What are the critical success factors for Lean and/or Six-sigma implementations in South African Banks?

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ABSTRACT

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

South African Banks are not adopting Lean and/or Six-sigma to the point where it is going to make any sort of significant difference to the bottom line over a significantly meaningful period of time. So where are they going wrong? Often it comes down to key issues that are not addressed effectively as part of the deployment.

The research objectives are:

- The primary objective is to establish what the mission critical success factors for Lean and/or Six-sigma implementation in South African Banking are.
- The secondary objective is to define a list of the sources of benefits for Lean and/or Six-sigma implementations in South African Banking.

The research questions/problems to be addressed are:

- What are the mission critical success factors for Lean and/or Six-sigma implementations in South African Banking?
- How do South African Banks prioritise these critical success factors?
- How do South African Banks that are already on the Lean and/or Six-sigma journey perform against these critical success factors?

- What are the gaps between the importance's of the critical success factors versus the banks actual performance against these, and how is this gap impacting on the benefits that the banks are experiencing?
- What sources of benefits are South African Banks experiencing?
- Can generic guidelines be provided to the South African Banks for successful Lean and/or Six-sigma implementation?

The research design:

A literature survey was done on Lean, Six-sigma and Lean sigma to evaluate the history, benefits, challenges during implementation, applicability to services and the defining of the critical success factors required for effective implementation. Two of the Top 4 Retail Banks were selected to participate in this research. Judgement sampling was used due to the researcher's familiarity with these banks. 100 surveys were emailed and 57 surveys were completed with equal representation from each bank. All types of stakeholders were included from top management to employees. Descriptive, inferential and comparison statistics were performed on the data.

The main findings:

The following are the 8 mission critical success factors that are essential for the effective implementation of Lean and/or Six-sigma implementations in South African Banks, listed in order of priority:

- Senior leadership commitment and involvement
- There must be a shared vision and shared goals
- Genuine focus on the customer needs is key

- Measuring and monitoring progress
- The business strategy must be infused with the continuous improvement strategy
- Teamwork
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques

The banks that are already on this Lean and/or Six-sigma journey are not performing well against the implementation of these mission critical success factors in their current deployments. The performance is average overall. There is evidence that this is impacting negatively on the benefits realised as the optimum benefits is not currently being realised.

The sources of benefits that are applicable to South African Banks, in order of highest source of benefits achieved to the lowest are as follows:

- Reduced waste
- Reduced cycle time to delivery
- Improved speed and responsiveness
- Robust and stable processes
- Improved productivity
- Increased focus on customer needs
- Reduced costs
- Improved customer service
- Improved staff morale
- Improved innovation

- Improved competitive advantage
- Improved interdepartmental connectedness
- Improved flexibility
- Improved management of business risk
- Continuous improvement culture
- Increased revenues

As stated, these benefits are actually not being optimally achieved within South African Banks. The achievement of these benefits is pretty low at an average level of 57%. The Top 5 benefits defined above are all being achieved at a level between 61% and 74%.

If the critical success factors are effectively implemented within South African Banks, this will greatly impact on the banks profitability and service experience. This research study has successfully managed to provide generic guidelines to the South African Banking industry for successful deployment of Lean and/or Six-sigma implementations. If these are successfully implemented then the benefits defined could be reaped. This needs to be tested within the banking industry. The bank that manages to get this right will potentially have a huge competitive advantage within South African borders and outside. This will enable South African banks to compete successfully, internationally. This could bring huge profitability growth to South African banks and the country as a whole.

Recommendations for future research:

- Further research can be done to delve deeper into finding out what the actual expectations of the respondents were for the success of the Lean and/or Six-sigma initiative and the reasons they believe that they were not met.
- What are the practical ways to implement these critical success factors to ensure that they are adequately ingrained in the organisation and are effectively deployed in order to achieve maximum benefits?
- Test the actual benefits that bank are experiencing using a case study approach and define the business case for change.
- Different industries within the Services Sectors in South Africa can be involved to define the critical success factors and benefits to be realised for various South African Industries within the Services Sectors.
- What would the impact of Lean and/or Six-sigma be on an organisations performance? Surveys or semi-structured interviews could be undertaken to obtain more tangible insights on the actual benefits that the banks would be realising that actually contribute to their bottom line.
- How to measure the alignment of the organisational culture with Lean and/or Six-sigma principles? Lean and/or Six-sigma implementations are greatly influenced by an organisations culture, values and traditions. It would be of great value to investigate this aspect further.
- An explorative study that extracts the reasoning for the gap that exists between performance and importance factors will allow organisations to understand the issues of under-performance.

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STATEMENT OF OWN WORK

I, Jothilutchmee David declare that this research study is my own work, presented to the Graduate School of Business Leadership at the University of South Africa, in partial fulfilment of the requirements for the Masters in Business Leadership degree.

Signature: **Date**

TABLE OF CONTENTS

GLOSSARY OF TERMS

SARB	South African Reserve Bank
CSF's	Critical success factor's

LIST OF TABLES

CHAPTER 1: ORIENTATION

1.1. Introduction

Increasing competitive pressure from global markets and technology developments has resulted in continual demand for business improvement philosophies and methodologies in operations management to address these challenges. (McAdam & Hazlett, 2005)

Throughout history the role of continuous improvement within organisations has changed, evolved and matured. Individuals and organisations have pursued and will continue to pursue improved operating methods – from the first improvements made through the invention of machines that sped up production to using empirical and statistical methods to analyse and continuously improve all processes.

Some industries such as pharmaceuticals and healthcare focus most of their efforts on quality improvement of their products and services, whilst some industries like to predominantly utilise continuous improvement mechanisms to drive down costs. Ultimately, successful continuous improvement initiatives change the culture of an organisation. The culture change focuses on creating the right levels of motivation and desire so that continuous improvement becomes the way of work. This fundamental change in operating, managing and strategic processes requires a stimulus of a structured method or program of continuous improvement. Lean and/or Six-sigma are two popular continuous improvement methodologies.

Each of these methodologies has been successfully implemented by global companies such as Motorola, Toyota, General Electric and Raytheon. "However, these successful implementations were not without some difficulty. Subsequent implementations of Lean and/or Six-sigma have benefited from the literature and experiences produced by these pioneering companies." (O' Rouke, 2005).

Key success factors or key ingredients are those factors that are essential to the success of the implementation of any continuous quality improvement initiative. The identification of these factors will encourage their consideration when South African Banks or any company is developing an appropriate implementation plan.

Utilisation of Lean and/or Six-sigma is a recent continuous improvement strategy in South African Banks and this provides a fresh area for research. The aim of this research is to identify the critical success criteria or factors for successful Lean and/or Six-sigma implementations in South African Banks. A secondary objective is to identify the sources of benefits that South African Banks are achieving by utilising these continuous improvement mechanisms.

1.2. Objectives of research

Originally pioneered at Motorola as a way of improving production quality in the 1980's, Six-sigma has since proven its ability to transform organisations across different industries. It is a well-established methodology and

organisations have claimed great savings as a result of successful implementation of Six-sigma projects.

Lean (or Lean Thinking) was pioneered by Toyota in Japan in order to maximise production efficiency. Lean has also proven to be successful across many industry sectors globally over the years. Lean and Six-sigma provide an innovative way to integrate the power of variation reduction (Six-sigma) with aggressive waste elimination (Lean) techniques.

Manufacturing organisations build Lean and/or Six-sigma efforts on an established base of measurable processes and well-established quality programs. Services, because they produce intangible products usually with direct customer contact or participation, tend to have processes that are sometimes not very well understood and controlled and tend to develop less quantitatively orientated quality improvement programs. Service companies, if they can successfully implement and use Lean and/or Six-sigma methods to make process improvements, should achieve many of the same results as manufacturing companies (Hensley & Dobie, 2005).

Hence the service space provides a fresh new area for research on Lean and/or Six-sigma implementations. The primary objective is to establish what the mission critical success factors for Lean and/or Six-sigma implementation in South African Banking are. The secondary objective is to define a list of the sources of benefits for Lean and/or Six-sigma implementations in South African Banking.

1.3. Statement of problems and sub-problems

1.3.1. Problem statement

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

A problem statement is a clear and precise statement of the question or issue to be investigated with the aim of finding an answer (van der Wal, 2004). The problem definition is an extremely difficult but important process. The success of the research and its relevance depends heavily on this portion of the study process (Cooper & Schindler, 2003). The problem is defined clearly and it supports the remaining portion of the research.

This research seeks to identify which key issues should be addressed to successfully manage or eliminate the barriers and challenges of implementing continuous improvement initiatives – Lean and/or Six-sigma. The research also seeks to identify what sources of benefits South African Banks are actually achieving.

1.3.1.1. Sub-problem One

Even though many authors and leaders/experts//specialists in continuous process improvement have advocated the success factors at various places in the literature, very little attempt has been made to validate them by empirical research.

The first research problem/question is to determine the critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

How will this be determined?

The first step will be to conduct an exploratory study on the topic to what similar studies have done in other industries across the world. The ultimate objective will be to coalesce all the key ingredients from the existing literature on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations. The end result will yield a list of potential critical success factors for Lean and/or Six-sigma implementations.

Then via the questionnaire approach (survey), respondents will validate this list and a list applicable to South African Banking will be defined.

1.3.1.2. Sub-problem Two

Moreover, it is also important to understand the importance of each of these critical success factors and to define an order of prioritisation or ranking. The relative weightings of each critical success factor will enable the banking industry to understand which of the critical success factors are mission critical

and which are not that critical. This will enable them to focus on the most important critical success factors first and then to introduce the remainder with time.

Hence, the next sub-problem will be to establish how South African Banks will prioritise these critical success factors?

How will this be determined?

The respondents will quantify the relative importance of each critical success factors to the successful implementation in order to rank and prioritise them.

1.3.1.3. Sub-problem Three

All of the success stories are predominantly in Europe and the USA. There is not much literature on how South African Banks are currently performing on the implementation of Lean and/or Six-sigma implementations.

The next research problem/question will be to analyse and understand how South African Banks that are already on the Lean and/or Six-sigma journey are performing against these critical success factors.

How will this be determined?

The respondents will quantify how their organisations are performing against these critical success factors and will rate their actual performance against these critical success factors.

1.3.1.4. Sub-problem Four

It is important to understand the gaps between “importance of a critical success factor” and “actual performance” performance against this critical success factor within the South African banking context. It is also important to understand how this gap is impacting on the performance against benefits within the South African Banking sector. South Africa, and in particular banking, has its own set of challenges and barriers to the implementation of Lean and/or Six-sigma initiatives. This will enable the banking sector to understand what the particular gaps are, and what the banks are facing that is already on the continuous improvement journey. This will provide new entrants with new insights on reducing the risks and typical traps when deploying a Lean and/or Six-sigma initiative.

How will this be determined?

The respondents will quantify the relative importance of each critical success factors for the successful implementation in order to rank and prioritise them.

The respondents will quantify how their organisations are performing against these critical success factors and will rate their actual performance against these critical success factors.

The difference between these two will provide the information on the gaps that currently exist within organisations that are already on the Lean and/or Six-sigma journey.

The respondents will also rate how well they believe the banks are performing against achieving the benefits promised as per the discussion below.

1.3.1.5. Sub-problem Five

As discussed, all of these success stories are predominantly in Europe and the USA. There is not much literature on how South African Banks are performing on the implementation of Lean and/or Six-sigma implementations. What benefits are South African Banks achieving from these initiatives? Are the promised benefits, being achieved?

Hence, the research problem/question will be to determine how the respondents rate the overall success of the Lean and/or Six-sigma initiative.

How will this be determined?

The first step will be to conduct an exploratory study on the topic that similar studies have done in other industries across the world. The ultimate objective will be to define a list of potential sources of benefits from Lean and/or Six-sigma implementations within South African Banks.

The respondents will rate their organisations success via several questions related to the list of potential sources benefits on the survey questionnaire and will also rate the overall success of the Lean and/or Six-sigma initiative.

1.3.1.6. Sub-problem Six

There are not many guidelines to encourage South African banking leaders to venture into the continuous improvement journey in order to minimise risks and improve the overall success of the Lean and/or Six-sigma initiative.

Hence the research problem/question will be to provide guidelines for successful Lean and/or Six-sigma implementations in South African Banks.

How will this be determined?

This will be provided via analysis of the results obtained and generic recommendations will then be provided to the banking industry. Tests will be conducted to analyse the impact on the improvement approach on the mission critical success factors and sources of potential benefits. Tests will be conducted to analyse if there are differing views among the different stakeholders. Tests will be conducted to analyse if there are differing views among the different banks.

1.4. Definitions

Lean – "Lean (or Lean thinking) was pioneered by Toyota in Japan in order to maximise production efficiency. It focuses on creating "outstanding processes" and "eliminating waste". Lean has proven to be successful across many industry sectors globally." (IBM, 2006).

Six-sigma – "Originally conceived by Motorola as a way of improving production quality in 1985. Six-sigma is a data-driven method for achieving

near-perfect quality. It can be focused on both product and service activities and has strong emphasis on statistical analysis." (IBM, 2006).

