An analysis of the barriers that inhibit sustainable implementation of LEAN

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RESEARCH PROPOSAL

An analysis of the barriers that inhibit sustainable implementation of LEAN

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Declaration

I, Ayanda Sidinile hereby declare that:

- The work in this dissertation is my own original work;

- All sources used or referenced have been documented and recognized

- This dissertation has not been previously submitted in full or partial fulfilment of the requirements for an equivalent or higher qualification at any other recognized educational institution; and

- I hereby give consent for my treatise, if accepted to be available for photocopying and for interlibrary loan, and for the title summary to be made available to external organizations.

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Abstract

With global advances in technology, many organizations are finding it difficult and quite challenging to do business as usual. Japanese companies are on top of the world economy, while many Western companies are struggling to find ways to compete with them (Womack, et al., 1990). The Japanese secret weapon “Lean Production” is no longer a secret; more and more western companies are now learning and adopting Lean techniques to remain relevant and competitive.

Lean management is a consistent philosophy and a set of practices that must be maintained over time in order to see the gains (Losonci & Demeter, 2013). Lean is not a quick fix to reduce costs, but a continuous improvement journey that will transform an organization into a cost efficient value-driven system. Lean is still a fairly new phenomenon in South Africa, particularly in the Eastern Cape. The road towards the lean implementation is viewed by many as a challenging and yet rewarding journey.

South African organizations are following the trend of implementing lean in order to eliminate waste, improve quality, speed, customer satisfaction and thereby increasing profits. It is however still a long journey towards achieving total perfection. The main challenge facing South African organizations is the ability to sustain the lean improvements over a longer period.

This study will focus on identifying and analyzing the main barriers that inhibit many successful organizations from sustaining lean improvement efforts.

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CHAPTER 1: INTRODUCTION

Many organizations are faced with a problem of delivering exceptional customer service and adding value to its customers. In a world of extremely competitive markets, the ability to capture, retain, and deliver enhanced customer value is seen as a way of differentiating and gaining market share (Found & Harrison, 2012). It is no longer adequate to just do business as streamlined business processes and value streams give companies a niche' market over its competitors. To be able to do business, compete and retain customers, business processes must be both efficient and effective, which means developing and delivering products that exceed customer expectations (Found & Harrison, 2012).

Applying and adopting lean thinking to organizational processes is regarded as a way of improving operational efficiencies by eliminating all activities that do not add value. The lean philosophy has always been linked to operational performance (Chavez, et al., 2012). Lean can be conceptualized as a driver for developing supply chain core competence through allocating only those resources that would help in creating value to customers; in other words, increasing the level of performance and enhancing competitiveness (Shamah, 2013).

1.1 BACKGROUND

The "Lean" philosophy originated from the manufacturing sector, but more and more companies are following the trend of implementing lean principles in order to eliminate inefficiencies and waste in their business processes, improve quality, speed, and enhance customer satisfaction thereby increasing company profits and the bottom line (Bonneau, 2011).

Lean is still a fairly new phenomenon in South Africa, particularly in the Eastern Cape. The road towards the lean implementation is viewed by many as a challenging and yet rewarding journey. Very few organizations get to experience the full benefits as most leave the journey too early. Reengineering business processes can involve

making radical changes that employees may not be comfortable with. It then becomes management's responsibility to ensure that all stakeholders understand the need for change and that change is a crucial element to sustain competitiveness.

1.2 RESEARCH PROBLEM

The aim of this research is to analyse and evaluate the barriers that inhibit sustainable implementation of lean; and to ascertain any significant cultural factors, causes, symptoms and behaviours influencing the sustainability of Lean implementations.

Doing the study will contribute to the academic research done on the topic and possibly provide more empirical evidence as to the identification of the barriers that hinder successful implementation of Lean. This research will serve as constructive feedback to the organizations that participated in the study, and will also equip other organizations that wish to embark on the continuous improvement journey of lean engineering.

1.3 PROBLEM STATEMENT

There are so many new and improved technological breakthroughs in the global arena and many organizations know that in order to compete, one has to stay ahead of its competitors. The only way to compete is to continuously improve the way one does business. Change and innovation have become the norm for many Eastern Cape organizations.

Quite a substantial number of organizations in the Eastern Cape region have explored the benefits of implementing Lean and have decided to embark on the Lean journey to improve operational efficiency. However, it would seem that Lean is introduced into the organization and implemented over a short period of time, and suddenly the organization reverts to doings things the old way.

1.4 RESEARCH OBJECTIVES

The primary objective of this study is to analyse the barriers and obstacles that hinder successful implementation of Lean. The intent is to identify and assess the causes that inhibit a self-sustaining lean culture whereby change is welcomed and embraced by all.

To achieve the primary objective, the following secondary objectives have been identified:

- To establish and determine the impact and role that organizational culture plays on successful implementation of lean
- To establish challenges in sustaining a lean system over a period of time

1.5 RESEARCH METHODOLOGY

The research paradigm utilized in this research was of an exploratory nature consisting of a literature review and an assessment of lean in various organizations. Data was collected from various organizations in the Eastern Cape.

The sample for the study was organizations in the Eastern Cape region that have adopted the lean philosophy in their operations. Within these organizations, senior managers and staff members that were part of the Lean project implementation were selected. Outside the organization, all customers, suppliers and stakeholders that have long standing relationships with the selected organizations will be included in the sample; as they are part of the supply chain.

The methodology that was followed predominantly included web survey questionnaires. The data was captured and collected from the surveys. A web survey tool was used and a relevant link sent to the participants to complete the questionnaire. The objective of the study was to assess the adoption of Lean practices and to identify the barriers that hinder a sustainable Lean implementation.

1.6 MEASURING INSTRUMENTS

Past literature reveals that the following items may contribute and influence the sustainability of Lean Implementations. Participants from various industries were required to complete questionnaires with the intent to underpin and assess the factors that inhibit sustainable lean implementations.

The following characteristics were used to measure Organisational Culture:

- Continuous learning
- Innovation – sharing of ideas
- Rewards Program
- Continuous improvements
- Change / Resistance to change
- Behavioural traits
- Environment conducive to a culture of high performance

Items that were used to measure Stakeholder Involvement are:

- Employee engagement
- Employee involvement
    - Do employees have the necessary support to maintain new systems and processes
    - Are employees well trained in the new processes
    - Do the new systems and processes to make their jobs easier and faster
- Buy-in from stakeholders
- External forces at play, i.e. labour unions

Items that were used to measure Commitment are:

- Workforce attitudes and beliefs - enthusiasm
- Commitment and dedication
    - Is Management committed to the sustainability of Lean
    - Management awareness
    - Are employees motivated by the type of work they do
    - Are lean tools part of their daily work routine?

1.7 GEOGRAPHICAL DELIMITATION

This research was limited to organizations in South Africa with a particular focus in the Eastern Cape Region of companies that have Implemented Lean Principles in any area of the business, however, was not able to sustain the level of achievement they had expected.

1.8 OUTLINE OF THE STUDY

The study consists of five chapters. The chapters are outlined as follows:

Chapter 1: This is an introductory chapter that introduces the reader to the research problem as well as its limitations.

Chapter 2: This chapter is a literature review chapter and it gives the reader background information necessary to understand the research topic.

Chapter 3: Chapter 3 discusses the research methodology and design of the study

Chapter 4: Chapter presents and analyses the survey results.

Chapter 5: Chapter 5 is a conclusion chapter which discusses the findings into detail and opens up further opportunities for research in this topic.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

"The machine that changed the world" written by Womack and Jones has inspired and motivated many organizations to invest in continuous improvement programs such as Lean. For companies that have embarked on this continuous improvement journey; it can be asked: how has it benefited them? Has it been effective? Have they been able to sustain these results and achieve even more? What have they learnt from this process? Were their expectations met? Was it a worthwhile investment for the organisation? These are some of the questions that this study will try to address.

A survey conducted by Industry week in 2007 found that only 2% of companies that embark on the lean journey actually succeed (IndustryWeek, 2007). Only a few companies actually achieved and sustained the level of Lean and improvement they had expected. Many companies are jumping on the Lean bandwagon, but many are being taken for a ride (Asefeso, 2013). Many companies choose Lean programs without first considering their operations strategy and focus; whether the Lean improvement program will be aligned with the company vision. Sometimes Lean is not suitable for the type of business and industry and in these cases a different tool is suitable, companies sometimes miss the boat because everyone is going Lean, they must follow suit so as not to be left behind.

2.2 THE DEVELOPMENT OF LEAN

The Lean methodology originated from the Japanese after World War II and has transformed the automotive industry and made Japan a great economic force. The Lean concept evolved into a series of principles and its origins were developed from the Toyota Production System (TPS). The Toyota Production System is the cornerstone of Lean. The basic idea of the TPS is to maintain continuous flow of production in order to adapt to demand changes. What this means is only producing what is required in the right quantity at the right time (Just In Time Production).

Lean is primarily associated with manufacturing industries but can be also equally applicable to both service and administrative industries.

Lean is a philosophy that seeks to eliminate waste (“muda”, a Japanese term for waste) in all aspects of a firm’s production activity; based on the users perspective it is used to reduce and eliminate non-value added cost resulting in unnecessary steps, in a business process which in turn improves quality and efficiency and reduces cost (Elbert, 2013).

2.2.1 The Evolution of Mass Production

Before mass production was possible, four principles were discovered by various pioneers. The four principles are mentioned below:

- Interchangeability of parts
  When the Americans were on the verge of War, and the guns were heavily in demand; an American inventor and entrepreneur mass produced guns using the same parts. What this meant was, the parts of any gun would fit the others; before this, guns were custom made, and if a gun broke, the craftsmen had to custom make a replacement. With mass production, guns could be assembled and made quickly. By standardizing components, meant that the same part can be produced in many quantities (Ford, 2014).

- Automatic conveyance of work
  This refers to the continuous flow of production. Workers in a production line must remain where they are while the work moves. This ensures that workers do not have to lift or bend while working and that there is always a continuous flow (Ford, 2014).

- Division of labour
  This involves dividing a larger piece of work so that it is more manageable – this is done by allocating more than one person to a process. This way the final

product is completed sooner and faster – and there is room to deliver more products or to increase output (Ford, 2014).

- Elimination of individual waste motion
  Frederick Winslow Taylor came up with a theory that production was efficient when the workers 'efficiency was at its peak. The correct speed of the production line is the speed at which the workers can handle consistently.

In 1913, Henry Ford decided to use all of the above principles when he made his first "assembly line" car. Before this time, Ford made cars just like everyone else – one at a time; from start to finish (Ford, 2014).

Ford made drastic changes to standardize components, optimize working patterns and planned his production line for mass production. Workers were placed on designated work stations and parts were moved along their parts until completion. Ford, however needed to increase productivity; he continued experimenting until the production line was efficient and his vision was realized (Ford, 2014).

He believed that if he could make as many cost effective cars as possible, then everyone would be able to afford a car. Ford's ultimate aim was to put the "world on wheels" (Ford, 2014). Ford's assembly line of mass production revolutionized the automotive industry.

In the 1950s, Toyoda and Taiichi Ohno expanded these models upon their visit to the Ford factories in Detroit and created the Toyota. They produced this car more efficiently, with increased profit (Anderson, et al., 2008).

2.2.2 The Evolution of Lean Production

The Toyota Production System (TPS) evolved from many years of trial and error to improve efficiency based on the Just In Time concept developed by Toyoda the founder and president of Toyota. In 1960 Taichi Ohno helped to establish the Toyota Production System.

The TPS system was based on two concepts:

- Jidoka
  Jidoka translated “automation with a human touch”. This meant that when a defect was detected the equipment stopped immediately preventing effective products or parts from being produced. As a result only products that met quality standards were passed on to other processes.

- Just In Time
  JIT means only producing what is required at the right time in the right quantity. When an order is received or placed, it is only then that the production line must start doing what is required; and the parts required to assemble the vehicle must be readily available.

This process focused on adding value for the customer, and removing all the unnecessary waste that is not perceived to be value-add. Toyota’s relentless efforts to eliminate waste and continuously improving both work productivity and efficiency, saw TPS evolve into a world renowned system, now referred to as Lean Manufacturing.

2.2.3 Lean Principles

The key principle of lean is to cut out waste by eliminating activities that do not add value; this is done by creating continuous flow of product without bottlenecks, and by producing to order (demand-pull rather than supply-push), and by emphasising quality (Lee, et al., 2008). The Lean approach leads to the elimination of backlogs and allows for more synchronised production.

Lean thinking works on 5 basic principles. These are discussed briefly below:

- Value must be defined from the customer’s perspective. Value assumes that the organization is producing something that a customer is willing to pay for. (Tapping & Shuker, 2003)

- Identify the value stream. The value stream are those processes or set of activities that will ultimately add value to the final product.

- Make the value stream flow.
  Once the value stream has been specified and fully mapped; the next step is to make the value-creating steps “flow” by rearranging and optimizing the steps. (Womack & Jones, 2003). The value stream will flow if divisions and product silos are broken down to ensure that work streams are continually aligned with the creation of value.

- Pull work, do not push it
  A Pull system ensures that production and materials are based on actual customer demand rather than on relying on forecasting tools (Venegas, 2007).Only when a customer order is received, does the production line starts producing the final product.

- Pursue perfection by continually improving your processes. Eliminating non-value adding activities or “waste” in organizational processes allows an organization to easily improve the way it does business.

- Lean considers 7 Wastes (muda). Lean is largely driven by focusing on, and eliminating waste.

  Manufacturing Wastes:

  1. Overproduction
     Overproduction occurs when excess goods are produced either too early or in excess just in case demand pushes up instead of just in time (Kajdan, 2008).

  2. Transportation
     Unnecessary movement occurs when production processes are not sequential or are not in close proximity resulting in unnecessary movement of equipment (Kajdan, 2008).

3. Motion

   Unnecessary movement of people, products and equipment do not add value to the product rather unnecessary movement of workers back and forth wastes time and disrupts the production flow.

4. Over processing

   Over processing involves adding non-value add product properties that the customer is not willing to pay for.

5. Defects

   Releasing a defective unit to a customer means that something has to be manufactured, assembled or serviced twice; the customer only pays once. This rework costs the organization money and puts the company's reputation on the line. It is always better to deliver everything right the first time with the right specifications.

6. Waiting Time

   Waiting involves waiting for people and processes to complete their tasks. This causes huge delays and disrupts continuous flow of activities.

7. Inventory – too much inventory

   Excess stock sitting in a storage facility does not add value rather costs the organization money.

Service Industry wastes: These are very much similar to the manufacturing wastes (Venegas, 2007).

1. Delay
2. Duplication
3. Unnecessary movement
4. Out of stock
5. Errors
6. Manual processes
7. Unclear communication

Over time more and more categories of muda are being added to this list.

According to Liker as cited by Bonneau (2011) most business processes are 90% waste and 10% value-added work. It is the same in service organizations where most processes are not “Lean”. According to George as cited by Bonneau (2011) at least 50% and often more of the work can be considered as non-value added work.

2.3 THE 3PS

2.3.1 Purpose

With regard to the 3P implementation of lean manufacturing, purpose is described from two points of view by Pieterse, et al. (2010). From the organizational point of view, it is defined in terms of profit generation and expansion. However, the customer’s perception of purpose is that the organization exists to create value for its customers and consumers. It can also be said that the organization exists to satisfy the needs of their customers.

2.3.2 Processes

It is argued by Pieterse, et al. (2010) that the processes to achieve the organization’s purpose are the end-to-end activities that have to be conducted in the proper sequence and at the right time, to create value for the customer by solving a problem or satisfying their needs. Furthermore, processes are divided into three main families, according to Pieterse, et al. (2010), which are:

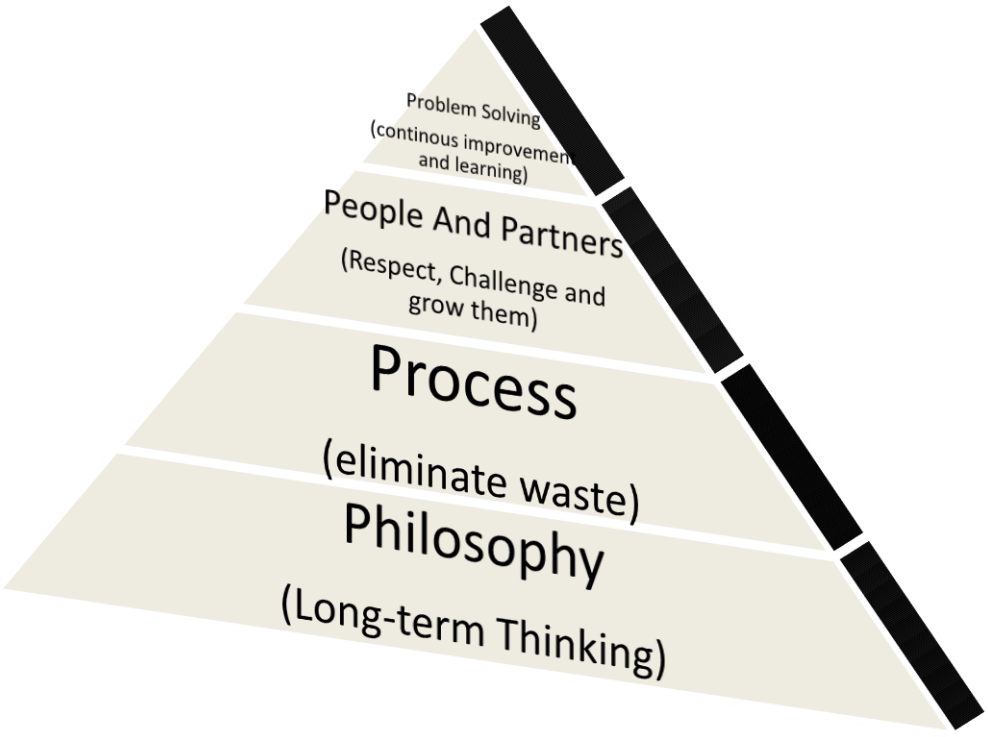
- To create the ability or capacity to start solving the problem;
- Thereafter the actual activity of fulfilling the solving of the problem only when the customer requests it; and lastly
- To support the customer through the lifecycle of the problem, such as the follow-up care and maintenance of a patient after an operation in a hospital.

2.3.3 People

In the lean philosophy a high regard is placed on the people doing the work, hence the workers are called associates. The intention of the people aspect of 3P according to Pieterse, et al. (2010) is to ask how the organization can engage their people at every level making them feel valued so that they willingly drive the Lean process.

This process has now been adjusted and is known as the 3 P's, which involves purpose, process and people. It is argued by Womack and Jones as cited in Pieterse, et al. (2010) that the organisation first has to determine its purpose, and then decide which processes are needed to realize the purpose and lastly engage the people to agree on the purpose and create the necessary Lean processes. The above approach to Lean thinking had been revised in order to include the enormous role that people play in the process of implementing lean. Toyota provides an in-depth approach to the 3Ps by developing the Toyota Way 4P Model. This model is used as a path to achieving operational performance and excellence (Liker & Franz, 2011).

DIAGRAM 1: THE TOYOTA WAY 4P MODEL



SOURCE: (Liker & Franz, 2011)

The 4Ps are different to the traditional 3Ps in that, Toyota ‘s foundation is based on a long term philosophy. All management decisions are supported and based on the long term vision of the company. To support this long term thinking, are people who ensure that the business processes deliver value to the customer, by eliminating waste through a series of continuous improvement efforts.

2.4 OVERVIEW OF LEAN TOOLS

Lean is a continuous improvement technique aimed at improving any process that will deliver value to the customer. Continuously striving to be better at something means trial and error at first, but with each iteration, a slight measure of improvement can be gained.

With each iteration, the experience curve improves and new ideas are born on how to achieve different and better results as before. Innovation and continuous improvement are the pillars for the development of Lean at Toyota. Even today, at Toyota, everyone is still striving for perfection.

2.4.1 The Kanban System

Kanban is a pull system, meaning it is a “production scheduling system” for Lean and Just In Time. It is used for managing and balancing resources, by only replacing what has been sold, consumed or replenished. It was developed at Toyota for smoothing the flow of the production line.

It uses Kanban cards as visual aids to show the value stream. Two types of cards exist:

1. Product ordering card: when an item or component has been replenished and needs to be replaced, it will be written on the card to notify preceding processes what quantity must be manufactured or ordered
2. Withdrawal card: when a problem arises what item/quantity must be withdrawn from the preceding processes?

There are three basic rules to implementing Kanban:

- **Visualize Workflow** – In order to see the manner and frequency of task changes; visual representation of the process is essential. The more complex a process is, the more useful and important creating a visual workflow becomes, but kanban can be used if there are just a few steps (do, doing, done) or a lot of steps (plan, design, draft, approve, schedule and implement).

- **Limit Work in Process (WIP)** - Get more done by doing less. Whether a project is simple or complex or whether the team is small or large, there is an optimal amount of work that can be in the process at one time without sacrificing efficiency. Kanban metrics lets you find that optimal number.

- **Measure and Improve Flow** – Kanban assists in finding and applying good metrics to improvements by providing the information required to twist a process to optimize flow and maximize efficiency. It is applied to existing processes because organizations simply want to identify ways to improve their current activities.

2.4.2 Six Sigma

Lean and Six Sigma are perhaps currently the most popular and some would even suggest the two most powerful continuous improvement strategies for achieving operational and service excellence in any organization today (Corbett, 2011). One of the core principles informing the lean theoretical framework is the elimination of non-value add in product-based process-driven value streams (Gibbons, et al., 2012)

Six Sigma is a continuous improvement methodology that seeks to improve quality of outputs by identifying errors (defects) and minimizing variables to achieve as close to ‘zero-defects’ as possible. Sigma evaluates how far a process deviates from perfection and continually improves it to achieve as minimal defects as possible.

