

University of KwaZulu-Natal

**Critical success factors for sustaining continuous improvement
at Blendcor–Durban**

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DECLARATION

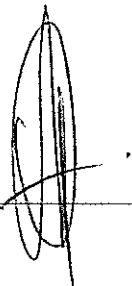
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The journey over the past two and half years has been incredible. It has been an emotional rollercoaster, culminating in great character building, becoming resilient and learning how to become a father. I wish to express my love and appreciation to my beautiful wife, Riona, and daughter, Azariah (MBA baby), who have been my pillars of strength and support.

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ABSTRACT

Innovation and increased knowledge management are the outcomes of successful continuous improvement deployment in an organisation. Innovation is a key strategy for growing economies and industries to maintain a competitive advantage. Knowledge management is an enabler of innovation and is considered as “the heartbeat” of continuous improvement. Blendcor which is an oils and lubricants manufacturer located in Durban introduced continuous improvement in 2011 to comply with international standards in manufacturing. Whilst Blendcor is in the infancy phase of the improvement journey, after four years, the results have not met the targets set by the company. In order to understand the problem a qualitative study was conducted among the senior management team to identify the barriers inhibiting the sustainability of continuous improvement and the critical success factors required to overcome the barriers. A qualitative study was chosen in order to obtain rich data that would get to the heart of the problem and to understand how the leadership were implementing continuous improvement. Eight face-to-face interviews were conducted based on an open ended interview schedule. Follow-up questions were asked for clarity and to expand on points that were raised by the participants. The responses were captured verbatim and were input into NVIVO for analysis. A number of themes emerged from the study. The lack of leadership commitment, goal misalignment and improper change management were the critical barriers experienced by the organisation. The results have demonstrated that these factors have the greatest impact on the sustainability of continuous improvement in the organisation. The empirical findings provided a platform for recommendations to overcome these barriers. The alignment of goals, effective change management and competency are the critical factors highlighted to overcome the barriers mentioned. It is critical that the leadership team assess the current situation and act on the recommendations immediately. The benefits of an effective continuous improvement plan will ensure focus and clear objectives, saving time and resources.

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LIST OF ACRONYMS AND ABBREVIATIONS

5S	sift, sort, shine, set and sustain
BP	British Petroleum
CEO	chief executive officer
CI	continuous improvement
CIRCA	Continuous Improvement Resource for Competitive Advantage
CT	cycle time
DMAIC	define, measure, analyse, improve and control
FTY	first time yield
GM	General Motors
GPA	general performance assessment
HIV-AIDS	human immunodeficiency virus infection / acquired immune deficiency syndrome
HR	human resources
IDP	individual development plan
IT	information technology
JV	joint venture
MCE	manufacturing cycle efficiency
NCR	National Cashier Register
NUMMI	New United Motor Manufacturing, Inc.
PDCA	plan, do, check and act
SAB	South African Breweries
SETA	Sector Education and Training Authorities
SME	subject matter expert
SOP	standard operating procedures
TPS	Toyota Production System
TQM	Total Quality Management
TWI	“Training within the Industry”
US	United States
VPM	visual performance management
ZD	zero defects

CHAPTER 1

Overview of the Study

1.1. Introduction

Shareholders are constantly demanding favourable return on investments. These are driven by reduction in operational costs through improvement initiatives. As a result, business processes are constantly being reviewed with the focus on improving the efficiency of value add activities and eliminating waste and non-value-add activities. Organisations are trialling and adopting continuous improvement (CI) tools to ensure that their business objectives are met. Madrigal (2012) stated that in a highly competitive environment firms need to focus on value-added activities to ensure sustainable growth. CI is the methodology that is used to gain these advantages. In order for manufacturing to successfully implement CI initiatives there needs to be an understanding of the factors that ensure successful deployment and sustainability thereafter. The aim of this research study was to highlight the critical success factors required to ensure sustainability of CI initiatives.

The aim of this chapter is to provide an overview of the research and provide motivation for the study. This chapter provides a summary outline of the population and sample size, the research methodology chosen, the data collection methods used and the limitations of this study.

1.2. Motivation for the study

Empirical studies have indicated that continuous improvement initiatives fail due to the lack of understanding of the critical success factors required during implementation. Many companies experience temporary gains but few succeed in sustaining the initial benefits of continuous improvement (Vermaak, 2008).

Balle (2005) stated that whilst continuous improvement initiatives are rich in information and theory there is poor sustainability at the shop floor and lack of employee involvement.

The study was undertaken using Blendcor as its location and hence the organisation will derive the most direct benefit from the study. Blendcor is in the infancy phase of the improvement journey, as continuous improvement has only been implemented since 2011.

However, the results are not commensurate with the efforts put into continuous improvement. Therefore it is important to ensure that the barriers are eliminated at an early stage through the implementation of sustainable systems. A better understanding of success factors will allow Blendcor to focus significant effort to ensure success with continuous improvement initiatives.

The study provides an overview of continuous improvement methodologies and discusses the intent of the tools. It thereafter discusses the benefits of well executed plans and the inhibiting factors in the implementation of continuous improvement tools. This study will benefit other organisations that have implemented continuous improvement tools as well as those who have yet to start. The study describes in detail the experiences of the leadership team at Blendcor, gaining an in-depth understanding of problem areas and thereafter identifying corrective measures. Further this dissertation outlines the critical success factors of Blendcor to sustain continuous improvement over the next few years.

1.3. Problem statement

Innovation is a significant factor in supporting economic growth. Knowledge management plays a key role in improving skills development in the country. Continuous improvement is a philosophy that is a recognised enabler for innovation and skills development. International organisations over the years have proved the effectiveness of this philosophy by saving large amounts of money and developing the skills and competencies in their organisations.

However, based on the literature review, continuous improvement still faces many challenges with the main one being sustainability. This raises the questions, “What are the underlying issues and what are the measures that need to be put in place to sustain these practices”. An empirical study in order to address the question was conducted.

1.4. Aim and objectives

The aim of this study was to determine the critical success factors for effective continuous improvement implementation at Blendcor through engagements with executive management

The objectives are listed below:

- To determine the current status of continuous improvement at Blendcor.

- To identify barriers affecting continuous improvement initiatives.
- To establish managements contribution to continuous improvement.
- To identify critical success factors for the sustainability of continuous improvement at Blendcor.

1.5. Focus of this study

Blendcor follows the SHELL and BP Continuous Improvement framework based on the joint venture (JV) partnership. The critical success factors are based on the Continuous Improvement framework from SHELL and BP. The current issues and success factors from the SHELL and BP plant are not included in this study.

The research study explored the tools that Blendcor can adopt to strategically progress on the continuous improvement agenda and may be a starting point for further research by SHELL and BP internationally. This study focused on the Blendcor Leadership team based at the Durban plant.

1.6. Data collection methods and treatment of data

An interview schedule (Appendix 3) was utilised whereby prescribed questions were formulated based on the research objectives. The questions were designed to ensure responses were as unbiased as possible. This afforded flexibility during data collection as the researcher could ask probing questions to gain clarity or insight into the topic. The data was organised into categories, sub-categories, patterns and relationships and is presented in this dissertation.

Visual representation of the results are used to present the data. This is achieved through the use of theme tables, word clouds, graphs and mind maps. Direct quotations from respondents are used to clarify and support findings as part of the data analysis step.

1.7. Limitations of the study

In qualitative studies, results are usually not generalisable (White, 2002). The purpose of the study was not to gather generalisable data, but to obtain opinions from experienced leaders who are responsible for policy development and the overall strategy, ensuring reliability of data. The study only focused on executive leadership and did not include other organisational levels of the business. Further limitations are discussed in Chapter 5.

1.8. Outline of the study

A systematic and structured approach was used during the research process. The study is documented and presented in five chapters (Table 1.1).

Table 1.1: Outline of the research process

Chapter	Content
1	Chapter 1 provides an overview of the research study. The motivation for the study and the problem statement are presented. The aims and objectives of the study are stated and the motivation and the sampling method used are described. The data collection method that was used is justified and any limitations to this study are clearly explained.
2	Chapter 2, the literature review, introduces the history and definition of continuous improvement. The philosophies and methodologies are discussed. The benefits and inhibitors are explained. The maturity framework and issues in South Africa complete the chapter.
3	Chapter 3 provides an overview of the research methodology and design. After documenting the various research options available to the researcher, justification is provided for the specific research methods employed in this study. Sampling decisions and a data collection strategy are also documented.
4	Chapter 4 presents and analyses the data collected. It provides a description of the participants followed by presentation and analysis of the data structured by the objectives of the study.
5	This chapter is the concluding chapter of this study and highlights specific conclusions that may be drawn, and focuses on recommendations based on the findings. The limitations of the study are also highlighted. The chapter concludes with recommendations for further research.

1.9. Summary

The competitive rivalry in the oil and lubricant industry is fierce and gaining a competitive advantage over rivals is critical due to rising costs and challenging economic conditions in the country. This study is aimed at assisting Blendcor in effectively using improvement tools to foster operational excellence. This chapter has presented an overview of the research project. The motivation for the study, focus area and the problem statement of the study have been explained. The research question and related research objectives were

presented, outlining the research process. The next chapter will review various sources of literature related to continuous improvement to gain an in-depth understanding of the concept and application. This will form the theoretical basis for the empirical study to follow.

CHAPTER 2

Literature Review

2.1. Introduction

In a highly competitive environment, organisations survive through differentiation, superior quality and effective cost management. The global recession in 2008 forced organisations to carefully assess their improvement tools and ensure correct continuous improvement strategies were in place to gain a competitive advantage over their rivals. The drive of competitive companies is to ensure that performance progresses periodically and that they have a competitive advantage over their rivals (Canel, Rosen & Anderson, 2000).

Continuous improvement has deep roots, based on the Japanese management philosophy, pioneered by the Toyota Motor Corporation, and continuous improvement tools are now used across all sectors around the world. Motorola, Johnson and Johnson and General Electric attribute their success to the Six Sigma methodology and other companies have mimicked the process (Schroeder & Robinson, 1991).

Toyota faced a global crisis in 2012, with massive recalls across the globe due to technical problems in their production process. Some of the reasons for the crisis were attributed to the new generation of staff and their lack of skill and commitment. The previous generations of skilled and motivated staff were committed to ensuring the success of Toyota and were indoctrinated to think that they will be forever in-debited to the company for the employment opportunity. Motorola and 3M showed impressive results from continuous improvement projects, however, they have lost substantial market share over the last few years and have also seen a reduction in innovation, post the project completion (Liker & Franz, 2011).

Continuous improvement is not just an implementation of tools and practices but requires a significant change in organisational culture and mindset. Sustainability of continuous improvement is a problem faced by most companies, including the leaders and experts of this concept (Madrigal, 2012).

Companies spend a considerable amount of money and allocate resources to deploy continuous improvement. Therefore, it is important that the key intents of the practices are

understood, success factors are determined and plans are based on the improvement in the maturity of continuous improvement.

This chapter discusses an overview of the history, philosophy, methodologies, benefits, maturity framework, sustainability, limitation factors and inhibitors of continuous improvement with a view towards understanding the critical success factors required to sustain continuous improvement.

2.2. History of continuous improvement

The earliest application of continuous improvement (CI) methodology dates back to the 1800s, in Scotland, where a shipbuilding company implemented a reward and recognition system based on improvements in the workplace (Bhuiyan & Baghel, 2005). The intention of the programme was to develop new and improved ways of work, whilst reducing operating costs.

During the early stages of continuous improvement, the National Cashier Register Company (NCR), experienced large shipment returns. The manager, John Henry Patterson, conducted a detailed problem-solving exercise, which indicated that acid had been poured into the cash registers. Upon further investigation, it was revealed that workers were unhappy with the harsh environmental conditions at the workplace and intentionally sabotaged operations. Patterson then improved working conditions through suggestion schemes. Subsequently, there was a reduction in the absenteeism rate and improvement in productivity (Schroeder & Robinson, 1991).

Post World War II, saw the collaboration between the United States (US) and Japanese manufacturing industries. The outcomes were based on the “Training within the Industry” (TWI) methodology which was created and adopted by the US during the war. This was a structured training programme, supported by job procedures, instructions and methods (Liker & Hoseus, 2008). The US assisted the Japanese in rebuilding their manufacturing industries with this approach whereby TWI coaches from the US were sent to Japan to assist in the roll out. Toshiba, Matsushita Electric and Toyota were the first companies to participate in the activity and rolled out the learnings nationally. The mass training exercise, which became known as Japanese management, also established Kaizen (continuous improvement) as a recognised method of operation (Schroeder & Robinson, 1991).

However, Japanese companies took continuous improvement methodology a step further, with the direct focus on quality management (Imai, 1986). This led to the Zero defects (ZD) movement at NEC in 1965, which resulted in workers agreeing targets of no defects with the employees. After the success of these projects in Japan, the world took notice and relooked their business operations, with Edwards Deming, Kaoru Ishikawa, Joseph Juran, Genichi Taguchi, Walter Shewhart becoming thought leaders and experts on the subject of continuous improvement (McKee, 2009).

However, there remain variations to the definition and application of continuous improvement, as business has evolved over the years.

2.3. Definition of continuous improvement

The term continuous improvement has been used for many decades as a broad philosophy amongst organisations; however, the core intent of continuous improvement is common amongst organisations that have successfully adopted this approach (Hansson, 2003). The term continuous is derived from the Latin word *continuus*, meaning to hold together. The word „improvement“ is the state of being improved or the quality of being better than before (Merriam-Webster, 2015). Wickens (1998) stated that all improvements must be based on the continuous search for excellence which is the essential base for continuous improvement.

According to Stålberg (2014, p. 21), “Continuous improvement is an improvement process that is constant, endless and on-going and includes various types of improvements ranging from incremental improvements to improvements of a more radical nature”. McKee (2009) defined continuous improvement as a quality philosophy that forms the basis of evaluation of processes and assumes that improvement is always possible. The aim of the philosophy is twofold with the increase in quality and reduction or elimination, of all forms of waste, ensuring customer satisfaction. However, Stålberg and Fundin (2014) stated that an accurate definition cannot be attained as the concept has different understandings based on the application and the environment.

There are common standards that are shared and used by all approaches of continuous improvement. One of these standards is that continuous improvement is a living activity whereby it is an ongoing process that requires continuous learning, which not only leads to improved quality but better performance in profit, productivity, costs and employee and

customer satisfaction. Another common standard is that everyone in the organisation must participate, including senior management (Madrigal, 2012, Stålberg, 2014, Stålberg & Fundin, 2014).