Lean Six-sigma (or Lean and Six-sigma) – "Lean and Six-sigma combines the principles and best practices of Lean and Six-sigma to yield lasting results. Lean and Six-sigma provides an innovative way to integrate the power of variation reduction (Six-sigma) with aggressive waste elimination (Lean) techniques." (IBM, 2006).

Critical success factors (CSF's) - "The idea of identifying CSF's as a basis for determining the information needs of managers was popularised by Rockart (1979). CSF's are those factors which are critical to the success of any organisation, in the sense that, if objectives associated with the factors are not achieved, the organisation will fail – perhaps catastrophically so. (Rochart, 1979). In the context of Lean and/or Six-sigma project implementation; CSF's represent the essential ingredients without which a project stands little chance of success." (Antony & Banuelas, 2002).

1.5. Delimitation of the study

- This study focuses on two continuous improvement methodologies – Lean and Six-sigma when used in combination or independently
- The study focuses on the deployment and implementation phases only
- This study focuses on the Service Sector and specifically the Banking Industry within this sector
- This study focuses on the Banking Industry in South Africa only

- The study focuses only on 2 of the Top 4 South African Banks that have implemented Lean and Six Sigma

1.6. Importance of the study

Process excellence is achieved through radically improving processes efficiency and effectiveness. Reduction in process costs and the simplification of the processes themselves are key elements to achieving process excellence. This in turn leads to organisational benefits – decrease in costs, increase in revenues and greater customer satisfaction. Operationally excellent organisations continuously look at ways of analysing and improving their processes in order to improve stakeholder and customer satisfaction levels.

Once the key processes are clearly understood by all – this will enable the organisation to prioritise and focus on the right processes with regard to implementing and sustaining the necessary changes required to remain competitive. Continuous improvement ensures that the core processes can quickly adapt and accommodate changes in policy and/or the range and provision of services offered. (IBM, 2006).

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

1.7. Outline of research report

The balance of this report is divided into six further chapters.

In Chapter 2, the theoretical foundation of the study is given. It includes a study of South African Banking, Process View, Business Process Improvement and some benefits obtained from a Lean and Six Sigma implementation in a South African Bank.

Chapter 3 is a literature review of the past and current views of Business Process Improvement, Lean Thinking, Six-sigma and Lean Six-Sigma. It looks at the history, benefits, challenges during implementations, application to a services organisation and critical success factors required for successful implementation.

The research methodology is outlined in Chapter 4.

In Chapter 5, the results of the study are provided and then discussed in Chapter 6. Chapter 6 will also include a general conclusion with recommendations.

In Chapter 7, the references, appendices and article for publication is given.

CHAPTER 2: THEORETICAL FOUNDATION OF THE STUDY

2.1. Introduction

Chapter 1 gives an overview of the research study. It provides a history and background to the identified problem; outlines the objectives of the study; provides some key definitions and the delimitation of the study; and, the importance of the study.

This chapter provides the theoretical foundation of the study. It includes a study of South African Banking, Process View, Business Process Improvement and some benefits of a Lean and Six Sigma implementation in a South African Bank.

2.2. South African Banking

Despite the dominance of imperial banks in South Africa, the skilful competition by the Dutch bankers led to the innovation and sophistication of the South African banking industry in the twentieth century. By the last half of the twentieth century, the South African banking industry was by far the most sophisticated in Africa and in sophistication matched or even surpassed those of other countries outside the European or American shores, such as Canada, Australia and New Zealand. The development was noteworthy because of the isolation of South Africa during the last part of the twentieth century. Despite the isolation, the banking sector developed parallel to the leading financial institutions of the developed world. Even before 1994, the central bank of South Africa, the SARB commented that the increased acceptability of South

Africa in the international markets led to the expansion of the international operations of South African incorporated banks and increased interest by foreign banks in developing a presence in the South African market.

All the motives for changes in the regulatory framework of banking internationally had manifested in the South African banking environment. These are:

- Liberalisation of international capital flows between countries, which increased competition for banks by international capital markets and thus acted as a limiting incentive to international investment in the financial sector
- Increasing disintermediation in the capital markets limiting financial intermediation by banks both in terms of access to capital (companies accessed capital directly in the capital markets) as well as funding of banks (depositors finding alternative better returns for deposits)
- Financial innovation in response to high inflation of the 1970s and central bank restrictions
- Information technology developments, which challenged the boundaries of geography and time and thus also affected regulation changes
- Unprecedented competition among banks caused by deregulation; the liberalisation of capital flows; the lifting of price controls; financial disintermediation; and, new competitors entering the markets

  (Verhoef, 2006)

The CEO of a major South African Bank said the following: "Is it possible to maintain a positive outlook when everything around you is negative? I think so, and I am not alone. Some of the most successful people in the world believe that a turbulent environment presents the best opportunity to lay the foundation for great wealth in the future. As South Africans, we can benefit from a similar approach. There are problems facing us now, some of which we did not have to deal with at the same time last year. There is also no denying that are all scared by the crime, frustrated by electricity blackouts and concerned by the slowing growth in the economy. We are bankers. We look the facts in the eye. This is precisely the reason why we also have to look the other facts in the eye. South Africa is not the only country in the world facing challenges and we have a great many advantages and opportunities. The advantage of being South African today is that most of our problems are local and within our spheres of influence. We are not threatened by wars, famine or upheaval." (Abacas Magazine, 2008).

2.3. Process view and business process improvement

In order to gain, retain or regain sustainable competitive advantage many firms have considered a range of efficiency or improvement related initiatives. While the rationale for these initiatives began with the need for operational efficiency, it has not evolved to include business process management (O' Regan & Ghobian, 2002). Sussan & Johnsson (2003: 46) found that "global competition is forcing managers to rethink the way they do business. It is no longer the big that eat the small; it is now the fast that eat the slow. There is a

significant return on investment for becoming more business process orientated and reengineering an organisation to more horizontal structures."

Organisations are striving to be flexible enough to adjust quickly to changing market conditions, lean enough to beat any competitor's prices, innovative enough to keep its products and services technologically fresh, and dedicated enough to deliver maximum quality and customer service. The solution lies in the way organisations do their work and why they do it that way (Hammer & Champy, 2001).

The Industrial Revolution had turned its back on process, deconstructing them into specialised tasks and then focusing on improving the performance of these tasks. Tasks, and the organisation based on them, formed the basic building blocks of the twentieth century organisation. The persistent problem that companies faced at the end of the twentieth century could not be addressed by means of task improvement. Their problems were process problems, and in order to solve them companies had to make processes the centre of their attention. In taking this momentous step, corporate leaders were doing more than solving a set of vexing problems. They were bringing down the curtain on two hundred years of Industrial history (Hammer, 1997).

Renewing competitive advantage is not about getting people to work harder, but of learning to work differently. This means that companies and their employees must unlearn many of the principles and techniques that brought them success for so long (Hammer & Champy, 2001).

Adopting a process view of the business represents a revolutionary change in perspective: it amounts to turning the organisation on its head. A process orientation to business involves elements of structure, focus, measurement, ownership and customers. It implies strong emphasis on how work is done within an organisation, in contrast to a product focus emphasis on what. Unless designers or participants can agree on the way work is and should be structured, it will be very difficult to systematically improve, or effect innovation. Taking a process approach implies adopting the customer's point of view (Davenport, 1993).

Every organisation is a collection of processes, both technical and social in nature. These processes are typical business activities the company performs that produce value, satisfy customer needs and generate income. This fragmented into tasks, with managers to oversee the work (Meadows & Merali, 2003). Adams & Peck (1996) note that with so much fragmentation, people rarely understand how they contribute to the whole, or why they do what, or who the customer is?

The functional silo structure makes it difficult for the organisation to move fast, adapt to change, integrate across functions, and focus on high levels of quality and service. Reorganising around core business processes that turn customer requirements or inputs into outputs can eliminate fragmentation, restoring a whole system perspective that focuses on markets and customers.

Davenport (1993) suggests that for businesses to survive and grow in the competitive environment of the nineties, simply formulating strategies will no longer be sufficient. It will also be necessary for organisations to design the effective processes to carry out the defined strategy. Hammer (2001) suggests that in the absence of a process focus, a company cannot consistently deliver the performance levels that customers always wanted and now demand.

The needed revolutionary approach to business performance improvement must encompass both how a business is viewed and structured, and how it is improved. Business must be viewed not in terms of functions, divisions, or products, but of key processes. Achievement of order-of-magnitude levels of improvement in these processes means redesigning them from beginning to end, employing whatever innovative technologies and organisational resources are available. Adopting a process view implies a commitment to process betterment. Hammer (2001:53) states that: "process is the way in which the abstract way of putting customers first gets turned into practical consequences. Without process, companies can decay into a spiral of chaos and conflict".

For a world of process-centred organisations everything must be rethought: the kind of work that people do; the jobs that they hold; the skills they need; the ways in which their performance is measured and rewarded; the careers they follow; the roles managers play; and, the principles of strategy that the

enterprise follows. A process-centred organisation demands a complete reinvention of the systems and disciplines of management (Hammer, 1997).

Sussan & Johnson (2003) suggested four propositions regarding the relationship between business process orientation, interdepartmental dynamics, esprit de corps and overall business performance. These are:

- The more business process oriented an organisation is, the lower the interdepartmental conflict
- The more business process oriented an organisation is, the higher the interdepartmental connectedness
- The more business process oriented an organisation is, the higher the spirit de corps
- The more business process oriented an organisation is, the higher the overall business performance

Williamson & Sherrard (1996: 53) state, “What is becoming more apparent is that winning companies know how to do their work better. The solution is simple. If companies want to become more successful, they need to critically examine how to change the entire integrated processes that gets the work done. In the course of this critical examination, they may discover how to do their work better, at less cost, and in a way that better supports their customers’ values.”

In their attempts to cope with the forces of change, companies need to realise that process management must permeate the organisation totally, and not be

confined to a department, a discipline or viewed as a narrow organisation paradigm. Process management is an encompassing philosophy. It is one that ultimately must be appreciated by all stakeholders, the customer, the employees, the shareholders and society. Without a broad systems perspective, companies will continue to produce products/services that fail to satisfy and delight the customers. Ultimately, narrow perspectives will lead to corporate downfalls. To be successful in the new era there is a necessity for transformation in perspective and values. Despite all the change that has occurred over the past years within the process management paradigm, organisationally there is a blind narrow focus on cost reduction and productivity. Events of recent times such as the drastic downsizing implemented by companies attest to this. By focusing their energies in this way, these companies have neglected or inhibited the other side of the business equation, namely, that of innovation, creativity and growth. To sustain themselves in the long run, companies must manage the future proactively. The future is uncertain. That much is accepted, but we choose and create major aspects of the future by what we do or fail to do. In other words, while the future is uncertain, and indeed beyond our immediate control, there still are large aspects of the future that we need to manage and control. Organisations of the future will need to configure their products and processes in a manner designed to integrate expertise from a full range of sources rather than functional sources or even just internal resources. Companies of the future will to become customer-sensitive, knowledge-creating and agile enterprises. To do so they must continuously exchange information and ideas with their customers and suppliers to continuously deliver customised

products and services. They will have to deliver value over a lifetime, rather than confine benefit delivery to a once-off specific transaction (Ahmed, 2000).

The competitiveness of a company is mostly dependent on its ability to perform well in dimensions such as cost, quality, delivery dependability, speed, innovation and flexibility to adapt itself to variations in demand. While alignment of operations with strategic priorities is core to competitiveness, the continuous improvement of operational processes plays a very important complementary role in the quest for competitiveness in the long-run (Carpinetti, Buosi & Gerolamo, 2003).

In the past few years, most service companies have come to realise that delivering quick service is not longer a competitive advantage. It is a must for survival. If you cannot provide the service when the customer wants it, then there is a competitor who can. Most companies operating in this competitive environment have realised the importance of meeting and exceeding customers' expectations. The companies have become professionals at improving processes in an effort to serve customers faster and cheaper than the competition (Hayes & Helms, 1999).

Kalakota & Robinson (2003: 266) state that "companies and government organisations need to ask: Do we have a detailed understanding of what the end-to-end process looks like? Are our end-to-end processes effective? Is our customer happy with our current way of doing business? Can it be improved? If so, what process improvement method should we use?"

The most profound lesson from Business Process Reengineering was never the reengineering but the focus on business processes. Processes are how we work and any company that ignores its business processes or fails to improve them, risk its future. Companies can use many different approaches to process improvement without ever embarking on a high-risk reengineering project (Davenport, 1996). Before designing services, it is important to pick a process improvement methodology: Six-sigma, Voice of the Customer, Lean Thinking, Theory of Constraints, Total Quality Management (TQM), Process Reengineering, Toyota Production Systems (TPS), and Activity Based Management.

2.4. Lean and Six-sigma

The introduction of Lean and Six-sigma to one of South Africa's Top 4 Banks has seen major value added to the organisation. The programme has focused on fixing broken or tedious processes that impact on employees' abilities to deliver great service experiences to customers. Some of the successes are:

- The lead time for credit card collections has been reduced from 30 days to 2 days
- The credit card sales completion rate has improved from an average of 41% to 72%
- The lead-time to pay out a home loan in the customer contact centre has improved from 22 days to 6 days. An approval in principal is now provided in 30 minutes instead of 5 days

- Vehicle and asset finance sales fulfilment processes have improved from 72 hours to less than 5 hours
- Private bank accounts can now be registered in 18 days instead of 40days
- Recruitment lead times for mass recruitment have decreased from 67 days to 31 days

(Abacus Magazine, 2008)

2.5 Summary

The main focus of Chapter 2 is to provide a theoretical foundation for the study.