It was formalized by Motorola in 1986 to improve the manufacturing process and is now adopted across other types of processes. Six Sigma draws inspiration from methodologies such as:

- Quality Control
- Total Quality Management (TQM)
- Zero defects

2.4.3 Theory of Constraints

The Theory of Constraints (TOC) is a management philosophy that focuses on logistics, performance measurement and logical thinking. TOC focuses the organization's scarce resources on improving the performance of its constraints.

Dr Eli Goldratt in his book “The Goal” calls The Theory of Constraints Synchronous manufacturing. Synchronous Manufacturing means that the entire production process is coordinated and in synch with its each other to achieve organizational goals (Pieterse, et al., 2010)

2.4.4 Kaizen

The ultimate objective of manufacturing industries today is to increase productivity through system simplification, organizational potential and incremental improvements by using modern techniques like Kaizen.

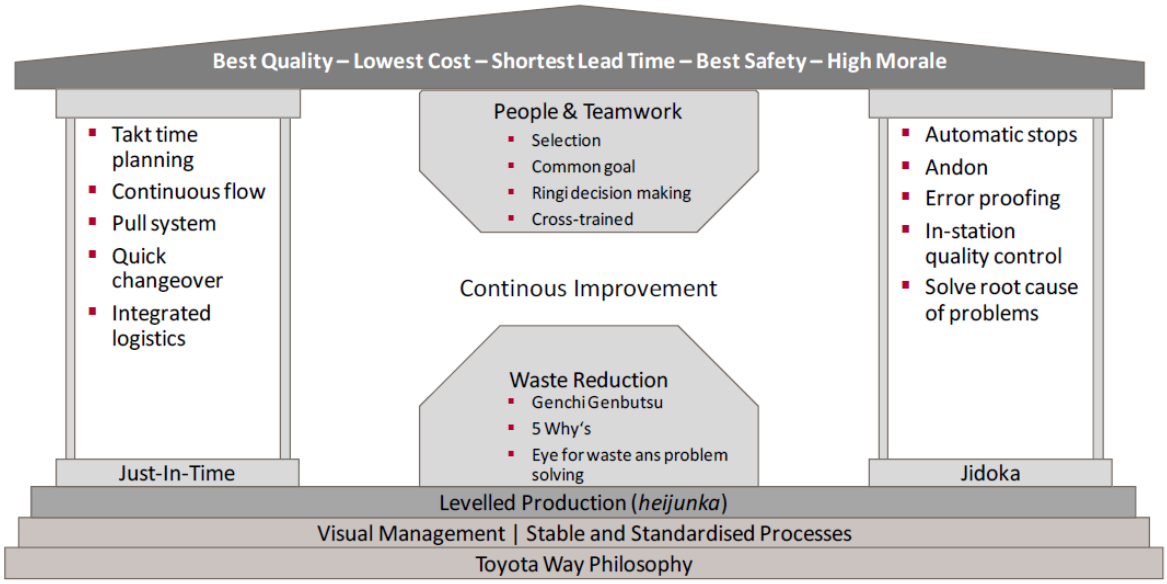
Most of the manufacturing industries are currently encountering a necessity to respond to rapidly changing customer needs. Kaizen is a Japanese word for continuous improvement. Kai means ‘change’ and Zen means ‘for the better’; Kaizen means to change continuously for the better involving everyone in the organization (Gupta & Jain, 2013).

Kaizen originated as an approach to improve productivity at Toyota Motor Corp (ToyotaMotorCorp, 2014). Kaizen requires involvement from all employees to continuously improve their work environment by coming up with innovative ways.

2.4.5 5S of Housekeeping

The 5S's of housekeeping are a methodology to keep the house in order. This is a methodology for organizing, cleaning and sustaining a productive work environment. The 5S's methodology ensures that all the right tools are available at the right time in the appropriate work stream. The house of Lean shown below is a basis for the 5Ss of housekeeping. Toyota developed the House of Lean as a visual management tool to help make problems transparent and visible to the workers.

DIAGRAM 2: HOUSE OF LEAN – 'TOYOTA PRODUCTION HOUSE'



SOURCE: (Liker & Hoseus, 2008)

- Seiri : Sort – Rearrange the work place and ensure that the production area only has the items that are needed to carry out the day's operations.

- Seiton: Simplify and straighten the work area to ensure order. Arrange work items so that they are easily accessible.

- Seiso: Shine and sweep the work area to ensure that it is clean

- Seiketsu: Standardise and maintain the work area.

- Shitsuke: Sustain and practise some discipline. Ensure that work area maintain the orderliness and cleanliness (Tapping & Shuker, 2003).

2.5 LEAN IMPLEMENTATION FAILURES

One way to stay competitive in this globalized market is to become more efficient and Lean manufacturing is the enabler for any organization that seeks to eliminate waste in all aspects of its operations (Wong, et al., 2009). Lean allows companies to focus their efforts on delivering quality products and services, thus achieving operational excellence (Duggan, 2006).

How does one achieve and sustain this level of excellence; many organizations seem to fall short and fail in maintaining sustainable Lean efforts. Lean Management aims to satisfy customers in terms of product and service quality; however, maintaining and delivering a consistent quality product and service is a major challenge faced by many organizations.

The purpose of implementing Lean is to increase productivity, reduce processing time and cost, and improve service/product quality, thus gaining a competitive edge (Wong, et al., 2009). Successful implementation and sustainability of lean requires that everyone in the organization be trained and buy-in into the application of lean tools and the effective strategies for lean implementation to avoid failure. It is up to Management to take the lead and show the team their commitment to Lean.

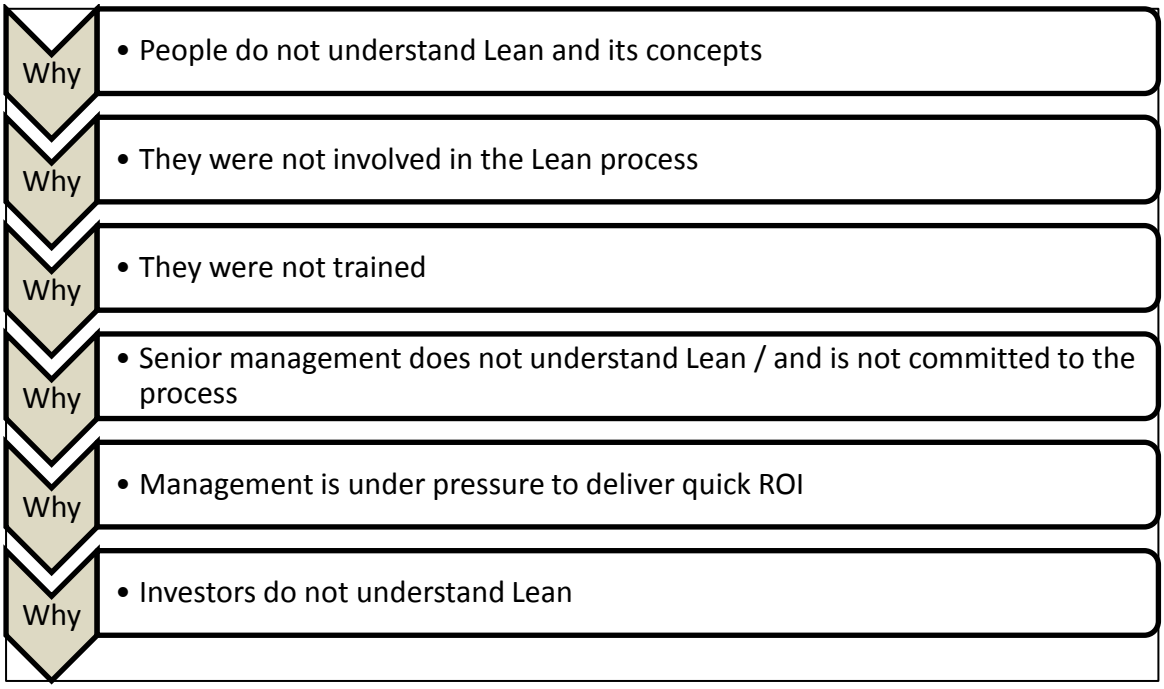
2.6 REASONS WHY LEAN IMPLEMENTATIONS FAIL

It is not yet clear as to why many Lean Implementations fail; and why many still do not sustain the Lean improvements and achievements. This study explores the reasons, obstacles and barriers that hinder the successful and sustainable implementation of Lean.

The literature reveals some of the reasons as to why many organizations fail in sustaining Lean improvement results. Toyota uses the five-whys analysis to understand why so many Lean implementations fail (Liker & Franz, 2011).

DIAGRAM 3: ROOT CAUSE ANALYSIS OF WHY LEAN IS NOT SUSTAINED

Lean improvements are not being sustained.



SOURCE: DERIVED FROM (Liker & Franz, 2011)

2.6.1 Lack of Management Commitment

Management plays a big role in Lean Projects and Lean Implementations (Rahman, et al., 2010). It is up to Management to take the Lead and show the employees that they believe that Lean is best for the organization and will help shape the future of

the organization. Management might be under pressure to deliver quick profits thus focusing on short term goals and forgetting about the long-term vision of sustainability. Management must show the rest of the employees that they buy in to Lean concepts and support the initiative. The message that employees will not be replaced by systems, but their jobs will be made easier and much more efficient once Lean techniques have been applied, needs to be conveyed and communicated clearly.

In most companies where lean is implemented, senior management is not involved in the day-to-day operations and continuous improvement efforts that are part of lean and as a result management fails to provide the necessary support and commitment (Anderson, et al., 2008). The lack of management support, commitment and buy into the Lean implementation poses a huge risk to the success and sustainability of Lean.

2.6.2 Lack of Employee Involvement

Employees at all levels of the organization need to be involved and understand the reasoning behind the Lean Implementation. Employees also need to buy in and support the changes that the Lean implementation will bring to the organization. They have to be made aware of the challenges that they will be faced with, once Lean is implemented. With any change, comes with it some challenges as well opportunities to grow and develop. Lean challenges the organization and its employees to continuously improve and innovate to achieve perfection. Employees need to understand that Lean implementations thrive in a culture of continuous learning and improvement.

One of the most important innovative concepts in the TPS system is to create a sense of community in the workplace through long-term service commitment in which seniority was considered? People are the most important assets to the company. Essentially, the longer that you worked at the company, the higher pay you received. This model considered workers as a fixed cost, similar to the

machinery, that does not depreciate, as long as the management continues to train the workers (ToyotaMotorCorp, 2014).

Toyoda also implemented intense employee involvement with decisions in the production line and restrictions on layoffs because this would mean more training for those currently unfamiliar with TPS. The company's management must commit to continuously investing in its employees and constantly improving which took decades for Toyota to master.

This collaborative effort between the workers and the managers opens the lines of communication where workers share their knowledge about the production lines and are willing to shape the job, its process, and try new procedures. Management must also go to the floors and see for themselves the production and flow so that they do not make major changes based on assumptions on how they believe production should go.

2.6.3 Lean transforms Organisational Culture

The prevailing literature suggests that underlying almost every Lean failure is the fundamental issue of organizational culture and change management. (Bhasin, 2013) Culture is defined as the assumptions, values, norms and the way an organization and its people behave. The literature advocates that nine of the top ten barriers to change are people related (Bhasin, 2013).

Lean transforms an organizational culture – Management have to accept, adopt and drive a culture of continuous learning and improvement. This culture drive must come from management. They must be part of it – be exemplary to staff and live by it. Employees will easily buy into this, if the change comes from higher up in the organization.

Once Lean has been implemented, the new culture and the way of doing things must resonate with employees. It must be part of their daily work routine. It is not an easy task to change a culture that took years to come about. A "Leaner culture" will also take some time to build. At Toyota, it began with a commitment towards a culture of

continuous improvement; small incremental improvements that eventually made a significant impact. There more times a task is performed, each time its performed new ideas are born to improve and perfect it. This is basically how the Lean philosophy evolved at Toyota; through continuous iterations of trial and error, a world class manufacturing phenomenon was discovered (ToyotaMotorCorp, 2014). When Lean is being introduced into the organization, everyone must embrace change and accept the shift in mindset and behaviour.

2.6.4 Lack of Communication

Communication is the most significant factor in sustaining Lean improvements. It is paramount that the right people know about the changes that Lean brings to the organization and the impact that these changes bring. The changes and their impact should be quantified and standardised so that the benefits of sustaining the changes become evident. Employees will easily buy in to this approach (Venegas, 2007). Numerous steps can be taken to ensure that the changes are implemented effectively:

- Make sure that people know how to perform the new task
- Clarify the specific roles of each employee
- Provide the employees with the necessary training they need to understand to implement the new changes (Venegas, 2007)

Management needs to understand that changes in the work processes impact on the people that will perform those processes. Adopting a human dynamics management tool in parallel to the Lean implementation will ensure that people are prepared for the changes to come. This is most critical to the success and sustainability of Lean in the organization.

2.6.5 Resistance by Unions

Unions still play a vital role in many organizations; their aim being to protect and be the voice of the low level workers. Scholars argue that change initiatives often encounter resistance from unions (Pieterse, et al., 2010). This could largely be because organizations do not involve unions in the Lean Implementation Process. What could help, is to possibly ensure that a representative from the union is made part of the Lean Team. Thereby allowing the union to hear first-hand the progress and challenges that the Lean implementation might bring to the organization.

2.6.6 Behavioural Issues of People

Employee attitudes could be the main obstacle in sustaining Lean improvements, especially if the employees are not involved and are not made part of the Lean implementation.

Employees who are motivated and empowered are key because they are the ones who are going to solve problems and make improvements in production. “No one knows the job better than those who do it” simply implies that the person who is experienced in his/her job is most likely to have a better understanding of its challenges and how it can be improved upon (Wong, et al., 2009). Cross-training and multi-skilling employees in various processes of the organization prepares them and enables them to respond faster to changes.

2.6.7 Lack of resources

Many organizations do not dedicate focus and resources to the Lean initiative; and as a result are not able to reap the benefits of Lean. The lack of resources further impacts on the lack of planning, communication and proper awareness. A dedicated lean team is required to ensure that proper planning is done prior to implementation, and that all the necessary checks are performed, employees are prepared for the initiative and that all stakeholders (including the union) are kept in the

communication loop with regards to the feedback, progress and challenges of the initiative.

2.7 LEAN SUSTAINABILITY

Organizations that have implemented Lean tools in their operations and processes have achieved sustainable results by employing the following success strategies.

2.7.1 Sustaining the commitment to Lean

Management must stay committed to the Lean journey to ensure significant improvements and sustainability over the long run. One of the biggest barriers to achieving lean sustainability is the lack of management support. Management must show and provide adequate support to the Lean team and to the organization as a whole.

Management needs to understand that a Lean implementation is a transformational journey and it will take some time to reap the rewards and actually see the results.

2.7.2 Sustain the gains by making Lean part of the daily work routine

Initiatives to implement lean manufacturing have focused too heavily on specific tools such as 5S and Just-In-Time without first understanding lean in its entirety. Lean as an entire system permeates an organization’s culture. Once Lean has been implemented in the organization, it is paramount to sustain and maintain the new changes in order to reap the benefits.

The only way to sustain the Lean improvements is to keep on doing them.

This can be achieved by:

- Conducting regular meetings – daily or weekly meetings
- Ensure that the new processes are documented
- Ensure that there is a way to collect feedback from process experts

- Conduct reviews to identify any issues or challenges
- Teach employees to be “Lean” everyday – the tools must be used daily to sustain the improvements

2.7.3 Sustaining the Lean Culture

Companies in many industries have been attempting to learn best practise approaches from Toyota, and are particularly interested in eliminating waste and developing lean processes that are efficient and cost effective (Liker & Hoseus, 2008).

Since Toyota started its operations a few decades ago, the founders believed that the key to success was investing in people (Liker & Hoseus, 2008). The Toyota culture has evolved over the years; however the company’s philosophy and its principles are still deeply rooted in the company’s values and mission. The culture is still driven by respect for people and continuous improvement. Many companies have become frustrated with improvement efforts that only yielded short term gains but had no sustainability, and it is believed that the missing piece that creates long term sustainability is the Toyota culture (Liker & Hoseus, 2008)

A change in work culture will ensure smooth transition of lean implementation. By adopting a culture of proper communication and training, learning and continuous improvement will nurture the lean environment and make it conducive for further small lean projects.

2.8 SUMMARY

The success and long term gains of any Lean journey do not come easily but through perseverance, determination and eagerness to achieve perfection. Even though Toyota shared its discovery of the Toyota Production System (TPS) with the world, very few organizations have been able to learn from it and its principles.

Many believe that Lean implementations merely involve implementing lean tools such as Just In Time or Jidoka. The main obstacle is very few organizations understand the cultural aspects involved in Lean implementations. A firm grasp on culture is very important because it ties all the separate tools of the lean system together (e.g. waste elimination, continuous improvement, kanban, poka yoke, jidoka, quality at source, standardized work) and is crucial to ensure a smooth lean transition and implementation (Wong & Cheah, 2011).

Does organisational culture have an impact on the adoption and implementation of lean thinking? This is one question this study aims to address and possibly provide some insight as to why organizational culture is so significant in sustaining Lean implementations.

Chapter 3 : RESEARCH METHODOLOGY AND DESIGN

INTRODUCTION

The Literature explored in the previous chapter put forward that Lean has a huge impact on the social and behavioural human characteristics. Several past, researchers had identified that culture affects the success of lean implementations, however, these findings were based on looking at the organizational culture from a holistic perspective; the relationship between culture and lean implementation has still not been adequately explored due to the lack of a detailed examination on how the dimensions of organizational culture correspond to the deployment of lean practices (Wong & Cheah, 2011).

Lean thinking principles have been adapted from manufacturing sectors to other industries. Leon is introduced to other industries as the use of new tools and techniques, which have a distinct difference when compared to those used in traditional practices. Many researchers identified the use of inappropriate tools as a barrier to the successful implementation of Lean; however, it is important to realize that the lean philosophy has to be clearly understood in order for these tools and techniques to be effective. Focusing, only, on lean tools may improve performance, but it will not lead to long term sustainable improvement or yield to the full benefits.

This study will take the form of an explorative nature; as it seeks to identify, determine and assess the factors that inhibit a self-sustaining Lean culture. The need for this research is to gain understanding and assess the causes as to why many organizations fail to sustain the level of improvements they had planned. For many decades, it has been the aim of researchers to explore and understand a research problem so that answers and solutions can be found to help the many that will still follow in the same journey.

3.1 RESEARCH DESIGN

This study focuses on the challenges to implementing lean – both structural and cultural barriers. The study employed an approach involving a web questionnaire survey to collect quantitative and qualitative data. It is based on findings from the questionnaire survey which included 13 questions and aimed to explore and analyze the findings.

The structure of the questionnaire was as follows:

- Background details (Section A: questions 1-9): To gain information about the Participants and their organizations, so it can be used for secondary analysis.
- The softer aspects of Lean (Section B1: 8 questions): To evaluate the extent to which the organizational culture is established and how it may impact on the sustainability of Lean, as well
- Challenges and barriers to the successful implementation of Lean (Section B2: 8 questions and B3 with 7 questions)
- Behavioural and social factors that may inhibit or limit the success of Lean (Section B4 with 6 questions)

An invitation to complete the questionnaire was sent to 200 organizations in the Eastern Cape. Participants were selected randomly from a number of organizations that have implemented Lean; the survey was hosted online for three weeks; participants were given two weeks in which to complete the questionnaire.

3.2 RESEARCH METHODOLOGY

A research paradigm or methodology is a philosophical framework that guides how the research is to be conducted (Collins & Hussey, 2009). Philosophy is the use of reasoning, argument and deductive logic in seeking the truth and understanding the problem.

There are two major research methodologies that a researcher can undertake to solve a problem.

3.2.1 Posivistism

Posivistic paradigm is underpinned by the belief that reality is independent of the researcher and its goal is the discovery of knowledge and the truth. This knowledge is derived from “positive information” (i.e. Surveys and observations) based on empirical research.

Many researchers conduct research that stems from the posivistic approach in order to explain and predict social phenomena (Collis & Hussey, 2009). The theories used in posivitist methodologies aims to explain and establish relationships between variables. Variables are attributes of a phenomenon and since they can take on different values; they can be measured, and as such posivistic studies are associated with quantitative methods of analysis (Collis & Hussey, 2009).

3.2.2 Interpretivism

Interpretivism was developed as a result of perceived criticisms of posivistic approach. Interpretivism believe that social reality is not objective but it is highly subjective because it is shaped by people’s perceptions. (Collins & Hussey, 2009). Interpretivism allows the researcher to investigate, explore and adopt a range of methods that “seek” to understand the problem in a different light. Conclusions of Interpretivism are not derived from statistical analysis of quantitative data. A difference between posivistic and intepretivism approaches has been tabled below for easier reference:

TABLE 1: RESEARCH APPROACHES (SOURCE: (Collis & Hussey, 2009)

	Posivistic Approach	**Interpretivism Approach**
Approach	Reality is objective	Reality is subjective
Research Process	Deductive	Inductive
Data analysis methods	Uses quantitative data analysis	Uses qualitative data
Research methods	Experimental studies and surveys	Interviews and case studies

This study has followed a deductive posivistic approach to ensure that the research was unbiased and objective. The deductive approach was used to develop and test the hypothesis that organizational culture has an impact and is significant in sustaining Lean implications. The inductive interpretivism approach was also used to carry out the research, collect the data, explore the social factors and barriers to Lean in order to develop a theory and model that would help other organizations to sustain Lean efforts.

Previous studies have mentioned a few implementation barriers and challenges to implementing Lean; this research also aims to validate these barriers and test their prevalence in the South African context.

