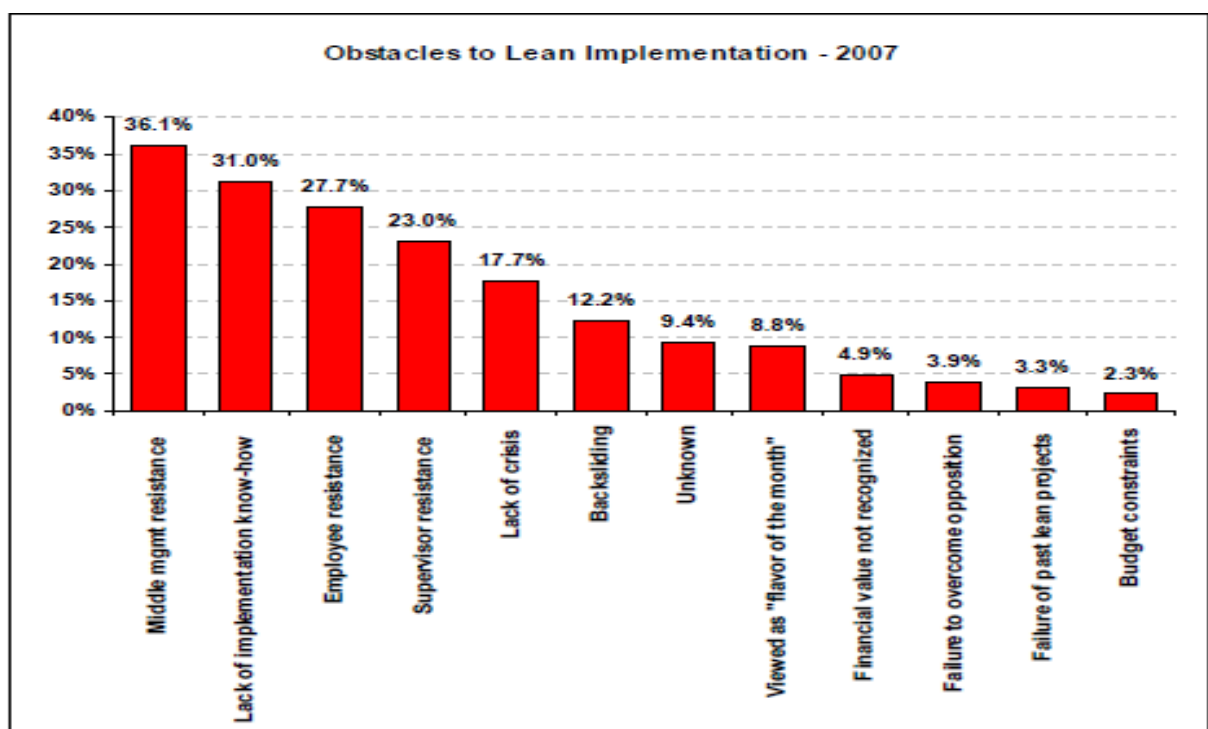
2.3 Implementation of Lean Management

There have been many studies that have confirmed that there has been a link between implementing Continuous Improvement (CI) programs and the performance of companies. Studies found that companies practicing quality practices showed better employee relations, improved operating procedures, achieved greater customer satisfaction, increased market share and profitability (Anderson *et al.*, 2006:285). Bhuiyan and Bhagel (2005) confirm that success can be achieved through the implementation of CI which is a “culture of sustained improvement aimed at eliminating waste in all organisational systems and processes, and involving all organisational participants”.

However, many researchers agree that the implementation of Lean Manufacturing (LM) and the transition to adopting Lean principles is a difficult and time consuming task. It is a process that requires a lot of effort, participation of everyone in the organisation, and requires adoption in principle, not only on the shop floor but in the organisational culture and organisational structure (Papadopoulou and Ozbayrak, 2005:794).

“About only one third to one fifth of TQM programs in the US and Europe have shown improvements in quality, productivity, competitiveness or financial results” (Harari, as quoted by Anderson *et al.*, 2006:285). Bhasin (2012:21) conducted research on 68 manufacturing companies in the UK. The research found that culture, employee attitude and resistance to change were the key obstacles to achieving successful lean implementation. Effective implementation requires cultural changes and a high degree of employee training and education (Sim & Rogers, 2009:39). A survey undertaken by the Lean Enterprise Institute in 2007, was completed by nearly 2500 participants cited the following obstacles to Lean Implementation: Resistance from management, supervisors and employees contributed to 86% of the total obstacles identified in the survey.

Figure 3 Obstacles to Lean Manufacturing results



Source: Lean Enterprise Institute, 2007 State of Lean Survey

Source: (http://www.lean.org/WhoWeAre/NewsArticleDocuments/Web_Lean_survey.pdf)

A survey undertaken by the “manufacturer” (Deloitte & Touche, 2002) of 100 organisations revealed the following barriers towards lean as cited by Bhasin (2012:406). Once more, similar findings reveal that culture and attitude are cited as obstacles to Lean Implementation.

- Company culture – 48 per cent.
- Investment/cost – 47 per cent.
- Staff attitude – 38 per cent.
- Change issues – 33 per cent.
- Lack of understanding of process – 29 per cent.
- Lack of understanding of benefits – 29 per cent.
- Nature of manufacturing facility – 27 per cent.

Bhasin and Burcher (2006), illuminate that while lean is concerned with eliminating wastes, it is more importantly about changing the culture. Organisational culture and employee attitude are directly related to people and fundamentally, “Lean is about making people before making things” (Balle, 2009). Understanding how these soft variables affect continuous improvement programs like Lean Manufacturing will help organisations in implementing successful programs. This opinion is confirmed by Boon, Arumgam and Hwa (2005:287) who affirms that understanding the soft elements of CI is vital in successful implementation.

2.4 Measuring a Continuous Improvement Organisation

Organisation need to assess their success of their improvement initiatives. Self-assessment is an approach that is used to strengthen continuous improvement by “measuring an organisations current performance against a model that represents excellence” (Kaye & Anderson, 1999:488). Next, the ISO 9000 framework and the Malcolm Baldrige National quality awards will be discussed.

2.4.1 ISO 9000 Framework

The ISO 9000, the ISO 9001 and 9004 standards are based on eight quality management principles. These principles were chosen because they can be used to improve performance and achieve success. They provide a guideline for that “can be used by top management in order to lead an organisation towards improved performance”.

Table 2: ISO 9000 Framework

Focus on your customers	Organisations rely on customers. Therefore: <ul style="list-style-type: none">• Organisations should understand customer needs.• Organisations should meet customer requirements.• Organisations should exceed customer expectations.
Provide leadership	Organisations rely on leaders. Therefore: <ul style="list-style-type: none">• Leaders should establish a unity of purpose and set the direction the organisation should take.• Leaders should create an environment that encourages people to achieve the organisation's objectives.
Involve your people	Organisations rely on people. Therefore: <ul style="list-style-type: none">• Organisations should encourage the involvement of people at all levels.• Organisations should help people to develop and use their abilities.
Use a process approach	Organisations are more efficient and effective when they use a process approach. Therefore: <ul style="list-style-type: none">• Organisations should use a process approach to manage activities and related resources.
Take a systems approach	Organisations are more efficient and effective when they use a systems approach. Therefore: <ul style="list-style-type: none">• Organisations should identify interrelated processes and treat them as a system.• Organisations should use a systems approach to manage their interrelated processes.
Encourage continual improvement	Organisations are more efficient and effective when they continually try to improve. Therefore: <ul style="list-style-type: none">• Organisations should make a permanent commitment to continually improve their overall performance.
Get the facts before you decide	Organisations perform better when their decisions are based on facts. Therefore: <ul style="list-style-type: none">• Organisations should base decisions on the analysis of factual information and data.
Work with your suppliers	Organisations depend on their suppliers to help them create value. Therefore: <ul style="list-style-type: none">• Organisations should maintain a mutually beneficial relationship with their suppliers.

Source: (<http://www.praxiom.com/principles.htm>)

Taylor and Wright (2003:545) are of the opinion that ISO 9000 has a role to play in strengthening system and procedures of CI programs. However their research on 113 CI programs found that holding an ISO 9000 certification had no significant effect on CI success. They observed that the firms that discontinued with CI programs had a very poor understanding of the relationship between CI programs and ISO9000.

2.4.2 Malcolm Balridge Quality awards

Table 3 *Malcolm-Balridge Quality Awards*

Customer-driven quality	Quality is defined and judged by the customer, and must therefore account for all product and service features and characteristics that contribute value to customers
Leadership	Senior leaders set directions and create a customer orientation, clear stakeholder-driven values, and high expectations.
Employee participation and development.	Companies need to invest in the development of the work force through education, training, and opportunities for continuing growth.
Design quality and prevention	By emphasizing design quality, companies can prevent problems and waste by building quality into products and services and efficiency into production and delivery processes.
Company responsibility and citizenship.	Basic expectations of the company include business ethics, protection of public health, safety, and the environment, and support of publicly important purposes.
Continuous improvement and learning.	Continuous improvement and learning need to be a regular part of daily work, seek to eliminate problems at their source, and be driven by opportunities to do better.
Fast response.	Success in competitive markets requires shorter cycles for product/ service introduction, faster and more flexible response to customers
Long-range view of the future.	Pursuit of market leadership requires a strong future orientation and a willingness to make long-term commitments to key stakeholders.
Management by fact.	Operations and decisions of the company should be based on measurement and data-driven performance analysis.
Results focus	The performance system needs to focus on results, which are guided by and balanced by the interests of all stakeholders.

Source: (<http://www.mqi.com/mbnqa.htm>)

Many similarities exist between the two models. The five most important themes identified between both models according to Kaye and Anderson (1999:489) is:-

- Organisational culture and employee focus
- Leadership
- Strategic Focus
- Process standardisation
- Learning from results

2.5 Quality values of a CI Culture

“The creation of a supportive organisational culture is an essential platform for the implementation of lean manufacturing” (Achanga, Shehab, Roy, & Nelder, 2006:468). Implementing lean throughout an organisation is tough enough if everyone embraces its philosophies and willingly does the work required to make the change happen. However, it’s that much tougher if management is less than supportive of the effort or doesn’t understand the essential role it plays in developing a lean culture (Jusko, 2011). Essentially creating the right culture, communicating the right expectations, committing to the principles of quality management, and building and empowering the people, is the foundation phase to creating an organisation capable of successfully implementing continuous improvement and subsequently value creation. Detert et al., (2000:850) identified that whilst vast amounts of research has been done in the field of organisational culture, there has been limited studies on cultural values that are specific to continuous improvement programs. Detert *et al* (2000) researched culture as it relates to the implementation of CI initiatives. They combined other researchers’ instruments, and extracted from this study nine key components of culture in a proposed model for TQM. They used Schein’s model of culture and focused on the value level of culture; they linked these nine cultural constructs to a set of values and beliefs, which they argued are the foundation of successful TQM adaption. In order to address this gap in research, Detert *et al.*, (2000) developed a framework that linked general culture dimensions to total quality management values. This framework focuses on organisational culture as a system of shared values that define what is important and that guide employees attitudes and behaviours. This study uses these dimensions of culture to identify behaviours related to cultural values that can facilitate or inhibit change implementation.

Table 4: TQM values and beliefs framework

	Organisational Culture Dimensions	TQM Value
1	The basis of truth and rationality in the organisation	Decision making should rely on factual information and the scientific method. Focuses on the degree to which employees believe something is real or not real and how truth is discovered (data based decision making)
2	The nature of time and time horizon	The concept of time in an organisation has bearing in terms of whether the organisation adopt long term planning, strategic planning and goal setting, or focus and reacting on a short time horizon (long term view)
3	Motivation	Employees are intrinsically motivated to do quality work if the system supports their efforts. Management should identify whether manipulating others' motivation can change effort or output of employees (systems focus).
4	Stability versus change/innovation/personal growth	Organisations that are risk-taking always stay innovative with a push for constant, continuous improvement, whilst those who are risk-averse tend to be less innovative, with little push for change (continuous improvement).
5	Orientation to work, task, and co-employees	The main important issues here is the responsibility employees feel for their position and how they are educated in terms of their roles and responsibility (employee involvement).
6	Isolation versus collaboration/cooperation	Cooperation and collaboration (internal and external) are necessary for a successful organisation. In some organisations, collaboration is often viewed as a violation of autonomy (collaboration).
7	Control, coordination, and responsibility	A shared vision and shared goals are necessary for organisational success. All employees should be involved in decision making and in supporting the shared vision (Goals)
8	Orientation and focus-internal and/or external	An organisation may decide to have internal orientation focusing on people and processes within it, or emphasize on external orientation focusing on external competitive environment, or have a combination of both (customer focus)
9	Quality at no cost	Creating a quality organisation does not necessarily cost money. Commitment to quality, creativity and innovation creates a quality culture.