It is evident that organisations adopt a process view for many reasons.

Some reasons are:

- Improve customer service
- Focus on customer needs
- Improve profitability
- Reduce staff costs
- Reduce non-staff related (e.g. infrastructure) costs
- Reduce interdepartmental conflict
- Improve interdepartmental connectedness
- Improve flexibility
- Improve speed
- Flight competition
- Obtain end-to-end view

- Improve innovation
- Improve quality
- Manage business risk
- Improve predictability of service delivery

In the next chapter, a literature review is given of the past and current views of Business Process Improvement, Lean Thinking, Six-sigma, and Lean Six-Sigma. It looks at the history, benefits, challenges during implementation, application to a services organisation and critical success factors required for successful implementation.

CHAPTER 3: LITERATURE REVIEW

3.1. Introduction

The main focus of Chapter 2 was to provide a theoretical foundation for the study.

In this chapter, a literature review is given of the past and current views of Business Process Improvement, Lean Thinking, Six-sigma and Lean Six-Sigma. It looks at the history, benefits, challenges during implementation, application to a services organisation and critical success factors required for successful implementation.

3.2. Business process improvement

Shin & Jemella (2002) have categorised process improvements into three categories: quick hits (low risk with fast payback), incremental improvement (small degrees of change with small but significant results) and reengineering (demonstrating breakthrough thinking with aims for dramatic business results). Valris & Glykas (1999) classify redesign into two modes: incremental and radical. In the former case, the aim is at improving what already exists within the organisation, usually by eliminating non-value added activities in order to achieve lower throughput times and best allocation of resources. In the latter case, change redesign will challenge e01xisting organisational frameworks and might introduce new technology. Hall, Rosenthal & Wade (1993) define process improvement in terms of breadth and depth. Breadth refers to the span of the process (i.e. does it focus on a single function, cross-functional or

organisation wide) and depth refers to how many of the levels of depth (i.e. roles and responsibilities, measurements and incentives, structure, information technology, shared values, and skills) change as a result of the process initiative.

Process improvement requires a significant investment of valuable time and resources. It is important for organisations to target investments in areas that offer meaningful return. Real and significant improvement comes from making enhancements to an organisations core value creating processes (Gardner, 2002). To improve a process you must be able to measure it accurately, utilise as many people as possible (team work), make bold changes to get significant results and have a lot of support from top management to see that the necessary changes get implemented (Hayes & Helms, 1999).

Process management tools can help organisations elevate their performance to the next higher level. Over the past few decades, several tools and techniques have been developed with the explicit purpose of improving process performance. The eighties saw a quality revolution with American companies spending many millions of dollars and effort-hours on TQM and Continuous Improvement. Motorola developed the concept of Six-sigma which was soon adopted by many other world class organisations, including General Electric. At the same time the United States military were experiencing significant problems with system development and engaged Carnegie Mellon University Software Engineering Institute to come up with a

solution. They developed the Capability Maturity Model (CMM). As the nineties unfolded, reengineering came into vogue and again corporations invested heavily. These methods have all required substantial changes within the business world and have brought with them substantial benefits.

Gardner (2002) believes that methodology selection should be driven by an honest assessment of your improvement needs. Factors to consider in an assessment may include maturity of the process, the magnitude of improvement sought, the time available to gain the improvement and the degree of acceptable risk. Depending on these factors, the fundamental question is whether an organisation wants to pursue an incremental approach, such as Six-sigma's define-measure-analyse-improve-control, or a more radical approach, such as reengineering. If organisations do not carefully consider methodology and tool selection when launching improvement projects, then their efforts will likely be ineffective.

Multiple methodologies, tools and techniques are employed in pursuit of process improvement. Several of these are broad based approaches to organisational management and change, and others are more specific tools that are employed either in conjunction with these broad based approaches or in isolation. The next section will elaborate on the more complex broad based methodologies for Total Quality Management, Business Process Reengineering, Six-sigma, Capability Maturity Model, Theory of Constraints and Lean Thinking.

3.3. Lean Thinking

Lean is achieving more with less through “rapid and relentless” improvement.

Lean businesses focus on the processes used by people to perform an activity, and separate value added work from non-value added but necessary work and waste. In lean terms, waste is anything that adds cost or time without adding value. It is an activity done that adds no value to customers even though it may be included in the overall cost (Tapping & Shuker, 2003). The lean management focuses on improving the entire business system, rather than optimising individual parts of the business (Emiliani & Stec, 2004).

3.3.1 History

In the 1980’s, a new tightly integrated form of work organisation called lean manufacturing became known as a result of Japanese philosophy and influence. Based on a just-in-time approach in which buffer stocks were removed and suppliers were expected to supply parts on demand. It greatly increased efficiency and speed of production (Mumford, 1999).

Lean has evolved from the initial work conducted with the Toyota Production System in Japan.

At its core, the lean management system is focused on eliminating waste, creating value for end-user customers, and getting material and information to flow without interruption (Emiliani & Stec, 2004).

3.3.2. Benefits

More and more organisations are recognising that the speed or delivery or response is a key competitive differentiator in the mind of customers and this is what Lean creates.

“Lean can be a major strategic initiative focused on major cost efficiencies managed from the top of the business, or it can evolve in smaller discrete initiatives lower down the organisation.” (Atkinson, 2004).

Emiliani & Stec (2004) define the following characteristics of a lean business:

- Short lead times
- High quality
- Low cost
- High productivity
- Superior financial and non-financial performance
- Improved time-based competitiveness
- Customer satisfaction
- Balance of stakeholders’ interests
- Conflict reduced or eliminate

According to George (2002), Lean is a process philosophy with three purposes, to:

- Eliminate wasted time, effort, and material
- Provide customers with make-to-order products
- Reduce costs while improving quality

A lean process is one in which the value-added time in the process is more than 25% of the total lead time of that process.

According to the Mckinsey Quarterly Report (1998), the following are some benefits that banks in the USA are achieving from the implementation of Lean Manufacturing – the benefits gave a 15 to 25% cost saving and improved responsiveness to customers:

- Lean Increased the capacity by 25% in cheque processing without any additional investment
- Lean reduced processing times by 20 – 30% for residential mortgage underwriting
- Management practices, based on Lean principles are used in:
    - Automated workforce scheduling – reduces the times spent waiting for calls and when combined with part-time employment, is effective in minimising labour waste
    - Automated voice response units – interactive computer that handles simple queries hence reducing labour required
    - Call scripting – provides standardisation, minimises labour wastage and improves consistency and quality
    - Automated call routing – matching demand as closely as possible to agent availability
    - First call resolution procedures – reduces labour waste and improves productivity

- The allocations of agents for telephone duties rather than having them perform back-office activities. This eliminates wasteful setup activities
- Workstation sharing – agents on different shifts use the same workstation
- Automated predictive diallers for outbound calls that automatically select and dial target customers

3.3.3. Challenges during implementation

According to Atkinson, managers can be literally overwhelmed by the sheer range and scale of information available on Lean and may be discouraged by the information available on Lean strategies and methodologies.

Many still it as a simple attempt to take unnecessary costs out of the organisation. This is not the only objective of Lean. If it is used for cost cutting purposes only, it will not win the hearts and minds of the organisation's people. Lean needs to be positioned to take it rightful role as a preventative methodology.

Some challenges according to Atkinson (2004):

- Failing to create processes are end to end in nature and cross functional boundaries
- The thinking that the use of a tool is good and it's overuse is even better
- Not working with the people that actually produce the product or service

- Not instilling a listening and thinking culture

3.3.4. What application does Lean have in Service Organisations?

Lean is an incredible opportunity for improvement in most service organisations. Estimates are that more that 40% of staff operating costs are spent on wasteful activities. Hence this is a major benefit to service organisations as the majority of the costs in this type of organisation are attributed to staff costs.

Financial service has always been keen to reduce their operating costs. Over the last couple of years they used many “once-off” and “quick win” approaches to achieve this, like downsizing the branch networks, installing call centres and more recently relocating call centres overseas. This has resulting in huge, none sustainable reductions in their cost to income ratios and profitability. These are easily copied by competitors and are some of the things that could come about by applying Lean thinking. Lean is a thinking solution that can deliver huge, sustainable returns if it is implemented in the spirit of “relentless improvement” instead of “quick fix” cost reductions (Atkinson, 2004).

According to Atkinson (2004), who focused on a leading provider of Insurance Services in the UK. They found that over 200 work activities, which resulted in wastage in staff time through reworking the same cycle of activities, sometimes several times, resulted in potential wastage of 40% of labour costs.

Raising bank's efficiencies will take more than one time cost cuts and Lean approaches if implemented well could bring about huge benefits. A typical consumer orientated bank can realise one-off improvements in its efficiency ratio of 2 to 5 percentage points by applying Lean techniques in areas such as check processing, credit application and approval, and call centres. A disciplined focus on operational effectiveness may yield an additional year-on-year productivity improvement. As pressures of productivity intensify, banks should act quickly to embrace these techniques and move toward continuous productivity improvement (The Mckinsey Quarterly Report, 1998).

3.3.5. Critical success factors required for successful implementation

According to Atkinson (2004), the following are some of the critical success factors for Lean Implementations:

- Lean has to be sold as a major change initiative (preventative method)
- The preferred route of a "top-down" approach will have a major impact (senior leadership commitment, force and energy)
- Process management is a critical factor
- The belief that the use of a tool is good and it's overuse and application is better – misses the part of Lean thinking and is a major failure
- Obsessing about process design with those that produce the product or service
- Lean thinking can only exist if we install a listening and a thinking culture

- Relentless working on the core 6 or 8 processes, whether in a manufacturing or service organisation will create a Lean culture
- Lean will be successful, if implemented in the spirit of "relentless improvement" rather than "quick fix" cost reductions
- The "positioning of Lean in an organisation" as a major change driver is critical. This could be positioned under one or more of the following:
    - As a cost reduction exercise
    - To cope with specific threats to the business, usually associated with poor relations with the customer base or a particular customer
    - To address quality of product or service problems
    - To reduce cycle time from order to delivery
    - To launch and deliver new products and services
    - To develop best value

In summary, Atkinson (2004) considers the following 4-step approach to work well:

- Selling and communicating the Lean Philosophy
- Senior management commitment
- Design of projects
- Selling the benefits of Lean thinking

According to Cadavid & Duque (2007) the following are the critical success factors for Lean implementations:

- Prepare and motivate the people – intense communication, what to expect and need for change
- Roles in the change process – informed and active leadership, involvement of workers, experts acting as coaches, support from other areas
- Methodologies for change – use of model lines, Kaizen events, focus on flow, quick and visible improvements, orientation towards action, apply PDCA (plan, do, check, act) cycle, problem solving, practical thinking, sustaining the improvements, focused teams and right sizing of equipment
- Environment for change – job security (no Lean "layoffs"), divulge and apply guiding principles, allow experimentation, build trust

3.4. Six-sigma

Six-sigma is a management philosophy that attempts to improve customer satisfaction to near perfection. A Six-sigma company has a little more than three bad customer experiences for every million opportunities. Six-sigma is for most organisations a major change from how they typically managed their business. Movement towards managing with fact and data and aggressively pursuing greater efficiencies and effectiveness is a dramatic change. Six-sigma focuses on identifying, quantifying and driving out errors in business processes. Change, even the positive change associated with Six-sigma, will be resisted (Eckes, 2001).

Pande, Neumann & Cavanaugh (2000: 6) define Six-sigma as: "a comprehensive and flexible system for achieving, sustaining and maximising business success. Six-sigma is uniquely driven by close understanding of the customer needs, disciplined use of facts, data, and statistical analysis, and diligent attention to managing, improving, and reinventing business processes". There are multiple reduction; productivity improvements; market-share growth; customer retention; cycle-time reduction; defect reduction; culture change; and product/service development.

Pande et al (2000) have defined several key principles of Six-sigma, including:

- Genuine focus on the customer to ensure customer satisfaction and value
- It is driven by facts and data. It begins with clarifying what measures are vital to gauging business performance and then applies data and analysis to build an understanding of key variables to optimise results
- Process focus, management and improvement are the key vehicles to success
- Move to proactive management
- Ensure "boundary less collaboration" by breaking down barriers to improve teamwork, up, down and across organisational lines
- Drive for perfection but tolerate failure

3.4.1. History

Six-sigma was originally developed at Motorola in the 1980's for production processes. However, today service firms – and service functions within

almost every sector – are using Six-sigma methods to boost performance (Biolus, 2002).

3.4.2. Benefits

General Electric (GE) annual report in 1999 stated the following: "…the Six-sigma initiative is in its fifth year – its fifth trip through the operating system. From a standing start in 1996, with no financial benefits to the company, it has flourished to the point where it produced more than $2 billion in benefits in 1999, with much more to come this decade" (Coronado & Antony, 2002).

Motorola, claims similar savings. In 1999, Motorola was honoured with the Malcolm Baldrige award. Motorola had spent $170 million on training and education and as a result saved $2.2 billion in reducing costs of poor quality (Coronado & Antony, 2002).