Van der Westhuizen (2008) affirmed the concept of a continuous learning organisation, stating that the heart of improvement is a learning organisation which is focused on ongoing experimentation and learning from past mistakes. Continuous improvement can also be described as an enabler for innovation as it creates an environment that is conducive to creativity through learning whereby there is alignment with personal objectives and that of the company (Quesada-Pineda & Madrigal, 2013). According to Page (2010, p. 23), “Continuous improvement means achieving a new mindset by which ongoing improvement is the natural course of business instead of an event. This will help to validate that the business process continually delivers effectiveness, efficiency and adaptability to the organisation”. Page (2010) furthermore describes CI as a business monitoring tool whereby processes are improved through monitoring and optimisation of the continuous sequential flow. However, Wickens (1998) suggested that continuous improvement should be seen as a special activity, rather than normal work. He warned against receiving additional reward when the practices are deployed effectively. For continuous improvement to be effective, employees need to feel secure and strive to eliminate non value-adding activities. This should be incorporated into standard work and practices. Liker and Franz (2011) stated that the plan, do, check and act (PDCA) or Deming cycle is the core of continuous improvement as the methodology is structured to plan and get to the systemic aspects of the problem.

2.4. Continuous improvement philosophies

The philosophies of continuous improvement are based on achieving small, incremental changes instead of rigorous changes (Prošić, 2011). The thinking revolves around creating simplistic tools to control critical outputs (Berger, 1997).

2.4.1. Deming cycle

Dr E. Deming is considered the father of modern quality control. He developed a practical continuous improvement model for improvements in products and processes. The Deming cycle, also known as the Deming Wheel has its roots in the Bell laboratories in New York where Deming worked with mentor, Walter Shewhart (Deming Institute, 2010).

Singh and Singh (2009, p. 53) stated that “The Deming cycle is a continuous quality improvement model consisting of a logical sequence of four repetitive steps for continuous Improvement and learning”. These four steps are more commonly known as the PDCA cycle. Berger (1997) described the PDCA cycle as framework model for continuous improvement, which makes the process visible and measurable, as illustrated in Figure 2.1.

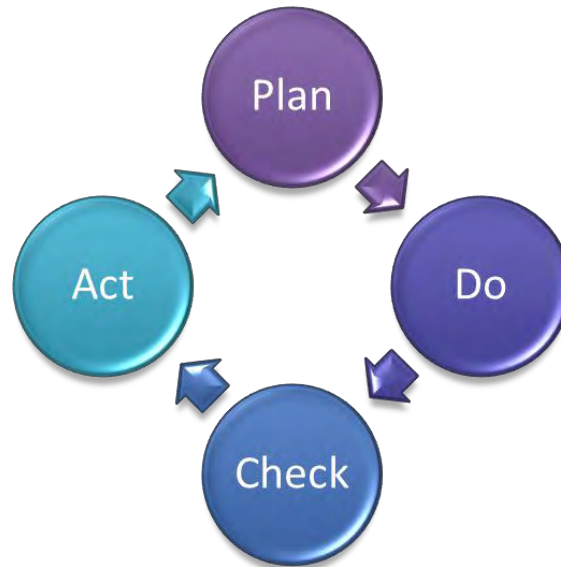


Figure 2.1: The Deming cycle

Source: Adapted from Liker, J. & Franz, J. 2011. *The Toyota Way to Continuous Improvement: Linking Strategy and Operational Excellence to Achieve Superior Performance*. McGraw-Hill, New York.

The PDCA cycle is a platform for workers to test ideas and thereafter propose solutions to management.

- **Plan**

Moen and Norman (2009) stated that the Plan phase describes the problem and hypothesises possible causes and solutions. The key intent of this phase is to ensure that the problem description is accurate and free of vagueness and ambiguity. Liker and Franz (2011, p. 27) explained the three steps of the Plan phase as identifying the gap to target, analysing the root cause and formulating countermeasures. The identification of the gap to target is achieved through tracking of key performance indicators at the defined intervals. The root cause analysis clarifies the area of focus, whilst the formulation of countermeasures should adequately resolve the root cause.

- **Do**

Liker and Franz (2011) explained the three steps of the Do phase as the development of the implementation plan, clear communication of the plan and timeous execution of the plan. The Do phase must be a follow up to the Plan phase and link to the implementation plan, whereby the root causes and countermeasures are aligned. Vermaak (2008) stated that the critical element of the Do phase is the execution of the plan as majority of the activity happens at this stage.

- **Check**

Moen and Norman (2009) explained the Check phase, as the review of results from the Do phase. The three steps of the Check phase are the monitoring of progress, modification of the plan if necessary and the constant monitoring of results (Liker & Franz, 2011).

- **Act**

The Act phase corrects the process should there be misalignment (Moen & Norman, 2009). If the results are unsatisfactory then the project needs to go back to the Plan phase. It is highly likely that the problem statement or root cause was not properly defined. However, if results are favourable, then the process must be standardised. Liker and Franz (2011) added that further improvement projects can stem from the success of the last project. The PDCA cycle can start again to achieve new targets.

2.4.2. Kaizen

Imai (1986) used the term *kaizen* to define continuous improvement as an “...ongoing improvement involving everyone, including both workers and managers. The kaizen philosophy assumes that one’s way of life, be it one’s working life, and social life, deserves to be constantly improved”. Kaizen is thus a state of mind that encourages everyone to consider it unusual when conditions do not evolve continuously (Schroeder & Robinson, 1991). Chen, Dugger and Hammer (2000) defined kaizen as a Japanese term that indicates continuous improvement through effective standardisation of work. Palmer (2001) stated that word *kaizen* is a compound of two concepts, Kai (change) and Zen (for the better). The process involves producing incremental improvement, through the elimination of all forms of waste that adds no value to the organisation (Liker & Hoseus, 2008).

Bergmen and Klefsjö (2010), Stålberg and Fundin (2014) interpreted kaizen as continuous improvement that is aimed at improving the way work is conducted and organised. The role of standardised work is of utmost importance, as this is used as the basis for improvement. From this base, better ways of work are created and thus become the new standard to build on. However, Brunet (2000) highlighted the potential disadvantages of Kaizen activities. These include the burden of lower level management, as they are required to be present on the shop floor and also to ensure that administration tasks are completed timeously. The continuous improvement methodologies are derived from the philosophies of the Deming cycle and kaizen.

2.5. Continuous improvement methodologies

There are numerous continuous improvement methodologies that have developed over the years, however, the most recognized are Total Quality Management (TQM), Lean Manufacturing and Six sigma (Madrigal, 2012).

2.5.1. Total Quality Management - TQM

There are many descriptions of TQM, however, few have clear definitions (Hansson, 2003). Dale, Wu, Zairi, Williams and Van der Wiele (2001) used the analogy of an umbrella as concepts and ideologies related to quality improvement. The most important concept within the umbrella is mutual cooperation from all in the organisation to ensure that customers' needs and expectations are exceeded. Ishikawa, the quality guru and credited for creating the Japanese quality circle movement, defined TQM as a total system approach and involves all employees across all levels of the organisation, including customers and suppliers (Jorgensen & Nielsen, 2013). Flood (1993) described TQM as a complete system that requires managing sets of issues, which include technical issues, cultural issues and political issues.

However, Liker and Franz (2011) highlighted the problem of adaption to the system by organisations. The system was implemented in companies such as Allied Signal, Motorola and General Electric, and thereafter in other companies around the world. It became a "mindless" exercise that used statistics to reduce variation in processes. Often young and inexperienced individuals would analyse large amounts of data and propose recommendations, without an in-depth understanding of the process (Liker & Hoseus, 2008).

Ismail (2012) stated that many companies have failed to imitate TQM based on the “Japanese Way”, as they have focused purely on the product and not the TQM culture. The Japanese management style focuses on improving product quality and on individual and team management systems. Therefore, the successful adoption of TQM by foreign countries becomes difficult based on culture and management style. Webster (1999) stated that TQM is primarily culture based and often organisations fail due to the lack of focus on ensuring that the culture is extended to all facets of the organisation. Figure 2.2 shows committed leadership as the basis of TQM, with the focus on customers as the core intent.



Figure 2.2: The TQM cornerstone model

Source: Adapted from Bergmen, B. & Klefsjö, B. 2010. *Quality from Customer Needs to Customer Satisfaction*. Studentlitteratur, Lund.

Figure 2.2 highlights the primary focus of TQM on customers and committed leadership as the foundation. TQM requires focus on the process, the drive to continuously improve, decisions that are based on facts and the commitment from everybody.

- **Focus on process**

Olcay and Sadikoglu (2014) stated that focusing on the process resulted in reduced variation in process and improved overall product quality. This is achieved through physically monitoring the process and constantly analyzing data. According to Gharakhani et al. (2013) the benefits of focusing on the process, are reduced complexity and reduced variation which is achieved through greater understanding of the process.

- **Improve continuously**

Westcott (2013) stated that continuous improvement is the driver of TQM and provides organisations with creative tools to deal with complex problems. Gharakhani et al. (2013) stated that TQM requires continual improvement of practices in all functions of the organisation. The quality improvement journey towards “zero defects” can only be achieved through the implementation of a continuous improvement framework.

- **Let everybody be committed**

Employees need to be involved in the process of developing the strategy of continuous improvement. This is achieved through the empowerment of employees by increasing their decision making powers (Thamizhmanii and Hasan, 2010). Njie et al. (2008) indicated that employee commitment is only achieved if there is top management commitment. The relationship between employee and management is a vital component in building sustainable solutions.

- **Base decision on facts**

The performance indicators of an organisation need to be updated and tracked continuously to ensure that business can make accurate decisions based on historical and current data trends. (Westcott, 2013). Solms (2013) indicated that the benefit of factual data improves decision making through the increased ability to trust available data.

- **Committed leadership**

Gharakhani et al. (2013) highlighted the lack of management commitment as the reason for many TQM implementation failures. Participation starts at management level and filters through to employees. Hasmhi (2000) stated that the TQM implementation program is a long journey and requires constant leadership visibility and commitment. This will ensure that employees are held accountable for delivery and will improve employee involvement.

- **Focus on customer**

The basis of quality parameters are determined by requirements of the customer. The customer determines the level of effort required by the company to meet quality standards. (Westcott, 2013). Hasmhi (2000) stated that service relationships with internal customers,

assist companies to better understand customer requirements and hence ensure their efforts are aligned to quality requirements.

For improvements requiring elimination of waste, Lean manufacturing is the methodology to be used (Erikson, Andersson & Torstensson, 2006).

2.5.2. Lean manufacturing

After World War II, the automotive industry needed to improve efficiency and quality whilst reducing cost. Toyota Motor Corporation began using lean principles to improve their production lines (Schroeder & Robinson, 1991). By the 1980s, Toyota worker output was three times higher than that of their US and European counterparts. This system became known as the Toyota Production System (TPS) (Brunninkhuis, 2013).

Taichi Ohno, founder of the Toyota Production System, categorised muda (Japanese term for waste) into seven categories (Figure 2.3):



Figure 2.3: 7 Wastes

Source: Adapted from Nordin, N., Baba, M., & Dzuraidah, A. 2010. A Survey on Lean Manufacturing Implementation in Malaysian Automotive Industry. *International Journal of Innovation*, vol. 1, no. 4, pp. 374–380. World Scientific Publishing, London.

Figure 2.3 illustrates the seven types of waste defined in the Toyota Production System. Ohno described the continual reduction of waste as the heart of continuous improvement

(El-Namrouty & AbuShaaban 2013). Nordin *et al.* (2010) stated that the aim of Lean manufacturing is to achieve a state of smooth production flow, which is achieved through the elimination of waste and increasing value-adding activities. The identification of all non-value activities is the initial stage of any improvement initiative. Without proper identification of these activities the root cause cannot be determined. (Okpala, 2014). Kanaka (2013) explained the need for waste elimination by Toyota based on resource shortages post-World War. The Japanese classified all aspects of time, equipment, resources, material, and space that were required for the product. The additional aspects that did not constitute these elements of the product were considered waste.

According to Erikson *et al.* (2006) the improvement in process flow is the based on process analysis. Table 2.1 defines the metrics used in Lean manufacturing.

Table 2.1: Lean manufacturing tools

<i>Metric</i>	<i>Scope</i>
<i>Inventory turnover</i>	The amount of times inventory is sold and replaced over a defined period of time.
<i>Manufacturing cycle efficiency (MCE)</i>	The overall value-added time in total manufacturing time.
<i>First time yield (FTY)</i>	The overall yield from the original time through the process excluding any rework.
<i>Cycle time (CT)</i>	The duration of raw materials entering the plant until the product exits the manufacturing facility.
<i>Tact time</i>	The production speed required to meet output demand.
<i>Customer reject rate</i>	The measurement of rejects based on the customer feedback
<i>Lead time</i>	The time taken between placing an order and delivery to the customer.

Source: Adapted from Zugelder, T. 2012. *Lean Six Sigma Literature: A Review and Agenda for Future Research*. Unpublished M.Sci.-dissertation. The Ohio State University, Columbus.

The metrics in Table 2.1 are the quantitative metrics widely used in industry to measure the effectiveness of lean manufacturing tools. The metrics are based on rate of improvement and probability of achievement (Nightingale, 2005).

The main principles used to deploy lean manufacturing include standardised work, 5S (sort, sift, shine, set and sustain) and effective problem solving. (Earley, 2014).

2.5.2.1. 5S

Prabowo (2000) defined 5S as a structured methodology used to enforce organisation and standardization in the workplace, improving work efficiency and productivity. Korkut, Cakıcıer, Ulay, Seda Erdinler and Doğan (2009) stated that 5S provides order and discipline at organisations, whilst also improving quality and safety.



Figure 2.4: 5S steps

Source: Adapted from Korkut, D., Cakıcıer, N., Ulay, G., Seda Erdinler, E., & Doğan, A. 2009. 5S Activities and its Application at a Sample Company. *African Journal of Biotechnology*, vol. 8, no. 8, pp. 1720–1728. Academic Journals, Lagos.

The first step is sort, whereby there is disposal of unwanted items in the workspace. Step 2 and 3, set and shine, ensures that workplace is orderly and clean. Step 4, standardise, ensures that tasks are simplified. The last step, sustain, are the principles required to ensure that the workplace remains in good condition (Prabowo, 2000).

2.5.2.2. Standard operating practices

Standard operating practices, also known as SOPs, are written procedures with the purpose to define practices in accordance with agreed specifications (Grusenmeyer, 2003).

Bianca (2013) indicated that the benefits of well written SOPs are improving quality control, ensuring replication and routines and improving performance management.

However, the pitfalls are the limitations of creativity and deny flexibility (Amare, 2012). This is due to the well-structured format of the document.