Source: Detert et al (2000:855) and Detert et al (2003:310)

2.5.1 Ideas about truth and rationality in the organisation (Data-based decision making)

Organisations regard truth as a product of “systematic and scientific knowledge” where “hard data” is considered as the basis for decision making. The concept of what is true and how the truth is derived determine how peoples adopt standards or principles. The TQM approach to truth and rationality is the scientific method, where data is used for decision making. This is a central value of TQM and is regarded as “management by fact”. Data analysis becomes the basis to measure problems, discover causes and find solutions (Detert et al., 2000:853).

2.5.2 Ideas about the nature of time and time horizon (long term view)

According to Detert et al., (2000:855) the time horizon of an organisation helps determine whether “leaders and other organisational members adopt long term planning and goal setting” or focus on short term current situations. TQM principles consider long term commitment as crucial to enhance quality in the long run even if short term sacrifices need to be made. In addition a “long term commitment includes the ideas that organisations should make investments that support the long range mission” (Detert et al., 2000:855). A medium-sized company would need a minimum of three to five years to start pursuing the lean philosophy” as cited by (Bhasin & Burcher, 2006:59).

2.5.3 Ideas about motivation (System focus)

The concept of motivation features prominently in organisational culture studies. The ideas of how people are motivated; “from within or external forces, are people inherently good or bad, should people be rewarded or punished and whether effort and output can be changed by motivation”. TQM literature suggests that people are intrinsically motivated to do a good job but their work quality is sometimes affected by the system in which they work. The TQM value is that “sources of problems should be searched for in processes – not employees”. This view indicates that employees

will be “intrinsically motivated to do a good job if they work in an environment without fear and coercion” (Detert *et al.*, 2000:855).

2.5.4 Ideas about stability versus change/innovation/personal growth (CI)

Individuals are either prone towards stability or change. Those open to change are considered “risk takers” whilst those who are cautious have a “need for security”. Dynamic organisations drive for innovation and therefore promote risk taking. The need to continuously do better and improve is evident in the organisational culture. Risk-averse organisations focus on “being good enough” and not challenging the status quo. TQM literature reveals that a premium is placed on change and is referred to as continuous improvement and a fundamental TQM philosophy. This belief represents a “mindset in which things are never good enough” and continuous improvement is constantly induced into the environment. In addition to this belief is the idea that “improvement cannot come without change” and therefore change should be viewed positively as opposed to fearfully (Detert *et al.*, 2000:856).

2.5.5 Ideas about orientation to work, task, and co-employees (Employee involvement)

An individual’s perception about work reflects how they view work as a production and a social activity. A person that regards work with a “task focus” has an objective to achieve “accomplishment and productivity”. A person who regards work as a “means to an end” in order to obtain only financial benefit views productivity as less important than the social relationship formed at work. TQM literature suggests that the purpose of an organisation is to achieve results that are important to all stakeholders of the organisation. This implies that an organisation undertaking continuous improvement programs will have a social and productivity concern for its stakeholders which include employees (Detert *et al.*, 2000:856).

2.5.6 Ideas about isolation versus collaboration/cooperation (collaboration/teamwork)

Individually or collaboratively motivated work is dependent on an organisations idea of how work is best accomplished. Some organisations view work accomplished by individuals as productive and in and control, and consider working together as inefficient and a violation to autonomy. Contrary to this view, some organisations place a “premium on collaboration as a means to deliver better decisions and overall output”. This type of organisation promotes teamwork, arranges tasks around groups of people as opposed to individuals. The TQM belief focuses unequivocally on the importance of “cooperation instead of isolation for achieving maximum effectiveness”. This principle believes that collaboration leads to better decisions, higher quality and higher morale”. In addition this value in TQM extends to relationships and partnerships with suppliers and customers within the organisation. The underlying belief is that organisations will “benefit from cooperation in the pursuit of quality Detert *et al* (2000:857). Bhasin and Burcher (2006:63) are in agreement that focusing on the customer in order to continuously improve, needs to be in place in order for people to look creatively at what they do on a daily basis and therefore strive to do it better. Empowerment and partnerships are perceived as the foundation on which TQM principles are established

2.5.7 Ideas about control, coordination, and responsibility (goals/shared vision)

Organisations vary in their degree to which control is concentrated which is usually at the top or shared. “Tight” control is indicative of formalised rules and procedures set by a minority with the intention to guide the behaviour of the greater organisation and centralise decision making. The TQM view of this value takes the form that “a shared vision and shared goals amongst employees and management are critical for organisational success”. This view supports an environment where work is “loosely controlled, flexible, and autonomy of workers is cherished”. The organisation is guided by fewer rules and formalised procedures, and shares power and decision making throughout the organisation. This value also refers to a “belief in the power of coordinated action”. This value suggests that employees should “sacrifice some

autonomy for the sake of organisation wide goals” as this will lead to better results. Alignment of the organisations vision and goals is better achieved when all employees know and understand the company’s vision and align their goals to this vision. The TQM value also supports the idea that employees should be involved in a significant manner when decisions are being formulated about the visions and goals they are asked to support (Detert *et al.*, 2000:857). Bhasin *et al.*, (2006:58) also support the view that decisions should be made from the lowest level and up. Employees must be given the freedom to plan and decide (Dahlgaard and Dahlgaard-Park, 2006:274). These same authors elaborate that without a shared vision, policy deployment will be an “artificial process or show” and application of tools and competencies will not be used effectively.

2.5.8 Ideas about orientation and focus- Internal and/or External (Customer focus)

This belief refers to the organisations relationship with the environment. Internally focused organisations focus on people and processes within the organisation. Ideas about innovation are obtained primarily from engineers, managers and, scientists within the company who offer improvements over existing products, processes or programs. In this type of organisation it is assumed that these experts know best where improvements are required. Externally focused organisations target primarily “external constituents, customers, competitors and the environment”. “Innovation is based on the needs of external stakeholders and improvements are judged by external benchmarks”. In addition these organisations are constantly seeking new ideas from less conventional sources. This view off external focus is consistent with the TQM orientation that an organisation should be “customer driven and actively engaged in partnerships with the community, suppliers, and other external constituents”. In addition employees understand that they should seek external sources for new information and their success should be “judged against external benchmarks” (Detert *et al.*, 2000:858). Phillips (as cited by Boon *et al.*, 2006:41) defines customer focus as the “degree to which a firm continuously satisfies customer needs and expectations”. In their study, (Boon *et al.*, 2006:50) found that customer focus had a weak relationship with employee commitment and indicated

that this could be the result of inadequate management communication to employees about the organisations commitment to customer focus.

2.5.9 Quality at same cost

This is a concept that is based on the premise that in order to have a quality organisation it will not necessarily cost you more money (Detert et al., 2003). Abilla (2009) states that an unsaid principle of Lean thinking is creativity before capital and simply implies “before you spend money, think first; before you beg for resources, use your creativity first”. According to Abilla, by not giving employees the opportunities to address problems we are “robbing employees of the opportunity to think, to create, and to contribute to solutions to the challenges the company is facing” (<http://www.shmula.com/mind-before-money-creativity-before-capital/1200/>)

2.5.10 Urgency

According to Miller (2011:14) excellence can be displayed by organisation or individuals that are in “rapid motion” and a sense of comfort or ease is a “sign of culture in decline”. Instilling a culture of urgency promotes quick reaction to addressing issues and creates energy to problem solving. In addition an organisation that responds to issues with sincere urgency is in fact eliminating waste of all kinds.

2.5.11 Purpose

Purpose is an important cultural characteristic of Lean, as a Lean organisation instil high levels of motivation in its employees, which is the fundamental understanding of purpose. Miller (2011:12) states that the power of purpose lies in the energy it creates and those leaders that instil purpose in their employees ultimately direct them to a common purpose of the organisation. According to Miller, purpose is the beginning of strategy where each team in the organisation by means of a common purpose, can understand its role to the larger purpose of the organisation e.g. the engineering teams understands their impact on safety, reliability and customer

satisfaction. “These connections are a unifying element that reduce conflicts and increase the ability of the organisation to win as one large team” Miller (2011:13).

2.6 Key soft success factors of CI implementation

The other key soft success factors variables for CI implementation were identified by Sim and Rogers (2009). These factors were established as important soft organisational factors that should be inherent when an organisation is pursuing a CI initiative, they include; leadership, business reasons for implementation, training, communication and job security.

2.6.1 Leadership

Achanga *et al.*, (2006:467) insists that strong leadership traits are required in order to permeate the vision and strategy across the organisational structure. Good leadership ultimately fosters effective skills and knowledge enhancement amongst its workforce. Change implementation must come from top management and spread to other levels. During implementation management is required to support and be involved in improvement initiatives and foster examples of teamwork and good communication (Nordin *et al.*, 2008). Senior management plays an important and challenging role as a change agent during change implementation programs. Juran (as quoted by Kujalo, 2002:95) cites “It is now clear that upper managers have a vital role to play in the quality planning process. This role requires extensive personal participation. It cannot be delegated, since a major change in company culture is needed.” Nordin *et al.*, (2008) and Kujalo (2002:94), both illuminate that successful lean manufacturing implementation has “significant relationship with transformational and transactional leadership dimensions”. Nordin *et al.*, (2008) advocate that lean leaders should exhibit the following traits:

- Clearly communicate the goals and visions of the organisation.
- Empower the members of the organisation to act.
- Inspire its employees to achieve the organisations mission.

- Communicate hope and opportunity for the future.
- Foster an environment of teamwork.
- Support innovation and finding new ways of doing things.
- Stress personal responsibility.
- Recognise and reward the team.

In his doctorate thesis on leadership styles in Lean manufacturing, Wöehl (2011:58) concluded that both transformational leadership and transactional leadership style are needed to implement lean manufacturing. Transformational leaders need to “foster a culture of creative change and growth” which is required to create a culture conducive to continuous improvement. Transactional leaders are needed to “stabilise and standardise the improvements” implemented by lean manufacturing. Wöehl (2011) explains this leads to “a proposal of coexistence of both leadership styles, such that one leadership style depends on the other”.

Ahire, Golhar and Waller (1996:27) developed six items to measure leadership’s commitment to quality:

- Clarity of quality goals for the organisation
- Importance given by top management to quality as a strategic issue
- Importance given by top management to quality versus cost
- Importance given by top management to quality versus production schedule
- Resource allocation to quality improvement efforts
- Performance evaluation of managers based on quality

The first three items (goals, strategic issues and quality versus cost) confirms the same items in Detert *et al.*, (2000) cultural values framework, but affirms that leadership is responsible to ensure these items are enveloped into the culture of a quality organisation.

2.6.2 Job security

Lean overarching principle is waste identification which results in the elimination of non-value adding activities. Wong *et al.*, (2009:529) advises that resistance from

employees might be due to the “fear factor” that they would lose their jobs if they find out that their jobs do not add value. Wong *et al.*, (2009) advocates that it is crucial that top management gives ample support as well as job security to the employees in order to obtain their “buy-in” by emphasising the potential benefits of Lean Manufacturing. Sim and Rogers (2009:38) identified that in the US since 1990 employment in manufacturing has decreased; incidentally this had coincided with the introduction of many CI programs. Whilst many other factors like acquisitions and joint ventures have contributed to the drop in employment, many employees believe CI initiatives threaten their job security.

2.6.3 Development and Training

People have to possess the necessary skills and competence levels to identify problems and provide solutions. In addition employees have to be supported by means of tools and guidance to allow them to participate and achieve expectations (De Jager, Minnie, De Jager, Welgemoed, Bessant & Francis, 2004:317). Training and development have been recognised as essential to the implementation of continuous improvement environment. TQM cultural values assume that employees are “self-motivated and therefore need to be challenged rather than controlled”. In the TQM discipline, employees are expected to express themselves through good work and have an internal motivation for personal improvement (Kujalo, 2002:94). Hackman and Wageman (1995:22) argue that even though the tendency to learn is internally built in, people also require tools and coaching if they are to express that inclination in their work behaviour. They identified that TQM practices create good learning environments both by “minimizing fear in the organisational culture and by providing members with a rich and diverse set of learning tools”. In addition they acknowledge that the cultural value of using data decision making encourages workers to use “scientific methods to analyse and improve those processes”.