Real benefits in service and transactional processes:

- Reduced medication and laboratory errors and thereby improved patient safety.
- Reduced profit margin significantly in a community hospital and the estimated saving is more than $1 million per year.
- Significant savings in process timelines, improvements in cash management and increased customer loyalty and satisfaction.

(Antony & Banuelas (2002)

Consistency of process should lead to other benefits including improved quality levels, reduced waste, increased focus on the customer and improved profitability (Hensley & Dobie, 2005).

3.4.3. Challenges during implementations

Not all companies are achieving the same benefits as Motorola and GE did are still achieving. Fewer than 10% of the companies doing it to the point where it's going to significantly affect the balance sheet and the share price in any meaningful period of time (Coronado & Antony, 2002).

According to Hensley and Dobie (2005) the following are the potential difficulties when implementing six-sigma in services:

- It is more difficult to gather data in services vs. manufacturing
- Measurements of customer satisfaction is more difficult in services
- The service sub-processes are harder to quantify hence the measure and control phases are more difficult in services
- Most of the data is collected manually in services vs. automated methods in manufacturing

Six-sigma works most successfully when it is adopted as a management philosophy as opposed to a quick fix for particular problems.

According to Byrne (2003), one of the biggest reasons why six-sigma initiatives fail is that organizations lack strong and visionary leadership. Another key reason for failure is that it is not seen as an entirely new way of

working which relies on the collection and analysis of data and the use of numerous statistical tools for correcting defects – it is not a quick fix and results do not follow very quickly.

3.3.4. What application does Six-sigma have in Service Organisations?

Six-sigma is attractive to services due to its customer-driven methodology. The benefits that six-sigma has experienced in manufacturing should be translatable to services organisations. Services organisations have scrap and waste just like manufacturing. Inconsistent processing in services also has a cost impact just like manufacturing. Six-sigma is being implemented successfully in a broad range of services and manufacturing companies are also utilising six-sigma within the service operations part their business. In Financial services, Fidelity Investments began using six-sigma in 2002 in order to improve customer satisfaction and reduce variation. The Defence Finance and Accounting Service utilised six-sigma to identify and measure costs of poor process control.

(Hensley and Dobie, 2005)

Fedex, Home Depot and Wal-Mart have reinvented their supply chain processes to deliver products to customers more reliably, fast and at lower costs. These gains are at the heart of six-sigma. Financial services have recently assumed the widest expansion of sis-sigma. Banking operations tend to have highly repetitive and relatively standardised transactional

processes – a natural environment for the application of six-sigma (Patton, 2005).

3.4.5. Critical success factors required for successful implementation

Coronado & Antony (2002), define the following critical success factors for successful Six-sigma project implementations:

- Management involvement and commitment – the support and commitment of senior management is critical
- Cultural change – Six-sigma is known as a breakthrough strategy as it involves change in the company's values and culture
- Communication – communication, motivation and education is critical. A communication plan is an integral part of the initiative to ensure that employees feel engaged and part of the journey and are provided with the necessary information around how Six-sigma can benefit them and the business
- Organisational structure - before even selecting Six-sigma, there are certain characteristics that are critical and it must be viewed as a long-term strategy. Resources and investment must be available over a considerable period of time
- Training – creates a sense of ownership at every level in the organisation and addresses the "why" and "how" questions

- Linking Six-sigma to business strategy – Six-sigma cannot be treated as a standalone initiative and it must have direct impact on both financial and operational benefits
- Linking Six-sigma to customer – Six-sigma must begin and end with the customer in mind
- Linking Six-sigma to human resources - this is directly related to the organisational culture changes – goals must be created and internalised at an individual level
- Linking Six-sigma to suppliers – Six-sigma must go beyond the company's walls
- Understanding tools and techniques within Six-sigma – it is critical for all involves to understand the key tools and techniques used
- Project management skills – the key elements of project management are important (time, cost and quality). Clearly defining them will provide the team with the scope, aim and resources required to implement the improvement in a short period of time at the lowest possible cost with the right requirements
- Project prioritisation and selection - projects selected must be closely tied to business goals and should provide maximum financial benefits to the organisation

According to Byrne (2003) the following are some key ingredients are critical for a successful six-sigma launch and implementation:

- Strong, hands-on top leadership of initiatives

- The ability to cascade six-sigma leadership responsibilities to leaders at all levels in the organisation
- Commitment of business process owners to six-sigma principles and practice
- Careful selection of Black Belts to spearhead the programme
- Appropriate and customised training of Black Belts

3.5. Lean Six-sigma (Lean and Six-sigma)

The concept of Six-sigma has been combined with Lean Thinking to create a complimentary methodology, called Lean and/or Six-sigma, utilising the strengths of both approaches. George (2002) defines Lean and Six-sigma as a methodology that maximises shareholder value by achieving the fastest rate of improvement in customer satisfaction, cost, quality, process speed, and invested capital. The fusion of Lean and/or Six-sigma is required because:

- Lean cannot bring a process under statistical control
- Six-sigma alone cannot dramatically improve process speed or reduce invested capital.

The principle of Lean and Six-sigma is the activities that cause customer's critical-to-quality issues and create the longest time delays in any process offer the greatest opportunity for improvement in cost, quality, capital, and lead time" (George, 2002: 4).

3.5.1. History

General electric's Transportation, famous for their highly successful Six-sigma program, state that: "Lean and Six-sigma tools have been used extensively in the last 10 years at General Electric. However, the crossover was not always obvious, intentional, or a result of any implementation strategy. Over time with continuous use, there was growing awareness that the best DMAIC Six-sigma Improvement tools were "Lean-like". Lean was used in varying degrees in Six-sigma projects, with different approaches based on the individual's exposure and training in Lean tools." (O' Rourke, 2005).

3.5.2. Benefits

""In a system that combines two philosophies, Lean creates the standard and Six-sigma investigates and resolves any variation from the standard" (Breyfogle, 2001). A leading Six-sigma advocate, Michael George from the George Group, states that the purpose of Lean and/or Six-sigma is twofold. First, "to transform the CEO's overall business strategy from vision to reality by the execution of appropriate projects," and second, "to create new operational capabilities that will expand the CEO's range of strategy choices going forward." (O' Rouke. 2005).

3.5.3. Challenges during implementations

According to O' Rourke (2005), most organisations want to improve quality and reduce costs but continuous improvement methodologies are a daunting undertaking. Many organisations fail to properly structure and support continuous improvement initiatives, which cause them to fail.

Some barriers to the deployment and implementation of the Lean and/or Six-sigma initiative were identified by O' Rourke (2005):

- Resistance to change
- Lack of cohesive business strategy
- Budget and time constraints
- Fractured organisational structure
- Getting the right people identified as Black Belts
- Identification and prioritising of the projects
- Negotiating with line managers to recruit the "best" and "brightest" employees for black belt training

3.5.4. Critical success factors required for successful implementation

- Senior leadership should take an authoritative, visible and active stance in the continuous improvement
- The business strategy must be infused with the continuous improvement strategy and must include Lean and/or Six-sigma principles
- Consultants should be brought onboard during the early stages of the decision making process
- The new structure created by the continuous improvement initiative should be standardised across the entire organisation to prevent localised modification
- The training plans for Green/Black/Master Black Belts should be standardised and centrally controlled

- The continuous improvement initiative should be recognised as the training ground for future senior leadership and should be treated as a leadership development program
- The goals and the principles of the continuous improvement initiative should be communicated using both formal and informal techniques
- The success of the initiative should be measured using existing metrics (bottom line business benefits), the voice of the customer metrics and employee satisfaction metrics

(O' Rourke. 2005).

According to IBM (2006), the following are the 10 critical success factors for sustainable success for Lean Sigma implementations:

- Committed leadership – Leadership must own and visibly commit to the changes and the other employees will be lead by example
- Customer focus – Base decisions on process and customer facts and ensure improvements are targeted at real problems and enables growth
- Strategic alignment of projects – Clear alignment of improvement efforts to the strategy and to ensure that resource is not wasted on non-strategic issues
- Business process management – understanding the core and support processes and overcomes problems of silos and helps to prioritise improvements

- Systematic approach to change – Engage a framework for change with defined deliverables at each stage and key stakeholders and communities buy into the changes
- Benefits realisation and tracking – Focus on delivery of measurable benefits traceable to ledgers and ensures business case is delivered
- Performance management – Agreeing performance objectives and motivating people to deliver, career planning and raises commitment and sustainability at the outset
- Capabilities, learning and knowledge – Leveraging the learning from each wave of improvements and creates a common language of change and speeds up change
- Deployment management - Integrate transformation activities into a cohesive plan and ensures change is coordinated and resources are used to best effort
- Full time resourcing and organisation – High potential resources work on improved priorities and ensure benefits realisation.

3.6. Summary

The main focus of Chapter 3 was to conduct a literature review on Business Process Improvement, Lean thinking, Six-sigma and Lean Six-sigma. The benefits, implementation challenges, application in services organisations and success factors were reviewed.

In order to address Sub-problem one, the first step was to conduct an exploratory study on the topic as similar studies have been done in other

industries across the world. The ultimate objective was to extract all the key ingredients from the existing literature on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations. The end result is a list of critical success factors for Lean and/or Six-sigma implementations.

In summary, the Top 20 critical success factors analysed, for Lean and/or Six-sigma Implementations are:

- Position as a cultural change driver
- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- Process management focus
- Must be positioned in the spirit of "continuous improvement"
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Training - motivation and education of people
- Measuring and monitoring progress
- Change management specialist expertise
- Financial resources must be available over a considerable period of time
- People resources must be available over a considerable period of time
- Employee empowerment
- Teamwork
- Performance management and reward systems
- Genuine focus on customer needs is key

- The business strategy must be infused with the continuous improvement strategy
- Project management skills
- Project prioritisation and selection
- The new structure created by the continuous improvement initiative should be standardised

In summary, the sources of benefits realised during Lean and/or Six-sigma implementations are:

- Reduced cycle time to delivery
- Improved quality
- Reduced waste
- Increased productivity
- Improved customer service
- Increased focus on customer needs
- Increased revenues
- Reduced costs
- Improved staff morale
- Improved interdepartmental connectedness
- Continuous improvement culture
- Improved flexibility
- Improved speed and responsiveness
- Improved competitive advantage
- Robust and stable processes
- Improved management of business risk

- Improved predictability of service delivery
- Improved innovation

The literature survey validates that there is evidence for the application of Lean and/or Six-sigma implementations in services organisations.

The list of critical success factors identified and sources of benefits identified will be tested in the South African Banking environment via a survey approach.

The next chapter will define the research methodology that will be used.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

In the preceding chapters a broad study orientation is given and the research problem and sub-problems (Chapter 1) as well as an overview of the theoretical foundation of the study (Chapter 2). In Chapter 3, a literature review is done on the views on business process improvement, Lean thinking, Six-sigma and Lean Six-sigma.

In Chapter 4, a full exposition of the study is given including the propositions for each sub-problem. The research methodology is defined which includes the sample design, method of data collection, measuring instruments, data analysis, and assumptions of the study and limitations of the study.

The research methodology and design impact directly on the quality of research findings (Cooper & Schindler, 2003). A research design is “logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of study” (Yin, 2003). The research project’s “logic” is the paradigm that helps us understand the social phenomena (Creswell, 1994) (O’ Rouke, 2005).

“Two of the most popular research paradigms shape the process the research follows to understand the questions posed at the beginning of the research. The qualitative study is defined by Creswell (1994) as “an inquiry process…based on building a complex, holistic picture, formed with words,

reporting detailed views on informants, and conducted in a natural setting." Creswell (1994) alternatively defines the quantitative study as "an inquiry process…based on testing a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalisations of the theory hold true." (O'Rouke, 2005).

The chapter provides a full description of the research plan, structure and execution.

The method that will be used to conduct the research will be quantitative in nature, collecting data by means of a survey questionnaire. The parameters for the research will be outlined in the research propositions/hypotheses.

The first step will be to conduct an exploratory study on the topic as similar studies have been done in other industries across the world. The ultimate objective will be to coalesce all the key ingredients from the existing literature on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations.

4.2. Problem statement

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly

structure and/or support continuous improvement initiatives, which ultimately doom then to failure.

A problem statement is a clear and precise statement of the question or issue to be investigated with the aim of finding an answer (van der Wal, 2004). The problem definition is an extremely difficult, but important process. The success of the research and its relevance depends heavily on this portion of the study process (Cooper & Schindler, 2003). The problem is defined clearly and it supports the remaining portion of the research.

This research seeks to identify which key issues should be addressed to successfully manage or eliminate the barriers and challenges of implementing Lean and/or Six-sigma continuous improvement initiatives. The primary objective is to establish what the mission critical success factors for Lean and/or Six-sigma implementation in South African Banking are. The secondary objective is to define a list of the sources of benefits for Lean and/or Six-sigma implementations in South African Banking.

A good hypothesis should be adequate for its purpose; it should be testable and better than its rivals. (Cooper & Schindler, 2003). A hypothesis test can be conducted to investigate statistically whether a claim is justified.