2.5.2.3. Problem solving

Based on the PDCA cycle, problem solving is the process of defining a problem and implementing solutions to correct the deviation (Moen & Norman, 2009). The PDCA format is the most widely used problem-solving methodology as it is a team-based approach to problem solving (Gorenflo & Moran, 2009).

The primary intent of Lean manufacturing is to improve flow in process. For reduction in process variation, Six Sigma is deployed. Whilst Lean manufacturing's primary effect is reduced lead time, Six Sigma aims to reduce costs (Erikson *et al.*, 2006).

2.5.3. Six Sigma

Sigma originates from the Greek letter, σ , symbolising the standard deviation of population in statistics and mathematics. (Tikkala, 2014). Evans and Lindsay (2005, p. 3) defined Six Sigma as “ a business process improvement approach that seeks to find and eliminate causes of defects and errors, reduce cycle times and cost of operations, improve productivity, better meet customer expectations, and achieve higher asset utilization and returns on investment in manufacturing and service processes. It is based on a simple problem solving methodology - DMAIC, which stands for Define, Measure, Analyse, Improve and Control - that incorporates a wide variety of statistical and other types of process improvement tools”.

The foundation of Six Sigma is based on statistical analysis with the measurement being defects per million opportunities, with the Six Sigma equating to fewer than 3.4 errors per million opportunities (Zugelder, 2012; Evans & Lindsay, 2005). Motorola engineer Bill Smith developed and implemented Six Sigma in the 1980s. The focus was to improve quality management. Thereafter, General Electric, Sony, Samsung and other companies started to implement Six Sigma methodology, resulting in millions of dollars in savings and improvement in overall quality management and productivity (Khaidir, Habidin, Ali, Shazali & Jamaludin, 2013).

Successful implementation of Six Sigma requires a sound business philosophy, infrastructure and a set of defined methods. Projects are based on customer issues, business goals and priorities, and thereafter a selection process is conducted to select the most appropriate project based on risk, cost savings and complexity (Moore, 2008).

Apart from the large cash savings, quality improvement is also enhanced through successful application of Six Sigma methodology. Critical quality measures, measurement of defects and process capability are analysed to remove subjectivity within problem-solving teams. The systematic quantitative approach translates business strategy into tangible tasks. Savings and quality improvements are quantified and are based on data that is verifiable and accurate (Fursule, Bansod & Fursule, 2012). Table 2.2 illustrates the goal and analytical tools used during each phase of the project. The analytical tools primarily consist of statistical instruments (Tikkala, 2014) (Table 2.2).

Table 2.2: DMAIC

<i>Phase</i>	<i>Goal</i>	<i>Tools</i>
<i>Define</i>	This phase encompasses the definition of the product or process requiring improvement. In this phase the team working on the project and the customers' needs are determined.	Project Charter Voice of the customer gathering SIPOC (High-level process map) Stakeholder analysis Process flowcharts
<i>Measure</i>	Measures the influential factors and attributes of the problem and quantifies the problem.	Benchmarking Process sigma calculation Customer surveys, interviews VSM (Value stream mapping) Capability analysis Pareto charts
<i>Analyze</i>	This phase analyses and determines the root cause of the defined problem.	Time Series/Run Chart 5 Whys Hypothesis Testing (Continuous and Discrete) Cause-Effect diagrams Root-cause analysis
<i>Improve</i>	The Improve stage identifies solutions and improves the process by eliminating defects.	Pugh Matrix Brainstorm solutions Simulation Software The 5S method Design of Experiments Mistake Proofing

Control	The Control phase identifies systems to ensure sustainability of the solutions proposed in the Improve phase.	Control charts Training requirements Documented new processes Return on investment (ROI)
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Source: Adapted from Fursule, N., Bansod, V., & Fursule, S. 2012. Understanding the Benefits and Limitations of Six Sigma Methodology. *International Journal of Scientific and Research Publication*, vol. 2, no. 1, pp. 1–9. International Journal of Scientific and Research Publications, New Delhi.

However Zimmerman and Weiss (2005), highlighted inadequate information, selecting wrong Six Sigma projects, serving the wrong customer and failing to consider the human side of change as the downfalls of the Six Sigma methodology. Examples of poor morale were observed when Home Depot and 3M implemented Six Sigma. Therefore, Fursule *et al.* (2012) stated that Six Sigma should be a holistic approach that encompasses human behaviour change, with employees playing an integral part in the process.

Whilst there is differentiation between TQM, Lean manufacturing and Six Sigma, the aims and concepts are similar. These aims are focused on reduction of waste and resources, while improving quality performance and financial results. These aims are needed for organisations to gain the competitive advantage in a fiercely competitive environment (Erikson *et al.*, 2006).

2.6. The need for continuous improvement: Gaining the competitive advantage

According to Porter (1996), companies need to be flexible to respond to competition and market changes. This is done through benchmarking of best practices and improving continuously. “A company can outperform rivals only if it can establish a difference that it can preserve. It must deliver greater value to customers or create comparable value at a lower cost, or do both” (Porter, 1996, p. 2). The cost advantage is generated through activities that are more efficient than the competition, whilst also offering differentiation. The activities are then considered the units of competitive advantage. Canel *et al.* (2000) stated that customers’ expectations and demands have increased due to globalisation, new technologies and improved communications. This has forced companies to focus on product quality and customer satisfaction as differentiating factors. Due to ever-growing global competition, companies have no other alternative than to reduce costs, improve quality, whilst ensuring that customers’ needs are met. Improving operational excellence through continuous improvement in business practices is the differentiating factor for

sustaining the competitive advantage amongst rivals (Pettersson, 1990; McAdam & O'Hare, 1998; Bedell, 2014).

2.6.1. Improving operational excellence

General Electric reported an increase in market capitalisation from \$12 billion in 1960 to \$500 billion in 2000. They attributed the success to the continuous improvement initiatives that were adopted (Madrigal, 2012). The partnership between Toyota and General Motors (GM), in February 1984, called the New United Motor Manufacturing, Inc. (NUMMI) to produce the Chevrolet Nova and the Toyota Corolla was an opportunity to test the adoption of Japanese continuous improvement methodology being applied to an existing US facility. The GM facility in California had been closed in 1982 due to high absenteeism, poor productivity and major conflict between labour and management. With the implementation of continuous improvement through kaizen methodology, the plant began producing excellent results. The Wall Street Journal in 1986 reported that NUMMI “has managed to convert a crew of largely middle-aged, rabble-rousing former GM workers into a crack force that is beating the bumpers off the Big Three plants in efficiency and product quality” (Schroeder & Robinson, 1991). However, major Japanese electronics companies that were pioneers in continuous improvement methodologies recorded losses of \$21 billion in 2011, being overtaken by the Chinese and South Korea. Companies such as 3M, Motorola and General Electric who had invested heavily in continuous improvement methodologies such as Six Sigma and Lean manufacturing lost considerable market share. “The more you hardwire a company on total quality management, the more it is going to hurt breakthrough innovation” (Ashkenas, 2012, p. 1).

There is definitely a need for continuous improvement, however, the approach needs to ensure that the cultural impact is assessed and there is customisation of continuous methodologies to the organisation, thereby still promoting creativity (Ashkenas, 2012). The sustainable performance of results is attributed to a learning organisation that promotes continuous improvement in operational results (Ashogbon, 2012).

2.6.2. Improving knowledge management and organisational learning

“Knowledge management is the planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed” (King, 2009, p. 4).

Knowledge acquirement over the last decade has become a critical resource for the creation and sustainment of competitive advantage in a competitive environment. Improvement is gained through the incorporation of knowledge into the routines of an organisation; however, it requires a continuous improvement-based approach to be effective (Beeken, 2008).

Organisational memory is the foundation of the knowledge management base and is an indication of an organisation's absorptive capability. This is achieved through individuals' experience, life skills, personal capability and thereafter being codified through formalised documentation and procedures (Wang & Ahmed, 2002).

Creation of organisational knowledge begins with the social interaction between individuals whereby experiences and mental models are shared. Thereafter, individuals learn by doing and finally internalise new knowledge. Knowledge management matures as a resource capability when knowledge is rich, which is achieved through continuous improvement behaviours. This process further unlocks operational excellence activities through the ongoing development of an ever-growing knowledge management base (Beeken, 2008).

Knowledge management plays a significant role in organisations achieving sustainable competitive advantage. Considered an intangible asset, knowledge management strengthens core competencies through the transfer of skills and best practice. Tacit knowledge, which is the type of knowledge which is difficult to transfer as opposed to explicit knowledge, which is the formal codification of knowledge, has a positive correlation on attainment of competitive advantage (Rahimli, 2012). Organisational learning is the collective individual knowledge within an organisation. It is made up of an accumulation of individual learnings that are shared through personal and group interactions.

Nonaka and Takeuchi's knowledge creation model, illustrated in Figure 2.5, shows the link between individual, team and organisation knowledge transfer (Wang & Ahmed, 2002).

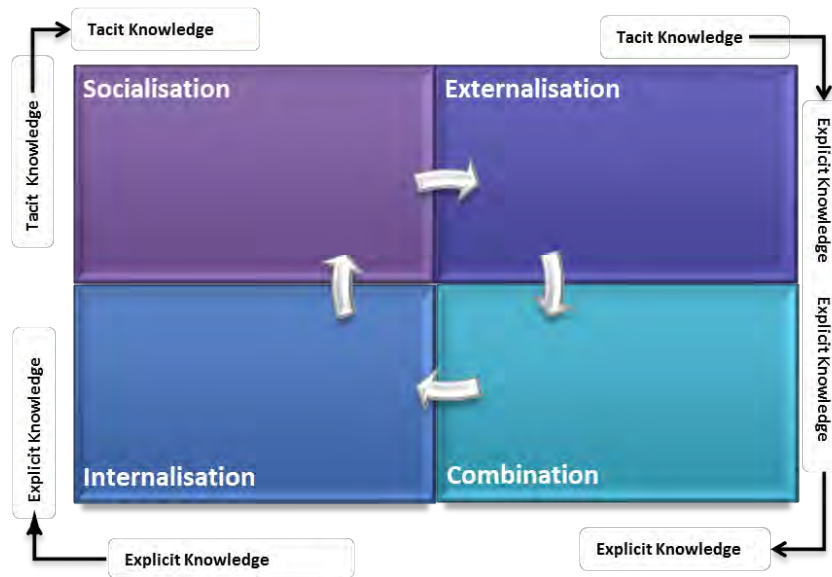


Figure 2.5: The knowledge conversion processes in a knowledge-creating organisation

Source: Adapted from Nonaka, I. & Takeuchi, H. 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press, Oxford.

The first step is socialisation whereby tacit knowledge is transferred between individuals. This is achieved through face-to-face communication and sharing of experiences. The second step is externalisation whereby the tacit knowledge is converted to explicit knowledge. This is achieved through the codifying and modelling of ideas. Combination is the explicit to explicit knowledge transfer that takes existing knowledge and creates a new form that is organised. The fourth step, internalisation (explicit to tacit) is the creation of new knowledge through the improvement of existing models (Nonaka & Takeuchi, 1995).

Ashogbon (2012) stated that the heart of continuous improvement is a learning organisation, which is constantly improving through the framework as discussed above. The result of effective continuous improvement implementation is improved operational performance and sustainable organisational performance. Organisational performance consists of improvement in skill competencies, safety and attendance, attitudes towards change, communication and cooperation (Atanasov, 2012). King (2009) stated that organisational learning and knowledge management are related to continuous improvement whereby best practices and processes are embedded. This is achieved through formalised documentation and training methodologies. However, Schulz (2001) stated that the learning and knowledge-sharing process is dispersed and unevenly distributed, causing

independent learning experiences which in turn cause a random jumble as compared to routine-based processes.

Rahimli (2012) stated that value from resources through knowledge management enhances innovation and the competitive advantage that would be created will be sustainable.

2.6.3. Creating innovation

Innovation is a necessity in gaining competitive advantage as Asian countries have improved and created new products that were initially considered western innovations. The continual focus on innovation creates the differentiating factor for successful companies (Vang Helgesen, 2009). Wong, Tjosvold and Liu (2008, p. 2): “Innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders”. Berkun (2014) described the lack of understanding between problem solving and innovation, indicating that the term is „loosely“ used in organisations. He defined innovation as a significant positive change.

In a study by Du Plessis (2007), she described innovation as the creation of new learnings and ideas to progress business processes and create market-driven services and products. The study found that innovation occurs through incremental and major improvements. Bendle (2012) created the link between continuous improvement and innovation, proposing that innovation is created through improvements and follows the PDCA cycle developed by Deming. Whilst the need for gaining a competitive advantage is clearly articulated by organisations, the limitations and inhibitors are not clearly understood (Jorgensen & Nielsen, 2013).

2.7. Factors affecting implementation of continuous improvement

Despite the simple definition and the benefits of continuous improvement implementation, it is not always successful and is difficult to sustain in the long term. Bessant, Caffyn and Gallagher (2001) stated that continuous improvement unleashes creativity and innovation, however, it indicates that success depends on a supportive organisation and relies on a learning organisation that is willing to explore and experiment to achieve new levels of excellence.

Kaye and Anderson (1999) listed the following as inhibitors to continuous improvement:

1. Lack of identification of critical success factors.

2. Lack of understanding of the concepts of quality and continuous improvement by some managers and employees.
3. Insufficient integration of continuous improvement activities
4. Existence of a blame culture when mistakes occur which may inhibit innovation.
5. Reliance on quick fixes and firefighting.
6. Low levels of employee empowerment.
7. Lack of non-financial performance measures in some organisations.

Jorgensen and Nielsen (2013) stated that a factor for the lack of sustainability of continuous improvement is due to inadequate tools and technology at the initial stages of deployment which senior management does not consider relevant due to associated costs linked to the need for automation and technology.

In a comprehensive literature review conducted by Madrigal (2012), she summarised the inhibitors of continuous improvement as outlined in Table 2.3. The lack of structured systems and effective planning are clearly highlighted as the core of the inhibitors.

Table 2.3: Inhibitors of continuous improvement sustainability

Factor	Inhibitors
Leadership and motivation	Lack of senior management support
	Little or no leadership characteristics or experience
	Insufficient motivation from leadership to justify the improvement
Measurement and information	Little or no measurement systems
	Information and data analysis is non-existent
	No proper information communication structure
Strategy and objectives	No targets and objectives set relating to CI
	A structured CI strategy is lacking
	Lack of CI measurable KPI's to determine progress
Training learning and skills	Learning and development not seen as a business objective
	No training on CI tools
Process issues	Problem solving structure is non-existent
	Projects are not completed on time
	Management of change is not adhered to.
Cultural issues	Majority of workforce resistant to change
	CI awareness lacking at all levels of the business
Others	Lack of CI resources
	No continuity of CI team
	All employees not involved in process

Source: Adapted from Madrigal, J.S. 2012. *Assessing Sustainability of the Continuous Improvement through the Identification of Enabling and Inhibiting Factors*. Unpublished Ph.D.Phil.-thesis. Virginia Polytechnic Institute and State University, Blacksburg.