The analysis consisted of two major steps. The first step was to identify the obstacles and barriers encountered by all organizations that have implemented Lean and compare the results. The second major step was to analyze the barriers and results in order to come up with a proposed model for change.

3.3 SAMPLE

3.1.1 Sample and Sample Size

A sample is a subset of a population. In a positivistic study a random sample is chosen to provide an unbiased subset of the population (Collins & Hussey, 2009). The larger the sample size, the better it will be to statistically validate the findings and the results to a population.

200 participants were randomly selected from a number of organizations in the Eastern Cape that have implemented Lean.

3.1.2 Measuring instrument

The measuring instrument used is a web survey. A web survey is a methodology designed to collect primary data from a sample, with a view to generalize the results to a population and ensure anonymity of the respondents (J.Collins & R.Hussey, 2009).

The aim of a structured questionnaire is to get views and opinions of experts in a particular subject area. There are extensive web tools that allow a setup and creation of a survey; once setup it can be emailed to potential participants. Thereafter preliminary results can be viewed as the results come in.

3.1.3 Survey Procedure

The data was captured through web survey questionnaires undertaken in 36 manufacturing, automotive, pharmaceutical and service organizations. A web questionnaire was developed and a link to complete the questionnaire was given to the various organizations selected for the study.

Several organizations comprising of various sizes and in various stages of Lean implementation were targeted to explore the prevailing culture of the respective organizations; similar statements were given to both the low level workers and management and they were asked to respond utilizing a scoring scale of 1-5; a 1 if they totally and unambiguously disagreed with the statement.

3.3 SUMMARY

This chapter has examined and discussed the research design and methodology that has been adopted for this study.

As previously mentioned, this study is of an explorative nature; as it seeks to identify, determine and assess the factors that inhibit a self-sustaining Lean culture. The need for this research is to gain understanding and assess the causes as to why many organizations fail to sustain the level of improvements they had planned.

The next chapter will present, review and analyse the results of the survey.

Chapter 4 : ANALYSIS AND INTERPRETATION OF THE STUDY RESULTS

4.1 INTRODUCTION

The aim of this chapter is to present the results of the survey and discuss its outcome and findings. The primary objective of the survey was to identify the barriers and obstacles that hinder successful implementation of Lean. The intent of the questionnaire was to identify and assess the causes that inhibit a self-sustaining lean culture.

4.2 SAMPLE AND SAMPLE SIZE CHARACTERISTICS

The web survey link was electronically sent to approximately 200 companies around South Africa with particular focus to companies in the Eastern Cape. The respondents were given two weeks to complete the survey. Only about 60 emails were undelivered; of the 140 that was successfully delivered only 90 read the email survey. The number of respondents that successfully completed the survey was 36; 5 started the survey, but failed to complete it.

TABLE 2: SAMPLE REPRESENTATION DATA (SOURCE: WRITER COMPOSITION)

Sample	**200 companies**
Delivered	140
Undelivered	60
Read email	90
Participated	41
Did not complete	5
Valid results used	**36**

To ensure instrument reliability and validity, the incomplete responses have been removed from the analysis results. Therefore one cannot say that the 36 that actually completed the survey is representative of the Lean population in South Africa,

however it does represent a fair number of those companies that wish to learn from the findings of this study and how they can perhaps improve the status of Lean in their own organizations. The response rate from the survey was fairly disappointing; however quite a number of companies were keen to know what the outcome and the findings of the study would reveal.

4.3 CHARACTERISTICS OF THE RESULTS

Some demographic information such as gender, position and operating industry was requested from the respondents in order to better understand the sample.

4.3.1 Operating Industry

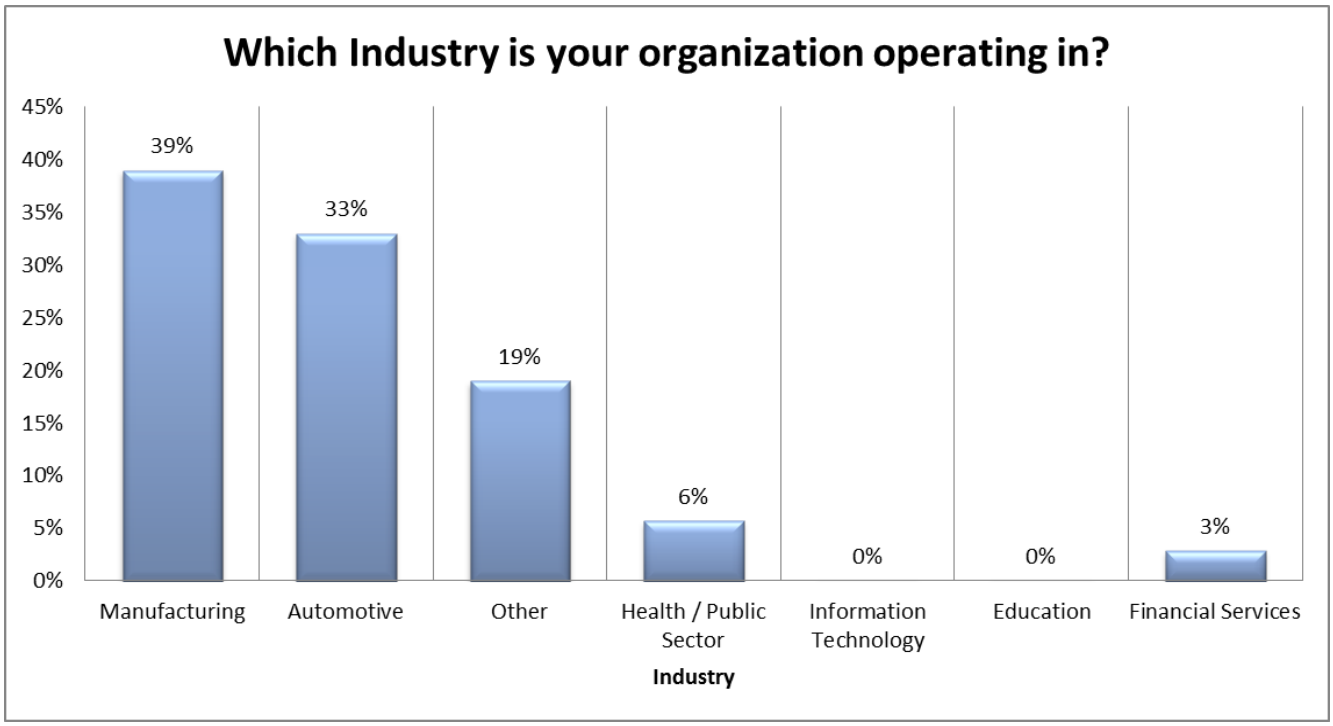
As illustrated in Table 3, 72% of the organizations that participated in the web survey were from manufacturing, and automotive industries, with a small subset from other industries. It would then mean that the findings of this research are representative of the population in the automotive and manufacturing industries.

It is rather surprising to note that there were no organizations in the Education and Information technology sectors that participated in the survey.

TABLE 3: OPERATING INDUSTRY

Operating Industry	Frequency	% of respondents
Manufacturing	14	39%
Automotive	12	33%
Other	7	19%
Health / Public Sector	2	6%
Information Technology	0	0%
Education	0	0%
Financial Services	1	3%
Grand Total	**36**	**100%**

FIGURE 1: OPERATING INDUSTRY



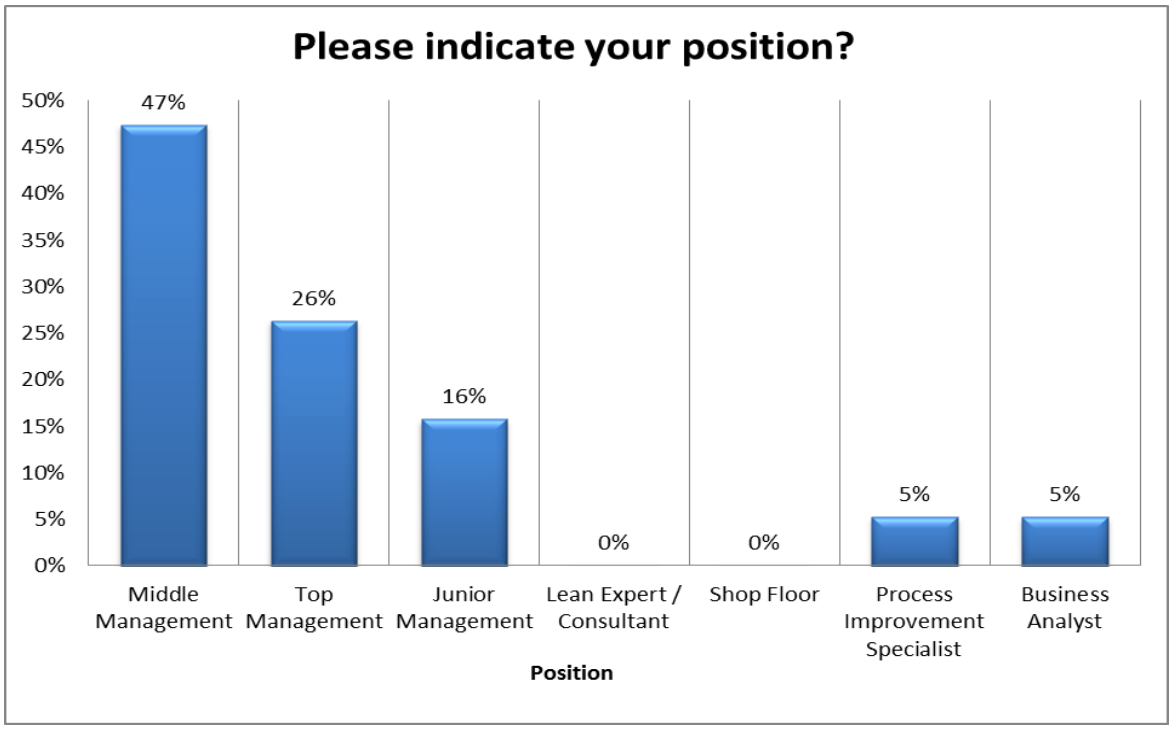
SOURCE: SURVEY QUESTIONAIRE – Q1.

4.3.2 Position

As illustrated on Figure 2 below, the survey respondents came from a broad range of job positions, with middle management and top management dominating the respondents. It was also quite surprising to note that no one from the shop floor/factory was given an opportunity to complete the questionnaire. The questionnaire was sent to Management to distribute to their staff who had been involved in Lean Implementations.

Another key factor to note is that, no consultant or Lean expert was among the respondents. These were all mostly key management staff members.

FIGURE 2: POSITION

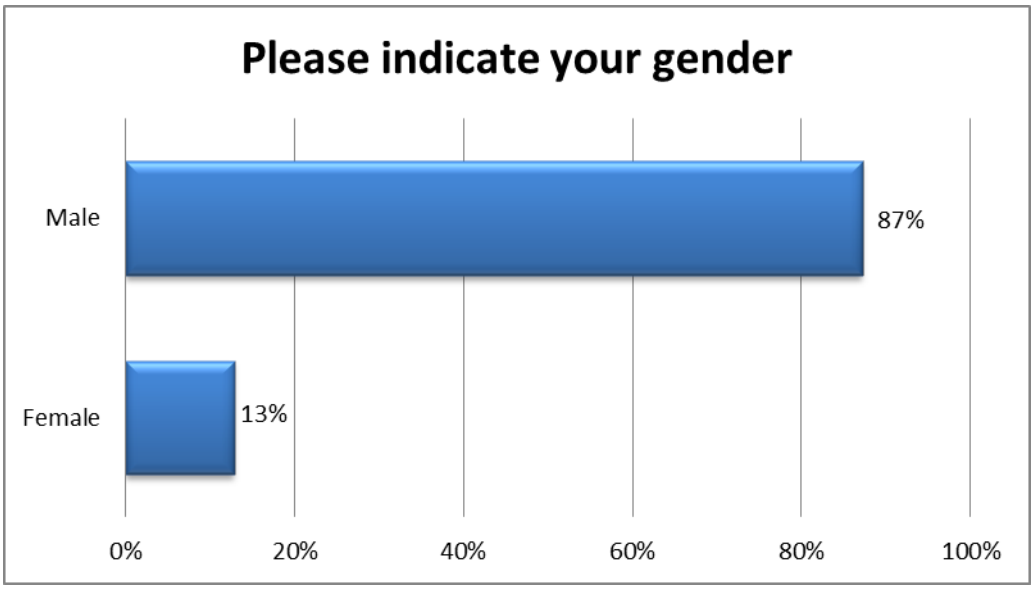


SOURCE: SURVEY QUESTIONNAIRE– Q2.

4.3.3 Gender

As indicated on Figure 3 below, 87% of the respondents were male while a mere 13% were female. This is truly representative of the sample as most respondents were middle and top management from manufacturing and automotive industries.

FIGURE 3: GENDER OF RESPONDENTS



SOURCE: SURVEY QUESTIONNAIRE – Q3.

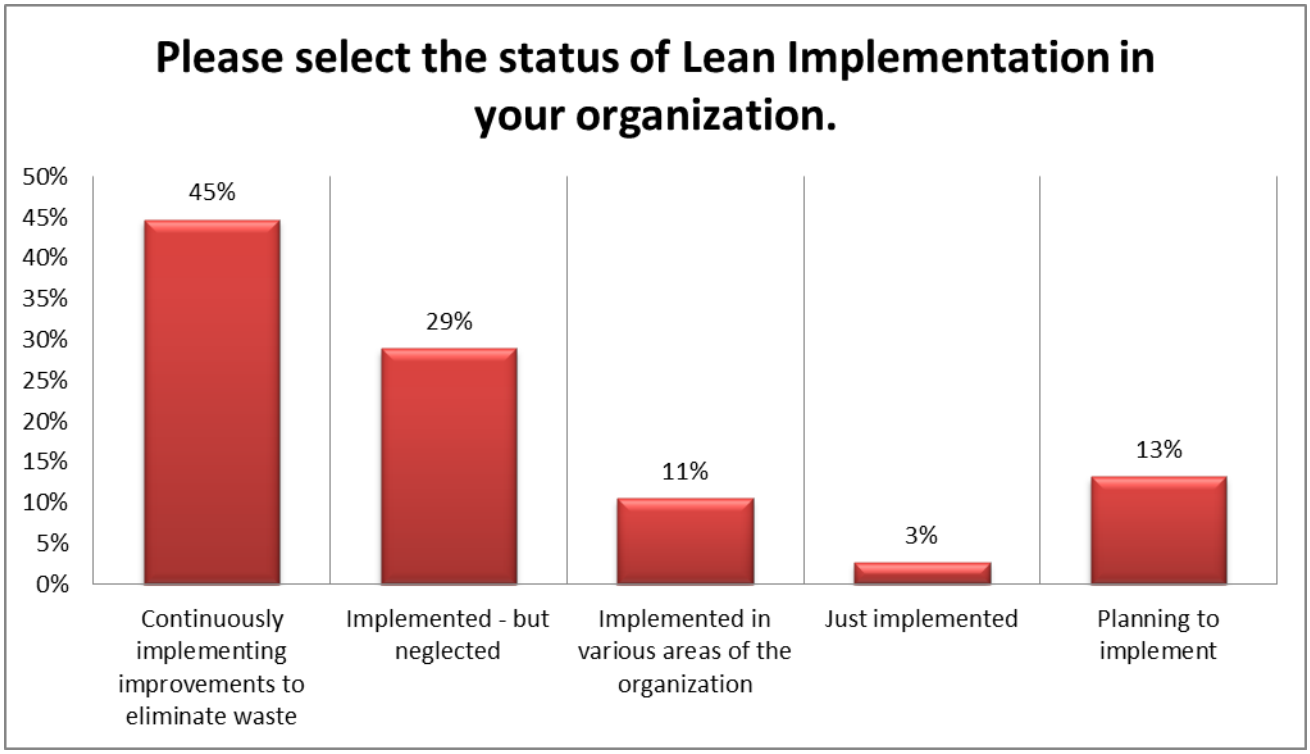
4.3.4 Status of Lean Implementation

The respondents were asked to comment on the status of Lean Implementation in their respective organizations.

As illustrated on Figure 4 below:

- 45% are continuously implementing lean improvements to eliminate waste. Lean is a continuous journey of small incremental improvements.
- 29% have implemented lean but neglected it. They failed to sustain the lean improvements and often went back to doings the old way
- 13% are still planning to implement lean. These are the companies that can potentially learn and gain insight from the findings of this study.
- 11% have implemented lean in the various areas of their organization. For these companies, Lean is a journey and are yet to reap the rewards.
- 3% have just implemented lean. It is with great hope that this study would contribute positively to those who have just embarked on the continuous improvement journey of Lean

FIGURE 4: STATUS OF LEAN



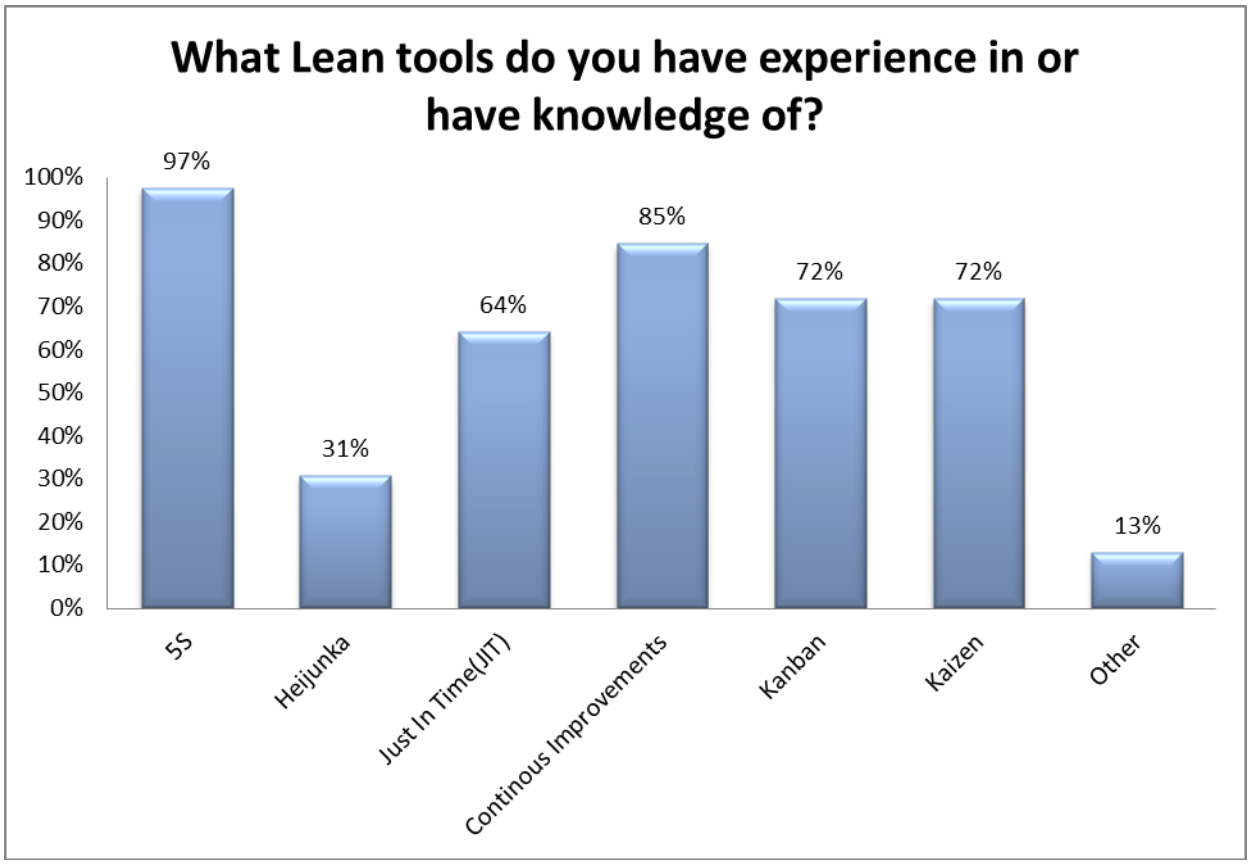
SOURCE: SURVEY QUESTIONNAIRE – Q4.

4.3.5 Lean Tools

As illustrated on Figure 5 below:

- 97% of the respondents have experience or have knowledge of 5S of housekeeping
- 85% have experience or have knowledge of continuous improvements techniques
- 72% have experience or have knowledge of Kanban techniques
- 72% have experience or have knowledge of Kaizen techniques
- 64% have experience or have knowledge of Just In Time (JIT) techniques
- 31% have experience or have knowledge of heijunka
- 13% have experience or have knowledge in other Lean tools

FIGURE 5: LEAN TOOLS

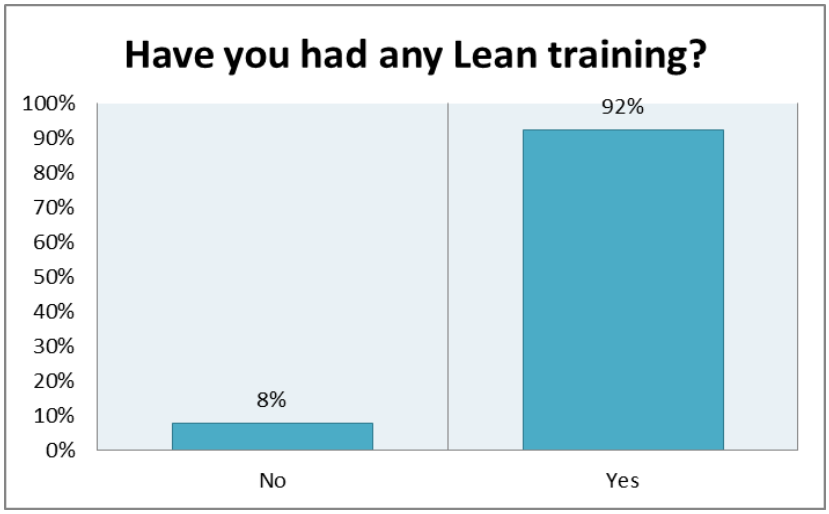


SOURCE: SURVEY QUESTIONNAIRE – Q5

4.3.6 Lean Training

As illustrated on Figure 6 below: 92% of the respondents had some form of lean training.