2.6.4 Business reasons

Employees need to understand from the outset what the organisational objectives are to pursuing a strategy of continuous improvement. In addition to the

organisational benefits, employees also need to be convinced that they will be obtaining personal benefit by improving themselves in addition to the business reasons. A clear vision for the organisation, embracing continual improvement, should be established and clear expectations on how the company intends to achieve these objectives need to be established. Employees who are encouraged by the fact that the company wants to invest in them will be inclined to support implementation reasons. Taylor and Wright (2003: 541) advocate that senior leadership understanding of the purpose of CI in terms of strategic significance has an impact on the success of CI program and that CI could achieve more if it was treated as a strategic issue as opposed to an operational one.

2.6.5 Communication

Boon *et al.* (2006:39) defines organisational communication as the “process of sharing information with other individuals” and this transacts into a process where individuals and groups “aim to carry out organisational goals”. They advocate that communication can affect empowerment of employees and in turn affect employee commitment. Boon *et al.* (2006:50) found in their study communication to be a dominant quality practice that had a strong association with employee commitment. An important barrier of lean manufacturing success is due to inconsistent and unclear communication. Nordin *et al.* (2008) points out that communication is regarded as a key issue in the successful implementation of change programs particularly for “announcing, explaining or preparing people for change and the effects of the impending change”. In addition, Nordin mentions that miscommunication may lead to “misunderstanding of lean philosophy and concept, misapplication of lean tools and techniques, and confusion regarding the employee’s roles and responsibilities”. Nordin *et al* (2010:379) emphasise that appropriate communication and training on the principles of Lean Manufacturing is important for employees to achieve a “greater level of understanding about the system and encourage motivation and innovation in the work culture and employee attitudes”.

Lean Culture is much more than the tools and techniques that form the foundation of practising lean management. Lean culture is the framework of daily values, habits

and relationships within which the techniques can succeed and be sustained” (Miller, 2011:7). Miller is adamant that without the support of the culture, Lean techniques will often fail. Lean culture according to Miller (2011:8) include:

- The engagement of all members of the organisation, from top to bottom.
- Leadership that understand, practices, models and reinforces the values and behaviours of lean culture. Be the change.
- A culture where leaders respect and encourage those who are on the spot and the “world’s greatest experts” in their work.
- Elimination of all forms of waste.
- Continuous effort to optimise quality of products, services and processes.

2.7 Work Related attitudes

“Manage the Culture Effectively and It will Manage Employee Behaviour and Attitudes” (Deming as cited by Gander (2009:108). Karia and Asaari (2003:1), advocate that organisations that have adopted quality management practices have experienced an “overall improvement in organisation performance such as attitude, commitment, and effectiveness”. The importance of a quality culture is “enhanced through its impact on employee morale and work attitudes” (Boon, Bakar, Arumugam, Vellapan & Loke, 2007:67). Bhasin (2012:21) conducted research on 68 manufacturing companies in the UK and found that culture, employee attitude and resistance to change were the key obstacles to achieving successful CI implementation.

2.7.1 Job satisfaction

2.7.1.1 Definition

Job satisfaction refers to a “positive emotional status” of an employee towards his or her job (Karia and Asaari, 2003:3). Locke (1976) as cited by Boon *et al.* (2007:67) defines a more detailed description of job satisfaction as “an emotional reaction that results from the perception that one’s job fulfils or allows the fulfilment of one’s

important job values, provided that it is to the degree that those values are congruent with one's needs". Job satisfaction is an emotion of how one feels towards one's job, and can be identified as a feeling of being satisfied or dissatisfied with one's job.

2.7.1.2 Consequences of Job satisfaction

The focus of this section is on the consequences of job satisfaction, as job satisfaction is one of the most common employee attitudes that are often related to organisational outcomes. Kreitner and Kinicki (2008:173) identified a few strong correlates of job satisfaction that as a result of increasing this variable will result in increasing job satisfaction. This discussion will include the following variables; motivation, job involvement, organisational citizenship behaviour, turnover and job performance.

Motivation – Kreitner and Kinicki (2008:173) advocate that there is a significant strong relationship between motivation and job satisfaction and that managers should be aware and mindful of how their behaviours affects employee satisfaction. It is suggested by the authors that managers can enhance employee motivation through attempting to increase job satisfaction.

Job Involvement - "Job involvement represents the extent to which an individual is personally involved with his or her work role" Kreitner and Kinicki (2008:173). The authors cite that job involvement is moderately related to job satisfaction. In addition they suggest that managers should create satisfying work environments in order to promote employees job involvement.

Organisational Citizenship Behaviour (OCB) - Kreitner and Kinicki (2008:174) suggest that OCB relates to employees exhibiting behaviour beyond the call of duty. Example of OCB gestures would include; suggestions for improvements, training new people, respect for rules, punctuality, etc. The authors revealed a moderate significant relationship between OCB and job satisfaction. They advocate that employee perceptions about being treated fairly at work are related to employee's

willingness to engage in OCB and therefore managers should strive to make employee related decisions in a fair and reasonable manner.

Turnover - Kreitner and Kinicki (2008:175) advise that turnover “disrupts organisational continuity and is very costly”. The authors reveal a moderately negative relationship between job satisfaction and employee turnover. In addition they suggest that managers should find ways to improve job satisfaction and thereby reduce employee turnover intentions.

Job Performance – Kreitner and Kinicki (2008:175) state that job satisfaction and job performance are moderately related and that job satisfaction is a key work attitude when an organisation attempts to increase employee’s job performance. In addition they found that both job satisfaction and job performance indirectly influence each other through various individual and work environment characteristics. According to the authors, a positive employee satisfaction results in positive business level outcomes like customer satisfaction, productivity, profit, reduced employee turnover and a decrease in work-related accidents.

2.7.1.3 Relationship between Job satisfaction and CI dimensions

Karia and Asaaria (2003) in their study on the impact of TQM practices on work related attitudes found that continuous improvement practices lead to positive impact on job satisfaction. Their criteria for CI variables that were in common with this study included leadership, training, customer focus and data and information. Boon et al. (2007:62) found in their study of TQM influence on job satisfaction that variables of teamwork, organisational trust, organisational culture and customer focus were positively related to employee job satisfaction, where teamwork was a dominant and significant quality practice. Boon *et al.* (2007:71) found in their research that there was a weak relationship between reward and recognition (high pay, opportunities for personal growth, and praise for good performance) and job satisfaction. Boeselie & Van der Wiele (2001) using a survey of 2300 records examined the perceptions of employees on CI policies against overall job satisfaction and found that there was a positive perception of employees on CI values that lead to high levels of job satisfaction. The common variables used in this research study to Boeselie and Van

der Wiele (2001) were goals, co-operation, shared information (communication), leadership and customer focus. These various studies show that there is a definite relationship between quality cultural values as well as other key soft success factors that impact job satisfaction.

2.7.2 Employee commitment

2.7.2.1 Definition

Employee commitment is defined as “An affective reaction of an individual to the whole organisation and the degree of attachment and loyalty towards the organisation” (Karia & Asaari, 2003:3). This definition is confirmed by Boon, Safa, & Arumugam, (2006:38) who states that “employee commitment is an emotional attachment to an organisation”.

2.7.2.2 Consequences of employee commitment

There are considerable amounts of literature on the employee commitment and variables that have an influence on this outcome. Literature reviews indicate that organisational performance, job satisfaction, intention to leave and organisational justice has some of the most significant relationships with employee commitment.

Organisational performance - Dost, Ahmed, Shafi and Shaheen, (2011) advise that employee commitment plays a very key role in improving the organisational performance and can be measured through a company’s financial performance, employee turnover, return on equity etc. “Today it becomes necessary for every organisation to have a full level of its employee commitment in order to have outstanding performance on a long term basis” (Dost *et al.*, 2011:87). The same authors are of the opinion that when employees work in a team, each person tries his level best to prove that they are the best, and this in turn increases their commitment level in the organisation that ultimately increases the performance of the organisation. In addition they advise that the level of employee commitment in the organisation for individual projects or to the business is assumed as a major reason for better organisational performance that leads to organisational success.

Job satisfaction - Chughtai and Zafar (2006:45) advise that organisations have a greater chance of retaining their employees if they offer them jobs that are interesting, challenging, and give them a sense of accomplishment. Implying that satisfaction with the actual work carried out can promote organisational commitment. Chughtai and Zafar (2006:45) found a positive relationship between commitment and satisfaction in their research.

Intentions to leave - Employees who are committed to their organisations are prone to continue working for the organisation. In addition these workers tend to exert more effort on behalf of the organisation, and work towards its success and are likely to be better performers than the uncommitted employees (Chughtai & Zafar, 2006:46)

Organisational justice - Chughtai and Zafar (2006:45) found that employees, who perceived both distributive justice (perceived fairness of the amounts of compensation employees receive) and procedural justice (perceived fairness of the means used to determine those amounts) to be high, would be more motivated to continue their association with their current institutions. The authors recommend that an organisation's rules, policies and procedures should be based on the foundation of distributive and procedural justice and that any perceived inequity in the distribution of rewards or any perceived injustice in the decision making process is likely to lower commitment levels.

2.7.2.3 Relationship between employee commitment and CI variables

Karia and Asaari (2006) found that in their study on quality practices and employee attitudes that training and education, empowerment and teamwork, continuous improvement and problem solving lead to positive impact on employee commitment. Boon *et al's* (2006) study on TQM practices relating to people oriented aspects and employee commitment found that collaboration, communication, customer focus and employee involvement were found to be positively associated with employee commitment and concluded that collaboration, communication and employee involvement were decisive factors for employee commitment.

2.7.3 Intentions to Quit

2.7.3.1 Definition

Vandenberg and Nelson (1999:1315) define intention to leave as an ‘individual’s own estimated probability (subjective) that they are permanently leaving the organisation at some point in the near future’.

2.7.3.2 Antecedents of intentions to Quit

Ghapanchi and Aurum (2011:241) found that individual factors, organisational factors, job related factors and psychological issues were some of the key consequences (antecedents / causes) of intentions to quit.

Individual factors – entail individual attributes like demographics, human capital, motivational constructs and professional behaviour that impact an employee’s decision to leave. Ghapanchi and Arum (2011:243) cite that tenure, age, education and gender are the most common factors that influence intention to quit.

Organisational factors – these are related to the “individual’s perception of the organisation” (Ghapanchi & Arum, 2011:243). These include items of remuneration and benefit, human resource aspects like training and fair practices and organisational culture aspects of teamwork. The authors found that remuneration was the most common factor influencing an employee’s intention to quit.

Job related factors – these factors can be classified into job characteristics like task identity, job social support from supervisors, job difficulties that involve work stress or role ambiguity and job attractiveness (Ghapanchi & Arum, 2011:244). The authors cite that the most common job related factors affecting intention to quit are role conflict, role ambiguity and autonomy.

Psychological factors – these factors include job satisfaction, organisational commitment and perceived job security. Job satisfaction related to career and

organisational satisfaction and was found to be the most frequent reason for employees resigning (Ghapanchi & Arum, 2011:244).

2.7.3.3 Relationship between intentions to leave and CI variables

(Karia & Asaari, 2003:1) ascertain that quality practices can retain employees and gain their loyalty. In addition they affirm that the successful implementation of quality practices is likely to motivate employees to perform and remain within the organisation. Boselie & Vanderwiele (2001) found that a positive perception of employees on TQM concepts that lead to a lower intention to leave. Yue, Boon and Keung (2011:6632) found that CI soft practices such as customer focus, organisational trust, communication, employee involvement and empowerment played a significant role in positively improving employee's tendency to remain and are therefore negatively associated with turnover intentions. Based on previous studies, results show that there is a definite relationship between quality cultural values as well as other key soft success factors that impact an employee's intentions to leave.

2.7.4 Work success

2.7.4.1 Definition

Judge, Cable, Bordreau and Bretz (1994:3) define career success as "the positive psychological or work-related outcomes or achievements one has accumulated as a result of one's work experiences". This opinion is confirmed by Thomas, Eby, Sorenson & Feldman (2005:367) that work success is the "accumulative positive work and psychological outcomes resulting from one's work experience". Work success therefore represents 'a feeling of pride and personal accomplishment that comes from knowing that one has done one's personal best' (Eby, Butts & Lockwood, 2003).