The inhibitors to continuous improvement are largely linked to people rather than processes due to the nature of change and ineffective change management (Gunnarsdottir, 2014).

2.7.1. Change management

Change management is a continuous cycle that matches the organisation with changing business cycles to gain the competitive advantage (Digman, 1999).

Quesada-Pineda and Madrigal (2013) stated that change is the most important factor when implementing CI initiatives due to people requiring to work constantly with new ideas. Diaz (2013) highlighted organisations' resistance to change as the main obstacle when implementing CI initiatives.

Galpin (1996) listed the following crucial factors as required when implementing change:

- Goal alignment to new change process.
- Operational policies and procedures to reinforce new behaviour.
- Training on new ways of work.
- Recognition of employees who succeed in the new system by management.
- Communication of the change, pre- and post-implementation.
- Organisational structure.

2.7.2. Goal alignment

Ayers (2013) stated that goal alignment is achieved when the objectives and purposes of teams and individuals are aligned with the objectives and purposes of the organisation.

When the strategic goals and objectives are aligned, the result is clearer direction for the organisation (Cato & Gordon, 2012). Tosti and Jackson (2003) stated that goals emanate from the mission and vision of the organisation. They further added that leadership is the lever to ensure that alignment occurs.

Lunenburg (2011) highlighted the key aspects required for goal alignment as mutual agreement between both parties, ensuring goals are attainable and constant communication and feedback.

Bessant *et al.* (2001) indicated that effective change management is required to grow CI maturity in organisation.

2.8. A maturity framework for continuous improvement

The Continuous Improvement Research for Competitive Advantage (CIRCA) was developed in the 1900s by the Brighton Business School in collaboration with British industries. The model was intended to measure the effectiveness of continuous improvement application. CIRCA defined continuous improvement as “a company-wide process of enabling and sustaining a continuing stream of focused incremental innovation”. The definition covered small scale operations conducted by employees to the involvement of leadership in continuous improvement activities. Over 100 companies participated in interviews and case studies to develop a model that was fit for industry. The model was completed in 2001 by John Bessant and fellow researchers at the Brighton Business School. The model consists of five levels of maturity based on behaviours and abilities (Jansmyr & Nilsson Graas, 2012).

Bessant *et al.* (2001) stated that this model is powerful and provides a holistic evaluation of continuous improvement and supports the human resource development plan for industries, whereby training and evaluation could be based. However, Jorgensen and Nielsen (2013) indicated that the model is linear in nature and continuous improvement follows the path of the organisation, which is nonlinear in nature. This is due to the ever-changing strategies and focus of companies.

Table 2.4 illustrates the five stage evolution of continuous improvement developed by John Bessant.

Bessant *et al.* (2001) stated that prior to using the model, a prerequisite check needs to be conducted by the organisation. The first step is to diagnose the current state through audit tools that are focused on behavioural models. The next step is reinforcing correct behaviours and developing new ones to achieve excellence. The third step is to implement the new changes using appropriate enablers. The final step is to review and repeat the process.

Table 2.4: Five stages in the evolution of the CI system

CI maturity level	Characteristic behaviour patterns
Level 1 – (Pre-CI)	The concept is shown interest during crisis mode, visits by senior management to the plant and during audits. Implementation is carried out on an ad hoc basis.
Level 2 – (Structured CI)	There are plans in place to develop CI across the organisation and they have been approved by all levels of the organisation.
Level 3 – (Goal-oriented CI)	Key performance indicators are linked to CI initiatives and are established to drive business objectives.
Level 4 – (Proactive CI)	Individuals and teams are empowered to manage the CI implementation.
Level 5 - (Full CI Capability)	All systems are effective in linking business objectives. The culture of learning is embedded in the organisation.

Source: Adapted from Bessant, J., Caffyn, S., & Gallagher, M. 2001. An Evolutionary Model of Continuous Improvement Behaviour. *Technovation*, vol. 21, no. 2, pp. 67–77. Universidade Federal de Itajubá, Itajubá.

2.9. Factors affecting continuous improvement implementation in South Africa

Vermaak (2008) highlighted the two key factors affecting the successful implementation of continuous improvement in South Africa compared to the Japanese, namely culture and skills shortage .

2.9.1. Culture

Naidoo (2011) stated that teamwork, selflessness and group cohesiveness are the primary focus of Japanese culture. Gamble and Gamble (2010) stated that the Japanese are indoctrinated to show loyalty to the employee and are always indebted to the company. The high crime rate and law offences are examples of barriers that negatively impact culture in South Africa. The political issues over years have negatively affected personal commitment and motivation (Vermaak, 2008).

2.9.2. Skills shortage

There is a lack of skilled personnel in South Africa to meet the demands relating to business strategic intent and functionality of business. The misalignment between the Sector Education and Training Authorities (SETA) is a contributing factor. The aim is to ensure that there is a merging of theoretical and practical knowledge (Schroenn, 2015). A

consolidated report by the Solidarity Research Centre highlighted the factors causing the skills shortage crisis in South Africa. These factors which are large scale emigration, Employment Equity preventing skills workforce from being used, human immunodeficiency virus infection – acquired immune deficiency syndrome (HIV–AIDS) and school education standards are the key factors that are causing the crisis (Calldo, 2008).

2.10. Summary

Challenging economic conditions have forced companies to improve efficiency and effectiveness in all facets of business processes. Continuous improvement methodologies have been applied with the intent to improve performance measures in pre-determined timelines. The literature review suggests that continuous improvement is a powerful tool assisting organisations in gaining the competitive advantage in the market place. The benefits of an effective continuous improvement programme are that it results in cost benefits, waste reduction and improvement in product quality. As discussed, there is evidence suggesting significant improvement in performance indicators of global companies, based on successful implementation of continuous improvement tools.

This chapter has highlighted the main challenges experienced by organisations in the sustainment of continuous improvement initiatives, namely leadership support, employee involvement and lack of resources. However, there is minimal evidence indicating how the manufacturing sector and more specifically the oil industry can sustain the effectiveness of practices and tools of the continuous improvement framework. This gap has been addressed through empirical research based on insights of senior management at Blendcor. The following chapter will outline the methodology used to achieve the aim of the study.

CHAPTER 3

Research Methodology

3.1. Introduction

The previous chapter highlighted the need for continuous improvement in a competitive environment. Companies such as Motorola, 3M, General Electric and Toyota base their success on continuous improvement tools and methodologies. However, there are factors inhibiting the sustainment of continuous improvement.

The existing research has been limited in identifying the critical success factors for the oil manufacturing sector and hence the need for this study. This chapter discusses the research methods available and the justification of methods selected for this study.

3.2. Overview of Blendcor

Blendcor (Pty) Limited is a co-owned Shell and BP lubricants blending and grease manufacturing company. The site, comprising approximately 53000m², is situated in Island View, Durban, with its frontage on Honshu Road. The property is leased from the Transnet National Ports Authority and falls under the jurisdiction of the National Key Points Act. Both shareholders, Shell and BP, are part of the larger international organisations and as such Blendcor is considered an operating unit of these international companies. The performance of Shell and BP internationally is measured by the cumulative performances of the individual operating units. Hence, Blendcor is obliged to conform to the requirements of Shell and BP international standards in addition to the statutory, local, regional and national requirements.

Blendcor is registered as a company in terms of the Companies Act and operates as a cost centre. All operating costs are recovered from the shareholders. Capital projects are motivated and justified by Blendcor management and funded separately by the shareholders on approval. The CEO of Blendcor is the general manager (GM) who is appointed by the Blendcor Board of Directors. The Board comprises three appointees from Shell and three from BP. Blendcor employs 132 staff on a permanent basis and 30 on a contractual basis to carry out its day-to-day operations – these being conducted on a single shift basis. The plant is the largest lubricants manufacturing facility in Africa and produces

on average each year: 170 million litres of blended lubricants, 8 million kg of grease and distributes 50 million litres of base oil on behalf of its shareholders

3.3. Research methodology

Sekaran and Bougie (2010) described research as a step by step, rigorous and organised method of problem solving. This includes highlighting sub-problems, data collection, data analysis and drawing of conclusions. This approach is illustrated in Figure 3.1.

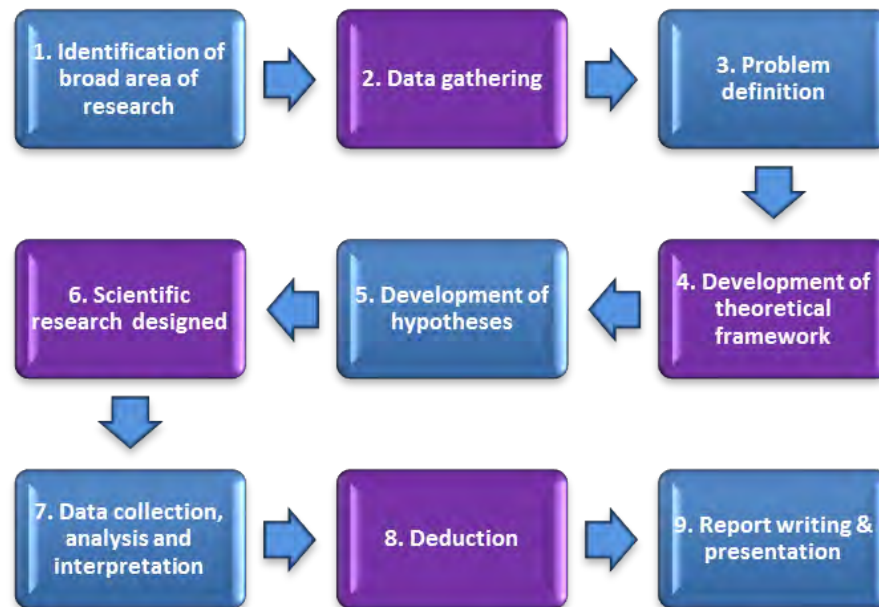


Figure 3.1: The research process

Source: Adapted from Sekaran, U. & Bougie, R. 2010. *Research Methods for Business*. John Wiley & Sons, West Sussex.

Kothari (2004) highlighted that steps are not mutually exclusive and activities might overlap; however, the guideline presented in Section 3.1 is a useful procedural guideline. White (2002) stated that the outcomes of research are improved business and management processes.

3.4. Aim and objectives

Leedy and Ormrod (2013) stated that research is triggered by an individual's quest to develop and increase their knowledge on issues or phenomena that require answers or clarity. Kothari (2004) highlighted the importance of the objective statement as it determines the data to be collected, characteristics of the data which is relevant and relations that need to be explored.

3.4.1. Aim

The aim of this study was to determine the critical success factors for effective continuous improvement implementation at Blendcor through engagements with executive management.

3.4.2. Objectives

The objectives are listed below:

- To determine the current status of continuous improvement at Blendcor.
- To identify barriers affecting continuous improvement initiatives.
- To establish management's contribution to continuous improvement.
- To identify critical success factors for the sustainability of continuous improvement at Blendcor.

3.5. Type of study

Sekaran and Bougie (2010) outlined the four types of study and highlighted the purpose of each type (Figure 3.2):

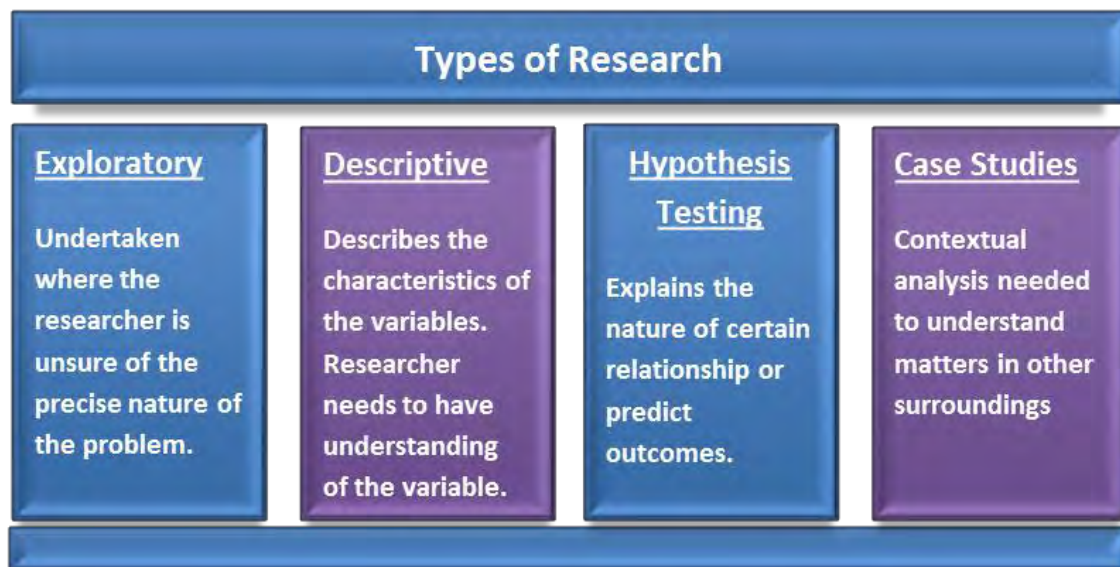


Figure 3.2: Types of research

Source: Adapted from Sekaran, U. & Bougie, R. 2010. *Research Methods for Business*. John Wiley & Sons, West Sussex.

Figure 3.2 provides an overview of the research objectives and selection of the type of study which is dependent on the researcher's nature of research. The literature review highlights the need to understand the systematic issues that hinders the sustainability of continuous improvement. This study was exploratory in nature as the critical success factors for Blendcor are unknown and emerging themes and topics will be a result of the study. Kowalczyk (2014) indicated that exploratory research lays the groundwork for future studies and develops new topics or new angles.

3.6. Approach

Johnson, Onwuegbuzie and Turner (2007) and Williams (2007) stated that there are three major research paradigms. These are quantitative, qualitative and mixed research. The selection of the approach is based on the aims and objectives of the researcher. The data and source of information will also inform the researcher of method to be used.

3.6.1. Quantitative research

Quantitative research methods involve numeric or statistical approaches to research design. (Williams, 2007). Tewksbury (2009) indicated that quantitative research is more "scientific" in approach, with the focus on concepts and variables.

This research method relies primarily on quantitative data whereby researchers test hypotheses and theories based on data (Johnson *et al.*, 2007).