FIGURE 6: LEAN TRAINING



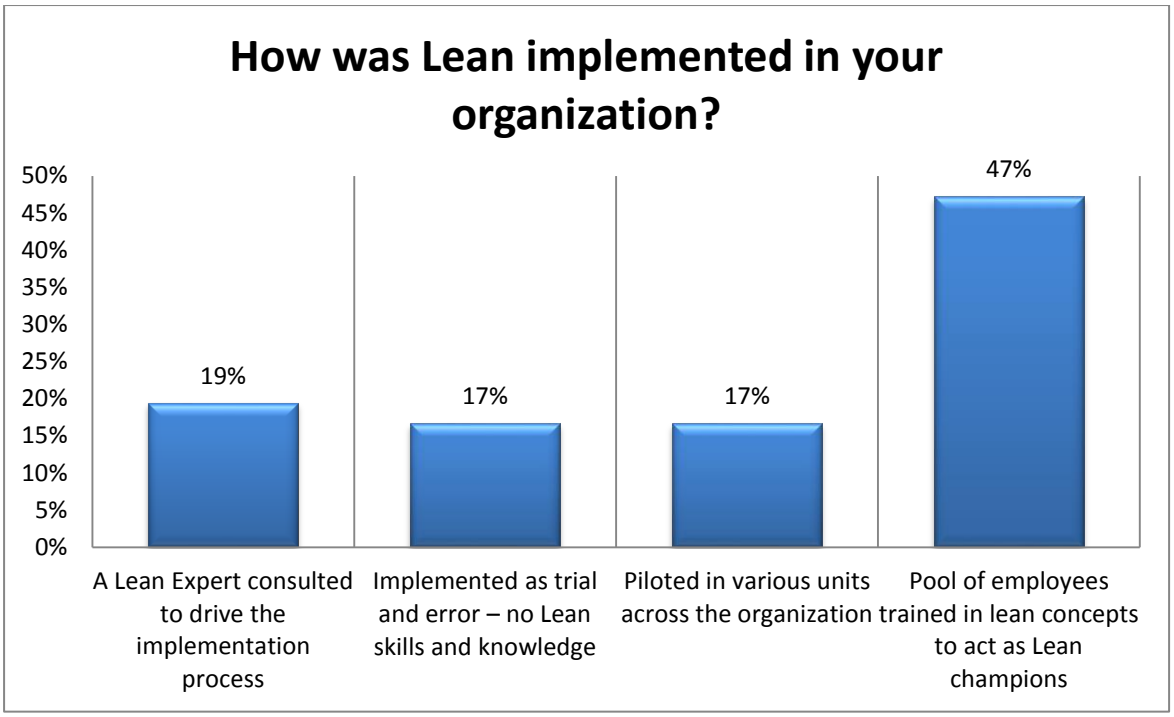
SOURCE: SURVEY QUESTIONNAIRE – Q6

4.3.7 How was Lean Implemented in your organization

As illustrated on Figure 7 below:

- 47% of the respondents were selected and trained in lean concepts in order to act as lean champions for the organization
- 19% of the respondents confirmed that their organizations brought in a Lean Expert to drive the implementation
- 17% of the respondents confirmed that Lean was piloted in the various areas across the organization
- 17% of the respondents implemented Lean as trial and error – with no Lean skills and knowledge

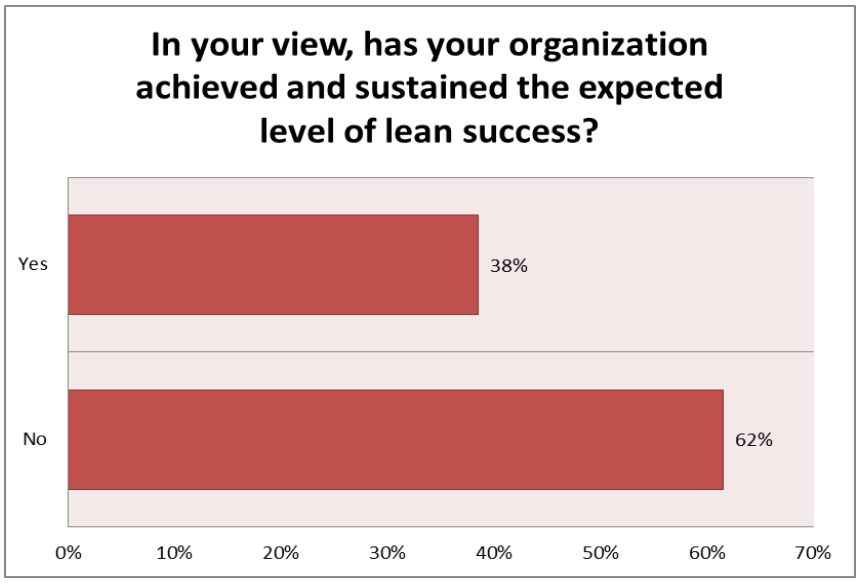
FIGURE 7: HOW WAS LEAN IMPLEMENTED?



SOURCE: SURVEY QUESTIONNAIRE – Q7.

4.3.8 Lean Sustainability

FIGURE 8: LEAN SUSTAINABILITY AND SUCCESS



SOURCE: SURVEY QUESTIONNAIRE – Q8.

As illustrated on Figure 8 above:

- 62% of the respondents said they had not achieved and sustained the expected level of lean success
- 38% of the respondents had achieved and sustained the expected level of lean success

4.3.9 Reasons for not sustaining Lean achievements and success

The 62% of the respondents that had not achieved and sustained the expected level of lean success had the following to say. These are some of the reasons why certain organizations have not sustained the level of success:

- The Lean Project is still in the planning phase and the organization needs to involve lean specialists to ensure foundation is firmly in place.
- For some organizations lean is an ongoing effort, “a journey” they can always improve...” The organisation will never reach that level, it is a journey. There is always room for improvement. We have been busy with this process for the past 10 years and it feels as if we have just started with the intervention.
- It is an ongoing journey that we are engaged in, the organisation has definitely advanced a lot in terms of Lean implementation but we are not yet a Lean organization. Lean / TPS have to be the organization's culture, lived by all employees. Culture change is the main thing, running from management to shop floor employees.
- Many departments still fall back to old habits especially when under pressure to deliver.
- Lack of commitment to maintain lean processes from all team members
- The bottom line and pursuit of profit take priority.
- Management is not prepared to dedicate resources to Lean projects
- Lean was implemented top down... management implemented various Lean tools and strategies but failed to sustain them. The moment the management focus shifted, the progression of lean tools/implementation reversed. The focus should be on training and creating a Lean "Culture".
- There is no Lean champion to drive the implementation and sustain its efforts

- Resistance from the unions
- Lack of top management involvement and participation

4.3.10 Prevailing Organizational Culture

The following statements were directed to the respondents in order to understand the prevailing organization culture and how it has impacted on the sustainability of Lean.

- 43% agree that the prevailing organizational culture can have an impact on the sustainability of Lean
- 20% strongly agree that the prevailing organizational culture can have an impact on the sustainability of Lean
- Even though more than 70% believe in a culture of continuous learning, innovation and continuous improvement techniques, they still fail to reward and recognize employee's efforts and achievements

TABLE 4: ORGANISATIONAL CULTURE

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Responses	Weighted Average
The company creates a culture conducive to continuous learning by encouraging employees to grow and advance their careers	0 (0.00%)	4 (11.11%)	4 (11.11%)	**17 (47.22%)**	11 (30.56%)	36	3.97 / 5
The company involves employees in important decisions.	2 (5.56%)	4 (11.11%)	8 (22.22%)	**18 (50.00%)**	4 (11.11%)	36	3.50 / 5
The company rewards employees for coming up with new ideas	2 (5.56%)	8 (22.22%)	**13 (36.11%)**	8 (22.22%)	5 (13.89%)	36	3.17 / 5
Innovation and continuous improvement in processes is a priority	1 (2.78%)	3 (8.33%)	6 (16.67%)	**16 (44.44%)**	10 (27.78%)	36	3.86 / 5
The company recognizes and rewards people's efforts	2 (5.56%)	6 (16.67%)	**13 (36.11%)**	10 (27.78%)	5 (13.89%)	36	3.28 / 5
The company is committed to achieving excellence	1 (2.78%)	4 (11.11%)	2 (5.56%)	**20 (55.56%)**	9 (25.00%)	36	3.89 / 5
The organization is committed on eliminating wasteful activities that do not add value in the eyes of the customer	1 (2.78%)	3 (8.33%)	4 (11.11%)	**16 (44.44%)**	12 (33.33%)	36	3.97 / 5
Management goes to work areas regularly to encourage people and to find out what they can do to support improvement efforts	2 (5.56%)	7 (19.44%)	3 (8.33%)	**17 (47.22%)**	7 (19.44%)	36	3.56 / 5
							3.65 / 5

SOURCE: SURVEY QUESTIONNAIRE – Q. B1

From the results of the survey, it can be deduced that:

Almost 50% of the respondents agreed:

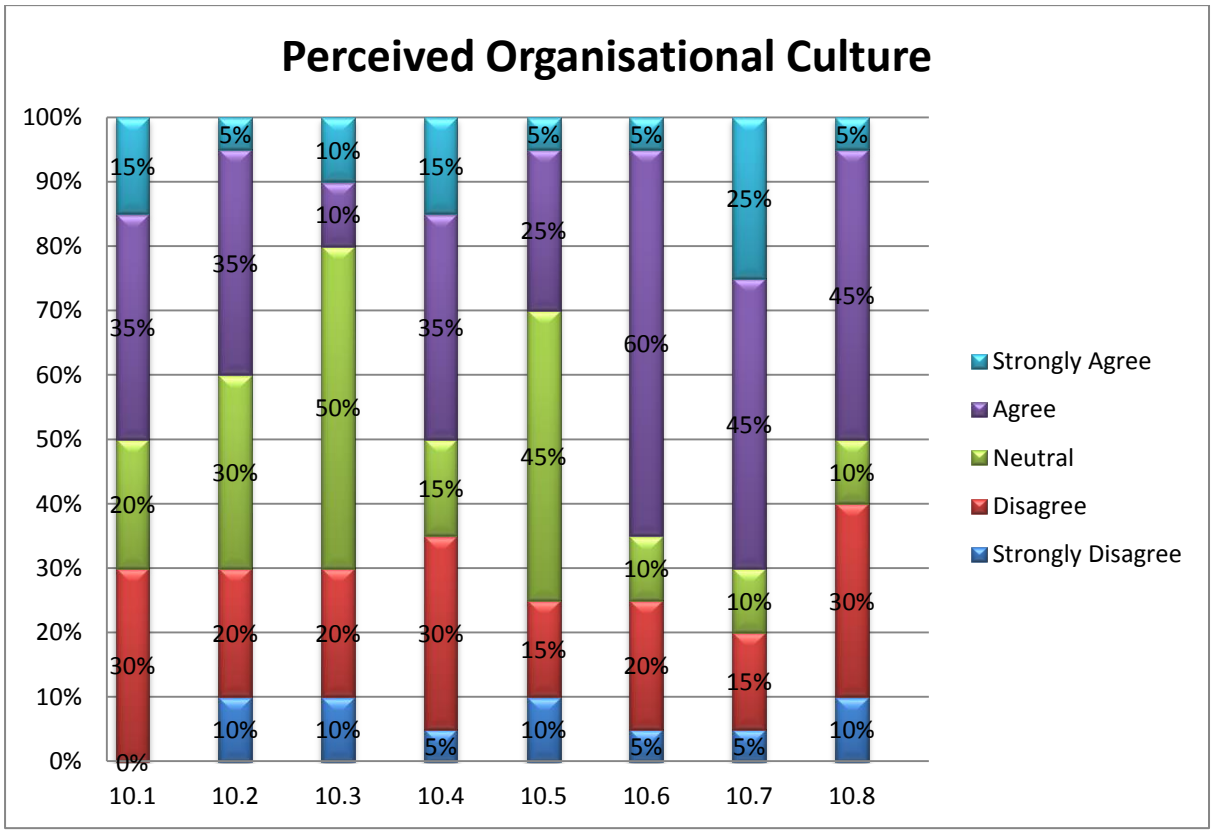
- that their organizations create a culture conducive to continuous learning
- that their organizations involve employees in important decisions
- innovation and continuous improvement in processes is a priority
- Their organizations are committed to achieving excellence
- Their organization is committed on eliminating wasteful activities that do not add value in the eyes of the customer

More than 35% were unsure or neutral:

- On whether their organizations rewarded their employees for coming up with new ideas or recognized and rewarded people's efforts

However if one looks at the respondents that said they had not sustained the benefits of Lean, the results are rather interesting:

FIGURE 9: PERCEIVED ORGANISATIONAL CULTURE BY 62% OF THE RESPONDENTS THAT SAID THEY HAID NOT SUSTAINED LEAN EFFORTS



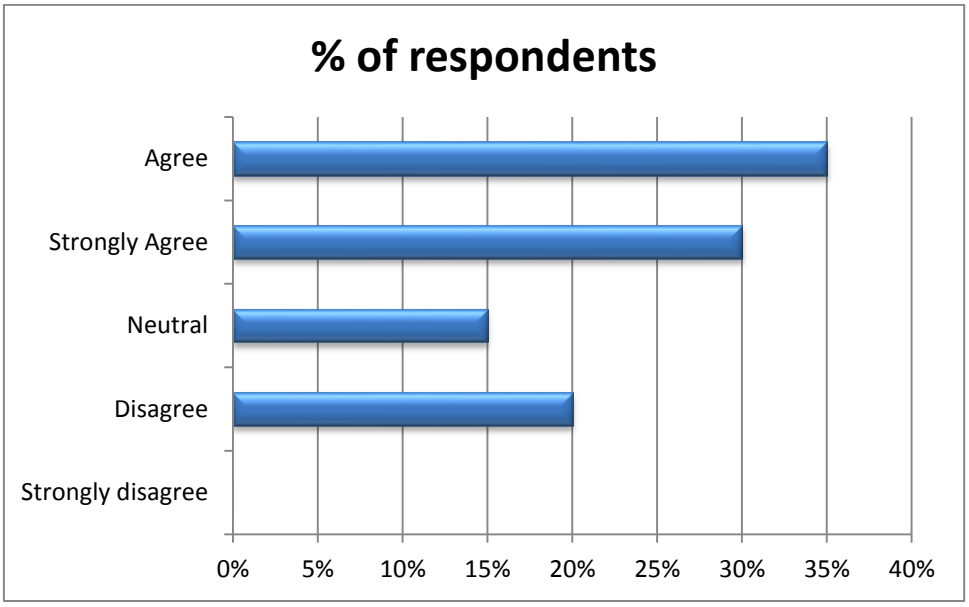
SOURCE : SURVEY QUESTIONNAIRE – Q. B1

Based on figure 9 above: it can be deduced that the perceived organisational culture from those respondents that had not sustained lean efforts is still somewhat a culture that still needs to be developed so that it can mature to the right lean culture.

The graphs below will look at each of the individual survey questions that make up the organizational culture (question B1)

10.1 The company creates a culture conducive to continuous learning by encouraging employees to grow and advance their careers

FIGURE 10: CONTINUOUS LEARNING CULTURE

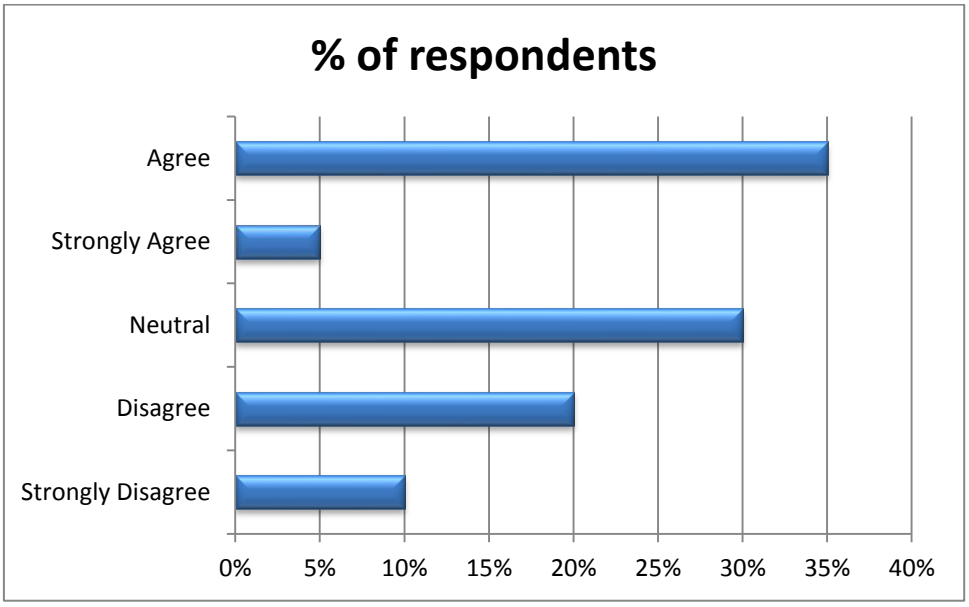


SOURCE: SURVEY QUESTIONNAIRE – SECTION B1: Q1

- From figure 10, it can be inferred that 65% of the respondents agree that a continuous learning culture is prevalent in their organizations
- For 25% of the respondents a continuous learning culture does not exist
- Another 15% is uncertain whether a continuous learning culture exists or not

10.2 The company involves employees in important decisions.

FIGURE 11: EMPLOYEE INVOLVEMENT



SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q2

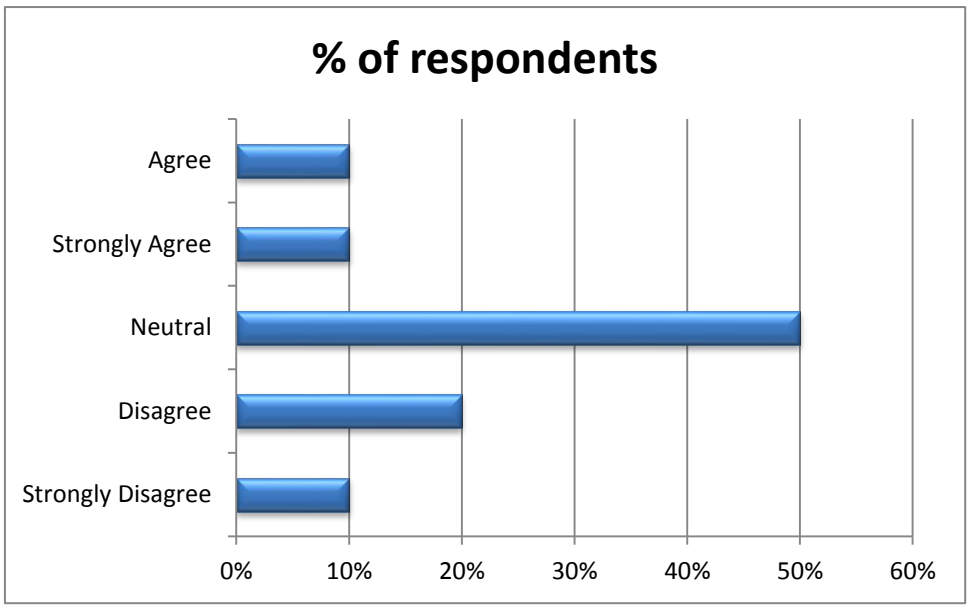
From figure 11 above, it can be inferred that:

- 40% of the respondents agree that their organizations involve its employees when making important decisions
- 30% of the respondents are uncertain that employees are involved in the decision making process. This probably means the organization does not involve employees in key decisions.
- 30% of the respondents disagree that their organizations involve employees in important decisions

10.3 The company rewards employees for coming up with new ideas
From the figure below, it can be inferred that:

- 50% of the respondents are uncertain that their organizations recognize and reward employees for coming up with new ideas
- 30% of the respondents disagree that their organization reward employees for coming up with new ideas.
- 20% of the respondents agree that their organizations do reward employees for coming up with new ideas.