4.2.1. Propositions (Research questions)

4.2.1.1. Proposition one

Even though many authors and leaders/experts//specialists in continuous process improvement have advocated the success factors at various places in literature, very little attempt has been made to validate them by empirical research.

The first research problem/question is to determine the mission critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

The end result of the literature survey conducted revealed that the following are the potential critical success factors for Lean and/or Six-sigma implementations in South African Banks:

- Position as a cultural change driver
- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- Process management focus
- Must be positioned in the spirit of “continuous improvement”
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Training - motivation and education of people
- Measuring and monitoring progress
- Change management specialist expertise
- Financial resources must be available over a considerable period of time

- People resources must be available over a considerable period of time
- Employee empowerment
- Teamwork
- Performance management and reward systems
- Genuine focus on customer needs is key
- The business strategy must be infused with the continuous improvement strategy
- Project management skills
- Project prioritisation and selection

The new structure created by the continuous improvement initiative should be standardised

Hence the following is Proposition 1:

P1: The above factors are the mission critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

How will this be determined?

Using the survey questionnaire approach, respondents will validate and score this list.

4.2.1.2. Proposition two

Moreover, it is also important to understand the importance of each of these critical success factors and to define an order of prioritisation or ranking. The relative weightings of each critical success factor will enable the banking industry to understand which of the critical success factors are essential and

which are not that essential. This will enable them to focus on the most critical success factors first and then to introduce the remainder in with time.

Hence the next sub-problem is how will South African Banks prioritise these critical success factors?

Hence the following is Proposition 2:

P2: The above critical success factors have an order of priority and do not have equal weighting in terms of importance.

How will this be determined?

The respondents will quantify the relative importance of each critical success factors for the successful implementation in order to rank and prioritise them.

4.2.1.3. Proposition three

All of these success stories are predominantly in Europe and the USA. There is not much literature on how South African Banks are performing on implementation of Lean and/or Six-sigma implementations. There is a perception that the performance against these critical success factors in South African Banks is not where it should be and hence this is having an impact on the benefits that banks are achieving from these programmes.

The next research problem/question will be to analyse and understand how South African Banks that are already on the Lean and/or Six-sigma journey

are performing against these critical success factors. Are they performing at the optimum level against these critical success factors?

Hence the following is Proposition 3:

P3: South African Banks are not performing at the optimum level in terms of ensuring that these critical success factors are effectively addressed in the implementation of Lean and/or Six-sigma implementations.

How will this be determined?

The respondents will quantify how their organisations are performing against these critical success factors and will rate their actual performance against these critical success factors.

Quantify how the respondents rate actual performance against these critical success factors

4.2.1.4. Proposition four

It is important to understand the gaps between “importance of a critical success factor” and “actual performance” performance against this critical success factor within the South African banking context. From research it is clear that the successful execution of these critical success factors is essential to ensure that the benefits promised are delivered effectively. South Africa and in particular banking has its own setting of challenges and barriers to implementation of Lean and/or Six-sigma initiatives. This will enable the banking sector to understand what the particular gaps are, that banks are

facing that are already on the continuous improvement journey. This will provide new entrants with new insights on reducing the risks and typical traps when deploying a Lean and/or Six-sigma initiative.

Hence the following is Proposition 4:

P4: Significant differences exist between what stakeholders believe are the critical success factors and the banks actual performance against these and this is reducing the benefits promised.

How will this be determined?

The respondents will quantify the relative importance of each critical success factors for the successful implementation in order to rank and prioritise them.

The respondents will quantify how their organisations are performing against these critical success factors and will rate their actual performance against these critical success factors.

The difference between these two will provide the information on the gaps that currently exist within organisations that are already on the Lean and/or Six-sigma journey.

Quantify the gaps between importances vs. actual performance against each of these critical success factors

The respondents will rate how well the banks are performing against the set of benefits promised in order to determine the impact on the benefits promised as discussed below.

4.2.1.5. Proposition five

As discussed, all of these success stories are predominantly in Europe and the USA. There is not much literature on how South African Banks are performing on implementation of Lean and/or Six-sigma implementations. What benefits are South African Banks achieving from these initiatives?

Hence, the research problem/question will be to determine how the respondents rate the overall success of the Lean and/or Six-sigma initiative.

From the literature survey, companies are experiencing the following sources of benefits:

- Reduced cycle time to delivery
- Improved quality
- Reduced waste
- Increased productivity
- Improved customer service
- Increased focus on customer needs
- Increased revenues
- Reduced costs
- Improved staff morale
- Improved interdepartmental connectedness

- Continuous improvement culture
- Improved flexibility
- Improved speed and responsiveness
- Improved competitive advantage
- Robust and stable processes
- Improved management of business risk
- Improved predictability of service delivery
- Improved innovation

Hence the following is Proposition 5:

P5: The Lean and/or Six-sigma initiatives are successful and the above types of benefits are being experienced by South African Banks.

How will this be determined?

The first step will be to conduct an exploratory study on the topic as similar studies have been done in other industries across the world. The ultimate objective will be to extract all the key benefits that organisations are experiencing from the existing literature on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations. The end result will be a list of potential sources of benefits from Lean and/or Six-sigma implementations.

The respondents will rate their organisations success based on several questions related to benefits as listed in the survey questionnaire.

The respondents will rate the overall success of the Lean and/or Six-sigma initiative as listed in the survey questionnaire.

4.2.1.6. Proposition six

There are not many guidelines to encourage South African banking leaders to venture into the continuous improvement journey in order to minimise risks and improve the overall success of the Lean and/or Six-sigma initiative.

Hence the research problem/question will be to provide guidelines for successful Lean and/or Six-sigma implementations in South African Banks.

Hence the following is Proposition 6:

P6: There are no major differences between banks in terms of the critical success factors and sources of benefits, and there are no major differences among the opinion of the different stakeholders and there are no major differences based on the improvement approach used (Lean only, Six-sigma only or combination of Lean and Six-sigma)

How will this be determined?

This will be provided by analysing the results obtained and be followed by recommendations. Tests will be conducted to analyse the impact on the improvement approach on the mission critical success factors and sources of potential benefits. Tests will be conducted to analyse if there are differing views among the different stakeholders. Tests will be conducted to analyse if there are differing views among the different banks.

Generic guidelines will be provided for successful Lean and/or Six-sigma implementations in South African Banks.

4.3. Sample design

4.3.1. Research population

The population is the group of entities that the study is aimed at (Eiselen, 2008). The research population will be two of the Big 4 banks in South Africa and consultants to these banks that deploy Lean and/or Six-sigma.

4.3.2. Sampling methodology

Any subset of the population is a sample. There are two broad categories of sampling – probability sampling and non-probability sampling. This study will utilise non-probability sampling. There are four types of none probability-sampling techniques – convenience sampling, judgement sample, quota sampling and snowball sampling.

This study will utilise judgement sampling. Judgement sampling is also called purposive sampling. Judgement sampling is where an experienced individual selects the sample on his or her judgement about some appropriate sample characteristics required by the sample unit.

Only South African banking organisations will be selected that have or are implementing Lean and/or Six-sigma methodologies. The people selected will be based on the researcher's familiarity with the organisations and its people. Consultants that are involved in the Lean and/or Six-sigma deployments will also be targeted.

The sample selection will be based on the following process:

- Two large banks will be specifically targeted where Lean and/or Six-sigma deployments have taken place
- The researcher has worked in these banking organisations so access to people and information will be accessible and direct contact will be made by email or telephone
- The people involved in the deployment will be targeted
    - Employees
    - Project leaders – Six Sigma Yellow/Green/Black Belts, Lean Value Stream Managers/Coaches
    - Project team members
    - Senior management
    - Line management
    - External consultants
    - Change management specialists
    - Human resource consultants
    - Process users

4.3.3. Sample size

Sample size will be determined by:

- Time and budget – study due by November 2008 with limit budget
- Sample size used in similar studies will be used as a guide – 100 surveys will be sent out and a response rate of ~55% is expected. This will enable an effective statistical analysis
- 50 surveys per bank will be sent out
- The questionnaire will be sent to all categories of stakeholders that were involved in the deployments to overall gain an understanding of their perceptions of the important success factors for effective Lean and/or Six-sigma implementations and to determine how well the banks are performing against these and what benefits they are achieving
    - Employees/Process users – directly impacted by the programme. It is critical to gain an understanding of the level of satisfaction, acceptance, fear and resistance
    - Project leaders – Six Sigma Yellow/Green/Black Belts, Lean Value Stream Managers/Coaches – It is critical to also gain an understanding of the approach and effectiveness of the approach from a project leadership perspective
    - Project team members – project team members are also important and have quite a few insights on this
    - Senior management – it is critical to include top managements perceptions on the initiatives currently as they have the power to make a difference on deployments going forward in the banking environment

- Line management – It is critical to test the acceptance of such programmes at all levels in the organisation and in particular in the areas that are directly impacted by the implementations
- External consultants – It is important to obtain a holistic view on the programme
- Change management specialists – It is good to gain an understanding from a change management angle
- Human resource consultants – To gain an understanding from the "people" representative is key. The change management specialist also will represent the "people-side"

4.4. Method of data collection

4.4.1. Secondary data collection

Information on the two banking organisations will be collected by reviewing the following:

- Internal newsletters
- Internal program reports
- Internal magazines

An exploratory study on the topic will be conducted as similar studies have been done in other industries across the world. The ultimate objective will be to extract all the key ingredients and key benefits from the existing literature on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations.

4.4.2. Primary data collection

This study will collect data via the survey questionnaire method. The researcher has worked at both the Big 4 South African Banks that will be targeted; hence access to respondents will be direct from the researcher. The researcher will brief respondents further via telephone if necessary.

The questionnaires will be emailed to 50 people in each to the two banking organisations. Follow-up calls will be conducted to provide feedback and obtain clarification in information.

The questionnaires will be automated and will be placed on a website. Data will be assimilated on an excel spreadsheet automatically by running a programme that will be developed.

Statistical analysis will then be conducted on the data.

4.5. Measuring instrument(s)

The questionnaire approach will be chosen for the following reasons:

- The literature survey will reveal what organisations that have been successful in Lean and/or Six-sigma, believe that there are critical success factors, that if implemented effectively will ensure sustainable benefits, hence specific questions will be asked in order to gather this specific information
- Questionnaires tend to produce information that can be measured statistically

- Opinions will be sourced based on the knowledge of the respondents

The questionnaire will comprise of the following sections:

- Background on the research study
- Personal information
- Background information
- Rate the importance of the critical success factors
- Rate the banks actual performance against these critical success factors
- Rate the actual benefits of the initiative
- Provide any general qualitative comments

The Survey Questionnaire is under Appendix 8.2. and 8.3.

4.5.1. Limitations

- According to Gillham (2000), the scaled questions have disadvantages, because respondents often do not use the entire scale (Antony & Banuelas, 2002)
- Hence, it would have been ideal to do some semi-structured interviews to gain a deeper understanding of Lean and/or Six-sigma practices in these organisations. This will not be possible, given the time constraints. The researcher has worked in the Lean and Six Sigma programmes at both of these institutions so have a deep understanding of the programmes

4.6. Data analysis

4.6.1. Quantitative

The following statistical tests will be required for this research project:

DESCRIPTIVE STATS:

- Descriptive percent stats
- Overall descriptive stats
- Central tendency stats
    - Mean
    - Median
    - Mode
    - Standard Deviation
    - Variation
    - Range
    - Minimum
    - Maximum

INFERENTIAL STATS:

- Cronbach alpha test (reliability test)

  In this research, the Cronbach's alpha test will be carried out because it is widely used in the internal reliability for a set of questions. Generally, an alpha of 0.60 or higher is thought to indicate an acceptable level of internal consistency (Antony & Benuelas, 2002).

All the factors in the survey instrument (questionnaire) will be checked against the Cronbach's alpha coefficient to check if they are above 0.60.

- Anova tests
- z-tests
- Chi-Square tests

4.6.2. Qualitative

The last question in the survey instrument is qualitative in nature. Any trends will be summarised.

4.7. Reliability and Validity

Any statistical measurements employed in the research study will require a further two considerations:

- Reliability and
- Validity.

4.7.1. Reliability

According to Leedy & Ormrod (2001), "reliability deals with accuracy. It relates to how accurate the instrument is."

This research study will use the Cronbach Coefficient alpha test to test the reliability of the data. A Cronbach coefficient alpha value below 0.7 is considered relatively low and unreliable. Thus any alpha value above 0.7 is acceptable. A value above 0.9 is considered a high reliability.

4.7.2. Validity

There is no statistical test to verify the validity of the data. According to Leedy & Ormrod (2001), "validity is concerned with the soundness, the effectiveness of the measuring instrument. Validity tries to identify exactly what the test should measure and whether it does actually measure this." There are several types of validity measures, two of which are appropriate for this research:

- Face validity – this type relies on the judgement of the researcher. The researcher must decide whether:
    - The instrument is measuring what it is created to measure
    - Whether the sample is adequate to be representative of the behaviour or trait being measured.
- Content validity – this validity looks at the "content" being studied, namely, how accurately the actual questions elicit the information required to complete the study.

Both the validity tests above are subject to the judgement of the researcher. To ensure face validity, the researcher will perform a cross analysis of the propositions with the questionnaire to ensure that the appropriate questions are included. To further ensure a high level of face validity, the respondents included in the sample will represent the behaviour or trait being tested. The content validity will be aided by the literature review upon which the propositions and questionnaire will be based.