3.6.2. Qualitative research

Qualitative research involves the describing, explaining and the interpretation of collected data (Williams, 2007). Tewksbury (2009) stated that the qualitative method provides depth of understanding of issues that are not possible through statistically based approaches. Qualitative research can also be described as a holistic view that involves discovery and occurs in a natural setting which enables the researcher to translate experiences into high level of detail (Williams, 2007).

3.6.3. Characteristics of quantitative and qualitative research

The selected approach to research is based on the problem of interest, type of information required, number of participants available, time constraints, etc. Table 3.1 differentiates between quantitative and qualitative studies.

Table 3.1: Characteristics of quantitative and qualitative research

Quantitative	Qualitative
Measurable	Interpretive
Context free	Context dependant
Hypothesis	Research questions
Reasoning is deductive	Reasoning is inductive
Subjects	Participants
Analysis made up of numbers	Analysis made up of words/ideas
Uses Instruments	Uses communications and observations
Highly controlled setting: Experimental setting	Flexible approach: Natural setting
Sample size:n	Sample size is not a concern; seeks "informal rich" sample
Facts are value free and unbiased	Facts are value laden and biased
Tests theory	Develops theory
Objective	Subjective
Reduction, control, precision	Discovery, description, understanding, shared interpretation

Source: Adapted from Anderson, J.D. 2006. *Qualitative and Quantitative Research*. [Online]. Available WWW: <http://web20kmg.pbworks.com/w/file/fetch/82037432/-QualitativeandQuantitativeEval> [Accessed 12 February 2015].

This research study aimed to ascertain the critical success factors for the sustainability of continuous improvement through the experiences and knowledge for the topic based on the feedback from the participants. A qualitative approach was used for this study because the study required an in-depth understanding of the problem rather than a surface description of a large sample population. The systemic issues were highlighted through detailed engagement with executive leadership at Blendcor.

Saunders, Lewis and Thornhill (2009) explained that qualitative research is relevant when the researcher is not sure of the variables and what to focus on.

3.7. Sampling

Fridah (2002, p. 3) defined sampling as “the act, process, or technique of selecting a suitable sample, a representative part of a population for the purpose of determining parameters or characteristics of the whole population”. Leedy and Ormrod (2013) stated that there are two sampling design methods which are probability and non-probability sampling.

In probability sampling, every element has a known probability of being part of the sample. These samples are based on the systematic, stratified, cluster area and simple random sampling methods. Non-probability does not allow the researcher to determine the probability and sampling is based on convenience, judgment and quota sampling methods (Kothari, 2004). This study used the non-probability sampling design due to the research design and desired outcomes of the study.

3.7.1. Non-probability sampling design

The two types of non-probability sampling designs are convenience and purposive sampling. In general, convenience sampling is the least reliable of the two methods as the sample is selected for quick analysis due to availability of members of the population.

Purposive sampling consists of two designs, namely judgment and quota sampling designs (Sekaran & Bougie, 2010).

White (2002) stated that quota sampling ensures that adequate groups are represented in the study and is useful when minority participation is required, however, it is not generalisable.

Judgment sampling is based on selecting the best choice of subjects who are in position to freely provide the desired information. The selection of the subjects is based on experience and expert knowledge of the researcher (Sekaran & Bougie, 2010).

Figure 3.3 illustrates the sampling decision tree and based on researcher requirements, the sampling tool that can be selected.

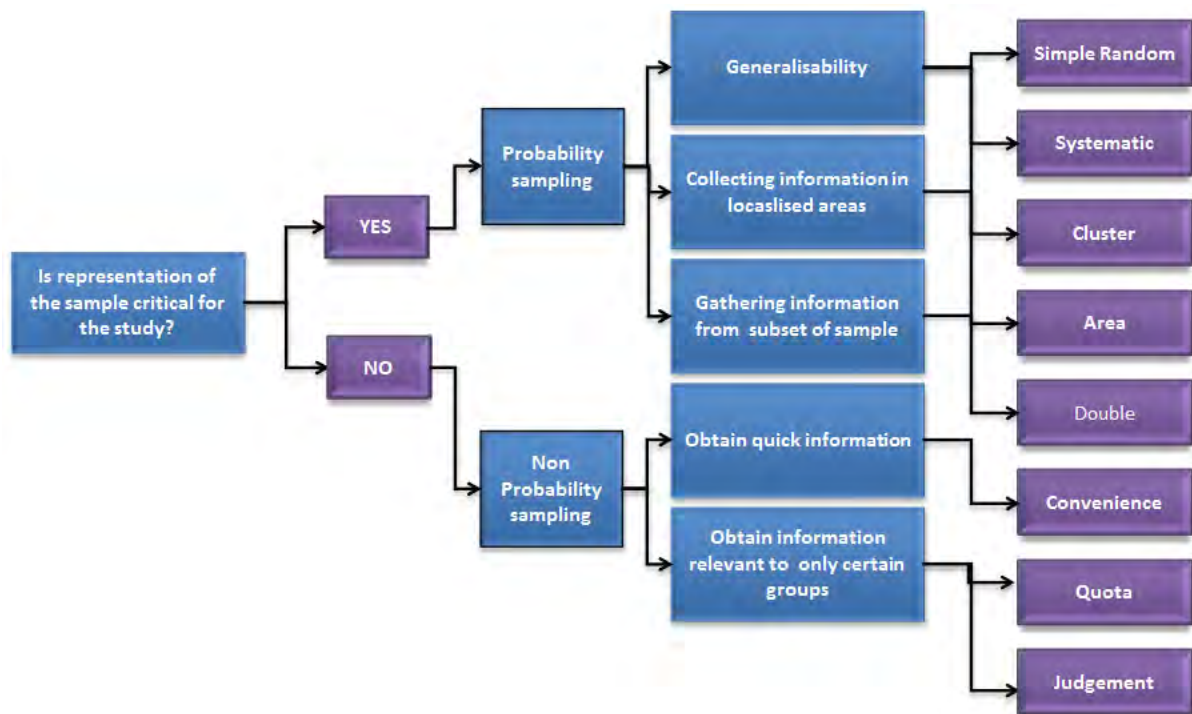


Figure 3.3: Sampling decision tree

Source: Adapted from Sekaran, U. & Bougie, R. 2010. *Research Methods for Business*. John Wiley & Sons, West Sussex.

Based on its nature, this study will adopt the judgment sampling design based on the experiences and knowledge of the Blendcor leadership team.

3.7.2. Description of the population

The population of this study consisted of all the individuals that comprise of the Blendcor plant leadership team. These individuals were selected based on their decision-making authority in the organisation and being accountable for the effective delivery of continuous improvement initiatives in their departments.

3.7.3. Participants in the study

The participants in this study compromised of the following leaders:

- Chief executive officer (CEO)
- Manufacturing manager
- Planning and procurement manager
- Quality manager
- Human resources (HR) manager

- Information echnology (IT) manager
- Health and safety manager
- Subject matter expert (SME) manager

3.8. Data collection

“Interviewing, administering questionnaires, and observing people and phenomena are the three main data collection methods in survey research” (Sekaran & Bougie, 2010, p. 185). Sekaran and Bougie (2010) classified interviewing, administration of questionnaires, observation of people and phenomena as primary data, whereby secondary data comprises of archives, company records, government publications, etc. (Table 3.2). The data represented in this study is primary as a study of this nature has never been conducted at Blendcor and data was thus collected for the first time.

Table 3.2: Advantages and disadvantages of various data collection methods

Data Collection Method	Advantages	Disadvantages
Interviews	Complex questions can be explained by the researcher.	Associated costs of face to face interviews are high.
	Use of visual aids in face to face interviews.	Potential to include interviewer bias is highly likely.
	Interviews can be longer than self completion techniques and more detail established	Easy to lose track of key discussion points.
Questionnaires	Can be used when sample is geographically dispersed.	Questionnaires that are emailed generally have a low response rate.
	Inexpensive method.	Those with low levels of literacy or no access to computers are unlikely to complete questionnaire.
	Anonymity for the respondent is maintained and when research topic is sensitive, it can increase the reliability of responses.	Respondents may answer superficially if length of questionnaire is too long.
Observation	Rich data is obtained.	Ethical principles can be easily contravened.
	Access to people in real life situations.	Time consuming.

Source: Adapted from Sekaran, U. & Bougie, R. 2010. *Research Methods for Business*. John Wiley & Sons, West Sussex.

Personal interviews are usually based on the sample frame and type of information required. Kothari (2008) indicated that this type of administration will attain more information than other methods, with greater flexibility and the observation method can be applied. The intent of the questions was to gain an understanding of the current state,

barriers, and management contribution of continuous improvement and thereafter to identify the critical success factors required for the sustainability of continuous improvement.

The disadvantages were that personal interviews are time consuming, expensive if travelling, possible bias exists, and the possible inaccessibility to respondents exists.

3.8.1. Interview design and preparation

A set of prescribed questions were formulated based on the research objectives (Appendix 3). The questions were designed to ensure responses were as unbiased as possible.

McNamara (2009) listed eight steps for effective preparation of an interview. He also stated that proper preparation will alleviate or exacerbate potential problems that could occur during the interview.

Table 3.3: Preparation steps for an interview

Preparation steps	
1	Choose a setting with minimal distraction
2	Explain the purpose of the interview
3	Confirm and address terms of confidentiality
4	Discuss the format of the interview
5	Indicate the length of the interview
6	Explain how to get in touch with you, the researcher, if required
7	Ask them if they have any questions prior to the interview starting
8	Don't recall on memory

Source: Adapted from McNamara, C. 2009. *General Guidelines for Conducting Interviews*. Free Management Library, Minneapolis.

The researcher used the steps mentioned above to ensure effective outcomes from the interview.

The researcher ensured that all relevant documentation was printed and available during the interview. The researcher used the preparation steps during all the interviews.

3.8.2. Pilot study

A pilot of this study was completed to ensure the questions were clear and unambiguous. Two pilot interviews were conducted with middle management to measure length and practicality of the interview. Leedy and Ormrod (2013) indicated that it is imperative to conduct pilot runs, as pre-testing will ensure questions are unambiguous and the researcher will determine the kind of responses expected during the interview. The average time required for the interview is approximately 45-60 minutes. The interviews were booked in Microsoft Outlook, with at least two weeks' notice given to the interviewees. The questions were emailed to the interviewees on the meeting notice to ensure that they were accustomed with the questions in order to improve the quality of the feedback.

3.8.3. Reliability and validity of interviews

Saunders *et al.* (2009) referred to reliability as the robustness of the questionnaire and the measure of reproducibility during varying conditions. For qualitative research, validity is the extent to which research results accurately represent the collected data, also known as internal validity, and can also be transferred to other settings and contexts (external validity) (Sekaran & Bougie, 2010).

Face validity was used for this study. Quinlan (2011) stated that face validity comprises detailed accounts of people's experience that is used in the research. The validity of the study was further strengthened as the participants are decision makers of the organisation and have direct influence on the outcome of continuous improvement initiatives in Blendcor.

3.9. Analysis

Sekaran and Bougie (2010) stated that after the data collection phase, the data needs to be coded, keyed in and edited. Sapsford and Jupp (2006) indicated data obtained from qualitative studies requires preparation before analysis can begin.

The data in this study was recorded electronically during the interviews, using a voice recorder. The data reduction tool that was used was NVIVO 10. The software analyses unstructured data and creates word tag clouds, word trees, coding and thematic, mind and tree maps. Based on the findings, key subjects and themes were highlighted with patterns and relationships emerging. This data was organised into categories, sub-categories,

patterns and relationships. Figure 3.4 below illustrates the process of data analysis during this study.

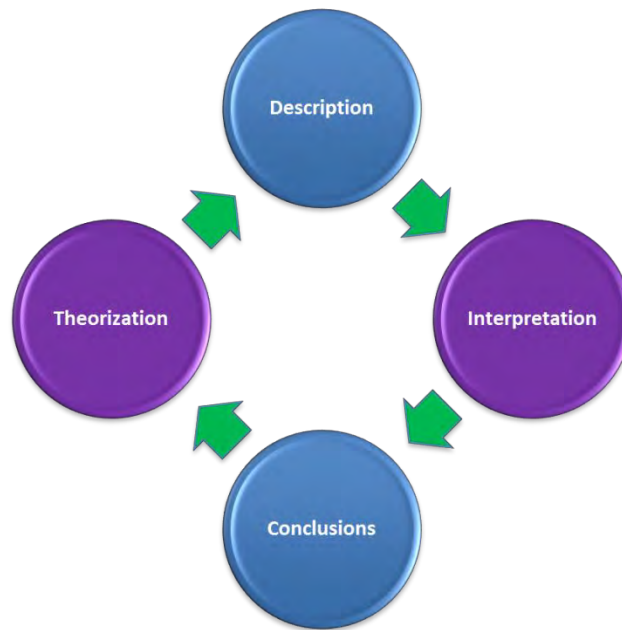


Figure 3.4: Four stages of data analysis

Source: Quinlan, C. 2011. *Business Research Methods*. Cengage Learning, Hampshire.

For this research, the first step comprised of a descriptive analysis of the data. Thereafter the researcher interpreted the data based on learnings and literature. The third stage required the researcher to draw major and minor conclusions from the data. The final stage was the linking of the findings and outcomes to the literature review as presented in Chapter 2.

3.10. Ethical considerations

A letter of consent was obtained from the general manager of Blendcor in order to proceed with the research (Appendix 5). Ethical clearance was obtained from the University of KwaZulu-Natal in the form of an ethical clearance letter (Appendix 4). Finally, informed consent was stated in the preamble to the interview schedule which participants would sign at the interview meeting (Appendix 2).

3.11. Summary

This chapter has presented the research methodology used for this study. The justification of research techniques and designs was presented and justified based on research methodology literature. The discussion in this chapter included the aims and objectives of

the study, description of the research instrument, data collection, reliability and validity and administration. Ethical considerations were clearly outlined to ensure compliance with research practices. The next chapter presents and discusses the results.

CHAPTER 4

Presentation of Results

4.1. Introduction

This chapter presents the data collected from the interviews. The data analysis model used consists of four stages. These are the description, interpretation, conclusion and theorisation.

4.2. Description of respondents

This section supports the quality and credibility of the sample size used. This is done by presenting their expertise, knowledge and experience in the manufacturing industry.

Table 4.1: Respondents' experience in the manufacturing industry

Role	Number of years experience in the manufacturing industry
CEO	20
Manufacturing Manager	19
Planning & Procurement Manager	15
Quality Manager	12
Health and Safety Manager	10
IT Manager	15
SME Manager	30
HR Manager	10

The individuals depicted in Table 4.1 above are the strategic decision and policy makers of the largest manufacturer and distributor of lubricants and greases in Africa. The experienced leadership team provided the researcher with access to excellent CI tacit knowledge gained from the sample over the years. It is evident that the average experience is 16.4 years.