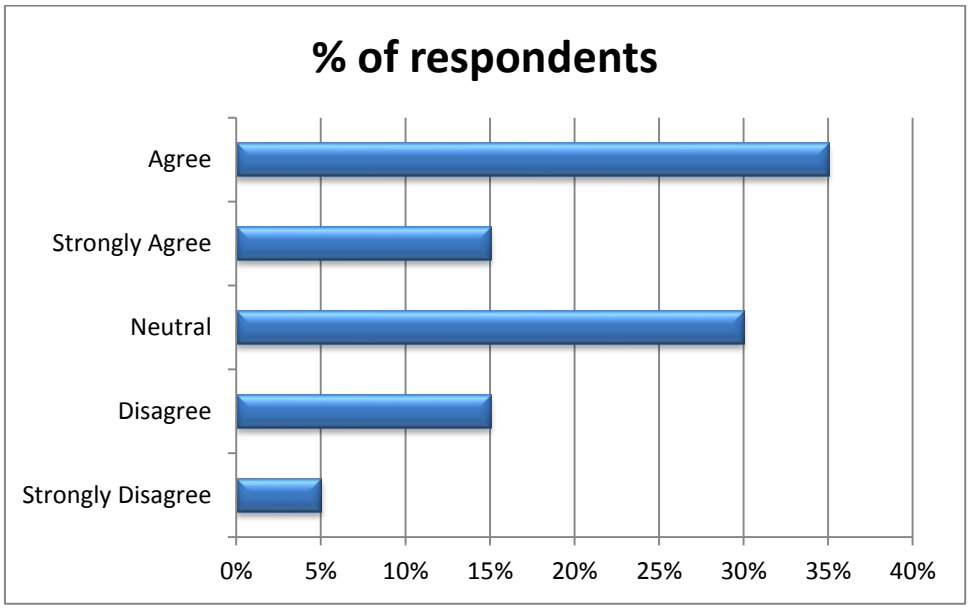
FIGURE 12: EMPLOYEE REWARDS FOR NEW IDEAS



SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q3

10.4 Innovation and continuous improvement in processes is a priority

FIGURE 13: INNOVATION AND CONTINUOUS IMPROVEMENT



SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q4

From figure 13 above, it can be inferred that:

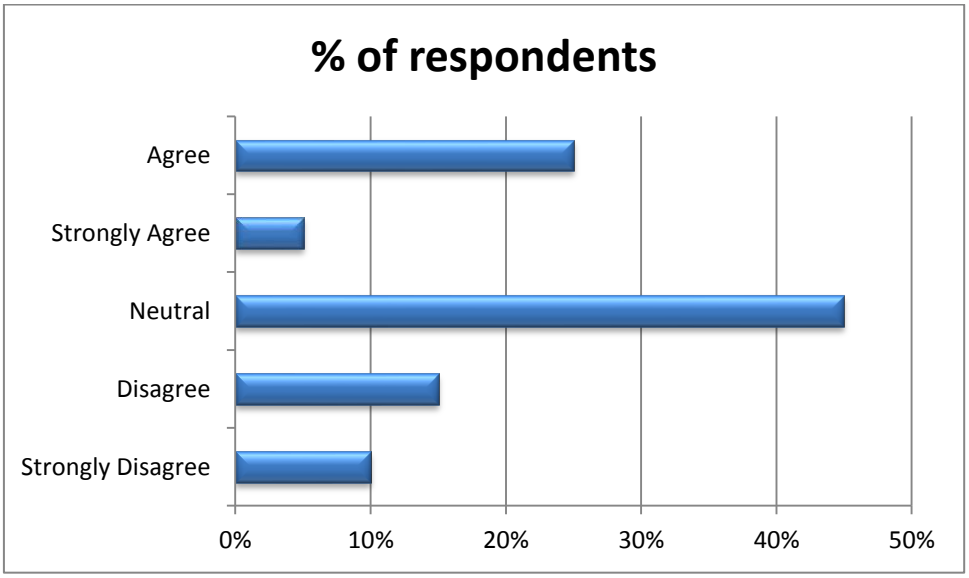
- 50% of the respondents agree that innovation and continuous improvement in processes is a priority for their organizations

- 30% of the respondents are uncertain whether innovation and continuous improvement in processes is a priority for their organizations.
- 20% of the respondents disagree that innovation and continuous improvement in processes is a priority for their organizations

10.5 The company recognizes and rewards people's efforts
From figure 14 below, it can be inferred that:

- 45% of the respondents are uncertain that their organizations recognize and reward employees for their best efforts
- 25% of the respondents disagree that their organization recognise and reward employee for their best efforts.
- 30% of the respondents agree that their organizations do recognise and reward employees for giving their best.

FIGURE 14: RECOGNITION AND REWARDS



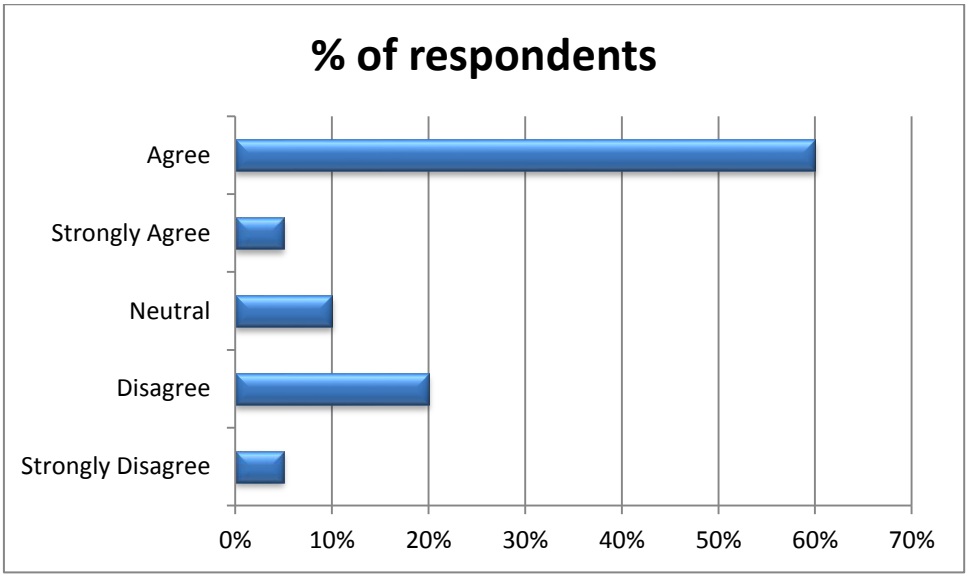
SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q5

10.6 The company is committed to achieving excellence. From figure 15 below, it can be inferred that:

- 65% of the respondents agree that their organizations are committed to achieving excellence

- 25% of the respondents disagree that their organizations are committed to achieving excellence and a mere 10% of the respondents were uncertain that their organizations are committed to achieving excellence

FIGURE 15: EXCELLENCE



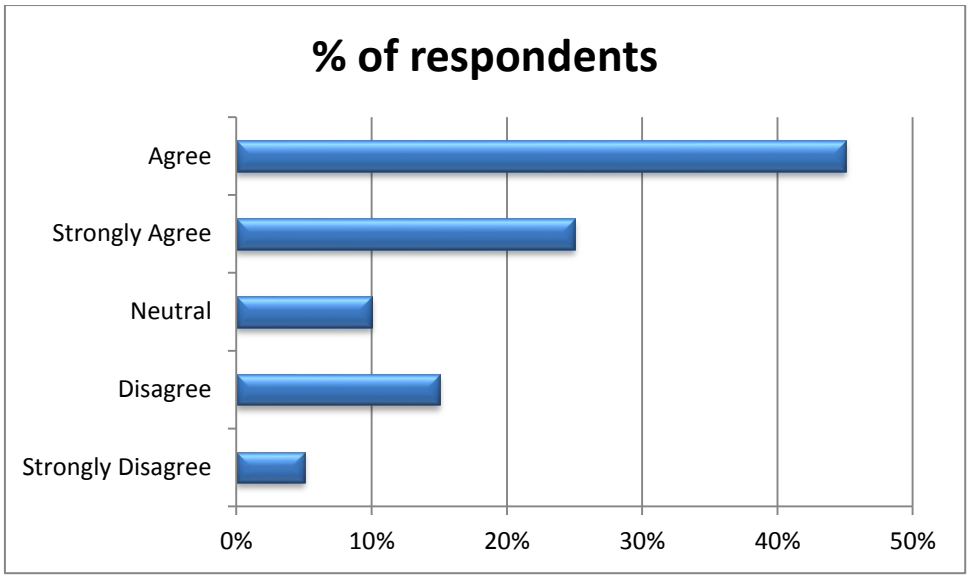
SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q6

10.7 The organization is committed on eliminating wasteful activities that do not add value in the eyes of the customer.

From the figure below, it can be inferred that:

- 65% of the respondents agree that their organizations are committed on eliminating wasteful activities that do not add value in the eyes of the customer
- 25% of the respondents disagree that their organizations are committed on eliminating wasteful activities that do not add value in the eyes of the customer
- 10% of the respondents were uncertain that their organizations are committed on eliminating wasteful activities that do not add value in the eyes of the customer

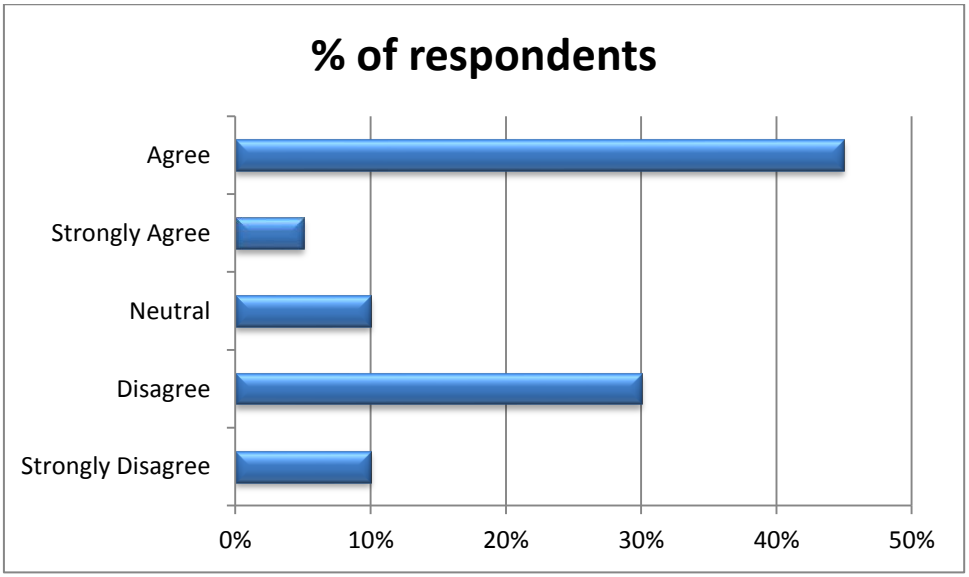
FIGURE 16: COMMITMENT ON ELIMINATING WASTE



SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q7

10.8 Management goes to work areas regularly to encourage people and to find out what they can do to support improvement efforts

FIGURE 17: MANAGEMENT ENCOURAGES IMPROVEMENT EFFORTS



SOURCE: SURVEY QUESTIONNAIRE - SECTION B1:Q8

From figure 17 above, it can be inferred that:

- 50% of the respondents agree that management goes to work areas regularly to encourage people and to find out from people what they can do to support improvement efforts
- 40% of the respondents disagree that management goes to work areas regularly to encourage people and to find out from people what they can do to support improvement efforts
- 10% of the respondents were uncertain whether management does indeed go to work areas regularly to encourage people and to find out from people what they can do to support improvement efforts

4.3.11 Implementation Barriers

The following statements were directed to the respondents in order to identify and analyse the implementation barriers that they may have encountered during their lean efforts.

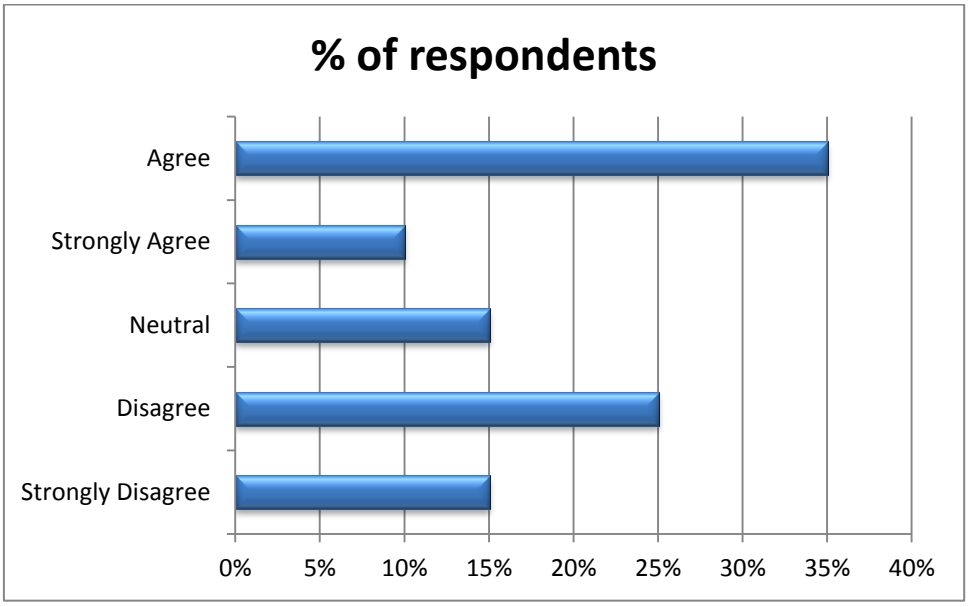
TABLE 5: IMPLEMENTATION BARRIERS

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Responses	Weighted Average
Management is very committed to the sustainability of Lean	4 (11.11%)	5 (13.89%)	5 (13.89%)	**18 (50.00%)**	4 (11.11%)	36	3.36 / 5
Management is aware and understands the changes required to ensure success of Lean	3 (8.33%)	5 (13.89%)	7 (19.44%)	**20 (55.56%)**	1 (2.78%)	36	3.31 / 5
Management communicates regularly with employees about the changes that Lean brings	4 (11.11%)	9 (25.00%)	5 (13.89%)	**16 (44.44%)**	2 (5.56%)	36	3.08 / 5
Management has encouraged Lean training for all in the organization	4 (11.11%)	7 (19.44%)	6 (16.67%)	**13 (36.11%)**	6 (16.67%)	36	3.28 / 5
All employees have been trained in Lean thinking and Lean tools	5 (13.89%)	**12 (33.33%)**	7 (19.44%)	11 (30.56%)	1 (2.78%)	36	2.75 / 5
Management has selected a Lean Champion to drive the Lean implementation	5 (13.89%)	9 (25.00%)	6 (16.67%)	**10 (27.78%)**	6 (16.67%)	36	3.08 / 5
Employees have the necessary support from Management	3 (8.33%)	7 (19.44%)	7 (19.44%)	**16 (44.44%)**	3 (8.33%)	36	3.25 / 5
Employees understand why Lean is implemented and how it relates to the organization's strategic objectives.	2 (5.56%)	9 (25.00%)	9 (25.00%)	**15 (41.67%)**	1 (2.78%)	36	3.11 / 5
Management understands the benefits of implementing Lean and sustaining its efforts	2 (5.56%)	7 (19.44%)	2 (5.56%)	**21 (58.33%)**	4 (11.11%)	36	3.50 / 5
							3.19 / 5

SOURCE: SURVEY QUESTIONNAIRE – SECTION B2

11.1 Management is very committed to the sustainability of Lean

FIGURE 18: MANAGEMENT COMMITMENT TO LEAN SUSTAINABILITY



SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q1

From figure 18 above, it can be inferred that:

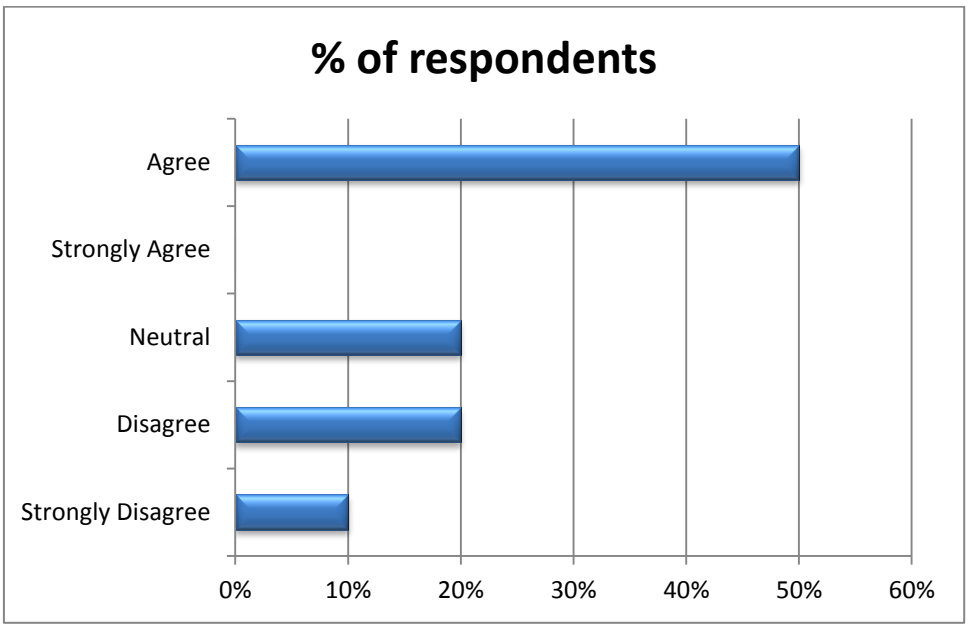
- 45% of the respondents agree that management is very committed to the sustainability of Lean
- 40% of the respondents disagree that management is very committed to the sustainability of Lean
- 15% of the respondents were uncertain whether that management was committed to the sustainability of Lean

11.2 Management is aware and understands the changes required to ensure success of Lean

From the figure below, it can be illustrated that:

- 50% of the respondents agree that management is aware and understands the changes required to ensure success of Lean
- 30% of the respondents disagree that management is aware and understands the changes required to ensure success of Lean
- 20% of the respondents were uncertain that management is aware and understands the changes required to ensure success of Lean

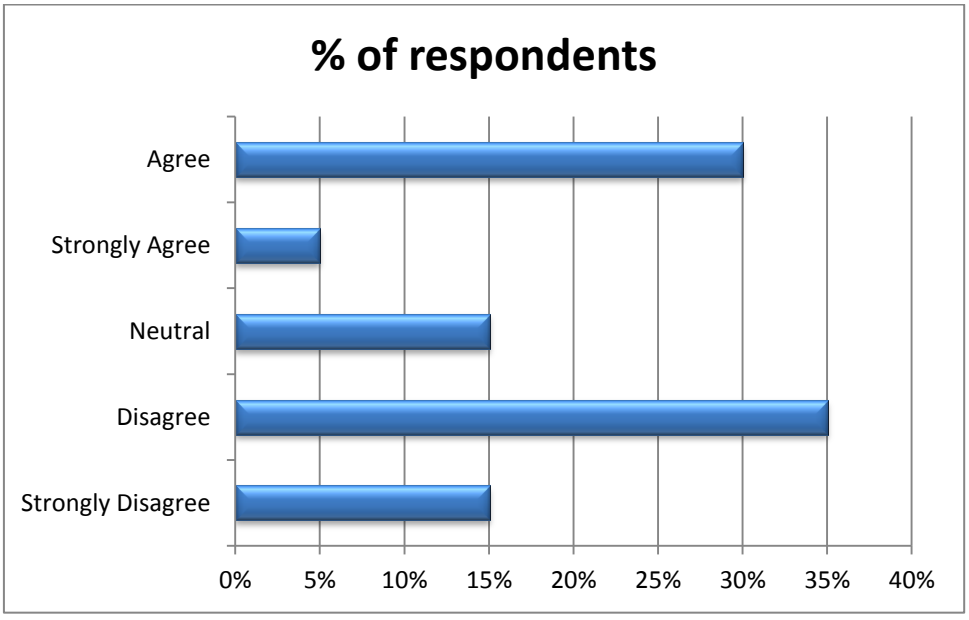
FIGURE 19: MANAGEMENT UNDERSTANDS LEAN CHANGES



SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q2

11.3 Management communicates regularly with employees about the changes that Lean brings

FIGURE 20: MANAGEMENT COMMUNICATES REGULARLY



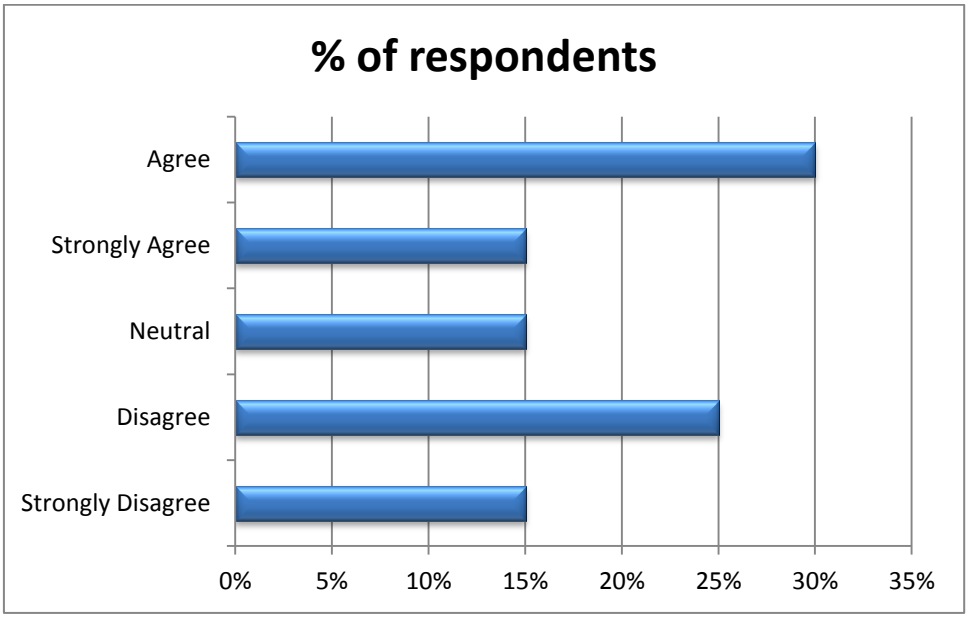
SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q3

From the above figure, it can be illustrated that:

- 50% of the respondents disagree that management communicates regularly with employees about the changes that Lean brings
- 35% of the respondents agree that management communicates regularly with employees about the changes that Lean brings
- 15% of the respondents were uncertain that management communicates regularly with employees about the changes that Lean brings

11.4 Management has encouraged Lean training for all in the organization

FIGURE 21: MANAGEMENT SUPPORTS LEAN TRAINING



SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q4

From the above figure, it can be illustrated that:

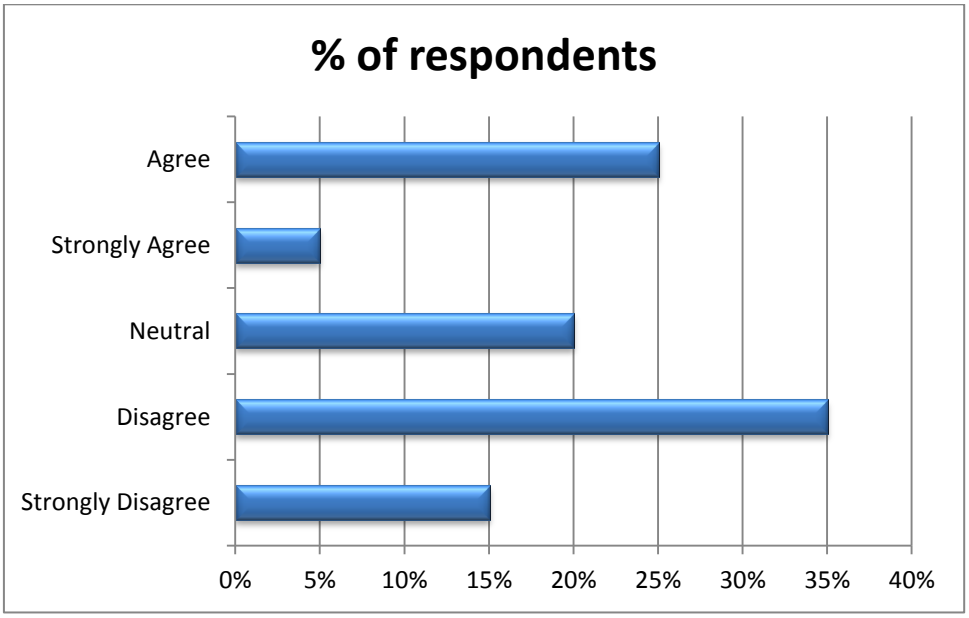
- 45% of the respondents agree that management has encouraged Lean training for all in the organization
- 40% of the respondents disagree that management has encouraged Lean training for all in the organization
- 15% of the respondents were uncertain that management has encouraged Lean training for all in the organization

11.5 All employees have been trained in Lean thinking and Lean tools

From figure 22 below, it can be illustrated that:

- 50% of the respondents disagree that all employees have been trained in Lean thinking and Lean tools
- 30% of the respondents agree that all employees have been trained in Lean thinking and Lean tools
- 20% of the respondents were uncertain that all employees have been trained in Lean thinking and Lean tools

FIGURE 22: EMPLOYEE TRAINING IN LEAN



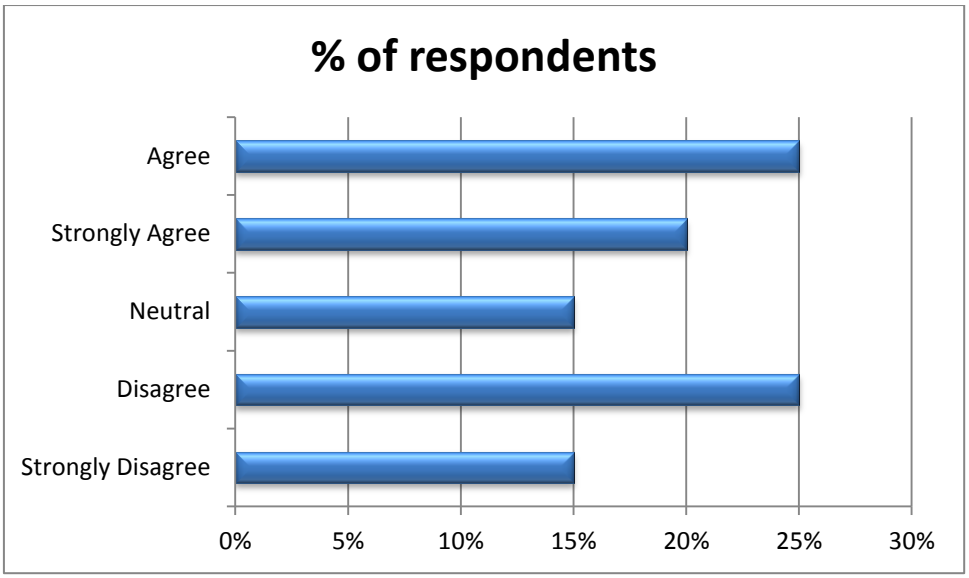
SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q5

11.6 Management has selected a Lean Champion to drive the Lean implementation

From the figure below, it can be illustrated that:

- 45% of the respondents agree that management has selected a Lean Champion to drive the Lean implementation
- 40% of the respondents disagree that management has selected a Lean Champion to drive the Lean implementation
- 15% of the respondents were uncertain that management has selected a Lean Champion to drive the Lean implementation

FIGURE 23: LEAN CHAMPION EXIST TO DRIVE LEAN IMPLEMENTATION



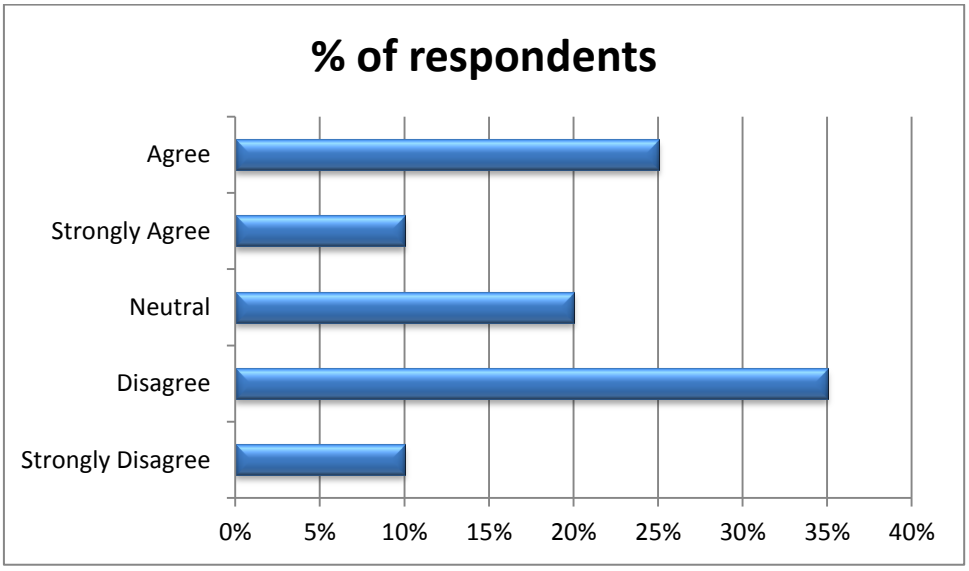
SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q6

11.7 Employees have the necessary support from Management

From figure 24 below, it can be illustrated that:

- 45% of the respondents disagree that management has selected a Lean Champion to drive the Lean implementation
- 35% of the respondents agree that management has selected a Lean Champion to drive the Lean implementation while 20% of the respondents were uncertain about management's plans.

FIGURE 24: EMPLOYEES HAVE SUPPORT FROM MANAGEMENT



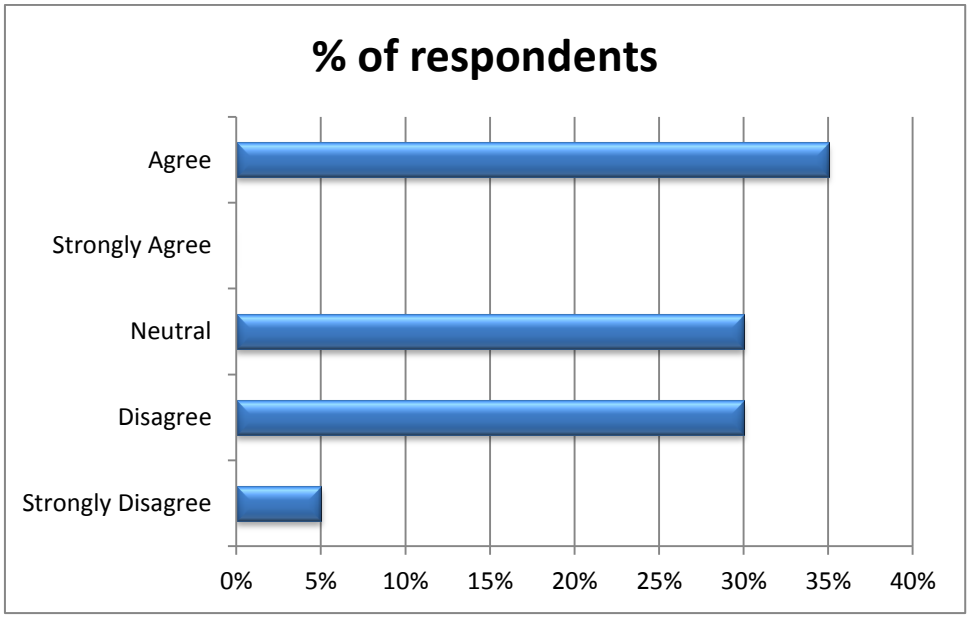
SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q7

11.8 Employees understand why Lean is implemented and how it relates to the organization‘s strategic objectives.

From the figure below, it can be illustrated that:

- 35% of the respondents disagree that employees understand why Lean is implemented and how it relates to the organization‘s strategic objectives.
- 35% of the respondents agree that employees understand why Lean is implemented and how it relates to the organization‘s strategic objectives.
- 30% of the respondents were uncertain that employees understand why Lean is implemented and how it relates to the organization‘s strategic objectives.

FIGURE 25: EMPLOYEES UNDERSTAND WHY LEAN IS IMPLEMENTED



SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q8

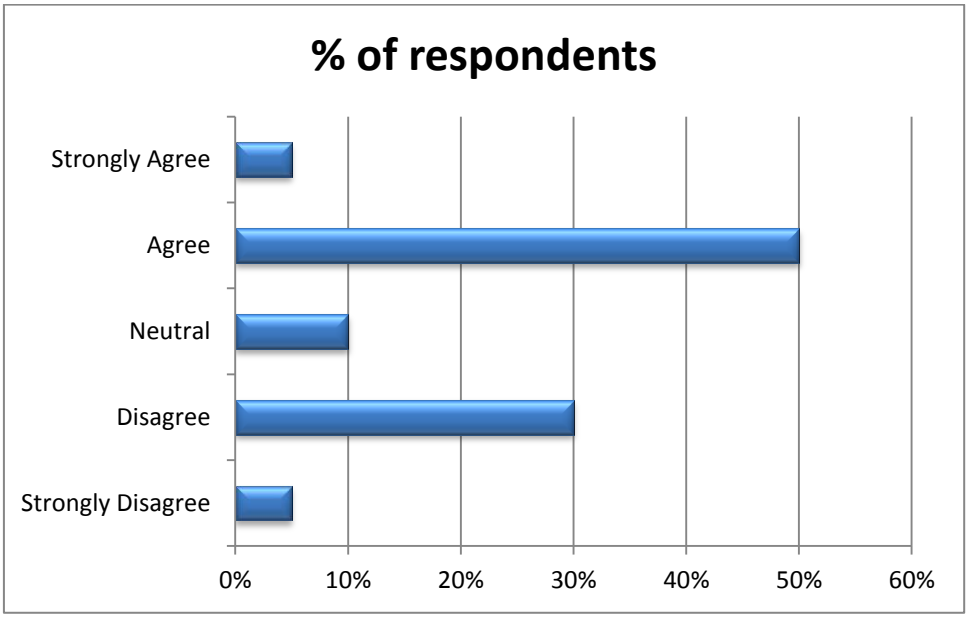
11.9 Management understands the benefits of implementing Lean and sustaining its efforts

From the figure below, it can be illustrated that:

- 55% of the respondents agree that management understands the benefits of implementing Lean and sustaining its efforts

- 35% of the respondents disagree that management understands the benefits of implementing Lean and sustaining its efforts
- 10% of the respondents were uncertain that management understands the benefits of implementing Lean and sustaining its efforts

FIGURE 26: MANAGEMENT UNDERSTAND BENEFITS OF LEAN AND SUSTAINING ITS EFFORTS



SOURCE: SURVEY QUESTIONNAIRE - SECTION B2:Q9

4.3.12 The Level of Stakeholder Involvement

The following statements were directed to the respondents in order to identify the level of stakeholder involvement throughout the implementation process.

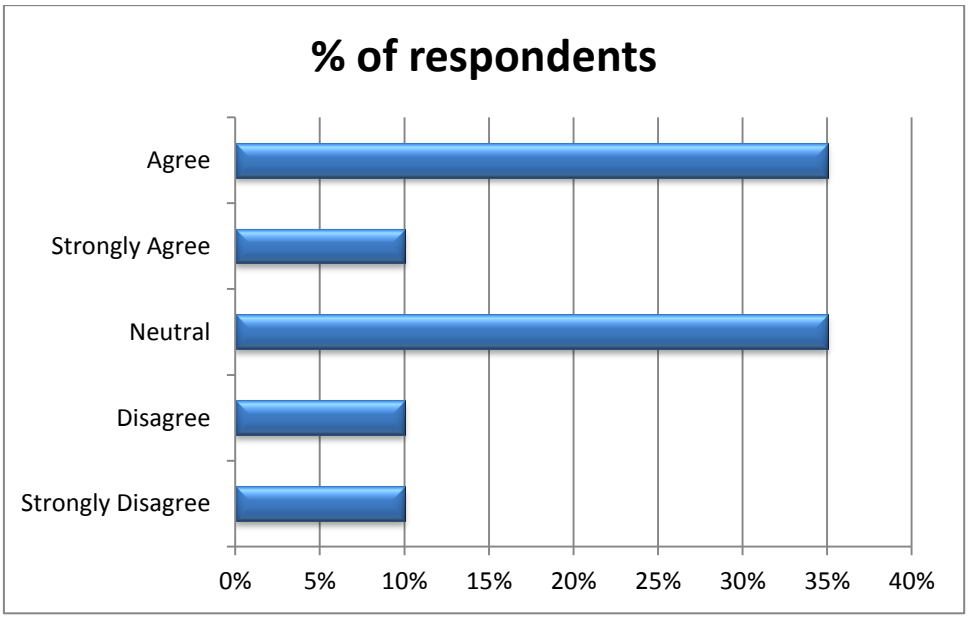
TABLE 6: STAKEHOLDER INVOLVEMENT

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Responses	Weighted Average
Employees were consulted and made aware of the Lean changes	3 (8.33%)	3 (8.33%)	11 (30.56%)	**17 (47.22%)**	2 (5.56%)	36	3.33 / 5
Employees are well trained in the new processes of Lean	3 (8.33%)	12 (33.33%)	7 (19.44%)	**14 (38.89%)**	0 (0.00%)	36	2.89 / 5
Employees understand that the "Leaner" processes will make their jobs easier	1 (2.78%)	8 (22.22%)	9 (25.00%)	**16 (44.44%)**	2 (5.56%)	36	3.28 / 5
There is buy-in and support from everyone to sustain the Lean implementation	4 (11.11%)	9 (25.00%)	**12 (33.33%)**	10 (27.78%)	1 (2.78%)	36	2.86 / 5
Employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs	2 (5.56%)	9 (25.00%)	11 (30.56%)	**13 (36.11%)**	1 (2.78%)	36	3.06 / 5
We are always looking for ways to reduce and eliminate waste in our processes	1 (2.78%)	7 (19.44%)	0 (0.00%)	**19 (52.78%)**	9 (25.00%)	36	3.78 / 5
Lean tools are part of everyone's daily routine	5 (13.89%)	9 (25.00%)	8 (22.22%)	**12 (33.33%)**	2 (5.56%)	36	2.92 / 5
							3.16 / 5

SOURCE: SURVEY QUESTIONNAIRE - SECTION B3

12.1 Employees were consulted and made aware of the Lean changes

FIGURE 27: EMPLOYEE CONSULTATIONS ABOUT LEAN CHANGES



SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q1

From the above figure, it can be illustrated that:

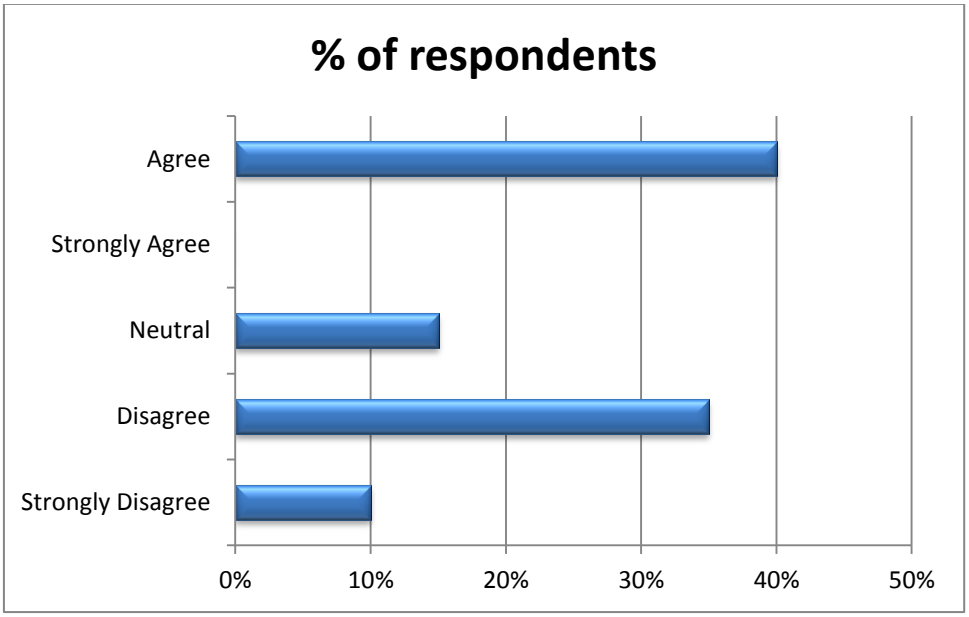
- 45% of the respondents agree that employees were consulted and made aware of the Lean changes
- 20% of the respondents disagree that employees were consulted and made aware of the Lean changes
- 35% of the respondents were uncertain that employees were consulted and made aware of the Lean changes

12.2 Employees are well trained in the new processes of Lean

From figure 28 below, it can be illustrated that:

- 40% of the respondents agree that employees are well trained in the new processes of Lean
- 45% of the respondents disagree that employees are well trained in the new processes of Lean
- 15% of the respondents were uncertain that employees are well trained in the new processes of Lean

FIGURE 28: EMPLOYEES WELL TRAINED IN NEW PROCESSES

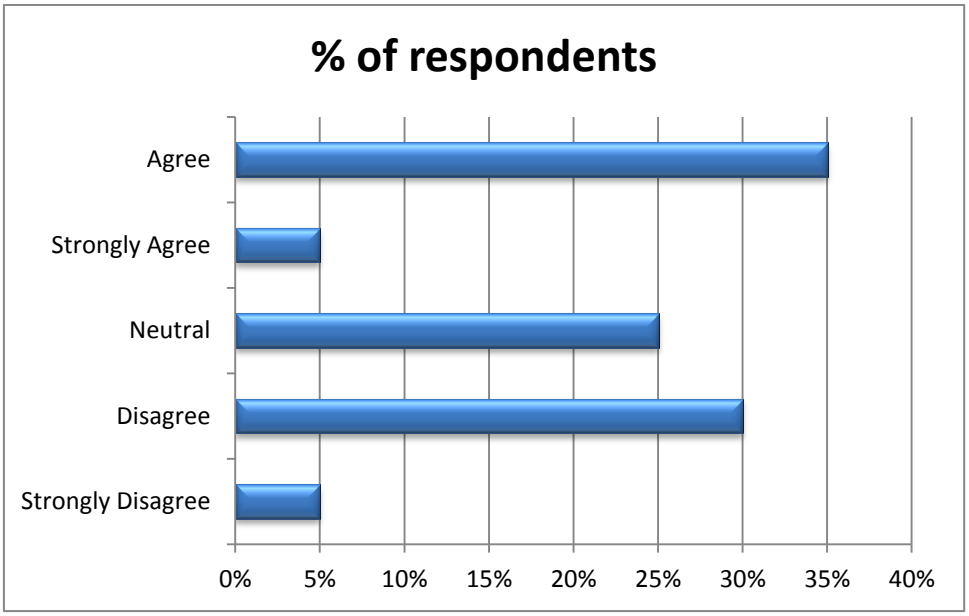


SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q2

12.3 Employees understand that the “Leaner” processes will make their jobs easier. From figure 29 below, it can be illustrated that:

- 40% of the respondents agree that employees understand that the “Leaner” processes will make their jobs easier
- 35% of the respondents disagree that employees understand that the “Leaner” processes will make their jobs easier and 25% was uncertain that whether the “Leaner” processes will make employees jobs easier