2.7.4.2 Consequences of work success

Ballout (2007:742) found in their research on career success that human capital, person-environment fit and organisational supports were common consequences related to career success.

Organisational rewards – this is based on the human capital theory and suggests that individuals who invest the most in human capital attributes such as education, training, and experience are expected to show a higher level of work performance, and subsequently obtain higher organisational rewards (Ballout, 2007:743). In addition Ballout suggests that the extent that human capital factors influence the performance of employees, greater personal attributes enable them to better perform their job, and consequently their pay should increase accordingly to “compensate them for the additional amount of human capital required by their job”.

Organisational size and promotion – this is based on the structural approach to career success and suggests that certain structural characteristics like organisational size help or hinder individuals in their career advancement (Ballout, 2007:743). Ballout suggest that there is a relationship between career success and organisational size, since larger organisations are more likely to facilitate career mobility and provide individual pay increases as employees move up the corporate ladder.

Individual's career strategy – this is based on the behavioural approach and suggest that individuals who have a firm control over their career choice and advancement can “assess their career prospects and enact appropriate career plans and tactics that contribute to career success” (Ballout, 2005:744). This approach assumes that career aspirants will take on a proactive role in managing their own careers and engage in strategies that match within the context of organisational strategies as opposed to relying on the organisations career systems. In addition Ballout cites from (Nabbi, 2003) that “self-nomination and networking mediates the relationship between career prospects and intrinsic career success”.

2.7.4.3 Relationship between work success and CI variables

Thomas et al (2005), found in their research a positive relationship between supervisor support, training and development and organisational resources with career success.

2.8 Conclusion

Avey, Wernsing, and Luthans (2008) in their study on how positive employee attitudes can influence organisational change, found that employees' that exhibit "positive psychological capital and emotions may indeed be an important contribution to positive organisational change". The literature indicates that there is a relationship between quality CI values and soft key success factors and work related attitudes. The literature review indicated that a high outcome for quality CI values and soft key success factors will exhibit positive work related attitudes. The positive work related attitudes will ultimately aid in the change implementation programs like continuous improvement.

2.9 Chapter summary

This chapter discussed the CI Philosophy of Lean Manufacturing and factors influencing implementation programs. The origins, tools and principles of Lean Manufacturing were discussed, highlighting the underlying theories of continuous improvement methodologies which focus on waste elimination and quality in all aspects of the work environment. Theory on the factors influencing CI implementation indicated that the culture of an organisation was regarded as a key success factor for implementation. The chapter also reviewed CI cultural quality values, soft key success factors for CI implementation and its relationship on work related attitudes of job satisfaction, employee commitment, intention to quit and work success. The literature discussed the main quality cultural values considered important to have in an organisation involved in CI initiatives and the literature also covered the key soft success factors that are vital for an organisation to exhibit when implementing CI. Work related attitudes of job satisfaction, employee commitment,

intention to quit and work success were defined, their consequences discussed and finally their relationship to other CI variables were examined. The literature review established that past studies have indicated to have found relationships with many of the quality culture values and key soft success factors with work related attitudes

CHAPTER 3

RESEARCH METHODS

3.1 Introduction

This chapter examines the methodology used to conduct this research report. The main objective of this study is to evaluate the effect of employee attitudes, as well as other key success factors on continuous improvement programs at a manufacturing concern. In chapter two, theoretical information was obtained from literature research. The literature review examined the principles of Lean manufacturing, key success factors required for its implementation and employee attitudes. This chapter will focus on the research design and method, the research process, the measuring instrument used, statistical analysis and the research objectives.

3.1.1 Research Method

Welman, Kruger and Mitchell (2005:2), describes research methodology as the “logic behind research methods and techniques”. Leedy & Ormrod (2010:10) offer a descriptive account of methodology as:

- Dictates how data are acquired
- Arranges data in logical relationships
- Sets up the approach for refining and synthesizing data
- Suggests how data will be interpreted
- Yields one or more conclusions that lead to expansion of knowledge

Research methodology is the approach and techniques one uses to collect and analyse data in a particular academic discipline. The two primary approaches to research are Qualitative and Quantitative research (Leedy and Ormrod, 2010:21). This study will use the quantitative research approach to reach its objectives. A survey design using a cross-sectional design was used to gather data for this study. The reasons for using quantitative research is that; it suited the purpose of the research as the research intends to explain, predict and test theory, data collection were in numeric data, statistical analysis needs to done and if offers a stable process

to undertake research (Leedy & Ormrod, 2005) as quoted by Kruger (2012:10). The reason for the use for the survey is that it is capable of retrieving information from large samples of the population. It requires minimal investment to develop and administer. Surveys can also extract information about attitudes that are difficult to establish using observation techniques (Glasow, 2005:2). Given the nature of the study regarding employee attitudes the survey method was regarded as the most appropriate tool to conduct this research.

Ultimately, research design provides the overall structure for the procedures the researcher follows, the data the researcher collects, and the data analysis the researcher conducts.

Welman, Kruger & Mitchell (2005:78) state that research is structured according to the research design used. The four types of research design according to Welman are;

- Experimental research
- Quasi-experimental research
- Non-experimental research
- Qualitative research

The non-experimental research design using a cross sectional design was used in this study. A cross-sectional survey collects data to make inferences or take snapshots about a population. Cross-sectional surveys can be conducted using any mode of data collection e.g. telephone interviews, mailed questionnaires, etc. A problem with cross-sectional surveys is that they may be repeated periodically and can result in a respondent being randomly selected for a subsequent survey; this is according to Encyclopedia of Survey Research Methods website (<http://srmo.sagepub.com/view/encyclopedia-of-survey-research-methods/n120.xml>).

3.1.2 Research Procedure

In order to undertake the research for the study, permission had to be obtained from the continuous improvement manager, human resource manager and the general manager of the manufacturing concern used in the study. An e-mail requesting for

permission was addressed to these parties, explaining the objectives of the research and contained the proposed questionnaire. The questionnaire was presented to the continuous improvement manager prior to distribution to gauge his insight, understanding, opinions and recommendation prior to distributing the final questionnaire.

After permission was granted, the questionnaire was distributed electronically to the employees of the company who had access to e-mail via personal computers. The introductory e-mail message containing the questionnaire assured employees that responses will be treated anonymously and that it was a voluntary request. This was done in order to obtain more truthful responses as posing questions on attitude can be regarded as sensitive information. In addition formal survey administration arrangements were made with supervisors in order to administer the survey to shop floor employees without access to computers. During these sessions, employees were advised that it was voluntary and that their anonymity would be guaranteed.

3.1.3 Research Process

The research has been conducted at a company belonging to the manufacturing industry. The plant is unique as it is the only manufacturing facility of its type in South Africa. Competition in this industry is rife and there is strong pressure on efficiencies and quality. The manufacturing concern belongs to a global company that has adopted Lean manufacturing as a business principle and strategy. In conducting this survey the entire population was included for the study. The population of the company consist of a total of 313 employees which includes salaried and hourly staff. The sampling frame is the entire population. It is estimated that nearly all employees have been exposed to continuous improvement training or continuous improvement projects. It was therefore viable to include all staff members in the sampling frame. The sample according to Table 5 guidelines advises that the sample size of approximately 300 requires a sample size of 169. The study achieved responses for 48% of the total population of the company. Administration of the survey was conducted over a three week period. After the completed surveys were returned, the data was captured in an MS excel spreadsheet, statistically processed and analysed.

It is perceived that this sample size will allow for a generalised perspective across the company involved in this research study to be obtained, in order to gain insight into employee attitude concerning continuous improvement initiatives.

Researchers generally draw conclusions about large groups by taking a sample. A sample is a part of the population selected to represent the population as a whole. Preferably, the sample should be representative and allow the researcher to make accurate estimates of the thoughts and behaviour of the larger population (Welman et al., 2005:54).

Sampling can be distinguished between probability sample and non-probability samples. This research used non probability sampling consisting of convenience samples. In non-probability sampling, members are selected from the population in some non-random manner and the degree to which the sample differs from the population remains unknown. Convenience samples involve selecting convenient or haphazard cases that are easy to obtain for samples. The sample selection process can continue until the required sample size is achieved (Welman et al., 2005:56). However the disadvantages of convenience samples according to Welman et al., (2005:70) are the potential of bias and influence that are beyond the control of the researcher as samples are easy to obtain. The larger the sample size, the lower the error in generalising the population (Welman et al., 2005:70). Assumptions about populations collected from data using any probability sample are based on probability.

According to Welman, sample size is governed by:

- The confidence we need to have in our data in order to represent the characteristics of the total population
- The margin of error that we can tolerate for estimates made from the sample
- The types of analysis we are going to undertake as many statistical techniques have a minimum amount of data cases for each variable
- The size of the total population from which the sample is drawn

Welman et al (2005:71) state that “the standard error of mean is influenced by the absolute sample size instead of the size of the population”. They indicate that the

number of units in the sample is more important than the percentage of the total population they represent. The table below provides some guidance on sample sizes for a quantitative study.

Table 5: *Table for determining sample*

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	171	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	391
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

*N is the population size
S is the sample size*

Source : (Krejcie & Morgan, 1970:3)

3.1.4 Measuring instrument

The questionnaire was structured into three sections namely Section One – Demographics, section two –participation in lean events and section Three – Cultural values, other soft key success continuous improvement factors and employee attitude. Section 3 uses a five-point Likert scale to assess perceived importance: strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The scale measured 76 items in total. *Quality cultural values* were assessed by using a measuring instrument developed by Detert, Schroeder, and Cudeck (2002) that measured nine quality cultural values. Changes were made to the original version which measured culture in schools, by adapting questions to refer to a company perspective. Two additional quality cultural variables of purpose and urgency were included in the measurement of cultural quality values and were adapted from a book by (Miller, 2011) on Lean culture. *The other key success factors variables for CI implementation* were used from a survey developed by (Sim *et al.*, 2009) to establish

soft barriers to Lean implementation. *Employee attitudes measures* questions were developed specifically for this study to measure employee attitudes.

Quality cultural values

Quality cultural values consisted of eleven dimensions in total, with three items per dimension. The dimensions of these variables include; goals, data-based decision making, continuous improvement, customer focus, long term view, employee involvement, quality at same cost, collaboration, system focus, purpose and urgency.

- *Goals*- This instrument measures the participant's understanding and alignment of his or her own goals to that of the overall goals and vision of the company. An example of one of the items on this scale included, "The Company's overall vision and goals guide my day to day work in my department". ($\alpha=0.73$).
- *Customer Focus* – This instrument measures the participant's perception of the importance of the customer when relating to company performance, company strategy and quality products. An example of one of the items on this scale included, "I believe that standards for company performance should be determined by external customers". ($\alpha=0.56$).
- *Long term vision* – This instrument measures a participant's understanding and acceptance of a company adopting a long term vision. An example of one of the items on this scale included, "I believe that our company should be long-term focused". ($\alpha=0.52$).
- *Continuous improvement*- This instrument measures the participant's adoption of continuous improvement tools and philosophy. An example of one of the items on this scale included, "I use CI concepts/tools to improve the way I work". ($\alpha=0.71$).
- *Employee involvement* - This instrument measures the participant's engagement and promotion of employee involvement. An example of one of the items on this scale included, "I encourage employee involvement in my department". ($\alpha=0.25$).
- *Collaboration* - This instrument measures the participant's involvement and the degree of promoting teamwork. An example of one of the items on this scale

included, "I encourage teamwork in my department and with other departments". ($\alpha=0.66$).

- *Data base decision making* - This instrument measures the participant's practice of using data for decision making and problem solving purposes. An example of one of the items on this scale included "If I propose a change I bring data to support my decision". ($\alpha=0.79$).
- *System Focus* - This instrument measures the participant's perception of fault finding in a problem situation, where one should look for a cause in a system or process first as opposed to a person. An example of one of the items on this scale included, "When someone is performing poorly I try to identify where the system is failing him or her". ($\alpha=0.77$).
- *Quality at same cost* - This instrument measures the participant's perception that creating quality and improvements does not necessarily cost money. An example of one of the items on this scale included, "Improving the quality of my work does not require additional money". ($\alpha=0.78$).
- *Purpose*- This instrument measures the participant's perception of their own contribution to the company. An example of one of the items on this scale included, "I contribute to the purpose of the company". ($\alpha=0.81$).
- *Urgency*- This instrument measures the participant's perception to his or her quick reaction to solving problems and initiating solutions. An example of one of the items on this scale included, "When I identify an improvement I implement it immediately". ($\alpha=0.68$).