4.3. Interview schedule and interview

An interview schedule (Appendix 3) was used as an informal structure, allowing the researcher to shape and control the information gathered from the interviews. This allowed participants to freely express their thoughts and ideas. This method allows for probing of the interviewee which produced rich and insightful information. The respondents were informed of their anonymity in the study, and hence could openly express their feelings, beliefs, perspectives and experiences. This also ensured objectivity and provided views that were not generally discussed in meeting rooms. Morrel-Samuels (2002) stated that respondents are more likely to actively participate in research if they are confident that personal anonymity is guaranteed.

4.4. Data analysis

The data collected through the interviews was analysed by using themes through an iterative process whereby prominent themes based on word frequency and relationships were highlighted. Direct quotations from respondents were used to support the findings. Selected key quotes were used to strengthen similarities and differences in responses.

The next section provides a description of each objective and then the question is presented. This is followed by the interpretation and conclusions from the findings. The description of the questions is illustrated using word clouds, theme tables and mind maps. These tools are used to reinforce the outlying themes and indicate levels of dominance.

4.4.1. Objective 1: To determine the current status of continuous improvement at Blendcor

The first objective of this study was to gain an understanding of the current status of CI in the organisation. The intent of the objective was to determine the lifecycle stage of CI. This objective set a reference point for further objectives to build on. To explore this objective further, three questions were asked to support the objective (Appendix 3).

4.4.1.1. Question 1: Describe the current status of CI at Blendcor?

The significant themes are the three lifecycle stages, namely infancy, awareness and early stages, insufficient resources, 5S and plan.

Table 4.2: Current status of CI at Blendcor

Current status of CI at Blendcor		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	Infancy	-	2	1	-	-	-	-	-	3	2
	Awareness	4	2	-	-	1	-	1	-	8	4
	Early stages	-	-	1	-	-	1	-	-	2	2
	Insufficient resources	-	-	-	1	-	1	-	-	2	2
	5S	4	-	-	-	1	-	-	-	5	2
	Plan	1	-	-	-	-	-	2	1	4	3

The three stages, namely infancy, awareness and early stages can be grouped as similar themes which indicates that CI is still in the development phase in the organisation. This also links to the insufficient resources which are a result of few initiatives being deployed.

The plan is indicative of the CI strategy that has been developed in 2015 and communicated to the leadership team.

4.4.1.2. Question 2: What are the practices that are going well?

The intention of this question was to gain an understanding of the CI tools that are currently being deployed effectively.

Table 4.3: Practices that are going well

Practices that are going well		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	5S	1	3	1	1	2	1	1	1	11	8
	SOP	4	-	1	-	-	-	-	-	5	2
	VPM	-	-	1	-	-	-	-	-	1	1

Whilst SOP and VPM were mentioned by two of the respondents, 5S is the strongest theme, with all respondents positively reinforcing the great work done on this practice (Table 4.4). Vermaak (2008) highlighted the significance of 5S, indicating that this practice is the starting point for all improvement activities.

Table 4.4: Practices that require improvement

Practices that require improvement		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	Problem solving	2	2	2	2	2	2	1	3	16	8

Table 4.4 indicates all respondents having the same view around problem solving.

Respondent#1 indicated that the biggest opportunity is problem solving.

“The biggest opportunity will be on implementation of problem solving at shopfloor level”.

Berger (1997) linked problem solving to the PDCA cycle, which is the never ending continuous improvement cycle, also known as Kaizen. Kaizen is the key pillars of the world renowned Toyota Production system.

4.4.1.4. Discussion of objective 1

The analysis of objective 1 indicated that CI is in the development phase based on the plan. Bessant *et al.* (2001) classified the various phases on CI maturity. Based on the maturity matrix, CI is at Level 1-Pre CI stage. The Pre-CI maturity level indicates that implementation is done on an *ad hoc* basis. This affirms the reasoning of 5S being the standalone practice. The plant primarily focused on 5S whilst other practices were treated as secondary. A possible reason for the focus on 5S can be based on the visibility of tangible evidence whereby the condition of the surrounding area can be easily assessed. Clear links are made to key business objectives, including safety and quality. Korkut *et al.* (2009) stated that 5S provides order and discipline in organisations, whilst also improving quality and safety.

Respondent# 3 stated “Apart from 5S, the overall CI agenda is lagging behind so we will still need to make sure people understand”.

Problem-solving capability is lacking due to the disproportionate focus on 5S and application thereof is unstructured.

Respondent# 8: “The plant does a lot of „firefighting” type problem solving. This talks to problem solving effectiveness. The problem solving administration is discouraging people to use the tools. It requires a lot of paperwork. It’s something we need to need to think around”.

4.4.2. Objective 2: To identify barriers affecting continuous improvement initiatives

The second objective of this study was to understand the barriers affecting CI initiatives. The intent of the objective was to highlight predominant issues that have caused CI initiatives to fail. This becomes a reference point when giving feedback on what can be done to remove the barriers.

4.4.2.1. Question 1: What are the key barriers that are affecting the sustainability of CI initiatives?

The intention of this question is to gain an understanding of the CI tools that are currently going being applied correctly.

The response to this question indicates that CI lacks priority, leadership commitment and champion support. Figure 4.2 provides an overview of the key words used for this question.



Figure 4.2: Word cloud analysis for continuous improvement barriers

The link between priority, leadership and champion were highlighted by Respondent#7 and Respondent #5:

Respondent#7: “CI ranks low on leadership priority and is not given sufficient time in meetings.

Respondent#5: “Leaders are not seen as CI champions whereby effective coaching of teams takes place”.

Table 4.5: Key barriers affecting sustainability of CI initiatives

Key barriers affecting sustainability		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	Lack of priority	1	1	-	-	-	2	3	1	8	5
	Leadership commitment	-	-	1	-	4	-	2	-	7	3
	Champion support	2	-	3	-	-	-	-	-	5	2
	Accountability	-	-	1	1	2	-	-	-	4	3
	GPA's	-	-	1	-	-	1	-	-	2	2
	Communication	1	1	-	-	-	-	-	-	2	2

Table 4.5 illustrates all the barriers affecting sustainability of CI initiatives. The majority of the respondents indicated that CI is not seen as a priority in the business and ranks as the highest. This was raised by five respondents, and key views are noted below:

Respondent #7: “Not high on leadership’s priority.....not given sufficient interest to attend those meetings...”

Respondent #6: “...If it’s not a priority in the beginning, it will not be a priority going forward”.

Lack of leadership commitment has a direct link with CI not being seen as a priority. An individual is driven by priorities given by management and this relates to inadequate champion support, lack of accountability and unclear general performance assessments (GPAs). A concerning issue is the views of leadership commitment amongst peers as the overall continuous improvement strategy is owned by the leadership team.

4.4.2.2. Question 2: What are the underlying causes of these barriers?

Based on responses to Question 1, the following items were raised as underlying causes to the barriers indicated above. Table 4.6 illustrates the underlying causes of the barriers affecting sustainability of continuous improvement. The themes highlighted can be direct causes for CI not being seen as priority and lacking leadership support.

Table 4.6: Underlying causes of barriers affecting CI sustainability

Underlying causes of barriers affecting CI sustainability		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	Insufficient time	-	-	-	1	1	-	1	-	3	3
	Change Management	-	1	-	-	1	-	-	-	2	2
	Not linked to core work activities	-	-	1	-	-	-	-	1	2	2
	Inadequate resourcing	-	-	-	-	1	-	-	-	1	1
	Skills shortage	1	-	-	-	-	-	-	-	1	1

Three respondents indicated that there is not enough time to do CI initiatives.

Respondent #4: “We do not assess the work day of our employees hence they are focusing on many items at any given time”.

Respondent #5: “...lack of CI time for teams to drive objectives...”.

Respondent #7: “...as there is no time and they have more important things to attend to...”.

Change management was highlighted as a barrier when implementing CI initiatives. Often fear of the unknown results in resistance to change.

Respondent #5: “...ineffective change management as people are fearful of the unknown”.

Kotter (2007) indicated that senior management is required to ensure change management is effective through buy-in and effective leadership. Kotter’s “8 steps to successful change”, highlight communication as a key step for effective change management. Communication is highlighted in Table 4.5 as one of the key barriers of CI.

4.4.2.3. *Question 3: What can be done to remove these barriers affecting sustainability of continuous improvement?*

The responses to this question were summarised using a mind map tool, illustrated in Figure 4.3, due to the strong relationships of themes and ideas. The mind map highlights the key themes and sub-topics. The dotted line represents the relationships between themes or sub-topics.

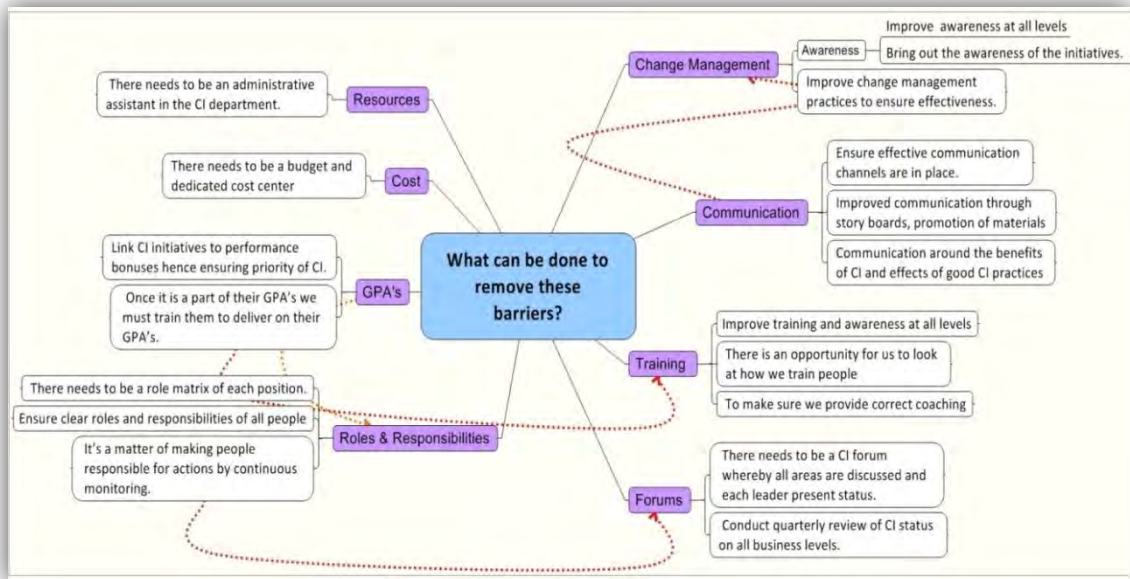


Figure 4.3: Mind map: What can be done to remove the barriers affecting the sustainability of continuous improvement?

Change management and communication have a very strong link and were the prominent theme in the analysis.

GPA's, roles and responsibilities, forums and training are linked through the alignment process of performance management.

Respondent #1: "...There needs to be a CI forum whereby all areas are discussed and each leader present status".

Respondent #3: "...ensure clear roles and responsibilities of all people. Once it is a part of their GPA's we must train them to deliver on their GPA's".

Respondent #3: "It's a matter of making people responsible for actions by continuous monitoring".

4.4.2.4. Discussion of objective 2

This objective highlighted key issues currently experienced in the plant. Leadership commitment and priority are highlighted as the major contributors. Jorgensen and Nielsen (2013) highlighted senior management buy-in during the initial stages of a project as an inhibiting factor of initiatives. The effect of these issues results in insufficient time to apply CI tools and poor change management by leaders. The primary intent of change management is to ensure buy-in from the workforce. Diaz (2013) highlighted organisations' resistance to change as the main obstacle when implementing CI initiatives. If leaders are not seen as change agents then resistance will be encountered. The solutions proposed, rank change management, communication and GPAs as the key factors, with the first two being related. GPAs that are poorly managed creates uncertainty amongst teams. Madrigal (2012) indicated that lack of measurable objectives is one of the factors that inhibits sustainability.

4.4.3. Objective 3: To establish management's contribution to continuous improvement

The intention of the objective was to understand the current status of management's commitment to CI and factors that hinder management from fully supporting the CI agenda.

4.4.3.1. Question 1: Describe management's contribution towards CI initiatives

The outcome of this question is presented in Figure 4.4 below. Six respondents indicated that management is not supporting and they lack commitment to the CI agenda.

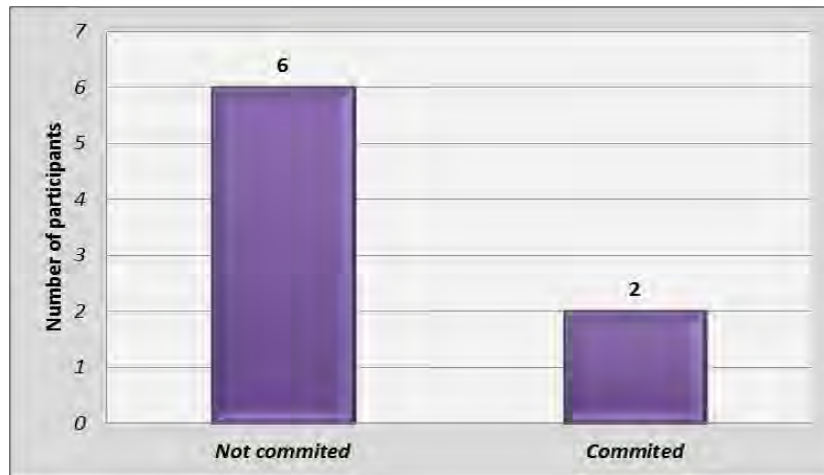


Figure 4.4: Management’s commitment to CI

Respondent #6: *“At the moment management is contributing very little to CI initiatives as they have too many priorities”.*

Respondent #7: *“This is not seen as a priority from the management team. This could be due to GPAs missing the CI link”.*

Respondent #2: *“There’s not enough leadership buy-in”.*

4.4.3.2. *Question 2: What is your contribution to CI initiatives?*

Table 4.7 highlights coaching as the dominant theme in this question. Six respondents indicated that they have a coaching role with their teams with regards to CI.

Table 4.7: What is your contribution to CI?

What is your contribution to continuous improvement?		Respondent								Sum	Count
		1	2	3	4	5	6	7	8		
THEME	Coach	1	1	1	1	2	1	-	-	7	6
	Change agent	-	1	-	-	-	-	-	-	1	1
	Provide resources	-	-	-	-	-	-	-	1	1	1
	No support	-	-	-	-	-	-	1		1	1

One respondent indicated that he did not support the CI agenda due to its absence in the GPAs.

Respondent #7: “No time to support the CI agenda as it is not part of my individual GPA”.