FIGURE 29: EMPLOYEES UNDERSTAND THAT LEAN WILL MAKE JOB EASIER



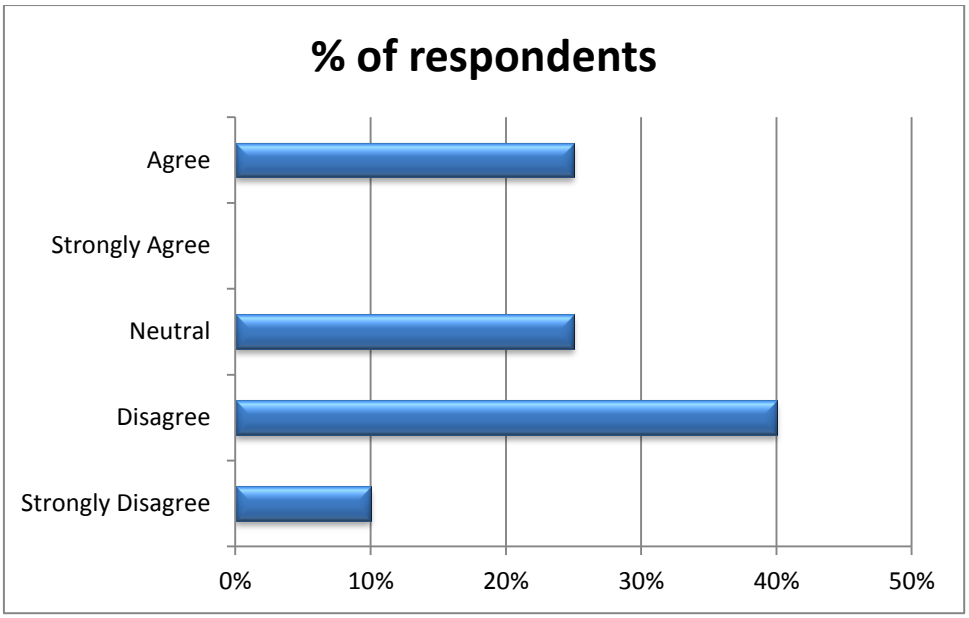
SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q3

12.4 There is buy-in and support from everyone to sustain the Lean implementation.

From the above figure, it can be illustrated that:

- 50% of the respondents disagree that there is buy-in and support from everyone to sustain the Lean implementation
- 25% of the respondents agree that there is buy-in and support from everyone to sustain the Lean implementation
- 25% of the respondents were uncertain that there is buy-in and support from everyone to sustain the Lean implementation

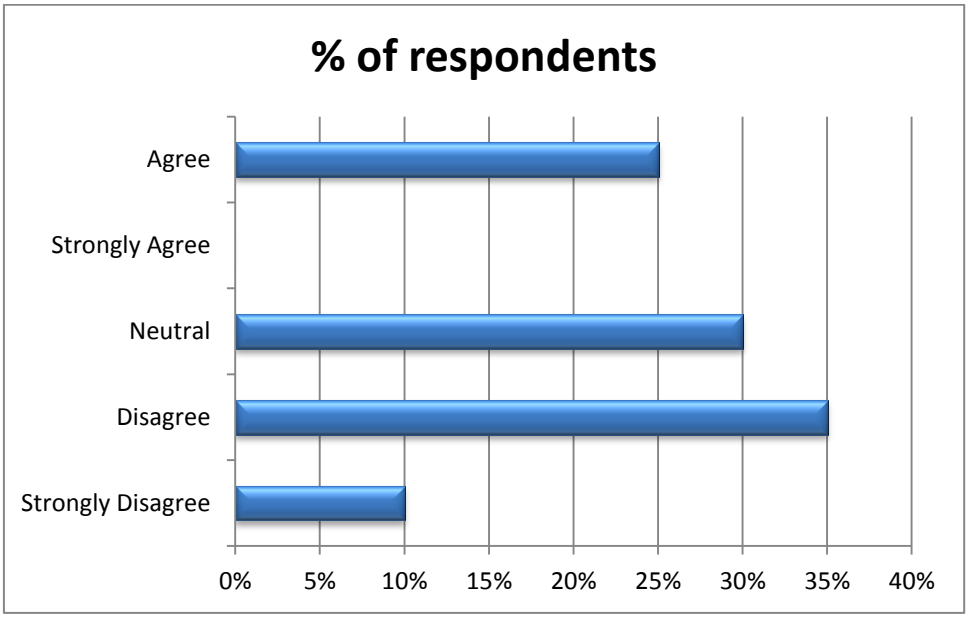
FIGURE 30: BUY IN TO SUSTAIN LEAN IMPLEMENTATION



SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q4

12.5 Employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.

FIGURE 31: EMPLOYEES PART OF LEAN IMPLEMENTATION PROCESS



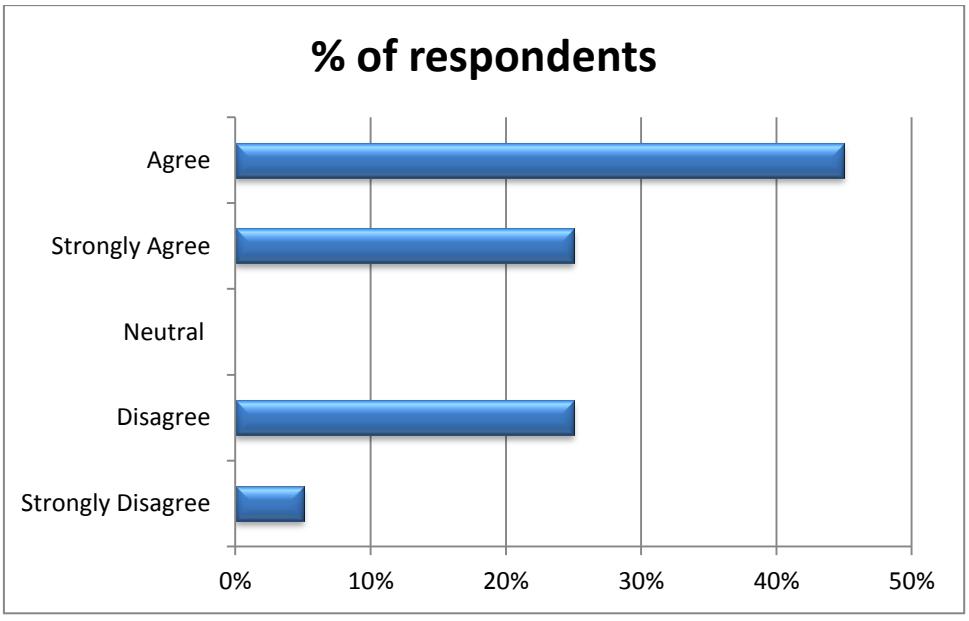
SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q5

From the above figure, it can be illustrated that:

- 45% of the respondents disagree that employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.
- 25% of the respondents agree that employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.
- 30% of the respondents were uncertain that employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.

12.6 We are always looking for ways to reduce and eliminate waste in our processes

FIGURE 32: CONTINUOUSLY ELIMINATING WASTE IN PROCESSES



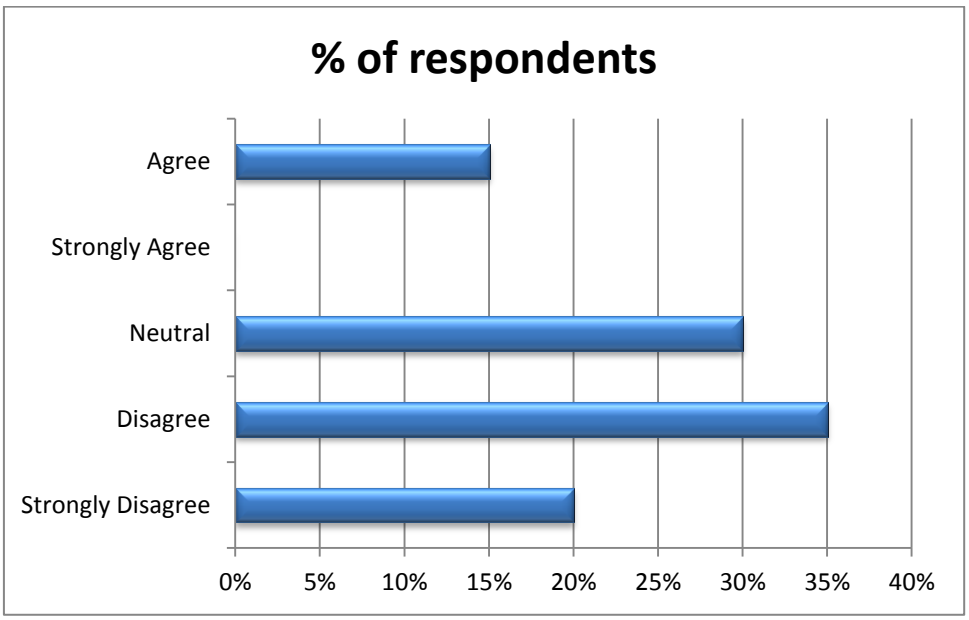
SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q6

From the above figure, it can be illustrated that:

- 70% of the respondents agree that employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.
- 30% of the respondents disagree that employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs.

12.7 Lean tools are part of everyone's daily routine

FIGURE 33: LEAN TOOLS PART OF DAILY ROUTINE



SOURCE: SURVEY QUESTIONNAIRE - SECTION B3:Q7

From the above figure, it can be illustrated that:

- 15% of the respondents agree that Lean tools are part of everyone's daily routine
- 30% of the respondents were uncertain that Lean tools are part of part of their daily work life which means it probably is not, if they do not know.
- 55% of the respondents disagree, it seems it is easier to fall back to the old way of doing things. Bad habits and old ways of doing things are still part of their work routine.

4.3.13 Cultural Factors

The following statements were directed to the respondents in order to identify the cultural factors that influenced Lean and prohibited its success.

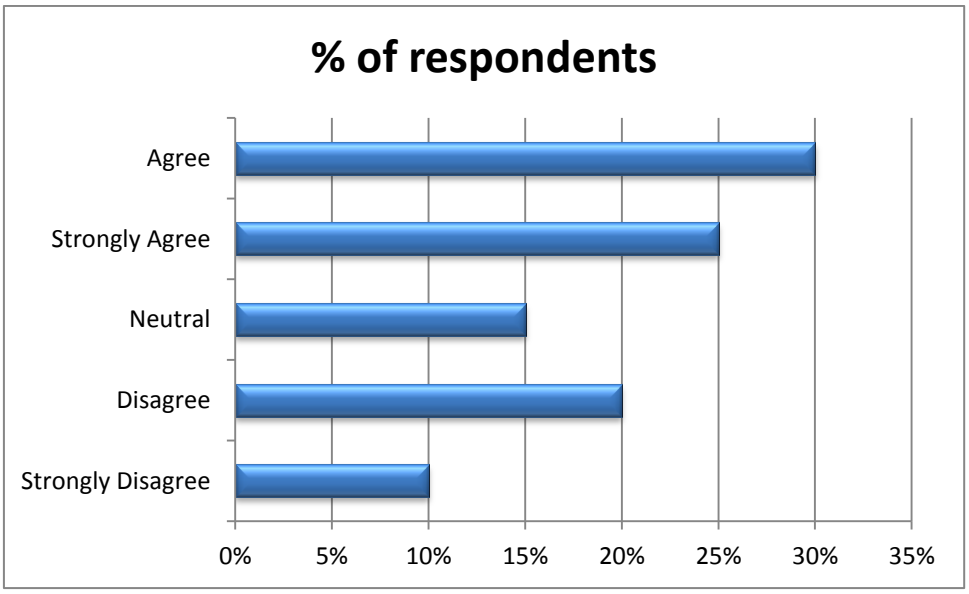
TABLE 7: CULTURAL FACTORS

	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Responses	Weighted Average
There is no dedicated budget for continuous improvements projects	4 (11.11%)	**11 (30.56%)**	6 (16.67%)	8 (22.22%)	7 (19.44%)	36	3.08 / 5
The organization does not have the necessary technical skills to sustain the Lean implementation	3 (8.33%)	**18 (50.00%)**	7 (19.44%)	5 (13.89%)	3 (8.33%)	36	2.64 / 5
Since Implementing Lean, employees have been worried about Lay-offs	4 (11.11%)	**15 (41.67%)**	11 (30.56%)	3 (8.33%)	3 (8.33%)	36	2.61 / 5
The labour unions do not support the Lean implementation	3 (8.33%)	11 (30.56%)	**15 (41.67%)**	4 (11.11%)	3 (8.33%)	36	2.81 / 5
Employees are not excited and enthusiastic about sustaining the Lean improvements	2 (5.56%)	9 (25.00%)	**14 (38.89%)**	8 (22.22%)	3 (8.33%)	36	3.03 / 5
Negative behaviour is not addressed early on in the Lean implementation	3 (8.33%)	**13 (36.11%)**	10 (27.78%)	9 (25.00%)	1 (2.78%)	36	2.78 / 5
							2.82 / 5

SOURCE : SURVEY QUESTIONNAIRE - SECTION B4

13.1 There is no dedicated budget for continuous improvements projects

FIGURE 34: NO DEDICATED BUDGET FOR CONTINUOUS IMPROVEMENTS



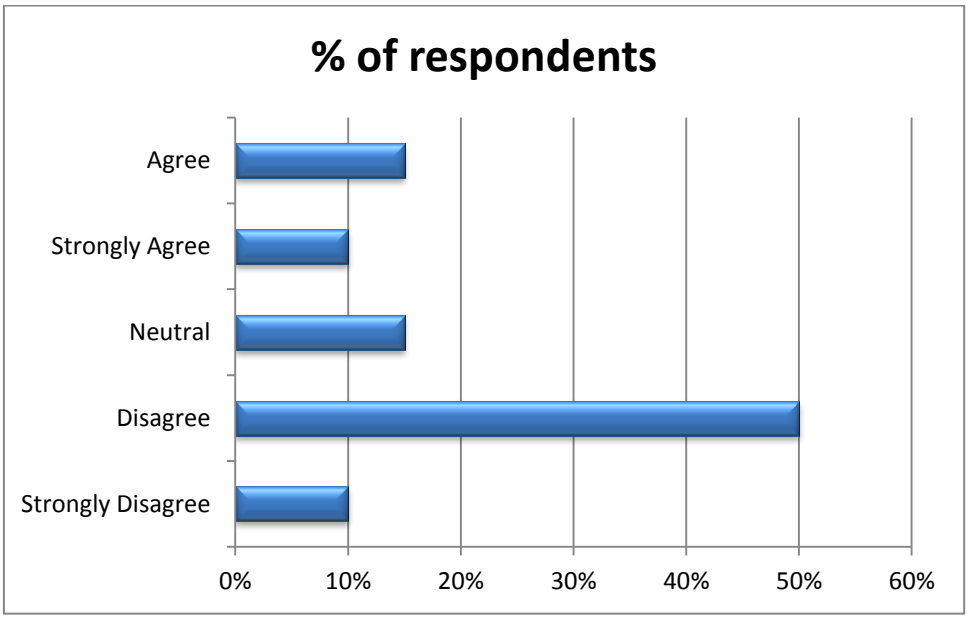
SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q1

From figure 34 above, it can be illustrated that:

- 55% of the respondents agree that there is no dedicated budget for continuous improvements projects
- 15% of the respondents were uncertain that there is no dedicated budget for continuous improvements projects.
- 30% of the respondents disagree that there is no dedicated budget for continuous improvements projects

13.2 The organization does not have the necessary technical skills to sustain the Lean implementation

FIGURE 35: ORGANIZATION HAS NO TECHNICAL SKILLS TO SUSTAIN LEAN IMPLEMENTATION



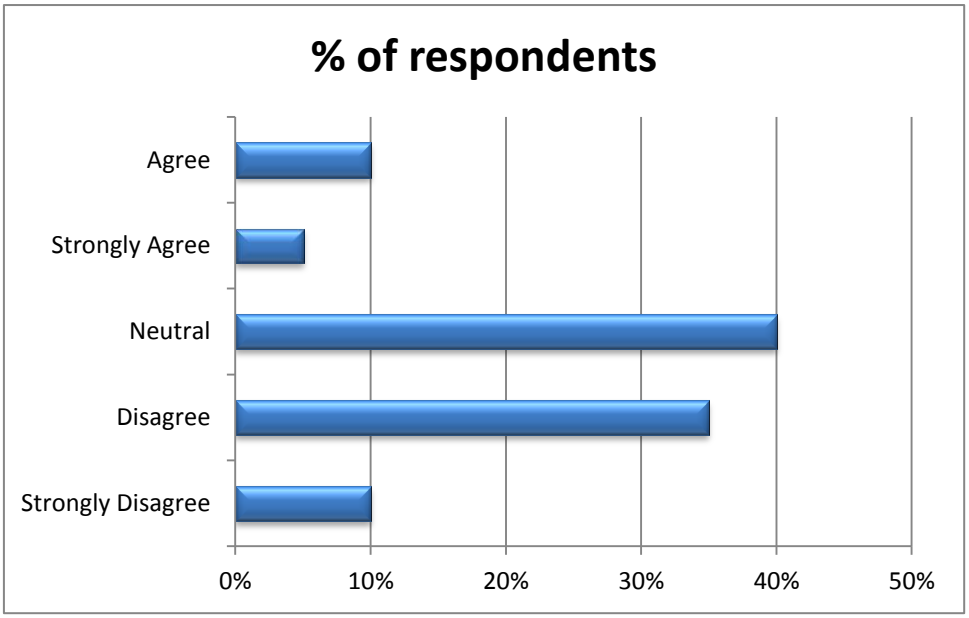
SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q2

From the above figure, it can be illustrated that:

- 60% of the respondents disagree that the organization does not have the necessary technical skills to sustain the Lean implementation
- 25% of the respondents agree that the organization does not have the necessary technical skills to sustain the Lean implementation
- 15% of the respondents were unsure that the organization does not have the necessary technical skills to sustain the Lean implementation

13.3 Since Implementing Lean, employees have been worried about Lay-offs

FIGURE 36: EMPLOYEES WORRIED ABOUT LAY OFFS



SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q3

From the above figure, it can be illustrated that:

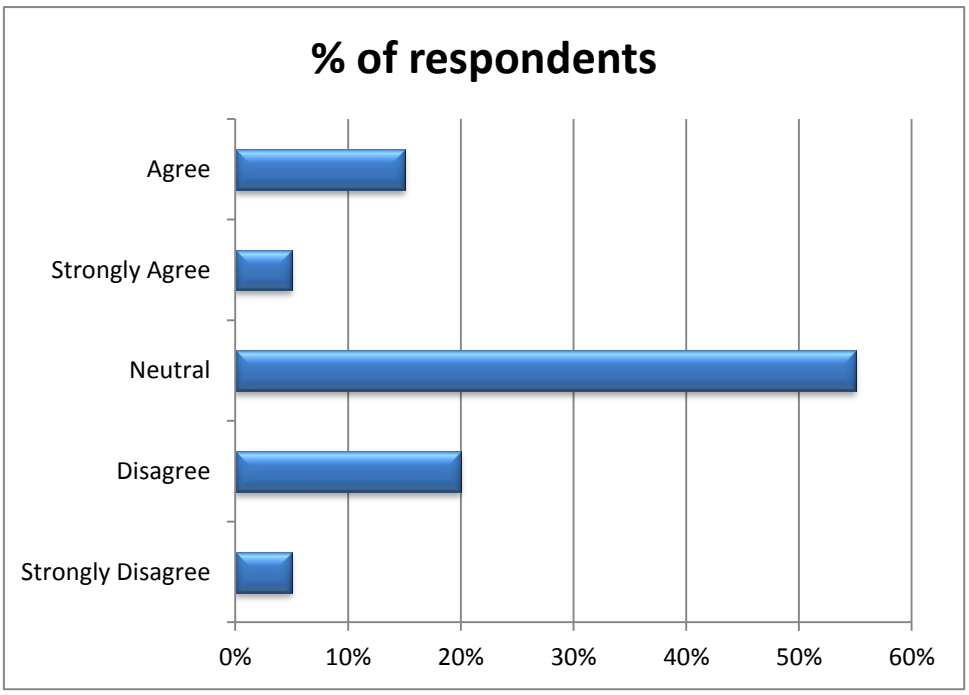
- 45% of the respondents disagree that since Implementing Lean, employees have been worried about Lay-offs
- 15% of the respondents agree that since Implementing Lean, employees have been worried about Lay-offs
- 40% of the respondents were unsure that since Implementing Lean, employees have been worried about Lay-offs

13.4 The labour unions do not support the Lean implementation

From the figure below, it can be illustrated that:

- 25% of the respondents disagree that the labour unions do not support the Lean implementation
- 20% of the respondents agree that the labour unions do not support the Lean implementation
- 55% of the respondents were unsure that the labour unions do not support the Lean implementation