4.8. Assumptions of study

- Respondents will be available to complete the questionnaire
- Acceptable response rate is about 55% which equates to about 55 respondents
- The will be an equal distribution of responses from both the banks
- There will be no major differences in opinion between the two banks and a set of critical success factors for banking will be defined
- It will be possible to link the benefits to the performance of the organisation against these critical success factors

4.9. Limitations of study

- Due to the quantitative nature of the study, there will be little or no opportunity to probe for more detail
- The study's scope is within the banking sector only. Only respondents from two of the Top Four South African Banks will form part of the study
- The study is very dependent on the respondents experience, knowledge and expertise in the field of Lean and/or Six-sigma
- The questionnaire will be sent to about 50 respondents in each company and there will a limitation on time to complete the questionnaire
- The study is dependent on the response rates

4.10. Summary

This chapter outlined the research methodology for this study. It discusses the problem statement and the six propositions. The sampling method that

will be used is Judgement Sampling. The sample size will be 50 respondents per bank. The data collection will be primarily via a survey question. Some secondary data on the two banks will be collected. There are some limitations to the data collection, which is discussed. The data analysis is discussed. This will be primarily quantitative analysis – descriptive and inferential statistics will be used. Some qualitative analysis will be conducted just to summarise some key additional information that will be provided by the respondents. The assumptions and limitations of the study have been discussed.

In the following chapter the results and findings will be discussed.

CHAPTER 5: RESULTS

5.1. Introduction

The preceding chapters provided the orientation (Chapter 1) of the study, an overview of the theoretical foundation (Chapter 2), a literature review (Chapter 3) and a full exposition of the study (Chapter4).

In this chapter, the results of the primary research conducted is presented and interpreted. The presentation of results will be aligned to the objectives of the study. The results of the propositions/hypothesis are given.

The results are discussed using a holistic approach and does not include a discussion for individual banks.

The SAS statistical programme was used to conduct the statistical tests described under Chapter 4 (descriptive, inferential and comparison dispersion stats).

Note that the qualitative feedback in Section 6 of the questionnaire did not give much valuable insights and was excluded from the analysis.

Full, detailed statistical results are displayed in Appendix 8.5 appended.

5.2. Questionnaire reliability

The Cronbach coefficient alpha was used to test the internal consistency of the factors. If the Cronbach coefficient alpha is between 0.4 to 0.7, it indicates medium internal consistency and reliability. If the Cronbach coefficient alpha is between 0.7 to 1.0, it indicates high or good internal consistency and reliability.

- Overall Cronbach alpha test:
    - Valid questionnaires = 56
    - Excluded = 1
    - Cronbach's coefficient alpha = 0.925

  The Cronbach coefficient alpha was produced for the overall questionnaire. The coefficient of reliability was significantly high, thus indicating a high level of reliability. Hence, the reliability analysis of the questionnaire continuous statements indicate this research instrument (Questionnaire) continuous study variables have adequate internal consistency and reliability.
- Section 3 (importance factors) Cronbach alpha test:
    - Valid questionnaires = 57
    - Excluded = 0
    - Cronbach's coefficient alpha = 0.836

  The Cronbach coefficient alpha was produced for the importance factors. The coefficient of reliability was high thus indicating a high level of reliability. Hence, the reliability analyses of the questionnaire

continuous statements in Section 3 indicate that these continuous study variables have adequate internal consistency and reliability.

- Section 4 (performance factors) Cronbach alpha test:
    - Valid questionnaires = 57
    - Excluded = 0
    - Cronbach's coefficient alpha = 0.940

  The Cronbach coefficient alpha was produced for the Performance Factors. The coefficient was significantly high, thus indicating a high level of internal consistency. Hence, the reliability analyses of the questionnaire continuous statements in Section 4 indicate that these continuous study variables have adequate internal consistency and reliability.

- Section 5 (sources of benefits) Cronbach alpha test:
    - Valid questionnaires = 56
    - Excluded = 1
    - Cronbach's coefficient alpha = 0.949

  The Cronbach coefficient alpha was produced for the Sources of benefits factors. The coefficient was significantly high, thus indicating a high level of internal consistency. Hence, the reliability analyses of the questionnaire continuous statements in Section 5 indicate that these continuous study variables have adequate internal consistency and reliability.

5.3. Results of the demographics of the research

The following table shows that Bank A and Bank B were almost equally represented. A key objective of the study was to ensure that both banks were equally represented.

Table 5.1. Responses from the banks

Bank	Frequency	Valid Percent
Bank A	28	49.1
Bank B	29	50.9
TOTAL	**57**	**100**

The following tables shows the different stakeholders (occupying different capacities) the completed the survey questionnaire.

Table 5.2. Capacity of the respondents

Capacity	Frequency	Valid Percent
Employee	10	17.5
Project leader	19	33.3
Project team member	3	5.3
Senior management	9	15.8
Line management	10	17.5
External consultant	4	7.0
Change management specialist	1	1.8
Process user	1	1.8
Human resources	O	0
TOTAL	**57**	**100**

All stakeholders, except human resources were represented. The view of the change management specialist compensates for the lack of a human resources response because the change management specialist represents the "people change" element of the implementation. Employees, project leaders, senior management and line management were the critical stakeholders and were well represented. Process users formed part of the employee grouping as this low number was not a problem.

All stakeholders stated that they did understand the reasons for the Lean and/or Six-sigma implementations and hence it ensures that all responses are valid.

The following table gives of view of the improvement approaches that were applied at both these banks in the different areas of the banks.

Table 5.3. Improvement approach applied

Improvement approach	Frequency	Valid Percent
Lean only	19	33.3
Six-sigma only	4	7.0
Lean and Six-sigma	34	59.6
TOTAL	57	100

The objective of the research was to give generic guidelines on the critical success factors for Lean and/or Six-sigma in the banking industry. All combinations of the improvement approaches have received valid responses. Lean and Six-sigma combination received 59.6% of the responses. Hence it will be possible to give generic guidelines to the banks, provided that there are no major variances with regards to the perceptions among these groupings.

Only 8.8% of the respondents believed that the initiative was a total success whilst 63.2% believed that there were many areas of success and 28.1% believed that there were some areas of success. None of the respondents believed that the initiatives were a total failure.

5.4. Results of the Propositions

5.4.1. Present results of research question 1 (Proposition 1)

The first research question was to determine the critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks. An explorative study of current literature and studies was conducted to determine these.

The Top 20 potential critical success factors determined, for successful Lean and/or Six-sigma Implementations, in South African Banks were as follows:

- Position as a cultural change driver
- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- Process management focus
- Must be positioned in the spirit of “continuous improvement”
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Training - motivation and education of people
- Measuring and monitoring progress
- Change management specialist expertise
- Financial resources must be available over a considerable period of time
- People resources must be available over a considerable period of time
- Employee empowerment
- Teamwork
- Performance management and reward systems

- Genuine focus on customer needs is key
- The business strategy must be infused with the continuous improvement strategy
- Project management skills
- Project prioritisation and selection
- The new structure created by the continuous improvement initiative should be standardised

P1: The above factors are the potential critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

In order to identify the critical success factors for successful Lean and/or Six-sigma implementations, descriptive tests were applied. The results of the breakdown of the ratings of each of the Potential Critical Success Factors are given in terms of the following split:

- Not important
- Little importance
- Average importance
- Important
- Very important

The means for each factor was calculated, thus highlighting the factors with the highest means as the more important factors. The means that were 5 (very important) defined the Critical Success Factors. The results are in the table below.

Table 5.4. Respondent's perceptions of the importance of the critical success factors

Potential critical success factors	Not/ Little importance %	Average importance %	Important %	Very important %	Average perception	Ranking [1 to 20]
Position as a cultural change driver	3.5	12.3	33.3	50.9	Important	12
There must be a shared vision and shared goals	0	1.8	17.5	80.7	V important	2
Senior leadership commitment and involvement	0	0	3.5	96.5	V important	1
Process management focus	1.8	7.0	47.4	43.9	Important	14
Must be positioned in the spirit of continuous improvement	1.8	5.3	42.1	50.9	Important	10
The benefits must be quantifiable and known	3.5	5.3	31.6	59.6	V Important	7
Ongoing communication – formal and informal	0	3.5	40.4	56.1	V important	8
Training – motivation and education of people	0	5.3	40.4	54.4	Important	9
Measuring and monitoring progress	0	3.5	31.6	64.9	V important	4
Change management specialist expertise	1.8	19.3	40.4	38.6	Important	16
Finance resources must be available over a considerable amount of time	3.5	17.5	49.1	29.8	Important	18
People resources must be available over a considerable amount of time	0	3.5	54.4	42.1	Important	15
Employee empowerment	0	17.5	50.9	31.6	Important	17
Teamwork	0	1.8	36.8	61.4	V important	6
Performance mug and reward systems	3.6	17.5	33.3	45.6	Important	13
Genuine focus on the customer	0	3.5	19.3	77.2	V important	3
The business strategy must be infused with the continuous improvement strategy	0	5.3	31.6	63.2	V important	5
Project management skills	0	15.8	59.6	24.6	Important	20
Project prioritisation and selection	0	10.5	38.6	50.9	Important	11
The new structure created by the continuous improvement initiative should be standardised	5.3	17.5	49.1	28.1	Important	19

From the results above, all the potential critical success factors have relevance to South African Banks. None of the critical success factors have been identified as "Not Important/Little Importance". 8 of the 20 potential critical success factors received an average perception by respondents as being "Very important", whilst 12 of the 20 potential critical success factors received an average perception by the respondents as being "Important".

Thus the critical success factors considered as "very important", but not ranked in order of importance, are as follows:

- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Measuring and monitoring progress
- Teamwork
- Genuine focus on customer needs
- The business strategy must be infused with the continuous improvement strategy

5.4.2. Present results of research question 2 (Proposition 2)

P2: The above factors have an order of priority and do not have equal weighting in terms of importance.

Based on the analysis of the results in Table 5.4., the following attributes defined the ranking:

- Average perception (based on the means calculated), and
- Important and Very important percentages.

From Table 5.4., the following are the mission critical success factors (Very important) in rank order:

- Senior leadership commitment and involvement
- There must be a shared vision and shared goals
- Genuine focus on the customer needs is key
- Measuring and monitoring progress
- The business strategy must be infused with the continuous improvement strategy
- Teamwork
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques

From Table 5.4., the following are additional success factors (Important) in rank order:

- Training – motivation and education of people
- Must be positioned in the spirit of continuous improvement
- Project prioritisation and selection
- Position as a cultural change driver
- Performance management and reward systems
- Process management focus
- People resources must be available over a considerable period of time
- Change management specialist

- Employee empowerment
- Financial resources must be available over a considerable period of time
- The structure created by the continuous improvement initiative should be standardised
- Project management skills

5.4.3. Present results of research question 3 (Proposition 3)

P3: South African Banks are not performing at the optimum level in terms of ensuring that these critical success factors are effectively addressed in the implementation of Lean and/or Six-sigma implementations.

In order to identify how South African Banks are performing against the potential critical success factors (defined below) for successful Lean and/or Six-sigma implementations, descriptive tests were applied.

The Top 20 potential critical success factors determined for successful Lean and/or Six-sigma Implementations in South African Banks were as follows:

- Position as a cultural change driver
- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- Process management focus
- Must be positioned in the spirit of “continuous improvement”
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Training - motivation and education of people

- Measuring and monitoring progress
- Change management specialist expertise
- Financial resources must be available over a considerable period of time
- People resources must be available over a considerable period of time
- Employee empowerment
- Teamwork
- Performance management and reward systems
- Genuine focus on customer needs is key
- The business strategy must be infused with the continuous improvement strategy
- Project management skills
- Project prioritisation and selection
- The new structure created by the continuous improvement initiative should be standardised

The respondents were asked to rate their perception of how well the bank performed against these critical success factors in Section 4 of the Questionnaire. The results of the breakdown of the ratings of the Performance of the bank against each of these Potential Critical Success Factors are given in terms of the following split:

- Poor performance
- Satisfactory performance
- Average performance
- Good performance
- Excellent performance

The means for each factor was calculated so as to establish the average perceptions of the performance of each factor within the bank. Performance tells how well the given factor was taken into consideration and implemented within the bank as a key success factor for the Lean and/or Six-sigma initiative.