Respondent#2 and #8 indicated that they are change agents and provide resources respectively.

4.4.3.3. Question 3: What are the inhibiting factors that hinder management from fully supporting the CI agenda?

The outcome of this question is similar to Objective 1, Question 3. The difference being Objective 1 was linked to the plant and Objective 3 was linked to leadership.

The response for this question is also summarised using a mind map tool, Figure 4.5, due to the strong relationships of themes and ideas. The mind map highlights the key themes and sub-topics. The dotted line represents the relationships between themes or sub-topics.

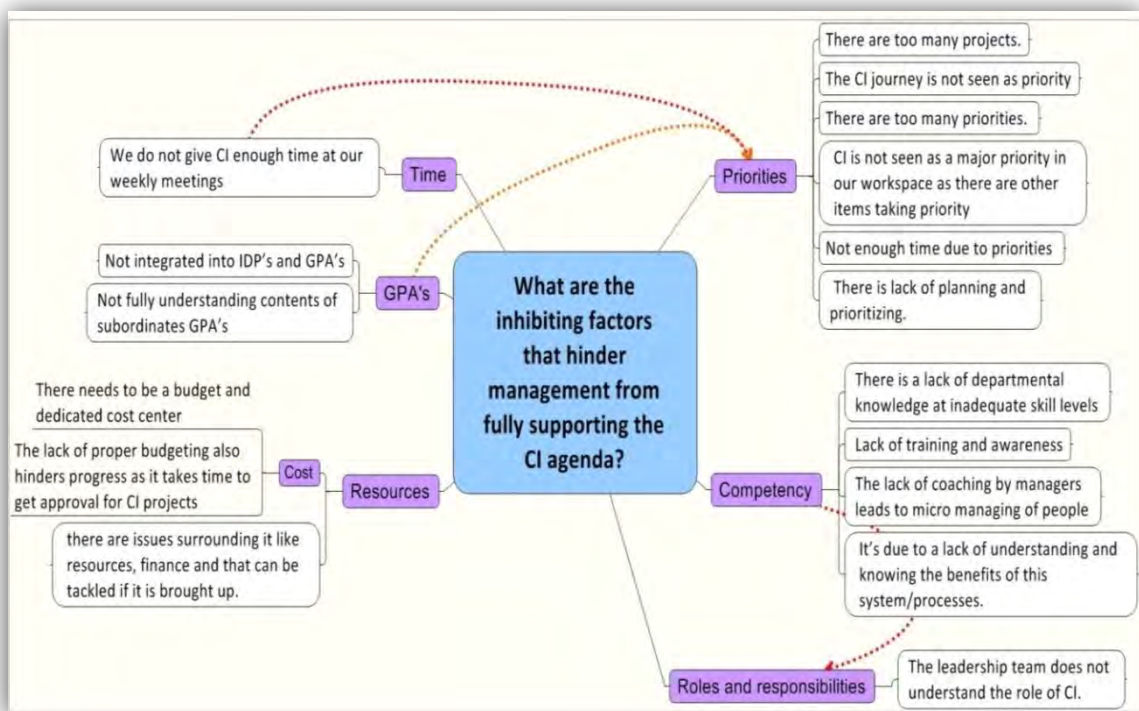


Figure 4.5: Mind map: Inhibiting factors hindering management support for CI

The lack of priority ranked as the highest theme.

Respondent #6: “There are too many priorities...”

Respondent #4: “There is lack of planning and prioritising...”

Respondent #2: “The CI journey is not seen as priority and is not integrated into IDPs and GPAs”.

There are two relationships shown in Figure 4.5, highlighted by the dotted line. The first being priorities, time and GPAs. These three components have interdependences with each other as the GPAs prioritise the work load and set targets to achieve against an agreed timeline. The interdependency was highlighted by Respondent # 6:

“There are too many priorities. Have goals that we can achieve and are realistic. Our teams have too many activities running at the same time”, and Respondent 7: “No time to support the CI agenda as it is not part of my individual GPA”.

Competency and understanding of roles and responsibilities of the leadership team was another prominent theme. The relationship between the two themes is depicted by the dotted line.

Respondent #3: “It’s due to a lack of understanding and knowing the benefits of the system/processes”.

Respondent #3: “The leadership team does not understand the role of CI”.

Respondent #6: People need to understand their roles”.

Competency builds the individual’s knowledge base and improves the application of the tools. This also assists in them understanding the requirements of the role.

The finding of this question is similar to Objective 2, Question 1, where leadership was highlighted as a barrier.

4.4.3.4. Discussion of objective 3

The lack of commitment from the leadership team was the major driver in the issues highlighted in this theme. As a result, priorities are not aligned to the CI agenda and therefore results in inadequate focus. This cascades to lower levels of the organisation and is shown in results gathered from Objective 2. GPA misalignment is related to the lack of

priority and commitment. Galpin (1996) indicated that goal alignment to a new change process is a crucial factor when implementing change.

Leadership competency in the application of CI tools assists in effective deployment, as roles and responsibilities are understood, whereby CI is seen as an enabler to the current issues faced in the plant. Kaye and Anderson (1999) indicated that lack of understanding of continuous improvement tools is one of the inhibitors to initiatives.

On the contrary, the majority of the respondents indicated they coach their teams on the application of CI. This could be attributed to the success of 5S in the plant where leaders play an active role in the sustainment of this practice. Wang and Ahmed (2002) stated that organisational memory is the foundation of knowledge management, which is achieved through experiences and life skills. Leaders have been constantly driving 5S over the last few years and it has become part of the current ways of work. Nonaka and Takeuchi (1995) highlighted the various steps of the knowledge conversion process. The leadership team can be considered to be in the first phase, socialisation. The first step is socialisation whereby tacit knowledge is transferred between individuals. This is achieved through face-to-face communication and sharing of experiences.

4.4.3.5. Objective 4: To identify critical success factors for continuous improvement sustainment at Blendcor

Objective 4 established the critical success factors required to sustain CI at Blendcor. The precursor to the objective has been discussed in previous objectives and sets the platform for respondents to highlight the key factors that are required.

4.4.3.6. Question 1: What are the key critical success factors that will ensure sustainability of CI at Blendcor?

GPA's, motivation, management and communication were the dominant themes emanating from the objective, as illustrated in Figure 4.6 below.



Figure 4.6: Word cloud: Key critical success factors for sustainability of continuous improvement

There is mention of consequence management for non-adherence to CI initiatives and links to GPAs. GPAs consolidate the solution with setting of appropriate goals and provide clarity of priorities.

Respondent #7: “Adopt effective consequence management and ensure that increases are linked to CI activities”.

Respondent #4: “Managers need to ensure effective consequence management is used to progress CI”.

Communication was another prominent theme emanating from the question. The respondents described the benefits of effective communication.

Respondent #3: “Developing good communication systems that promote best practices of CI”.

Respondent #8: “Communicate benefits when you see it as this motivates people”.

Respondent #1: “Effective communication is a powerful tool to bridge the gap between management and shop floor”.

A mind map, Figure 4.7, was used to illustrate the relationships of themes.

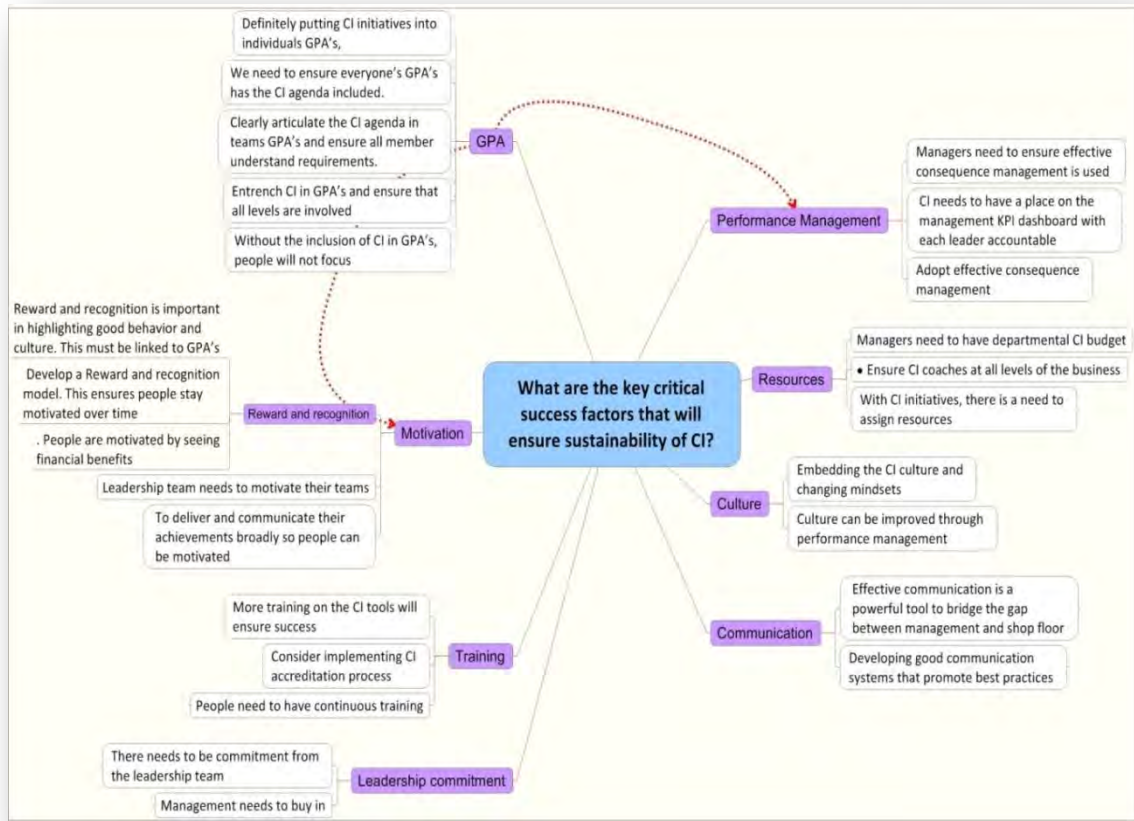


Figure 4.7: Mind map: Key critical success factors for sustainability of continuous improvement

GPA's also have a link to motivation through reward and recognition whereby good performance is rewarded accordingly. Achievement of goals and milestones are used as levers to reward and recognise individuals who are superior performers. Performance appraisals are based on GPA's. Hence, there is a relationship between GPA's and performance management, as tasks are tracked via the GPA.

Respondent #3: "Reward and recognition is important in highlighting good behaviour and culture. This must be linked to GPA's".

Respondent #5 indicated that a model is required for reward and recognition:

"Develop a reward and recognition model. This ensures people stay motivated over time".

The findings are representative of issues highlighted in Objective 2, Question 1, relating to leadership commitment based on the lack of priority reflected in the GPAs.

4.4.3.7. Discussion of objective 4

The need to ensure GPA alignment is the critical success factor that has been highlighted. When the strategic goals and objectives are aligned, the result is clearer direction for the organisation (Cato & Gordon, 2012). Tosti and Jackson (2003) highlighted leadership as the lever of the alignment process. However as highlighted in Objective 3, question 1, management commitment is lacking and links to the misalignment of GPA's relating to CI. GPA's are constructed based on business priorities and are reviewed periodically by teams to ensure performance is understood and actions agreed. The lack of commitment from leadership can be an indicator that business goals are not cascaded to their teams or inefficiencies in the GPA review system. Effective goal cascading ensures that goals are tailored to meet the requirements of the workplace.

Esu (2009) stated that goals are the building blocks of performance management. He adds that goals energises employees toward a common goal. Baroudi (2014) highlighted the link between goals and the influence on employee behavior. Clearly articulated goals ensures that employees drive the goal output and are aware of the consequences of failure.

Iveta (2012) highlighted the link between effective individual goals and motivation. Employee motivation increases when individual goals takes into account training and development of employees. The aim is to ensure that employees are equipped to meet the goal target. Goals are generally not achieved due to lack of training or inadequate information related to the goal. Jaros (2010) stated that well equipped employees are confident and motivated when executing tasks.

Motivation, performance management, communication and culture are all factors of change management (Galpin, 1996). Quesada-Pineda and Madrigal (2013) stated that change is the most important factor when implementing CI initiatives due to people requiring to work constantly with new ideas. Kotter (2007) highlighted communication as a key enabler of change management in the eight step model. Change management is a critical element in the quest to attain a competitive advantage (Digman, 1999). Change management ensures that all levels of the business buy into the vision and goals of an organisation. Jaros (2010) stated that high employee commitment levels to the change

management plan are associated with goal clarity and effective goal cascading. The change objective is easily achieved if these are in place.

However O'Donnell and Boyle (2008) stated that culture change can only occur if there is leadership commitment. This is achieved by management creating an atmosphere conducive to change.

4.5. Summary

The data presentation obtained from eight interviews has been presented in this chapter. The visual illustration of the data included tables, word cloud, mind maps and graphs and combined with relevant quotes from respondents was used to present the analysis of the data. Analyses of themes by objectives were identified and dominant themes were discussed further. A summary of each objective was provided.

The key findings of this chapter were:

- The excellent performance and ownership of 5S by leadership, based on links to other business objectives.
- The urgent need for an effective problem-solving framework.
- The lack of priority and leadership commitment to continuous improvement.
- The need for effective change management to assist in continuous improvement implementation. This includes motivation, communication and performance management.
- The misalignment and efficacy of GPAs highlighted as an issue and linking strongly to other themes.

Chapter 5 will present the recommendations for consideration by the various stakeholders in the Blendcor operation.

CHAPTER 5

Conclusion and Recommendations

5.1. Introduction

The need to gain a competitive advantage using continuous improvement is vital in ensuring sustainability of an organisation, especially when operating in an industry with high volumes and low cost margins. This study sought to identify the critical success factors for sustaining continuous improvement at Blendcor.

The objectives of the study were designed to understand and provide insight into the current issues experienced as well as the role of leadership in order to answer the research question. The objectives were structured to ensure that the Blendcor leadership team understand the changes required to successfully sustain continuous improvement initiatives. The data was gathered from the leadership team and the analysis was presented in Chapter Four. This chapter highlights the specific conclusions that may be drawn from the study and will focus on the recommendations based on the findings. The limitations of this study and future research recommendations are also noted in this chapter.

5.2. Key findings

The data provided in-depth insights into the elements of the continuous improvement framework, from which several conclusions may be drawn. The conclusions can be generalised to the entire population as the leadership team encompasses all operations of the organisation. The conclusions based on the empirical findings were drawn in relation to the objectives of the study, and are presented below.