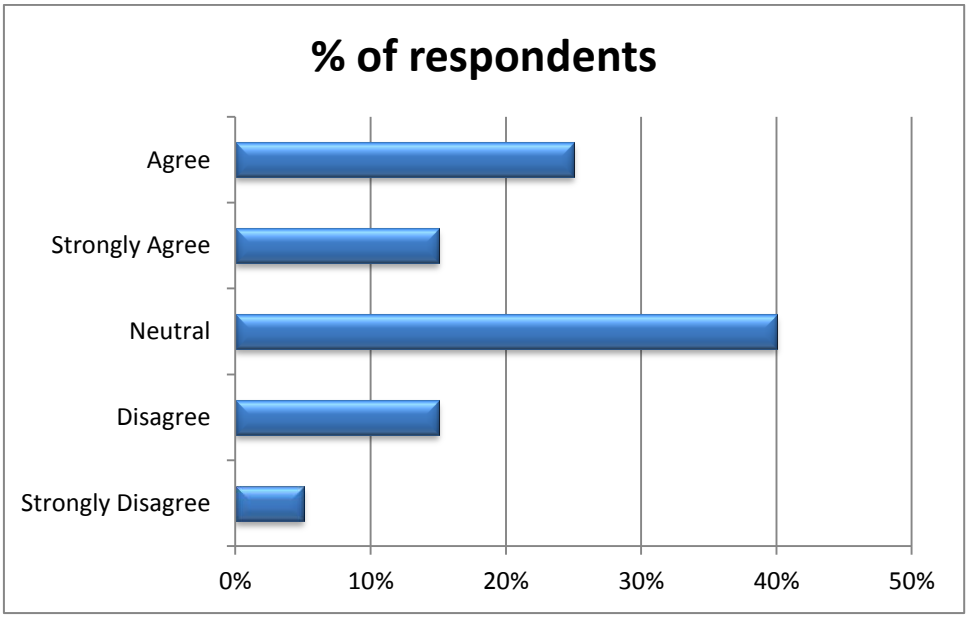
FIGURE 37: LABOUR UNIONS DO NOTSUPPORT LEAN IMPLEMENTATIONS



SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q4

13.5 Employees are not excited and enthusiastic about sustaining the Lean improvements

FIGURE 38: EMPLOYEES NOT ENTHUSIASTIC ABOUT SUSTAINING LEAN IMPROVEMENTS



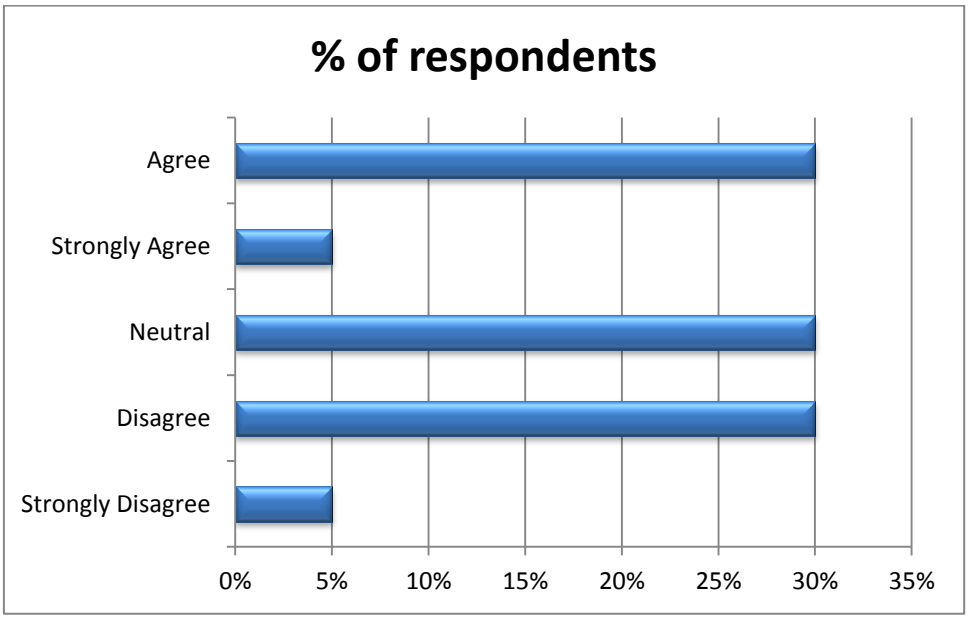
SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q5

From the above figure, it can be illustrated that:

- 20% of the respondents disagree that employees are not excited and enthusiastic about sustaining the Lean improvements
- 40% of the respondents agree that the labour unions do not support the Lean implementation
- 40% of the respondents were unsure whether employees are not excited and enthusiastic about sustaining the Lean improvements

13.6 Negative behaviour is not addressed early on in the Lean implementation

FIGURE 39: NEGATIVE BEHAVIOUR NOT ADDRESSED EARLY ON



SOURCE: SURVEY QUESTIONNAIRE - SECTION B4:Q6

From the above figure, it can be illustrated that:

- 35% of the respondents disagree that negative behaviour is not addressed early on in the Lean implementation
- 35% of the respondents agree that negative behaviour is not addressed early on in the Lean implementation
- 30% of the respondents were unsure whether negative behaviour is addressed early on or not in the Lean implementation

Chapter 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will summarise the findings of the research and provide recommendations and opportunities for further research.

5.2 SUMMARY

Chapter 2

Chapter 2 gave insight into Lean and its origins. This chapter was also a literature review into Lean implementations with emphasis on identifying from Literature barriers and challenges that organizations are currently faced with, when implementing Lean solutions.

Chapter 3

Chapter 3 presented the methodology and the design instrument used for the study.

Chapter 4

Chapter 4 presented, reviewed and analysed the results of the survey questionnaire.

5.3 CONCLUSIONS

The main purpose of this study was to identify and analyse the barriers that many organizations are faced with, during and after a Lean implementation.

As depicted on Table 8 below, the following organizational culture issues emanated from the survey results, as the top 3 barriers. For more than 60% of the respondents:

- Their organizations failed to communicate and involve employees in important decisions
- Their organizations failed to recognise and reward employees efforts and good ideas

TABLE 8: TOP ORGANIZATIONAL CULTURAL FACTORS IMPACTING LEAN IMPLEMENTATIONS

Perceived Organizational Culture	Strongly Disagree / Disagree	Neutral / Not sure	Strongly agree / Agree
The company involves employees in important decisions.	30%	30%	40%
The company rewards employees for coming up with new ideas	30%	50%	20%
The company recognizes and rewards people's efforts	25%	45%	30%

SOURCE: SURVEY QUESTIONNAIRE – SECTION B1

As depicted on Table 9 below, the following barriers emanated from the survey results, as the top 5 barriers:

- Poor communication about the changes that Lean brings
- Lack of management support
- Encouragement, motivation and stressing the importance of Lean training
- Lack of training on Lean thinking and Lean Tools
- Employees do not understand why Lean is implemented and how it relates to the organization's strategic objectives.

TABLE 9: TOP IMPLEMENTATION BARRIERS IMPACTING LEAN IMPLEMENTATIONS

Implementation Barriers	Strongly Disagree / Disagree	Neutral/ Not sure	Strongly Agree / Agree
Management communicates regularly with employees about the changes that Lean brings	50%	15%	35%
Management has encouraged Lean training for all in the organization	40%	15%	45%
All employees have been trained in Lean thinking and Lean tools	50%	20%	30%
Employees have the necessary support from Management	45%	20%	35%
Employees understand why Lean is implemented and how it relates to the organization's strategic objectives.	35%	30%	35%

SOURCE: SURVEY QUESTIONNAIRE – SECTION B2

As depicted on Table 10 below, the following stakeholder involvement issues emanated from the survey results, as the top 5 barriers:

- Lack of training in the new processes of Lean
- Lack of communication and the understanding that the “Leaner” processes will make jobs much easier
- Lack of buy-in and support from everyone to sustain the Lean implementation
- Employees are not part of the Lean implementation process – and are often not considered in decisions that impact their jobs
- Lean tools are not part of everyone’s daily routine; making it easier to fall back to old habits of doing things

TABLE 10: TOP STAKEHOLDER INVOLVEMENT FACTORS IMPACTING LEAN

Stakeholder Involvement	Strongly Disagree / Disagree	Neutral / Not sure	Strongly Agree / Agree
Employees are well trained in the new processes of Lean	45%	15%	40%
Employees understand that the “Leaner” processes will make their jobs easier	35%	25%	40%
There is buy-in and support from everyone to sustain the Lean implementation	50%	25%	25%
Employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs	45%	30%	25%
Lean tools are part of everyone’s daily routine	55%	30%	15%

SOURCE: SURVEY QUESTIONNAIRE – SECTION B3

As depicted on Table 11 below, the following Cultural, Behavioural and External Factors emanated from the survey results, as the top 5 barriers:

- There is no dedicated budget for continuous improvements projects or there are no dedicated resources to assist with the Lean implementations
- Since Implementing Lean, employees have been worried about Lay-offs. About 40% of the respondents are unsure as to what their staff thoughts are

on this issue. Since 73% of the respondents were top and middle managers it is quite clear that lack communication is an issue.

- The labour unions do not support the Lean implementation – 55% of the respondents are unsure as to what union members believe in and support
- Employees are not excited and enthusiastic about sustaining the Lean improvements. 40% of the respondents do not know what their staff's feelings are on the issue, which means that Management is not in touch with their staff.

TABLE 11: TOP CULTURAL AND BEHAVIOURAL FACTORS IMPACTING LEAN

Cultural, Behavioural and External Factors	Strongly Disagree / Disagree	Neutral/ Not sure	Strongly Agree / Agree
There is no dedicated budget for continuous improvements projects	30%	15%	55%
Since Implementing Lean, employees have been worried about Lay-offs	45%	40%	15%
The labour unions do not support the Lean implementation	25%	55%	20%
Employees are not excited and enthusiastic about sustaining the Lean improvements	20%	40%	40%

SOURCE: SURVEY QUESTIONNAIRE – SECTION B4

5.4 RECOMMENDATIONS

The primary objective of this study was to identify and assess the factors that inhibit a self-sustaining lean culture. The literature review revealed a few barriers that also emanated from our survey respondents.

Organizations that have implemented Lean tools in their operations and processes have fallen short in sustaining the positive results. It is evident from the results of this study that management and culture are essential in sustaining Lean improvements. It is thus critical for executive management to provide ample support to sustain the lean initiative. Communication between all managers and low level workers is critical in ensuring that the vision of lean is attainable and sustainable. It is also important to

create a continuous learning culture whereby knowledge and skills associated with lean implementations are shared across the organization (Wong, et al., 2009).

There are few success strategies that can be employed to sustain Lean efforts:

5.4.1 Management Commitment

- Management must stay committed to the Lean journey to ensure significant improvements and sustainability over the long run. One of the biggest barriers to achieving lean sustainability is the lack of management support.
- Management must go to the floor regularly to understand the issues that employees are faced with and work together with them to come up with solutions.
- Management can also show its commitment by ensuring that all staff are trained in Lean and that continuous evaluations are performed to ensure that staff are up to date with the latest Lean tools

5.4.2 Communication and Involvement

- Management must learn to be open and honest with staff
- Management must involve employees in decisions that impact their jobs by communicating regularly
    - Conduct daily / weekly meetings
    - Allow suggestions from staff on how to continuously improve
    - Ensure that there are proper channels in place to collect feedback, issues and challenges

5.4.3 Recognition an Reward

- People want to feel appreciated and valued – when they sense that their best work efforts are not recognised; then they start being “average” and delivering mediocre work.

- Teach employees to be “Lean” everyday - incentivise and reward Lean efforts. Incentive schemes can get employees motivated and engaged in Lean. Start a programme that allows employees to recognise and reward each other for being Lean or living the “Lean” way. This will get everyone excited and focused on sustaining the Lean efforts.

5.4.3 Have an Action Plan

It became apparent from the survey results that all respondents face similar challenges in embracing lean and sustaining its efforts. The table below summarizes specific steps that managers can take to produce and to get the best results from lean implementations.

TABLE 12: LEAN SUCCESS ACTION PLAN

PHASE	SPECIFIC STEPS	TIME FRAME
Getting started	Find a change agent	First 6 months
	Get lean knowledge	
	Find a lever	
	Map value streams	
	Begin kaikaku	
	Expand your scope	
Create new organization and culture	Reorganise by product family	6 – 12 months
	Create a lean function	
	Devise a policy for excess people	
	Devise a growth strategy	
	Remove anchor-draggers	
	Instil a “perfection” mind-set	
Install business systems	Introduce lean accounting	3-4 years
	Relate pay to company performance	
	Implement transparency	
	Initiate policy deployment	
	Introduce lean learning	
	Find the right tools	
Complete the transformation	Apply the steps to your suppliers/customers	By year 5
	Develop global strategy	
	Transition from top-down to bottom-up improvement	

SOURCE: (Womack & Jones, 2003)

5.4.3.1 The action steps explained

- Getting started
  - Find a change agent: find a senior leader or manager to drive the lean changes in the organization. It can be someone outside the organization; a lean expert or consultant who is known for fundamentally making radical changes.
  - Get the necessary lean knowledge: Be educated about lean and be willing to apply it. Some outside help from a lean expert would also contribute immensely.
  - Find a lever start applying lean thinking to any area of your business that is in trouble, or one that requires dramatic changes
  - Map the value stream: Identify current value streams and start mapping them. Review the entire value stream and define value in terms of the final product
  - Begin “kaikaku”: begin reorganising and rearranging activities or processes to eliminate waste. This is radically improving a part of the value stream.
  - Expand your scope: As momentum is gained, and problems are identified and fixed move on to the next part of the value stream

- Creating a new culture
  - Reorganise, rearrange and reengineer the organization
  - Create a Lean promotion function: create a permanent lean team to drive the lean projects must be established. These individuals will report directly to the change agent.
  - Deal with excess people at the beginning: when reengineering business processes, you are likely to reduce human effort. People that are no longer needed must be removed from redundant positions.
  - Devise a growth strategy : which absorbs resources at the same pace as they are being made redundant or freed up in their old jobs
  - Remove anchor draggers: Remove those people who are unable to accept new ideas or embrace change.

- Installing business systems
  - Utilize policy deployment: be careful of taking on too many lean initiatives at a time; rather have a deployment schedule that is agreeable, reasonable and practical with the number of resources available.
  - Create a lean accounting system: a value-stream based costing system that allows all suppliers / participants in a value stream to see what collective efforts are adding more cost than value. (Womack & Jones, 2003)
  - Pay your people in relation to the performance of the organization. The ideal compensation plan would be to pay each employee in exact proportion to the value they bring to the organization. (Womack & Jones, 2003).
  - Make everything transparent: have dashboards available that show and are visible to everyone about real-time performance of the each business unit.
  - Teach lean thinking and skills to everyone : encourage the workforce to attend lean training – make the training compulsory to ensure that everyone is trained in lean concepts and lean tools
  - Right-size your tools: what type of tools would allow smooth production flow; and would ensure instant switch over between products without delays? This starts the thinking process and ensures new ideas are born.

- Complete the transition
  - Convince your suppliers and customers to follow the same steps. Once all internal processes are lean; and the lean transformation is almost complete – have an idea of what works and what does not, now is the time to convince your suppliers and distributors to jump on the lean bandwagon.
  - Develop a global strategy: organizations that want grow beyond local borders must devise a global strategy in order to compete globally.

- Convert from top-down leadership to bottom-up initiatives: Lean initiatives must come directly from the frontline workers. In the beginning, lean initiatives might come up from management, but as sometime goes on, employees must be taught to be proactive and to come up with lean initiatives. This is a critical transition as the organization moves through the lean transformation, and is key to a self-sustaining lean organization. (Womack & Jones, 2003)

5.5 LIMITATIONS OF THE STUDY

The survey questionnaire was mostly completed by managers; 47% were top management, 26% middle management and 16% junior management. The voice of the workers was missing as the survey results represented managers in Automotive and Manufacturing industries. Managers need to work with low level workers to sustain Lean efforts hence this missing link is crucial.

5.6 CONSIDERATIONS FOR FUTURE RESEARCH

This study can be used as a basis for further research and therefore recommendations for further research need to be made.

The study was only confined to organizations in the Eastern Cape, mostly organizations in the Manufacturing and Automotive industries with a small subset from other industries. This study has identified and analyzed the barriers that inhibit lean success and it would make sense to follow a new dimension that needs to be investigated as to what factors contribute positively towards a self-sustaining Lean Culture. A theoretical framework or model would need to be developed in order to help organizations learn how to sustain lean efforts.

Negative factors and behaviours have been identified; the next steps would be to identify the positive contributors and to learn from specific organizations that have managed to sustain Lean efforts.

Success stories and testimonials from these organizations can be illustrated as case studies by other organizations expecting to achieve Lean success and also use them as benchmarks towards achieving Lean success and sustaining Lean change efforts in their own organizations.

5.7 CONCLUSION

Lean Implementations have become a strategic initiative for many organizations; that want to compete in the ever changing global technological era. More and more organizations are jumping on the Lean bandwagon, without proper planning, understanding and alignment of the organization's vision with Lean key success factors.

This study has provided insights into the current status of lean implementations as well as identified some implementation barriers. The organizations surveyed have a good understanding of lean, however have not yet gained the many benefits that Lean offers. Lean implementations are an on-going continuous improvement journey; to implement Lean and sustain its efforts over a longer period as well as to reap the benefits that it brings, organizations need to understand that a culture change and a mindset shift is required.

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ANNEXURE A: SURVEY EMAIL

Dear Respondent

I am studying towards my MBA (Masters in Business Administration) degree at the Nelson Mandela Metropolitan University Business School. I am conducting research on the sustainability of Lean Implementations. The primary objective of my study is to analyze the barriers and obstacles that hinder successful implementation of Lean. The intent is to identify and assess the causes that inhibit a self-sustaining lean culture.

I believe that my study will make an important contribution to the success and sustainability of Lean implementations in South Africa. You are part of our selected sample of respondents who has implemented Lean and whose views we seek on the above-mentioned matter. We would therefore appreciate it if you could answer a few questions. It should not take more than 10 minutes of your time and
we want to thank you in advance for your co-operation.

It would be greatly appreciated if you can complete the survey by no later than 27 August 2014. The link to complete the questionnaire:
http://kwiksurveys.com/s.asp?sid=ov20wmwl7rlimzk350689

Thank you very much
Ayanda Sidinile

To verify the authenticity of the study, please contact:
Prof K.Pieterse at NMMU Business School on 041 504 3774 and
jj.pieterse@nmmu.ac.za

ANNEXURE B: RESEARCH QUESTIONNAIRE

SECTION A: BIOGRAPHICAL DATA

Please answer the following questions by indicating with an 'X' in the appropriate box.

A1. Which industry is your organization operating in:

Automotive	
Construction	
Education	
Financial Services	
Health / Public Sector	
Information Technology	
Manufacturing	
Other: please specify	

A2. Please indicate your position?

Top Management	
Middle Management	
Junior Management	
Process Improvement Specialist	
Shop Floor	
Lean Expert	
Other: Indicate	

A3. Please indicate your gender:

Male	
Female	

A4. Please select the status of Lean Manufacturing in your organization.

Planning to implement	
Taking training - to implement	
Implemented in various areas of the organization	
Continuously implementing improvements to eliminate waste	
Implemented – not using the tools anymore	
Just implemented	

A5. What tools do you have experience in or have knowledge of?

Continuous Improvement	
Cross functional Teams	
Cellular Manufacturing	
5S	
Heijunka	
Kanban	
Kaizen	
Just In Time / Pull Systems	
Production Smoothing	
Poka-yoke	
Other: specify	

Please write freely and openly to answer the following questions:

A6. Have you had any Lean training?

Yes	
No	

A7. How was Lean implemented in your organization? Select appropriate

Answer.

1	A lean expert consulted to drive the implementation process
2	Pool of employees trained in lean concepts to act as Lean champions
3	Implemented as trial and error – no Lean skills and knowledge
4	Piloted in various units across the organization

A8. In your view, has your organization achieved and sustained the expected level of lean success?

Yes
No

9. If answered “No” to previous question – why do you think you have not sustained the gains of Lean?

Section B

Please indicate the degree to which you agree with the following statements:
1 – Strongly disagree
2 - disagree
3 - not sure
4 – agree
5 – strongly agree

Question B1 aims to identify the prevailing organizational culture and how it impacted on the sustainability of Lean.

		Level of agreement				
	B1. Organizational Culture	**1**	**2**	**3**	**4**	**5**
1	The company creates a culture conducive to continuous learning by encouraging employees to grow and advance their careers					
2	The company involves employees in important decisions.					
3	The company rewards employees for coming up with new ideas					
4	Innovation and continuous improvement in processes is a priority					
5	The company recognizes and rewards people's efforts					
6	The company is committed to achieving excellence					
7	The organization is committed on eliminating wasteful activities that do not add value in the eyes of the customer					
8	Management goes to work areas regularly to encourage people and to find out what they can do to support improvement efforts					

Question B2 and B3 is aimed at identifying the implementation barriers your organization has encountered.

		Level of agreement				
	B2. Management Commitment	**1**	**2**	**3**	**4**	**5**
1	Management is very committed to the sustainability of Lean					
2	Management is aware and understands the changes required to ensure success of Lean					
3	Management communicates regularly with employees about the changes that Lean brings					
4	Management has encouraged Lean training for all in the organization					
5	All employees have been trained in Lean thinking and Lean tools					
6	Management has selected a Lean Champion to drive the Lean implementation					
7	Employees have the necessary support from Management					
8	Employees understand why Lean is implemented and how it relates to the organization's strategic objectives.					
9	Management understands the benefits of implementing Lean and sustaining its efforts					

		Level of agreement				
	B3. Stakeholder Involvement	**1**	**2**	**3**	**4**	**5**
1	Employees were consulted and made aware of the Lean changes					
2	Employees are well trained in the new processes of Lean					
3	Employees understand that the “Leaner” processes will make their jobs easier					
4	There is buy-in and support from everyone to sustain the Lean implementation					
5	Employees are part of the Lean implementation process – and are considered in every decision made that impacts their jobs					
6	We are always looking for ways to reduce and eliminate waste in our processes					
7	Lean tools are part of everyone’s daily routine					

Question B4 aims to identify the cultural factors that influenced Lean and prohibited its success

		Level of agreement				
	B4. Behavioural Issues	**1**	**2**	**3**	**4**	**5**
1	There is no dedicated budget for continuous improvements projects					
2	The organization does not have the necessary technical skills to sustain the Lean implementation					
3	Since Implementing Lean, employees have been worried about Lay-offs					
4	The labour unions do not support the Lean implementation					
5	Employees are not excited and enthusiastic about sustaining the Lean improvements					
6	Negative behaviour is not addressed early on in the Lean implementation					

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for tomorrow

DECLARATION BY CANDIDATE

NAME: AYANDA SIDINTE

STUDENT NUMBER: 212433652

QUALIFICATION: MASTERS IN BUSINESS ADMINISTRATION

TITLE OF PROJECT: AN ANALYSIS OF THE BARRIERS THAT INHIBIT SUSTAINABLE IMPLEMENTATION OF LEAN

DECLARATION:

In accordance with Rule G4.6.3, I hereby declare that the above-mentioned treatise/ dissertation/ thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification.

SIGNATURE:

DATE: 5/12/2014