Other key soft success factors for CI Implementation

The other key soft success factors variables for CI implementation consisted of five dimensions containing four items per dimension and included dimensions of; business reasons for implementation, leadership, training, communication and job security.

- *Understanding of Business reasons for CI Implementation.* This instrument measures the participant understands of the benefits that CI can contribute to a company. An example of one of the items on this scale included, "Our Company

uses continuous improvement tools to compete in the global environment”. ($\alpha=0.67$).

- *Leadership commitment* This instrument measures the participant’s perception of leadership’s role and commitment in CI initiatives. An example of one of the items on this scale included, “Management ensures that CI is used to increase our company performance”. ($\alpha=0.86$).
- *Training and development*- This instrument measures the participant’s perception of whether the tools and training they receive for CI are adequate to use at work to make improvements. An example of one of the items on this scale included, “The Company provides me adequate training to be productive during improvement events”. ($\alpha=0.86$).
- *Communication*- This instrument measures the participant’s perception of whether communication is effective during implementation and whether the promotion of CI work done by employees is conveyed adequately. An example of one of the items on this scale included, “Our Company works hard at sharing best practices throughout all its divisions on CI”. ($\alpha=0.84$).
- *Job security*-- This instrument measures the participant’s perception of whether the company values employees and whether they believe that CI brings job security. An example of one of the items on this scale included, “CI has increased our job security”. ($\alpha=0.86$).

Employee Attitudes

This part included four dimensions containing; Job satisfaction (7 items), Employee commitment (5 items), Intentions to quit (3 items) and Work success (8 items).

- *Job satisfaction* - This instrument measures the participant’s satisfaction and fulfilment they receive from their jobs. An example of one of the items on this scale included. “In most ways my job is close to my ideal”. ($\alpha=0.67$).
- *Employee commitment* - This instrument measures the participant’s commitment and loyalty they feel towards the company. An example of one of the items on this scale included. “I feel that it is worthwhile to work hard for this organisation”. ($\alpha=0.86$).

- Intention to quit - This instrument measures the participant's feelings towards intentions to leave the company. An example of one of the items on this scale included. "I often consider quitting my job". ($\alpha=0.87$).
- Work success - This instrument measures the participant's perception of his or her work success and reputation at work. An example of one of the items on this scale included. "I do my work well enough to be complimented for it by my superiors". ($\alpha=0.84$).

3.1.5 Statistical analysis

"Statistics provide a means to get order out of chaos" (Leedy and Ormrod, 2010:30). The statistical analysis was carried out by means of the SPSS-program. Cronbach alpha coefficients were determined to assess the reliability of the measuring instruments. Pearson product-moment correlation was used to identify the relationships between the variables. A cut-off point of 0.30 (medium effect) was set for the practical significance of correlation coefficients (Cohen, 1988). A step-wise multiple regression analysis was conducted to determine the proportion of variance in the dependent variables of (job satisfaction, employee commitment, intentions to quit and work success) that is predicted by the independent variables of (cultural values of Continuous improvement and other key success factors for CI implementation). The effect size in the case of multiple regressions is given by the formula (Steyn, 1999): $f^2 = R^2/1-R^2$. The following parameters were used: 0.01 (small effect), 0.1 (medium effect) and 0.35 (large effect) were set for practical significance of f^2 (Steyn, 1999).

3.1.6 Research objectives

The *primary objective of this study* is to do a theoretical and an empirical investigation into quality cultural values and soft key success factor for CI implementation and work related attitudes of job satisfaction, employee commitment, intentions to quit and work success.

The *secondary objective of this study* is to:

- To determine the relationship between quality cultural values and soft key success factor for CI implementation and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.
- To determine the impact of quality cultural values and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success.
- To determine the impact of soft key success factor for CI implementation and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success

3.2 Chapter summary

The empirical research procedure that was conducted in this study was discussed in this chapter by focusing on; the research methods which was quantitative research method using a cross sectional design, describing the research process undertaken and discussing the sampling techniques, the measuring instrument used which was a Likert scale, the research objectives and statistical analysis conducted on the data. The following chapter will present the empirical results obtained.

CHAPTER 4

RESULTS OF THE EMPIRICAL STUDY

4.1 Introduction

The previous chapter examined the details of how the research was conducted in order to achieve the research objectives. The aim of this chapter is to report the results of the empirical study. This chapter presents the characteristics of the sample, the descriptive statistics of and the correlations between the different variables covered in this study as well as the regression analyses.

4.2 Demographic characteristics

Gender of respondents

Figure 1 describes the gender distribution of the respondents. The population of 313 employees consists of 89% male and 11% female. The sample represents 88% male and 12% female. This indicates a fair representation of both genders.

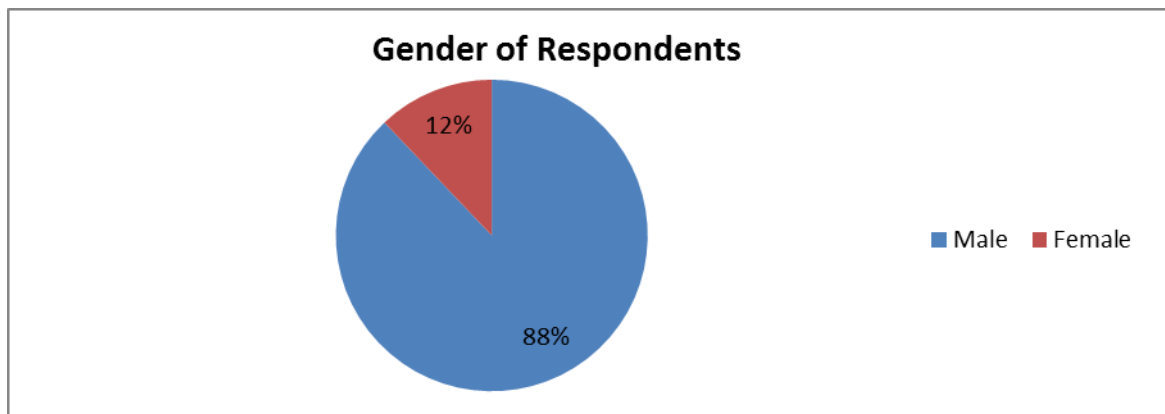


Figure 4 Gender of Respondents

Age of respondents

Figure 2 describes the age of respondents. 8% of the respondents represented the age group between 18-25 years old. 36% of the respondents represented the age group between 18-25 years old. 28% of the respondents represented the age group between 36-50 years old and 28% of the respondents represented the age group greater than 50 years old.

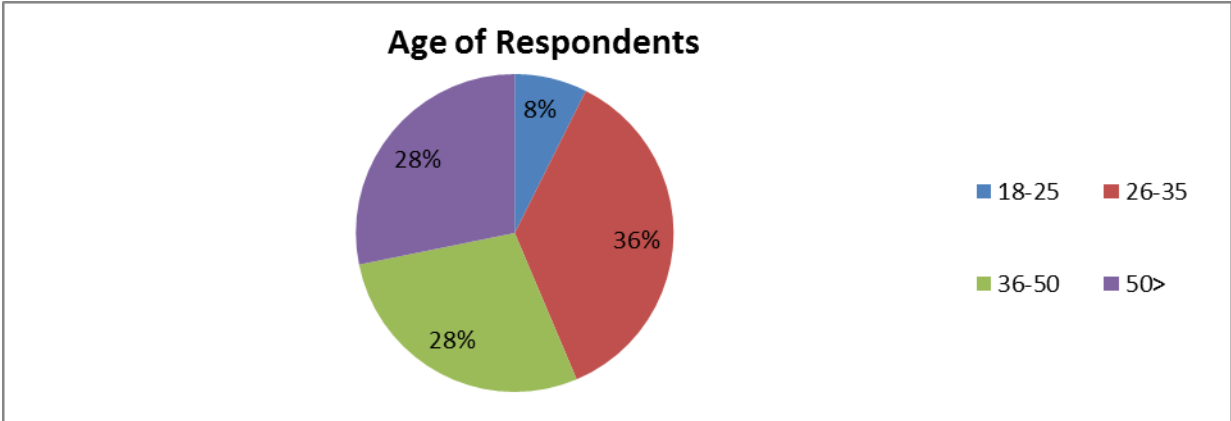


Figure 5 Age of Respondents

Job level of Respondents

Figure 3 indicates the job level of respondents. 76% of the respondents were from a general level in the company. 12% of the respondents were from a supervisory level in the company. 7% of the respondents were from a middle management level and 5% represented top management in the company.

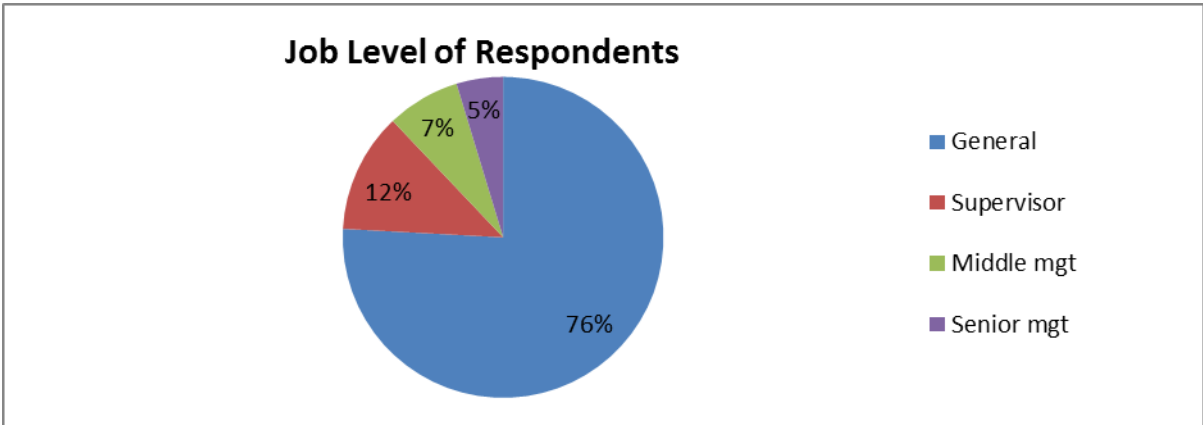


Figure 6 Job level of Respondents

Education level of respondents

Figure 4 represents the education level of respondents. 4% of respondents indicated a primary school education level and 67% indicated a secondary school education level. 18% of respondents had obtained a diploma, 4% a degree and 7% had obtained a post graduate degree.

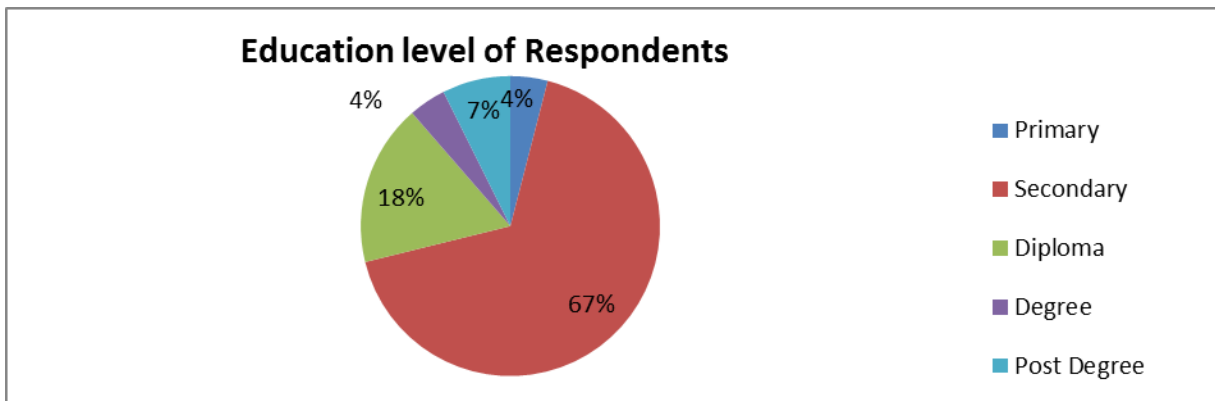


Figure 7 Education level of Respondents

Participation in continuous improvement activities

Figure 5 represents the number of occurrences employees in the sample participated in continuous improvement activities. 26% of respondents indicated that they had not participated in any specific CI activity. 48% of respondents had participated in one to two activities. 15% of respondents indicated they had participated in three activities. 7% of participants had participated in four events and 4% had indicated participation in more than five events.