5.2.1. The effectiveness of 5S

The findings indicate that 5S is the practice that is effective and seen as “alive and progressing”. Leaders are committed to ensuring that their work areas are clean and orderly. With safety being the biggest focus in the organisation, 5S is the key link to safety, whereby “a clean plant is a safe plant”. It can be concluded that the effectiveness of 5S can be attributed to seeing the tangible effects and benefits compared to other practices. The link to safety also ensures that there is a constant focus on this practice.

5.2.2. The need for problem solving

The lack of proper problem-solving structures creates recurring problems that take up time and resources to resolve. The mode of operation can be considered “firefighting”, whereby individuals are constantly in crisis mode. One can thus conclude that all levels of the organisation are spending a disproportionate amount of time on problem solving and neglecting other initiatives.

5.2.3. Lack of priority

The respondents agreed that there is a lack of priority regarding continuous improvement. Sixty-three percent of respondents indicated that priority was lacking due to various reasons. Insufficient time and lack of resources were the key issues contributing to the low priority levels.

5.2.3.1. Insufficient time

The disproportionate amount of time devoted to continuous improvement results in little or no time created for continuous improvement. One can thus conclude that the lack of priority can be attributed to the insufficient time allocation to continuous improvement.

5.2.3.2. Lack of resources

The lack of resources, namely budget and individuals, results in lack of focus and priority. The lack of proper budgeting often delays implementation of tools whereby other projects are given priority. The shortage of staff to focus on continuous improvement is a direct result of inadequate resource budgeting.

5.2.3.3. Leadership commitment

The respondents strongly agreed that there is lack of leadership commitment. Three quarters (75%) of the respondents indicated that their peers were not committed to the continuous improvement agenda. This links to the lack of priority as focus areas are communicated to managers through their leaders. Misaligned GPA’s result in lack of focus by individuals and teams. Employees need to see leaders demonstrating the importance of CI. This is achieved through constant interaction with the workforce, highlighting the benefits of CI tools and the need to gain the competitive advantage in the industry.

5.2.3.4. Leadership competency

Competency and understanding of roles and responsibilities of the leadership team, with regards to CI, has been highlighted as a gap. Competency in continuous improvement builds one's knowledge base and improves the application of the tools. This will also assist them in understanding the requirements of their role.

5.2.3.5. Coaching effectiveness

The respondents strongly agreed that they coached their teams on continuous improvement tools. However, this contradicts the overall view that there is a lack of leadership commitment. One can conclude that the efficacy of the coaching can be questioned. This is linked to leadership competency and understanding of the continuous improvement tools.

5.2.3.6. Change management

Respondents highlighted that change management elements need to be improved to ensure buy-in at all levels of the business. Creating the urgency is a critical component of change management; however, this is lacking due to the issues with prioritising and leadership buy-in. The key components that have been highlighted are the need for effective communication, motivation of the workforce, and performance management.

5.2.3.7. Communication

The respondents identified communication as a key enabler to drive the continuous improvement agenda. The lack of communication creates uncertainty about the change due to the unknown. Communication of the benefits also improves motivation levels of employees. One can conclude that employees are not kept up to date with continuous improvement initiatives.

5.2.3.8. Motivation

The need for reward and recognition is identified as a key enabler to drive initiatives. People who are motivated buy in easily to changes when the benefits are known. The types of reward and recognition mentioned included monetary and non-monetary factors. Employees need to get recognition from their peers in open forums. The sense of achievement ensures that employees are energized and focused to meet goals and objectives. As discussed in Chapter 4, employee development through individual goals promotes motivational levels in the workforce.

5.2.3.9. Performance management

The use of performance management is critical in driving positive behaviours. Respondents highlighted the need for consequence management to drive the desired behaviours. Performance management has a strong link to motivation and GPAs whereby good results are linked to business objectives.

5.2.3.10. Alignment of GPAs

The effective use of GPAs has been highlighted as the overarching theme in the study, being mentioned in the barriers and enablers for continuous improvement. GPAs have links to most of the themes mentioned. The GPA clarifies the priorities for the year and becomes the performance contract used by management and employees. One can conclude that the effectiveness of GPAs is lacking due to misalignment between all levels of the business.

5.3. Recommendations based on findings

Based on the research objectives set for this study and the findings, recommendations are proposed in the following sections. The researcher attempted to propose systems that will address the gaps relating to the sustainability of continuous improvement at Blendcor. By applying the recommendations presented below, Blendcor can improve the current performance of continuous improvement and ensure that practices are sustained over a long period of time.

5.3.1 Effective use of GPAs and performance management

Leaders need to ensure that correct information is recorded in their subordinates' GPAs. The next step would be to clarify the requirements which can be done via coaching and impromptu conversations. The GPA review needs to be formalised through scheduled monthly sessions for the manager to get feedback on progress and the employee to escalate issues. The outcome of the meeting should be defined actions that have been agreed on and should be tracked at the next meeting. The accountability needs to be clear with no ambiguity. Failure to meet the requirements after coaching and support must result in formal consequence management being undertaken by the manager. However, this should be the last resort.

5.3.2 Improving problem-solving effectiveness

A problem-solving framework needs to be created and implemented in the plant at all levels. The framework would include clarification of roles and responsibilities, development of clear triggers, construct of tools, escalation procedures, short interval control and competency building. All staff need to be trained in team problem solving and conflict management. The aim is to ensure that the majority of the problems are rectified at shop floor level, with minimal management interference. Management could then focus on strategic goals and have time to support the effective coaching of their teams.

5.3.3 Enhancing leadership competencies

A defined set of outcome-based deliverables need to be included in a competency assessment programme. The programme should have various levels of achievement which need to be assessed by an external continuous improvement specialist. The outcomes must be included in leaders' GPAs. The levels of assessments should be milestone based to ensure attention is given to the programme. A satisfactory outcome of leadership competency will be the correct application of continuous improvement tools in their areas.

5.3.4 Leadership forum

Leadership needs to present the status of projects at forums, chaired by the CEO. This will improve accountability of practices and force leaders to implement similar forums with their teams. The key intent of the forum is to ensure risks are escalated and leaders request support from other departments.

5.3.5 Employee forums

Employee Forums will ensure that the leadership team has regular engagements with the workforce. This creates focus and priority regarding CI. The CI scorecard will be presented, highlighting good performances and opportunity areas. The current quarterly employee forum can be amended to include CI as an agenda item.

5.3.6 Suggestion program

Suggestion boxes can be implemented across the plant to assist management in understanding the. The suggestions will be reviewed monthly and the best suggestions can be rewarded with vouchers. This promotes motivation and highlights CI as a priority for the leadership team. All suggestions will be tracked and feedback will be given to

employees by their line manager. This will improve morale of the workforce and improve communication by leadership to the workforce.

5.3.7 Reward and recognition structures

The reward and recognition structure will clarify frequency, criteria for selection and monetary value associated with good practices and behaviours. There should be a nomination committee that is led by the HR manager to ensure transparency and adherence to the process. The key factors to successful reward and recognition structures are consistency and visibility of the process. This will inspire and drive individuals to go above and beyond their normal work requirements.

5.3.8 Budget allocation

Each department should have a defined budget based on the magnitude of their plan. Each leader needs to control spend and highlight any shortfalls to the leadership forum. This will also ensure that leaders and their teams have autonomy regarding improvement initiatives.

5.4. Limitations of this study

It is necessary for the researcher to document limitations of the study as this provides guidelines for future research. The most significant limitation for this research study was the limited academic literature and studies related to manufacturing industries. Whilst there are studies identifying critical success factors in TQM and Lean manufacturing, minimal research could be found on continuous improvement as a broad topic. This made it difficult to draw comparisons with findings from other studies.

Due to time constraints, the research targeted the leaders based on their strategic positions in the organisation. Middle management may have contributed to identifying additional issues and success factors based on their direct involvement with operational teams based on their direct level of involvement in continuous improvement initiatives.

The geographic location was limited to the South African operation only. Results may not hold true in foreign countries based on the economic environment, skill levels, trade union power and overall business culture when compared to South Africa.

5.5. Recommendations for future study

Further studies should consider the following aspects of continuous improvement sustainability:

- Future research should include an evaluation of organisational change management. Based on the nature of continuous improvement it is important to understand change management requirements before commencing projects.
- In this study the sampling frame was limited to Blendcor. The research can be expanded to include international manufacturing organisations which would ensure a comprehensive view of critical success factors.
- The study can be expanded to include all levels of the organisation, ensuring that an end-to-end view is achieved.
- A key finding in this study was the effectiveness of coaching. A study determining the factors required for effective coaching and improving performance should be pursued.

5.6. Conclusions

The research objectives to identify the critical success factors for the sustainability of continuous improvement at Blendcor have been met. The outcome of the study highlights barriers affecting the organisation and has outlined practical and relevant recommendations for the Blendcor leadership team in their approach to improve continuous improvement in the organisation. The systemic gaps highlighted are also linked to other business objectives and focusing on the recommendations would ensure that other facets of the organisation improve. Despite the limitations, the study provides a foundation for increasing the continuous improvement maturity over the next few years.

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APPENDIX 1:
INTRODUCTORY LETTER

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Dear Respondent,

MBA Research Project

Researcher: Veshlin Ganesh (031 450 75 89)

Supervisor: Professor Anesh Maniraj Singh (031 260 7061)

Research Office: Ms M Snyman (031 260 8350)

I, VESHLIN GANESH, an MBA Student at THE UNIVERSITY OF KWAZULU-NATAL, invites you to participate in a research project entitled Critical success factors for the sustainability of Continuous Improvement at Blendcor–Durban.

The aim of this study is to: “Determine the critical success factors required to ensure sustainability of Continuous Improvement at Blendcor”.

Through your participation I hope to understand:

- The current status of Continuous Improvement at Blendcor.
- Barriers affecting Continuous Improvement initiatives.
- Management’s contribution to continuous improvement.
- Critical success factors for the sustainability of Continuous Improvement at Blendcor.

The results of the interviews are intended to contribute to the work plan that will improve Continuous Improvement sustainability.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this interview. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about being interviewed or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The interview should take about 45-60 minutes. I trust that you will enjoy being part of this study.

Sincerely

Investigator’s signature _____

Date _____

This page is to be retained by the participant

**APPENDIX 2:
CONSENT LETTER**

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

Researcher: Veshlin Ganesh (031 450 75 89)
Supervisor: Professor Anesh Maniraj Singh (031 260 7061)
Research Office: Ms M Snyman (031 260 8350)

CONSENT

I.....(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire. Please indicate if you are willing to allow the interview to be recorded by the following equipment:

	Willing	Not willing
Audio equipment		

SIGNATURE OF PARTICIPANT

DATE

.....

.....

This page is to be retained by researcher

**APPENDIX 3:
INTERVIEW SCHEDULE**

Objectives	Questions
1. To determine the current status of Continuous Improvement at Blendcor.	1.1 Describe the current status of CI at Blendcor? 1.2 What are the practices that are going well? 1.3 What are the practices that require improvement?
2. To identify barriers affecting Continuous Improvement initiatives.	2.1 What are the key barriers that are affecting the sustainability of CI initiatives? 2.2 What are the underlying causes of these barriers? 2.3 What can be done to remove these barriers?
3. To establish management's contribution to continuous improvement.	3.1 Describe management's contribution towards CI initiatives. 3.2 What is your contribution to CI initiatives? 3.3 What are the inhibiting factors that hinder management from fully supporting the CI agenda?
4. To identify critical success factors for Continuous Improvement sustainment at Blendcor.	4.1 What are the key critical success factors that will ensure sustainability of CI at Blendcor?

APPENDIX 4: ETHICAL CLEARANCE



**UNIVERSITY OF
KWAZULU-NATAL**
INYUVESI
YAKWAZULU-NATALI

28 April 2015

Mr Veshin Ganesh (200105685)
Graduate School of Business & Leadership
Westville Campus

Dear Mr Ganesh,

Protocol reference number: **HSS/0370/015M**
Project title: **Critical success factors for the sustainability of Continuous Improvement at Blendcor – Durban**

Full Approval – Expedited Application

With regards to your application received on 23 April 2015. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and **FULL APPROVAL** for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


.....
Dr Shemuka Singh (Chair)

/ms

Cc Supervisor: Professor Anesh Maniraj Singh
Cc Academic Leader Research: Mr M Hoque
Cc School Administrator: Ms Zarina Bullyraj / Ms Gina Mshengu




Humanities & Social Sciences Research Ethics Committee
Dr Shemuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
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APPENDIX 5:
GATEKEEPER'S LETTER

 BLENDCOR	BLENDCOR CO-OWNED BY SHELL AND BP CO. REG. No. 1986/001871/07 VAT REG. No. 4730133743	<small>P.O. Box 368 Durban 4000 135 Honshu Road Island View, Durban Republic of South Africa Tel: +27 (0) 31 450 6611 Fax: +27 (0) 31 466 3336</small>
<p>17th April 2015</p> <p>To whom it may concern:</p> <p>Dear Sir/Madam</p> <p><u>RE: VESHLIN GANESH - 830222 5254 08 7</u></p> <p>I, Vusi Ngidi, the undersigned, hereby give permission for Veshlin Ganesh to conduct research at Blendcor towards his dissertation entitled "Critical success factors for the sustainability of Continuous Improvement at Blendcor". He may collect data from our members provided that it does not interfere with the normal operations of the Blendcor business.</p> <p>The work may be published in the public domain provided the company is kept anonymous.</p> <p>Yours faithfully For Blendcor (Pty) Ltd</p> <div style="text-align: center;"></div> <p>VUSI NGIDI GENERAL MANAGER</p>		
<p><small>Directors: C L WILLIAMS (Chairman); J M MPUTAMPUTA; A W AHMAD (Indian); N SANCHO; R LYNCH; S VALLA; N R J IMASIKU (Alternate Director); J R WOODS (Alternate Director); T E NKHUMELENI (Alternate Director)</small></p> <div style="text-align: right;"></div>		

**APPENDIX 6:
EDITORS CERTIFICATE**

**Jeanne Enslin
Freelance language practitioner**

17 York Close
PARKLANDS
7441

24 June 2015

Proof of language editing

I, Jeanne Enslin, acknowledge that I did the language editing of Veshlin Ganesh's dissertation submitted in partial fulfilment for the degree of Master of Business Administration.

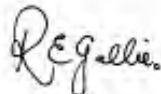
The title of the dissertation is:

Critical success factors for sustaining continuous improvement at Blendcor–
Durban.

If any text changes are made to the electronic document which I sent to Veshlin Ganesh on 24 June 2015, it needs to be returned to me to check the language of the changes. Technical editing, formatting and checking of references were done by Ronèl Gallie, a technical editor.



Jeanne Enslin
Language editor
082 696 1224



Ronèl Gallie
Technical editor
084 7780 292

J H Enslin BA (US); STD (US); Hons Translation Studies (UNISA)