Table 5.5. Respondent's perceptions of the performance of the banks against these CSF's (8 critical success factors highlighted)

Critical success factors	Poor perf %	Satisfactory perf %	Avg perf %	Good perf %	Excellent perf %	Average perceptions
Position as a cultural change driver	7.0	10.5	45.6	29.8	7.0	Average
There must be a shared vision and shared goals	10.5	8.8	47.4	31.6	1.8	Average
Senior leadership commitment and involvement	10.5	7.0	38.6	26.3	17.5	Average
Process management focus	7.0	8.8	24.6	52.6	7.0	Average
Must be positioned in the spirit of continuous improvement	10.5	10.5	40.4	31.6	7.0	Average
The benefits must be quantifiable and known	7.0	17.5	19.3	43.9	12.3	Average
Ongoing communication – formal and informal	10.5	17.5	33.3	29.8	8.8	Average
Training – motivation and education of people	8.8	12.3	33.3	31.6	14.0	Average
Measuring and monitoring progress	3.5	24.6	33.3	31.6	7.0	Average
Change management specialist expertise	14.0	21.1	29.8	31.6	3.5	Average
Finance resources must be available over a considerable amount of time	19.3	24.6	43.9	7.0	5.3	Average
People resources must be available over a considerable amount of time	24.6	12.3	45.6	15.8	1.8	Average
Employee empowerment	12.3	19.3	35.1	28.1	5.3	Average
Teamwork	8.8	14.0	38.6	31.6	7.0	Average
Performance management and reward systems	26.3	24.6	31.6	15.8	1.8	Satisfactory
Genuine focus on the customer	8.8	24.6	21.1	35.1	10.5	Average
The business strategy must be infused with the continuous improvement strategy	8.8	24.6	26.3	31.6	8.8	Average
Project management skills	3.5	24.6	31.6	38.6	1.8	Average
Project prioritisation and selection	14.0	17.5	33.3	28.1	7.0	Average
The new structure created by the continuous improvement initiative should be standardised	15.8	21.1	33.3	26.3	3.5	Average

From Table 5.5, Excellent Performance is low for all the success factors. The respondents average perceptions of the performance of the banks against these potential critical success factors is that, the banks are performing on an "average performance" against all the success factors, except for Performance management and rewards systems which achieved a "satisfactory performance" rating.

The respondent's average perceptions of the performance against the 8 critical success factors are "average performance".

- Senior leadership commitment and involvement – average performance.
- There must be a shared vision and shared goals – average performance.
- Genuine focus on the customer needs is key – average performance.
- Measuring and monitoring progress – average performance.
- The business strategy must be infused with the continuous improvement strategy – average performance.
- Teamwork – average performance.
- The benefits must be quantifiable and known – average performance.
- Ongoing communication – both formal and informal techniques – average performance.

Hence Proposition 3 is valid – there is significant difference in performance. The respondents believe that these are the mission CSF's but the banks are not performing at the optimum level with regard to these.

5.4.4. Present results of research question 4 (Proposition 4)

P4: Significant differences exist between what stakeholders believe are the critical success factors and the banks actual performance against these, and this is reducing the benefits promised.

The following results are used to establish if there are significant differences in:

- The performance of the banks against the critical success factors (means of the perceptions calculated)
- The average (mean) of the perceptions of the benefits achieved (expectations met + expectations exceeded)

Table 5.6. Banks performance against the critical success factors

Critical success factors	Performance of the banks
Senior leadership commitment and involvement	Average
There must be a shared vision and shared goals	Average
Genuine focus on the customer needs is key	Average
Measuring and monitoring progress	Average
The business strategy must be infused with the continuous improvement strategy	Average
Teamwork	Average
The benefits must be quantifiable and known	Average
Ongoing communication – both formal and informal techniques	Average

From the results above, significant difference exists against the performance of the critical success factors. The perception of the percentage of benefits "met and exceeded" is only 57.6% (see Table 5.8. below). 42.3% of respondents believed that the benefits are not being met fully. Hence proposition 4 is valid.

5.4.5. Present results of research question 5 (Proposition 5)

P5: The Lean and/or Six-sigma initiatives are successful and the type of benefits listed below is being experienced by South African Banks.

- Reduced cycle time to delivery
- Improved quality
- Reduced waste
- Increased productivity
- Improved customer service
- Increased focus on customer needs
- Increased revenues
- Reduced costs
- Improved staff morale
- Improved interdepartmental connectedness
- Continuous improvement culture
- Improved flexibility
- Improved speed and responsiveness
- Improved competitive advantage
- Robust and stable processes
- Improved management of business risk
- Improved predictability of service delivery
- Improved innovation

Question 2.5 on the Questionnaire (Appendix 8.2 and 8.3) was designed to identify the difference in perception of the level of success of the Lean and/or Six-sigma initiative. The table below shows these results.

Table 5.7. Respondent's perceptions of the level of success of the initiative

Level of success	Frequency	Valid Percent
Some success	16	28.1
Many areas were successful	36	63.2
Total success	5	8.8
Total	57	100

None of the respondents rated the overall success as a Total Failure. Only 8.8% rated the level of success of the initiative as a Total Success.

In section 5 of the Questionnaire (Appendix 8.2 and 8.3), the respondents were asked to rate the benefits that South African Banks are achieving from the implementation of Lean and/or Six-sigma initiatives. Each benefit was rated against the following scale-criteria:

- Did not meet expectations
- Partially met expectations
- Met expectations
- Exceeded expectations
- Not applicable (as some benefits may not be applicable within the South African context)

The results are displayed in the table below. The means of the average perceptions were also calculated and are displayed in the table below. Met

expectations and exceeded expectations give an indication of how successful each benefit was realised in the banks.

Table 5.8. Respondent's perceptions of the sources of benefits that banks are achieving

Sources of benefits	Did not meet expectations %	Partially met expectations %	Met expectations %	Exceeded expectations %	Met + exceeded %	Average perceptions %
Reduced cycle time to delivery	7.0	21.1	36.8	33.3	69.6	Met expect…
Improved quality	7.0	21.1	43.9	24.6	68.5	Met expect…
Reduced waste	7.0	17.5	42.1	31.6	73.7	Met expect…
Improved productivity	10.5	19.3	38.6	28.1	61.4	Met expect…
Improved customer service	7.0	33.3	33.3	22.8	56.1	Met expect…
Increased focus on customer needs	8.8	29.8	31.6	28.1	59.7	Met expect…
Increased revenues	17.5	33.3	26.3	14.0	40.3	Met expect…
Reduced costs	12.3	22.8	35.1	24.6	59.7	Met expect…
Improved staff morale	7.0	31.6	36.8	19.3	56.1	Met expect…
Improved interdepartmental connectedness	12.3	29.8	29.8	22.8	52.6	Met expect…
Continuous improvement culture	7.0	40.4	31.6	15.8	47.4	Met expect…
Improved flexibility	10.5	33.3	40.4	8.8	49.2	Met expect…
Improved speed and responsiveness	7.0	26.3	43.9	21.1	65.0	Met expect…
Improved competitive advantage	7.0	35.1	36.8	17.5	54.3	Met expect…
Robust and stable processes	8.8	24.6	49.1	14.0	63.1	Met expect…
Improved management of business risk	7.0	35.1	35.1	14.0	49.1	Met expect…
Improved predictability of service delivery	8.8	29.8	40.4	17.5	57.9	Met expect…
Improved innovation	7.0	35.1	35.1	19.3	54.4	Met expect…

All the types of benefits defined are being achieved at some degree by the banks. The respondent's average perceptions are that the benefits expectations were met by the banks but there is clear evidence that the

optimum benefits is not being realised. The range for every benefit source is 4, which reveals that the respondents have expressed varied of opinions.

Between 40.3% and 73.3% of the respondents perceived that the performance against these sources of benefits are either being "met" or "exceeded". An average of 57.6% of respondents perceived that the performance against these benefits are being "met" or "exceeded".

Between 42.3 and 59.6% of the respondents perceived that the performance against these sources of benefits were being partially met or not met. An average of 42.3% of respondents perceived the performance against these benefits as being "not met" or "partially met".

Proposition 5 is valid.

5.4.6. Present results of research question 6 (Proposition 6)

P6: There are no major differences between banks in terms of the critical success factors and sources of benefits. There are no major differences among the opinions of the different stakeholders. There are no major differences based on the improvement approach used (Lean only, Six-sigma only, or combination of Lean and Six-sigma)

The following inferential statistics were used to establish if the above proposition is fully valid, not valid or partially valid:

- Anova Test result – If the p value is less than or equal to 0.05, statistically there is a significant difference between group opinions. If the p value is greater than 0.05, statistically there is no significant

difference between group opinions. This test was used to test if there is statistical significant difference in perceptions between the 2 Banks (Bank A and Bank A) with regard to the following:

- Different Banks vs. Importance of the Critical Success Factors
- Different Banks vs. Performance against the Critical Success Factors
- Different Banks. Vs. Sources of benefits

- z-Tests – If the p value is less than or equal 0.05, statistically there is a significant difference between group opinions. If the p value is great than 0.05, statistically there is no significant difference between the group opinions. This test was used to test if there is statistical significant difference in perceptions due to the Nature of the Improvement Approach used (Lean only, Six-sigma only or Lean in combination with Six-sigma) with regard to the following:
  - Nature of the improvement approach vs. Importance of the Critical Success Factors
  - Nature of the improvement approach vs. Performance against the Critical Success Factors
  - Nature of the improvement approach vs. Sources of benefits
- Chi-square Tests – If the p value is less than or equal 0.05, statistically there is a significant difference between group opinions. If the p value is great than 0.05, statistically there is no significant difference between the group opinions. This test was used to test if there is statistical significant difference in perceptions due to the capacity of employment (stakeholder role) with regard to the following:

- Capacity of employment (stakeholder role) vs. Importance of the Critical Success Factors
- Capacity of employment (stakeholder role) vs. Performance against the Critical Success Factors
- Capacity of employment (stakeholder role) vs. Sources of benefits

5.4.6.1. Different banks vs. Importance of CSF's

One of the assumptions of this research study is that the Critical Success Factors (CSF's) are independent of the different banks. A generic list that is applicable to all South African Banks is possible. The results of the Anova-Tests are reflected in the following table.

Table 5.9. Different Banks vs. Importance of Critical Success Factors (Anova-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.980	No significant difference in opinions between the 2 Banks.
There must be a shared vision and shared goals	0.605	No significant difference in opinions between the 2 Banks.
Genuine focus on the customer needs is key	0.229	No significant difference in opinions between the 2 Banks.
Measuring and monitoring performance	0.928	No significant difference in opinions between the 2 Banks.
The business strategy must be infused with the continuous improvement strategy	0.155	No significant difference in opinions between the 2 Banks.
Teamwork	0.521	No significant difference in opinions between the 2 Banks.
The benefits must be quantifiable and known	0.663	No significant difference in opinions between the 2 Banks.
Ongoing communication – both formal and informal techniques	0.904	No significant difference in opinions between the 2 Banks.

Another interesting finding is that there is statistically no significant difference in opinions between the two banks with regard to all the success factors except for the following two:

- Financial resources must be available over a considerable period of time and
- People resources must be available over a considerable period of time.

The p-values for all of the following are above 0.05 as well: Training – motivation and education of people, must be positioned in the spirit of continuous improvement, project prioritisation and selection, position as a cultural change driver, performance management and reward systems, process management focus, change management specialist, employee empowerment, the structure created by the continuous improvement initiative should be standardised and project management skills.

5.4.6.2. Different banks vs. Performance against the CSF's

One of the assumptions of this research study is that all banks are having similar problems with regards to successfully establishing these Critical Success Factors. All banks are showing a similar performance against these Critical Success Factors. The performance gaps are similar across the banking industry. The results of the Anova-Tests are reflected in the table below.

Table 5.10. Different Banks vs. Importance of Critical Success Factors (Anova-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.686	No significant difference in opinions between the 2 Banks.
There must be a shared vision and shared goals	0.455	No significant difference in opinions between the 2 Banks.
Genuine focus on the customer needs is key	0.874	No significant difference in opinions between the 2 Banks.
Measuring and monitoring performance	0.567	No significant difference in opinions between the 2 Banks.
The business strategy must be infused with the continuous improvement strategy	0.297	No significant difference in opinions between the 2 Banks.
Teamwork	0.986	No significant difference in opinions between the 2 Banks.
The benefits must be quantifiable and known	0.111	No significant difference in opinions between the 2 Banks.
Ongoing communication – both formal and informal techniques	0.067	No significant difference in opinions between the 2 Banks.

Another interesting finding is that there is statistically no significant difference in opinions between the two banks in terms of performance with regard to all the success factors except for the following two:

- Must be positioned in the spirit of continuous improvement and
- People resources must be available over a considerable period of time.

The p-values for all of the following are above 0.05 as well: Training – motivation and education of people, project prioritisation and selection, position as a cultural change driver, performance management and reward systems, process management focus, change management specialist, employee empowerment, financial resources must be available over a considerable period of time, the structure created by the continuous improvement initiative should be standardised and project management skills.

5.4.6.3. Different banks vs. Sources of benefits

One of the assumptions of this research study is that all the banks are experiencing and could experience similar sources of benefits and benefit realisation. A generic list that is applicable to all South African Banks on the sources of benefits is possible. The results of the Anova-tests are displayed in the following table.