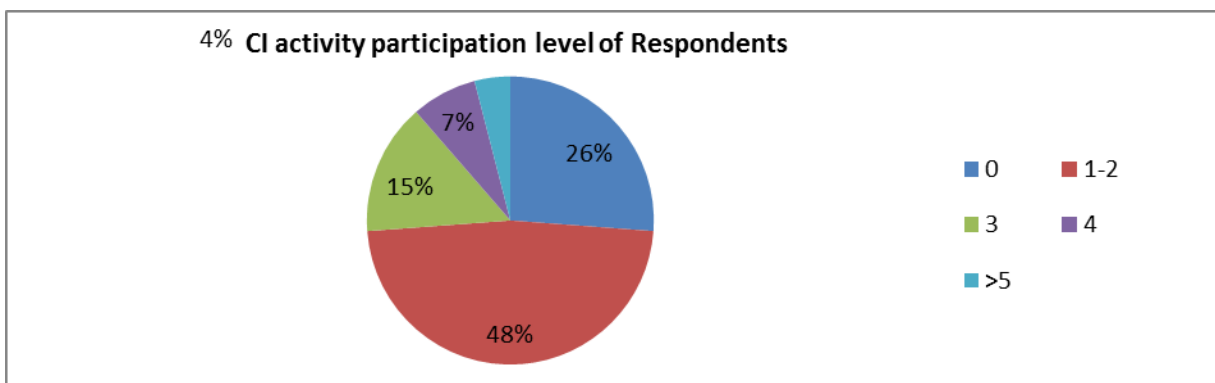


Figure 8 Participation in CI events

4.3 Descriptive and Correlation Analysis

The next discussion focuses on descriptive statistics of and the correlations between the variables covered in the study. The descriptive statistics of and the correlations between the variables covered in the study are presented in Table 1 below.

Table 6: Descriptive Statistics and Correlation Analysis

	α	M	SD	Kurtosis	Skewness	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Goals	.73	4.11	.60	-86	-86	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Customer focus	.56	4.16	.59	-52	-52	.32**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Long term view	.52	3.98	.66	-76	-76	.21**	.40**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Continuous Improvement	.71	4.11	.62	-1.06	-1.06	.44**	.30**	.17*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Employee Involvement	.25	4.09	.78	-1.05	-1.05	.34**	.29**	.33**	.41**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Collaboration	.66	3.87	.74	-69	-69	.34**	.40**	0.14	.46**	.44**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Data-based DM	.79	3.71	.71	-54	-54	.26**	.38**	.17*	.38**	.38**	.42**	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8. System focus	.77	4.08	.68	-1.25	-1.25	.45**	.50**	.31**	.52**	.44**	.51**	.57**	1	-	-	-	-	-	-	-	-	-	-	-	-
9. Quality at same cost	.78	3.65	.89	-52	-52	.24**	.29**	.36**	.28**	.39**	.24**	.31**	.31**	1	-	-	-	-	-	-	-	-	-	-	-
10. Purpose	.81	4.29	.71	-1.52	-1.52	.50**	.32**	.22**	.43**	.38**	.32**	.39**	.59**	.41**	1	-	-	-	-	-	-	-	-	-	-
11. Urgency	.68	4.06	.61	-86	-86	.41**	.25**	.18*	.45**	.35**	.30**	.40**	.46**	.36**	.49**	1	-	-	-	-	-	-	-	-	-
12. Implementation: CI	.67	3.81	.65	-31	-31	.41**	.38**	.27**	.52**	.37**	.48**	.40**	.59**	.25**	.36**	.35**	1	-	-	-	-	-	-	-	-
13. Leadership com.: CI	.86	3.82	.75	-63	-63	.45	.25**	.25**	.51**	.39**	.30**	.25**	.48**	.24**	.42**	.41**	.69**	1	-	-	-	-	-	-	-
14. Training: CI	.86	3.87	.69	-34	-34	.40**	.26**	.27**	.41**	.31**	.21**	.20*	.36**	.26**	.38**	.33**	.57**	.69**	1	-	-	-	-	-	-
15. Communication: CI	.84	3.8	.69	-47	-47	.50**	.30**	.22**	.47**	.45**	.35**	.31**	.41**	.27**	.44**	.32**	.57**	.64**	.75**	1	-	-	-	-	-
16. Job security: CI	.86	3.79	.85	-81	-81	.38**	.31**	.23**	.36**	.28**	.24**	.24**	.45**	.31**	.42**	.24**	.55**	.64**	.55**	.61**	1	-	-	-	-
17. Job satisfaction	.67	3.46	.84	-23	-23	.39**	.27**	.35**	.26**	.36**	.28**	.24**	.38**	.24**	.40**	.31**	.46**	.53**	.50**	.58**	.56**	1	-	-	-
18. Employee commitment	.86	3.79	.80	-757	-76	.51**	.29**	.37**	.41**	.43**	.32**	.36**	.51**	.33**	.53**	.43**	.54**	.65**	.59**	.64**	.67**	.74**	1	-	-
19. Intentions to quit	.87	2.58	1.15	.70	.70	-.22	.03	-.04	-.09	-.04	0	.05	-.56	.08	-.13	.02	-.16	-.26	-.19	-.12	-.17	-.32	-.34	1	-
20. Work success	.84	4.28	.57	-96	-96	.45**	.31**	.25**	.55**	.35**	.30**	.34**	.48**	.28**	.40**	.45**	.40**	.47**	.43**	.44**	.43**	.42**	.52**	.52**	0.03

Inspection of Table 6 shows that the eleven continuous improvement cultural values had a mean value of 4.01, indicating that employees agree on the CI quality value statements. The five other key soft success variables had a mean value of 3.8 indicating that employees agree with these statements concerning key soft success variables. The four work related outcome variables show a mean of value of 3.5 indicating that employees are neutral to agree on these statements. The standard deviations on all variables except intention to quit were below 1, indicating that most values were close to the mean. The Kurtosis on all variables except intention to quit was negative, which means that the tails are lighter than a normal distribution and the distribution has a flatter peak. Inspection of Table 6 shows that most of the Cronbach Alpha coefficients obtained were higher than the guideline of $\alpha > 0.70$ (Nunnally and Berstein, 1994). Those scales with lower than acceptable Cronbach Alphas ($\alpha < 0.70$) besides job satisfaction ($\alpha=0.67$) were excluded from the regression analysis.

Table 6 also summarises the correlation coefficients between the constructs. **Goals** is practically significantly related (large effect size) to employee commitment, purpose and communication. Goals is also statistically and practically significantly related (medium effect size) to customer focus, continuous improvement, employee involvement, collaboration, system focus, urgency, implementation CI, leadership commitment, training, job security, job satisfaction and work success. In additions, *Goals* is also statistically significant related to (small effect size) correlation with long term view, data based decisions, quality at same cost and negatively statistically significantly related correlation with intentions with quit. **Customer Focus** is statistically and practically significantly related (medium effect size) correlation with long term view, continuous improvement, collaboration, and data based decisions, system focus, purpose, implementation CI, communication, job security and work success. Customer focus is statistically significant (small effect size) correlation with employee involvement, quality at same cost, urgency, training, and job satisfaction and employee commitment. **Long term view** is also statistically and practically significantly related (medium effect size) correlation with employee involvement, system focus, quality at same cost, job satisfaction and employee commitment. Long term view is statistically significant (small effect size) correlation with continuous improvement, data based decision making, purpose, urgency, implementation CI,

leadership commitment, training, communication, job security and work success. **Continuous improvement** have a practically significantly related (large effect size) correlation with system focus, implementation CI, leadership commitment and work success. Continuous improvement is also statistically and practically significantly related (medium effect size) correlation with employee involvement, collaboration, data base decision making, purpose, urgency, training, communication, job security and employee commitment. Continuous improvement is statistically significant (small effect size) correlation with job satisfaction and quality at same cost.

Employee involvement are statistically and practically significantly related (medium effect size) correlation with collaboration, data base decision making, system focus, quality at cost, purpose, urgency, implementation CI, leadership commitment, training, communication, job satisfaction, employee commitment and work success. Employee involvement is statistically significant (small effect size) correlation with job security. **Collaboration** has a practically significantly related (large effect size) correlation with system focus. Collaboration is also statistically and practically significantly related (medium effect size) correlation with data base decision making, purpose, urgency, implementation CI, leadership commitment, communication, employee commitment and work success. Collaboration is also statistically significant (small effect size) correlation with quality at same cost, training, job security and job satisfaction. **Data based decision making** has a practically significantly related (large effect size) correlation with system focus. Data based decision making is also statistically and practically significantly related (medium effect size) correlation with quality at same cost, purpose, urgency, implementation CI, communication, employee commitment and work success. Data based decision making is also statistically significant (small effect size) correlation with leadership, training, job security and job satisfaction. **System focus** has a practically significantly related (large effect size) correlation with purpose, implementation CI and employee commitment. System focus is also statistically and practically significantly related (medium effect size) correlation with quality at same cost, urgency, leadership commitment, training, communication, job security, job satisfaction and work success. **Quality at cost** is also statistically and practically significantly related (medium effect size) correlation with purpose, urgency, and job security and employee commitment. Quality at cost is also statistically

significant (small effect size) correlation with implementation CI, leadership, training, communication, job satisfaction and work success.

Purpose has a practically significantly related (large effect size) correlation with employee commitment. Purpose is also statistically and practically significantly related (medium effect size) correlation with urgency, implementation CI, training, communication, job security, job satisfaction and work success. **Urgency** is also statistically and practically significantly related (medium effect size) correlation with implementation CI, leadership, training, communication, job satisfaction, employee commitment and work success. Urgency is also statistically significant (small effect size) correlation with job security. **Implementation CI** has a practically significantly related (large effect size) correlation with leadership commitment, training, communication, job security and employee commitment. Implementation CI is also statistically and practically significantly related (medium effect size) correlation with job satisfaction and work success. Implementation CI is negatively statistically significant (small effect size) correlation with intentions with quit. **Leadership commitment** has a practically significantly related (large effect size) correlation with training, communication, job security, job satisfaction and employee commitment. Leadership commitment is also statistically and practically significantly related (medium effect size) correlation with work success. Leadership commitment is also negatively statistically significant with intentions with quit. **Training** has a practically significantly related (large effect size) correlation with communication, job security, job satisfaction and employee commitment. Training is also statistically and practically significantly related (medium effect size) correlation with success. Training is also negatively statistically significant with intentions with quit. **Communication** has a practically significantly related (large effect size) correlation with job security, job satisfaction, and employee commitment. Communication is also statistically and practically significantly related (medium effect size) correlation with work success. Communication is also negatively statistically significant with intentions with quit. **Job security** has a practically significantly related (large effect size) correlation with job satisfaction and employee commitment. Job security is also statistically and practically significantly related (medium effect size) correlation with work success. Job security is also negatively statistically significant with intentions with quit.

Job satisfaction has a practically significantly related (large effect size) correlation with employee commitment. Job satisfaction is also negatively statistically and practically significantly related (medium effect size) with intentions with quit and work success. **Employee commitment** has a practically significantly related (large effect size) correlation with work success. Employee commitment is also negatively statistically and practically significantly related (medium effect size) with intentions with quit.

4.4 Regression Analysis

Next we focus on the regression analyses. Those scales with lower than acceptable Cronbach Alphas ($\alpha < 0.70$) were excluded from the regression analysis. Regression Analysis with Continuous improvement culture values as predictors of work attitudes are presented in Table 7 below.

Table 7: Regression Analysis with Continuous improvement culture values as predictors of work-related attitudes.

	Work attitude outcomes			
	Job Satisfaction	Employee Commitment	Intentions to Quit	Work success
Goals	0.22*	0.27**	-0.22*	0.19*
Continuous Improvement	-0.02	0.07	-0.04	0.34**
Data base decision making	0.11	0.06	0.10	0.04
System Focus	0.17	0.16	0.06	0.17
Quality cost	0.07	0.09	0.15	0.07
Purpose	0.17	0.22*	-0.14	0.02
R	0.48	0.64	0.29	0.62
R ²	0.23	0.41	0.09	0.39
Effect size (f^2)	0.06	0.20	0.01	0.18

* = $P < 0.05$ / **= $P \leq 0.01$

Table 7 summarises regression analysis with job satisfaction, employee commitment, intentions with quit and work success as outcomes with continuous improvement cultural variables as independent variables. Closer inspection of table 7 revealed that

CI cultural variables explained 23%, 41%, 9% and 39% of job satisfaction, employee commitment, intentions with quit and work success respectively. Goals ($\beta=0.22$; $t=2.47$) proved to be the only statistically significant predictor of job satisfaction; Goals ($\beta=0.27$; $t=3.44$) and purpose ($\beta=0.22$; $t=-2.49$) proved to be the only statistically significant predictors of employee commitment; Goals ($\beta=-0.22$; $t=-2.26$) proved to be the only statistically significant predictors of intentions with quit; Goals ($\beta=0.19$; $t=2.36$) and continuous improvement ($\beta=0.34$; $t=4.16$) proved to be the only statistically significant predictors of work success. The effect sizes were calculated to determine practical significance, given that we have already found they are statistically significant. The effect sizes for job satisfaction ($f^2=0.06$) indicated a medium effect, employee commitment ($f^2=0.20$) indicated a medium effect, intention to quit ($f^2=0.01$) indicated a small effect size and work success ($f^2=0.18$) indicated a medium effect.

Table 8: Regression Analysis with other key soft success variables as predictors of work-related attitudes.

	Work attitude outcomes			
	Job Satisfaction	Employee Commitment	Intentions to Quit	Work success
Leadership commitment: CI	0.15	0.21**	-0.26*	0.22*
Training CI	0.02	0.05	-0.10	0.09
Communication CI	0.30*	0.25**	0.15	0.14
Job security CI	0.28*	0.34**	-0.04	0.15
R	0.65	0.75	0.28	0.52
R²	0.42	0.57	0.08	0.27
Effect size (f^2)	0.21	0.48	0.01	0.08

* = $P<0.05$ / **= $P\leq 0.01$

Table 8 summarises regression analysis with job satisfaction, employee commitment, intentions with quit and work success as outcomes with other key soft success continuous improvement variables as independent variables. Closer inspection of table 8 revealed that other key soft success continuous improvement variables explained 42%, 57%, 8% and 27% of job satisfaction, employee commitment, intentions with quit

and work success respectively. Job security ($\beta=0.28$; $t=3.29$) and communication ($\beta=0.30$; $t=2.87$) proved to be the only statistically significant predictors of job satisfaction; Leadership commitment ($\beta=0.21$; $t=2.33$); Communication ($\beta=0.25$; $t=2.76$) and Job security ($\beta=0.34$; $t=4.48$) proved to be the only statistically significant predictors of employee commitment; Leadership commitment ($\beta=-0.26$; $t=-2.11$) proved to be the only statistically significant predictors of intentions with quit; Leadership commitment ($\beta=0.22$; $t=1.98$) proved to be the only statistically significant predictors of work success. The effect sizes were calculated to determine how important the effect of the variable being measured is in reality, given that we have already found they are statistically significant. The effect sizes for job satisfaction ($f^2 = 0.21$) indicated a medium effect, employee commitment ($f^2 = 0.48$) indicated a large effect, intention to quit ($f^2 = 0.01$) indicated a small effect size and work success ($f^2 = 0.08$) indicated a medium effect.

4.5 Discussion

To determine the relationship between quality cultural values and soft key success factors for CI implementation and work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success. The results revealed that quality cultural values and soft key success factors for CI implementation were positively related to each other and to work related attitudes such as job satisfaction, employee commitment, and work success and negatively related to intentions to quit. **Continuous improvement** was positive related to (with a large effect) system focus, implementation CI, leadership commitment and work success. **Goals** was positive related to (with a large effect) employee commitment, purpose and communication. **System focus** was positive related to (with a large effect) purpose, implementation CI and employee commitment. **Data based decision making** was positive related to (with a large effect) system focus. **Purpose** was positive related to (with a large effect) employee commitment. Implementation CI was positive related to (with a large effect) leadership commitment, training, communication, and job security and employee commitment. Leadership commitment was positive related to (with a large effect) training, communication, job security, job satisfaction and employee commitment. Training has a large effect with communication, job security, job satisfaction and employee commitment. Communication was positive related to (with a large effect) job

security, job satisfaction, and employee commitment. Job security was positive related to (with a large effect) job satisfaction and employee commitment.

Our research findings have found that an organisation that exhibits the quality cultural variable of goals and shared values, will influence all the four work related attitudes of job satisfaction, employee commitment, intentions to quit and work success investigated in this study. This indicates that a company that involves employees in a significant manner in decision making and when formulating goals and visions are likely to receive support in continuous improvement programs. In addition the quality cultural variable of continuous improvement will negatively impact intentions to quit, indicating that an organisation who engages in continuous improvement impact employee's decision to stay in a company. The quality cultural value of purpose will positively impact employee commitment, indicating that organisations that communicate and project that every employee has a purpose to the common purpose of the company will experience employee commitment.

Our research findings have found that an organisation that exhibits the key soft success factors of leadership commitment will positively influence employee commitment and work success indicating that leadership that promote growth and foster commitment to a continuous improvement culture will experience employee commitment and employees who feel proud of their work achievements. In addition the research found that leadership commitment will negatively influence employee's intentions to leave, indicating that employees who perceive commitment from their leaders in growth and change initiatives are less likely to leave a company. The study found that communication positively influences both job satisfaction and employee commitment, indicating that organisations that engage in the process of sharing information, tools, techniques, training, etc. create empowered employees who in turn exhibit job satisfaction and employee commitment. The study found that job security positively influences both job satisfaction and employee commitment, indicating that organisations who communicate that the intentions of continuous improvement initiatives are not to reduce workers but to promote the growth of the company using CI initiatives. Employees can then understand that growth means more stability and job security, which will result in job satisfaction and employee commitment.

Another objective of the study was to determine the impact of quality cultural values and soft key success factors for CI implementation on work related attitudes such as job satisfaction, employee commitment, intentions to quit and work success. The regression analysis (Table 7) revealed that CI cultural variables explained 23%, 41%, 9% and 39% of job satisfaction, employee commitment, intentions with quit and work success respectively. The regression analysis (Table 8) revealed that other key soft success continuous improvement variables explained 42%, 57%, 8% and 27% of job satisfaction, employee commitment, intentions with quit and work success respectively.

Sim et al. (2009) found that communication and a “clear relationship to company’s mission and goals” plays an essential role in CI initiatives in their research on a manufacturing plant. (Boon *et al.*, 2007) study on TQM practices relating to people oriented aspects and employee commitment concluded that collaboration, communication and employee involvement were found to be positively associated with employee commitment, and stated that communication was a dominant effect on CI practices. Boon, Arumugam and Hwa’s (2005) study on soft TQM practices that included leadership, education and training, and organisational culture that were in common with this study, found statistically significant relationships between these soft variables and job satisfaction and employee commitment. Karia, Abu & Asaari (2006) found that, training and education, empowerment and teamwork, and continuous improvement had a significant positive effect on job satisfaction and employee commitment. Boeselie and Van der Wiele (2001) examined the perceptions of employees on TQM policies against overall intentions to leave and found that a positive perception of employees on TQM concepts that lead to less intentions to leave. (Karia and Asaari, 2003:1), concluded in their research findings, that organisations who have adopted quality management practices have experienced an “overall improvement in organisation performance such as attitude, commitment, and effectiveness”. They found that continuous improvement and problem prevention was significantly related to job satisfaction and organisational commitment. Boon et al (2005) confirmed this finding in their study, which found that employees with a positive perception of the soft TQM concepts “lead to a higher level of employees work related attitudes”. Bhasin (2012:21) found that culture, employee attitude and resistance to change were the key obstacles to achieving successful CI implementation.

4.6 Conclusion

Previous research findings indicate similar findings to this research study, highlighting that job satisfaction, employee commitment, intentions to quit and work success can be predicted by some quality cultural value and some key soft success factors as discussed, that impact CI implementation programs. In addition quality cultural value and some key soft success factors are important for and matters for CI implementation programs.

4.7 Chapter Summary

This chapter presented the results and findings of the data analysis. The information was analysed by using the statistical package SPSS for windows. Descriptive statistics was used with establish normal distribution. The Cronbach coefficient alpha test was applied with test for reliability. Correlation and regression tests were performed with determine relationships between the predictors and work related outcomes. Chapter five will use these results with make recommendations with manufacturing operations implementing continuous improvement programs.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The objective of this research report was to present findings, communicate recommendations and conclusions and suggest areas of future research of the study conducted on continuous improvement (CI) cultural variables and soft key success factor for CI implementation, and the impact of these variables on work related attitudes of employees in a manufacturing concern of a multinational company. The chapter will include all the findings achieved by this research study with regards to the literature review and empirical study as well as recommendations and conclusion. Recommendations will be made to future studies in terms of conducting the study and recommendations will be made to the management of the company researched to assist them in identifying and developing the soft attributes of CI that are essential to attain positive employee attitude and that will ultimately aid in successful implementation of CI programs.

5.2 Conclusion

5.2.1 Conclusions with regard to the literature review

The literature review highlighted Lean manufacturing (LM), its origins, principles and implementation factors. We expressed that Lean manufacturing is regarded as a continuous improvement initiative that aims at waste elimination and involves the participation of the whole organisation including customers and suppliers. LM consists of five key principles; value as perceived by the customer, value chain understanding of value and non-value added steps, flow of processes and product, pull driven by customer demands and the strive for perfection by total elimination of wasteful activities.

Lean Manufacturing implementation requires management to lead the change initiative to a LM organisation. It requires the entire organisation to adopt and believe in the principles of LM, learn and use the tools of LM that aid in identifying and eliminating waste, and most importantly, it requires management to develop a culture that promotes the quality values of CI, and an organisation that exhibits soft factors that contribute towards overall implementation. It was established that both the hard issues (tools) and soft issues (culture and organisational soft issues) are required for the successful implementation of CI programs.

Eleven cultural quality values of CI were identified as important components of a CI culture. These values included a shared vision (goals), customer focus, long term vision, continuous improvement, employee involvement, collaboration, data base decision making, system focus, quality at the same cost, urgency and purpose. In addition five key soft success factors for CI implementation were also discussed as part of creating a culture for continuous improvement. These soft key success factors included leadership, communication, training and development, implementation reasons and job security. The literature study suggests that both quality cultural values and other key soft success factors have a relationship on employee attitudes. These variables were then used in the empirical study to predict employee attitudes such as job satisfaction, employee commitment, and intentions to quit and work success.

5.2.2 Conclusions with regard to the empirical study

The empirical study shows acceptable Cronbach alpha coefficients were obtained for most of the scales based on the guideline of $\alpha > 0.70$. The quality cultural values of; Continuous improvement, goals and system focus had a few large correlation coefficient effects with other variables. The relationship for the five key soft success variables indicated mostly strong relationships with each other and the outcome variables.

The regression analysis showed that cultural quality values for goals, continuous improvement and purpose can predict work related attitudes for the manufacturing concern researched in this study. The regression analysis showed that other key success factors for CI of leadership, communication and job security can predict work

related outcomes for the manufacturing concern researched in this study. These findings were partially confirmed by previous studies where various soft key success factors were used to show the influence on work related attitudes. Karia et al., (2003) found that organisations who have adopted quality management practices have experienced an “overall improvement in organisation performance such as attitude, commitment, and effectiveness”. Boon et al (2005) confirmed this finding in their study that employees with a positive perception of the soft TQM concepts of leadership, education and training, and organisational culture, “lead to a higher level of employees work related attitudes”. Karia et al., (2006) found that, training and education, empowerment and teamwork, and continuous improvement had a significant positive effect on job satisfaction and employee commitment. Boeselie et al., (2001) examined the perceptions of employees on TQM policies against overall intentions to leave and found that a positive perception of employees on TQM concepts that lead to less intentions to leave.

The literature review highlighted the importance of focusing on the quality cultural values and other key soft success factors of CI and how these variables influence work related attitudes. Job satisfactions, employee commitment, intentions to quit and work success are important factors in determining success of change implementation programs. Creating a culture for CI impacts positively on work related attitudes and ultimately aids in implementation success (Avey et al., 2008).

5.3 Limitation of the Study

The research study was performed on a single manufacturing concern which is part of a multinational company. The study achieved responses for 48% of the total population of the company and based on these factors the study outcomes may not be applicable to other organisations. The survey questionnaire was only administered in English and not all respondents’ first language was English which could have resulted in a risk for misinterpretation and misunderstanding. The study is dependent on the truthfulness of respondent’s answers. The study assumes that only the soft factors of CI affect employee attitudes and have not included the hard factors (tools and techniques of CI implementation) impact on employee attitudes.

5.4 Recommendations

This section provides recommendations for future research undertaken in this field of study and in addition provides some guidance on this subject to the management of the company researched. After examination and analysis of the research findings the following recommendations are suggested.

Recommendation for future research in the area of CI soft variables and employee attitudes of job satisfaction, employee commitment, intentions to quit and work success

- Further studies should include a larger sample of the population in order to include better representation.
- This study includes one company that is part of a multinational company. Future studies should include the entire complement of companies to compare results and individual implementation success rates.
- The survey questionnaire was only in English and this could have impacted the understanding of questions by respondents. Future studies should consider the respective language of respondents and include different language interpretations of the survey.
- Future studies should also establish the impact of the hard side continuous improvement (tools and techniques of CI) impact on employee attitudes. This will assist in looking holistically at CI impact on employee attitudes.

Recommendations for management with regards to the research results

The research results indicate that cultural quality values like goals, continuous improvement and purpose have a strong impact on work related attitudes. Goals specifically, are a significant predictor of all work related attitudes of job satisfaction, employee commitment, intention to quit and work success. The results indicate for the other soft key success factors of CI implementation like leadership, training and job security have a strong impact on work related attitudes. Leadership specifically, is a significant predictor work related attitudes of employee commitment, intentions to quit and work success.

Based on the studies research and findings the following considerations should be taken into account in order to improve work related attitudes in a company undertaking continuous improvement implementation:

- Leadership should display a clear shared vision to enable a culture where employees can set goals that are aligned to the overall vision and strategy of the company.
- Leadership needs to communicate the objectives of undertaking a continuous improvement program to employees in order to achieve “buy in” of the implementation process. This communication should incorporate the fact that CI can strengthen job security. This will eliminate a culture of insecurity and employees intending to quit.
- The organisation should view the CI process as a long term process and aim at achieving incremental achievements with sustainment as a key objective. This will allow for a culture that understands the value of sacrificing short term gains for long term benefits.
- A formalised training and development plan that pertains to the specific CI program should be rolled out to all staff members. As in the case of Lean manufacturing, a good understanding of the core principles of Lean, understanding of identifying and eliminating waste and tools and techniques of Lean manufacturing should be a key basic requirement for all staff members.
- A good understanding of CI principles should incorporate promoting a culture of “creativity before capital” where the notion of quality does not necessarily cost money originates. This will allow for employees to feel free to express their innovativeness and creativity at work.
- Leadership should by example strive to improve all key cultural values that are included in this study in order to strengthen the organisations quality cultural values. Collaboration and employee involvement will foster a culture of inclusiveness and shared responsibility.
- Leadership should promote the use of data in order to make decisions. This will create a culture of fact finding and exhibits characteristics of good organisational justice in decision making.
- Leadership should create an environment that makes all employees feel valued and purposeful towards the company’s goals. This will enable a culture where

the employee knows that his or her contribution is valuable in terms of the bigger goal of the organisation.

- Leadership should promote the habit of reacting with urgency to issues. This will enable a culture that is pro-active and diligent at sorting out problems.
- Leadership should strive to not find fault in people, but rather look at the system and process first to establish problems. This will promote a blameless culture, where people are free to express problems without fear of being blamed and punished.

5.5 Conclusion

In conclusion, the research has demonstrated that creating a culture for continuous improvement is detrimental to the success for CI implementation. An organisation that exhibits high cultural values for quality and high soft key factors will exhibit more positive employee attitudes. Positive employee attitudes aid in the success of change implementation programs. Continuous improvement is a long term journey powered by people.

5.6 Chapter Summary

This chapter presented the findings, limitations, recommendations for future research, and recommendations to the management of the company researched, for the study conducted on continuous improvement (CI) cultural variables and soft key success factor for CI implementation on work related attitudes of job satisfaction, employee commitment, intentions to quit and work success.

Thus to finally conclude with a citation by author John Miller,

*“If you want to prosper for a year, grow rice.
If you want to prosper for a decade, plant trees.
If you want to prosper for a century, grow people”.*

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APPENDIX A – QUESTIONNAIRE

SECTION A GENERAL INFORMATION

1	JOB LEVEL	GENERAL	SUPERVISORY	MIDDLE MGT	SENIOR MGT	
2	GENDER	MALE	FEMALE			
3	AGE	18-25	26-35	36-50	>50	
4	HIGHEST QUALIFICATION	PRIMARY SCHOOL	HIGH SCHOOL	DIPLOMA	DEGREE	POST DEGREE

SECTION B PARTICIPATION IN LEAN EVENTS

1	No of Kaizens attended in the past 2 years	0	1-2	2-3	3-5	>5
2	Level of Lean Training (belt)	None	White	Orange	Green	Black

SECTION C SURVEY

Please rate the extent to which you agree/disagree with the following statements by making an "X" over the appropriate number on the 1 to 5 point scale next to the statement.

1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
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1	In setting my own work goals, I consider the overall vision of the company.	1	2	3	4	5
2	I understand our companies strategy and can associate my work with it.	1	2	3	4	5
3	The company's overall vision and goals guide my day-day work in my department.	1	2	3	4	5
4	I believe that standards for company performance should be determined by external customers.	1	2	3	4	5
5	I believe that customer focus should be the drive for quality products.	1	2	3	4	5
6	I believe that a customer's focus should be a significant input in company strategy.	1	2	3	4	5
7	I believe that our company should be long-term focused.	1	2	3	4	5
8	I don't believe that when there is a change in senior management our long term objectives should change.	1	2	3	4	5
9	I believe that when we introduce a major company improvement program, we should give it at least 3 years to show results.	1	2	3	4	5
10	I use continuous improvement concepts/tools to improve the way I work.	1	2	3	4	5

11	I encourage continuous improvement initiatives and seldom support the protection of the status quo.	1	2	3	4	5
12	In addition to performing my tasks, I constantly improve on it.	1	2	3	4	5
13	Part of my job includes working on projects aimed at employee involvement.	1	2	3	4	5
14	I encourage employee involvement in my department.	1	2	3	4	5
15	I promote employee involvement initiatives in my department.	1	2	3	4	5
16	I encourage teamwork in my department and with other departments.	1	2	3	4	5
17	I frequently have conversations about my work methods with employees from other departments.	1	2	3	4	5
18	I structure my work time to allow opportunity to team up with other employees.	1	2	3	4	5
19	I use data to determine my decisions.	1	2	3	4	5
20	If I propose a change I bring data to support my decision.	1	2	3	4	5
21	I test my assumptions about causes of problems with data.	1	2	3	4	5
22	When something goes wrong, I look for the cause in our process rather than in specific employees.	1	2	3	4	5
23	When there is a problem, I identify where the system needs to be improved.	1	2	3	4	5
24	When someone is performing poorly I try to identify where the system is failing him or her.	1	2	3	4	5
25	Improving the quality of my work does not require additional money.	1	2	3	4	5
26	My approach to work can be improved without increasing the department budget.	1	2	3	4	5
27	I have made changes to improve my work outcomes without additional resources.	1	2	3	4	5
28	I consider my work meaningful.	1	2	3	4	5
29	I contribute to the purpose of the company.	1	2	3	4	5
30	I play a significant role in this company.	1	2	3	4	5
31	I have a strong desire to make improvements.	1	2	3	4	5
32	When I identify an improvement I implement it immediately.	1	2	3	4	5
33	As soon as issues arise, I initiate projects to address them.	1	2	3	4	5
34	Our company uses continuous improvement (CI) tools to compete in the global environment.	1	2	3	4	5
35	The company is working hard to reduce lead-times and eliminate waste in processes to meet business goals and objectives that benefit the Company and its employees.	1	2	3	4	5

36	The company rewards people who work hard to bring lean tools and culture to the area.	1	2	3	4	5
37	CI efforts help bring in new jobs due to an increase in quality and process improvements.	1	2	3	4	5
38	Management ensure that we use continuous improvement (CI) tools in our company.	1	2	3	4	5
39	Management ensure that CI is used to increase our company performance.	1	2	3	4	5
40	Management is committed to CI throughout the year and not just compliant during an audit.	1	2	3	4	5
41	Management follows through with issues on improvement events until they are completed.	1	2	3	4	5
42	People leading improvement initiatives are trained to effectively teach and guide CI in our company.	1	2	3	4	5
43	Our company encourage training and knowledge sharing of CI tools to apply at work.	1	2	3	4	5
44	The company provides me adequate training to be productive during improvement events.	1	2	3	4	5
45	CI training is provided with practical examples on how to best use CI tools.	1	2	3	4	5
46	We have timely and effective communication on all CI programs and tools rolled out by the company.	1	2	3	4	5
47	Our company values inputs from employees on continuous improvement.	1	2	3	4	5
48	Our company encourages communication about CI projects.	1	2	3	4	5
49	Our company works hard at sharing best practices throughout all its divisions on CI.	1	2	3	4	5
50	CI has increased our job security.	1	2	3	4	5
51	Our company focuses on securing jobs by utilising concepts like Lean and its tools (kaizen, 5S, TPM, etc).	1	2	3	4	5
52	Our company will do everything possible to reduce layoffs.	1	2	3	4	5
53	Our company believes their most valuable assets are their employees.	1	2	3	4	5
54	In most ways my job is close to my ideal.	1	2	3	4	5
55	The working conditions are excellent.	1	2	3	4	5
56	I am satisfied with my job.	1	2	3	4	5
57	So far my job provides me the important things I want in life.	1	2	3	4	5
58	If I could live my life over I would not change my job.	1	2	3	4	5
59	My job makes life is worth living.	1	2	3	4	5
60	All in all, I am satisfied with my job these days.	1	2	3	4	5

61	I feel that it is worthwhile to work hard for this organisation.	1	2	3	4	5
62	I am committed to this organisation.	1	2	3	4	5
63	I am prepared to take on more responsibility not in my job description.	1	2	3	4	5
64	I enjoy working for this organisation and I am not seeking a job elsewhere.	1	2	3	4	5
65	I am proud of this organisation.	1	2	3	4	5
66	I often consider quitting my job	1	2	3	4	5
67	I am looking for another job	1	2	3	4	5
68	I frequently ask around for a job somewhere else	1	2	3	4	5
69	I am always on time for my work.	1	2	3	4	5
70	I always meet deadlines in my work.	1	2	3	4	5
71	I do my work exactly as instructed by my superior.	1	2	3	4	5
72	I do my work well enough to be complimented for it by my superiors.	1	2	3	4	5
73	I do my work well enough to be complimented for it by my work team members.	1	2	3	4	5
74	I never pretend to be sick to be given leave to stay at home.	1	2	3	4	5
75	I have a good reputation among my co-workers.	1	2	3	4	5
76	My co-workers respect me for the value I add to our organisation.	1	2	3	4	5

APPENDIX B – DESCRIPTIVE STATISTICS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Skewness	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Goals	149	2	5	4.11	.595	-.863	.199	2.129	.395
Customerfocus	149	2	5	4.16	.588	-.521	.199	.188	.395
Longtermview	149	2	5	3.98	.659	-.764	.199	.526	.395
ContinuousImprovement	149	1	5	4.11	.620	-1.055	.199	2.465	.395
EmployeeInvolvement	149	1	5	4.09	.775	-1.047	.199	2.144	.395
Collaboration	149	2	5	3.87	.737	-.694	.199	.586	.395
DatabasedDM	149	1	5	3.71	.708	-.538	.199	1.201	.395
Systemfocus	149	1	5	4.08	.682	-1.247	.199	4.025	.395
Qualitycost	149	1	5	3.65	.891	-.522	.199	.202	.395
Purpose	149	1	5	4.29	.712	-1.522	.199	3.534	.395
Urgency	149	1	5	4.06	.607	-.862	.199	1.955	.395
ImplementationCI	149	2	5	3.81	.654	-.307	.199	.280	.395
LeadershipcommitmentCI	149	2	5	3.82	.752	-.627	.199	.101	.395
TrainingCI	149	2	5	3.87	.687	-.341	.199	-.031	.395
CommunicationCI	149	2	5	3.80	.694	-.472	.199	.163	.395
JobsecurityCI	149	1	5	3.79	.852	-.805	.199	.443	.395
Jobsatisfaction	149	1	5	3.46	.842	-.233	.199	-.087	.395
Employeecommitment	149	1	5	3.79	.798	-.757	.199	1.299	.395
Intentions2quit	149	1	6	2.58	1.150	.700	.199	.009	.395
Worksuccess	149	2	5	4.28	.574	-.957	.199	2.347	.395
Valid N (listwise)	149								