Table 5.11. Different Banks vs. Sources of benefits (Anova-test result)

Critical success factors	p-value	Result
Reduced cycle time to delivery	0.893	No significant difference in opinions between the 2 Banks.
Improved quality	0.049	There is significant difference in opinions between the 2 Banks.
Reduced waste	0.996	No significant difference in opinions between the 2 Banks.
Improved productivity	0.893	No significant difference in opinions between the 2 Banks.
Improved customer service	0.062	No significant difference in opinions between the 2 Banks.
Increased focus on customer needs	0.368	No significant difference in opinions between the 2 Banks.
Increased revenues	0.417	No significant difference in opinions between the 2 Banks.
Reduced costs	0.270	No significant difference in opinions between the 2 Banks.
Improved staff morale	0.088	No significant difference in opinions between the 2 Banks.
Improved interdepartmental connectedness	0.980	No significant difference in opinions between the 2 Banks.
Continuous improvement culture	0.574	No significant difference in opinions between the 2 Banks.
Improved flexibility	0.829	No significant difference in opinions between the 2 Banks.
Improved speed and responsiveness	0.647	No significant difference in opinions between the 2 Banks.
Improved competitive advantage	0.155	No significant difference in opinions between the 2 Banks.
Robust and stable processes	0.976	No significant difference in opinions between the 2 Banks.
Improved management of business risk	0.117	No significant difference in opinions between the 2 Banks.
Improved predictability of service delivery	0.325	No significant difference in opinions between the 2 Banks.
Improved innovation	0.124	No significant difference in opinions between the 2 Banks.

5.4.6.4. Nature of improvement approach vs. Importance of CSF's

One of the assumptions of this research study is that the Critical Success Factors are independent of the different improvement approaches used (Lean only, Six-sigma only, Combination of Lean and Six-sigma). The Critical Success Factors are independent of the improvement approach used. A generic list that is applicable to all South African Banks is possible. The results of the z-Tests are reflected in the following table.

Table 5.12. Nature of improvement approach vs. Importance of Critical Success Factors (z-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.673	No significant difference in opinions based on the differences in the improvement approach.
There must be a shared vision and shared goals	0.250	No significant difference in opinions based on the differences in the improvement approach.
Genuine focus on the customer needs is key	0.760	No significant difference in opinions based on the differences in the improvement approach.
Measuring and monitoring performance	0.457	No significant difference in opinions based on the differences in the improvement approach.
The business strategy must be infused with the continuous improvement strategy	0.991	No significant difference in opinions based on the differences in the improvement approach.
Teamwork	0.759	No significant difference in opinions based on the differences in the improvement approach.
The benefits must be quantifiable and known	0.341	No significant difference in opinions based on the differences in the improvement approach.
Ongoing communication – both formal and informal techniques	0.294	No significant difference in opinions based on the differences in the improvement approach.

Another interesting finding is that there is statistically no significant difference in opinions based on the improvement approach used for all the success

factors, not only the mission critical success factors. Hence the all 20 of the success factors will be applicable for all 3 of the improvement approaches – Lean only, Six-sigma only or a combination of Lean and Six-sigma.

The p-values for all of the following are above 0.05 as well: Training – motivation and education of people, must be positioned in the spirit of continuous improvement, project prioritisation and selection, position as a cultural change driver, performance management and reward systems, process management focus, people resources must be available over a considerable period of time, change management specialist, employee empowerment, financial resources are available over a considerable period of time, the structure created by the continuous improvement initiative should be standardised and project management skills.

5.4.6.5. Nature of improvement approach vs. Performance against the CSF's

One of the assumptions of this research study s that all banks are having similar problems with regards to successfully establishing Critical Success Factors independent of the improvement approach (Lean only, Six-sigma only, Combination of Lean and Six-sigma). All banks display a similar performance against these Critical Success Factors regardless of the improvement approach. The performance gaps are similar. The results of the z-Tests are reflected in the following table.

Table 5.13. Nature of improvement approach vs. Importance of Critical Success Factors (z-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.011	There is a significant difference in opinions of performance based on the improvement approach used.
There must be a shared vision and shared goals	0.063	No significant difference in opinions based on the differences in the improvement approach.
Genuine focus on the customer needs is key	0.729	No significant difference in opinions based on the differences in the improvement approach.
Measuring and monitoring performance	0.025	There is a significant difference in opinions of performance based on the improvement approach used
The business strategy must be infused with the continuous improvement strategy	0.049	There is a significant difference in opinions of performance based on the improvement approach used
Teamwork	0.145	No significant difference in opinions based on the differences in the improvement approach.
The benefits must be quantifiable and known	0.146	No significant difference in opinions based on the differences in the improvement approach.
Ongoing communication – both formal and informal techniques	0.030	There is a significant difference in opinions of performance based on the improvement approach used

There is significant difference in opinions of performance based on the improvement approach used for 4 of the 8 mission critical success factors:

- Senior leadership commitment and buy-in
- Measuring and monitoring performance
- The business strategy must be infused with the continuous improvement strategy
- Ongoing communication – both formal and informal communication

There are significant differences in performance based on the improvement approach used.

5.4.6.6. Nature of improvement approach vs. Sources of benefits

One of the assumptions of this research study is that all the banks are experiencing similar sources of benefits and benefit realisation, independent of the improvement approach (Lean only, Six-sigma or a combination of Lean and Six-sigma). A generic list on the sources of benefits that are applicable to all South African Banks implementing Lean only, Six-sigma only or a combination of Lean and Six-sigma, is possible. The results of the z-tests are reflected in the following table.

Table 5.14. Nature of improvement approach vs. Sources of benefits (z-test result)

Critical success factors	p-value	Result
Reduced cycle time to delivery	0.375	No significant difference in opinions based on the differences in the improvement approach.
Improved quality	0.508	No significant difference in opinions based on the differences in the improvement approach.
Reduced waste	0.424	No significant difference in opinions based on the differences in the improvement approach.
Improved productivity	0.555	No significant difference in opinions based on the differences in the improvement approach.
Improved customer service	0.258	No significant difference in opinions based on the differences in the improvement approach.
Increased focus on customer needs	0.699	No significant difference in opinions based on the differences in the improvement approach.
Increased revenues	0.633	No significant difference in opinions based on the differences in the improvement approach.
Reduced costs	0.369	No significant difference in opinions based on the differences in the improvement approach.
Improved staff morale	0.244	No significant difference in opinions based on the differences in the improvement approach.
Improved interdepartmental connectedness	0.796	No significant difference in opinions based on the differences in the improvement approach.
Continuous improvement culture	0.376	No significant difference in opinions based on the differences in the improvement approach.
Improved flexibility	0.612	No significant difference in opinions based on the differences in the improvement approach.
Improved speed and responsiveness	0.867	No significant difference in opinions based on the differences in the improvement approach.
Improved competitive advantage	0.225	No significant difference in opinions based on the differences in the improvement approach.
Robust and stable processes	0.736	No significant difference in opinions based on the differences in the improvement approach.
Improved management of business risk	0.471	No significant difference in opinions based on the differences in the improvement approach.
Improved predictability of service delivery	0.459	No significant difference in opinions based on the differences in the improvement approach.
Improved innovation	0.448	No significant difference in opinions based on the differences in the improvement approach.

5.4.6.7. Capacity of employment of respondent vs. Importance of CSF's

One of the assumptions of this research study is that the Critical Success Factors are perceived to be similar by individuals in all capacities or roles. All respondents have similar perceptions no matter what their capacity. The Critical Success Factors are independent of the capacity of the respondent. A generic list of CSF's that is applicable to all South African Banks is possible. The results of the Chi-square-Tests are reflected in the table below.

Table 5.15. Capacity of respondent vs. Importance of Critical Success Factors (Chi-square-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.932	No significant difference in opinions based on the different capacities of the respondents.
There must be a shared vision and shared goals	0.380	No significant difference in opinions based on the different capacities of the respondents.
Genuine focus on the customer needs is key	0.190	No significant difference in opinions based on the different capacities of the respondents.
Measuring and monitoring process	0.988	No significant difference in opinions based on the different capacities of the respondents.
The business strategy must be infused with the continuous improvement strategy	0.549	No significant difference in opinions based on the different capacities of the respondents.
Teamwork	0.507	No significant difference in opinions based on the different capacities of the respondents.
The benefits must be quantifiable and known	0.859	No significant difference in opinions based on the different capacities of the respondents.
Ongoing communication – both formal and informal techniques	0.416	No significant difference in opinions based on the different capacities of the respondents.

Another interesting finding is that there is statistically no significant difference in opinions based on the capacity of the respondent with regard to all success factors except for “employee empowerment”.

The p-values for all of the following are above 0.05 as well: Training – motivation and education of people, must be positioned in the spirit of continuous improvement, project prioritisation and selection, position as a cultural change driver, performance management and reward systems, process management focus, people resources must be available over a considerable period of time, change management specialist, financial resources are available over a considerable period of time, the structure created by the continuous improvement initiative should be standardised and project management skills.

5.4.6.8. Capacity of employment of respondent vs. Performance against the CSF’s

One of the assumptions of this research study is that all individuals in the banks are having similar problems with regards to successfully establishing these Critical Success Factors. All respondents have similar perceptions no matter what their capacity. All individuals in the banks are experiencing similar performance against these critical success factors regardless of the capacity of the individual. The perception of the performance gaps is similar by all. The results of the Chi-square-Test are reflected in the table below.

Table 5.16. Capacity of respondent vs. Performance against the Critical Success Factors (Chi-square-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.432	No significant difference in opinions based on the different capacities of the respondents.
There must be a shared vision and shared goals	0.199	No significant difference in opinions based on the different capacities of the respondents.
Genuine focus on the customer needs is key	0.826	No significant difference in opinions based on the different capacities of the respondents.
Measuring and monitoring process	0.074	No significant difference in opinions based on the different capacities of the respondents.
The business strategy must be infused with the continuous improvement strategy	0.229	No significant difference in opinions based on the different capacities of the respondents.
Teamwork	0.175	No significant difference in opinions based on the different capacities of the respondents.
The benefits must be quantifiable and known	0.225	No significant difference in opinions based on the different capacities of the respondents.
Ongoing communication – both formal and informal techniques	0.151	No significant difference in opinions based on the different capacities of the respondents.

5.4.6.9. Capacity of employment of respondent vs. Sources of benefits

One of the assumptions of this research study is that all individuals in the banks are having similar perceptions as to what the sources of benefits are and the benefits realisation within the banks. All respondents have similar perceptions no matter what their capacity. All individuals in the banks are experiencing similar perceptions of the benefits of Lean and/or Six-sigma initiatives, regardless of the capacity of the individual. A generic list of benefits applicable to South African Banks is possible. The results of the Chi-square-Tests are reflected in the table below.

Table 5.17. Capacity of respondent vs. Sources of benefits (Chi-square-test result)

Critical success factors	p-value	Result
Reduced cycle time to delivery	0.335	No significant difference in opinions based on the different capacities of the respondents.
Improved quality	0.475	No significant difference in opinions based on the different capacities of the respondents.
Reduced waste	0.230	No significant difference in opinions based on the different capacities of the respondents.
Improved productivity	0.574	No significant difference in opinions based on the different capacities of the respondents.
Improved customer service	0.097	No significant difference in opinions based on the different capacities of the respondents.
Increased focus on customer needs	0.148	No significant difference in opinions based on the different capacities of the respondents.
Increased revenues	0.254	No significant difference in opinions based on the different capacities of the respondents.
Reduced costs	0.310	No significant difference in opinions based on the different capacities of the respondents.
Improved staff morale	0.111	No significant difference in opinions based on the different capacities of the respondents.
Improved interdepartmental connectedness	0.179	No significant difference in opinions based on the different capacities of the respondents.
Continuous improvement culture	0.469	No significant difference in opinions based on the different capacities of the respondents.
Improved flexibility	0.335	No significant difference in opinions based on the different capacities of the respondents.
Improved speed and responsiveness	0.249	No significant difference in opinions based on the different capacities of the respondents.
Improved competitive advantage	0.425	No significant difference in opinions based on the different capacities of the respondents.
Robust and stable processes	0.167	No significant difference in opinions based on the different capacities of the respondents.
Improved management of business risk	0.844	No significant difference in opinions based on the different capacities of the respondents.
Improved predictability of service delivery	0.031	There is a significant difference in opinions based on the different capacities of the respondents.
Improved innovation	0.386	No significant difference in opinions based on the different capacities of the respondents.

5.4.6.10. Summary of results for Proposition 6

Hence, Proposition 6 is valid except for sources of Benefits, “Improved predictability of service delivery”. Hence, the benefits type “improved predictability of service delivery” will be excluded from the Generic Source of Benefits.

5.5. Summary

This chapter presented the results and findings of the data analysis. The information was analysed by using the statistical package SAS.

Descriptive statistics and central tendency statistics was used to establish the Critical Success Factors. The Cronbach coefficient alpha test was applied to test for reliability. A high degree of reliability was established.

Anova-Tests, z-Tests and Chi-square Tests were used to test the assumptions of the research study.

Correlation tests and comparison dispersions tests were performed and the results can be viewed in Appendix 8.5 appended.

All propositions were tested and analysed.

Note that the qualitative feedback in Section 6 of the questionnaire did not give much valuable insights and was excluded from the analysis.

In the next chapter the results and findings from this chapter will be discussed. An evaluation of each proposition against previous research and literature, and more importantly, in the direction of the findings of the survey, will be discussed and furnished.

CHAPTER 6: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

In Chapter 1, a broad study orientation was given, followed by an overview of the theoretical foundation of the study (Chapter 2). In Chapter 3, a literature review was done on previous research on business process improvement, Lean and Six-sigma. In Chapter 4, a full exposition of the study was given, which included the research design and analysis. In Chapter 5, the results of the primary research were presented and interpreted.

In this chapter, the researcher concludes the study with a discussion of the research findings, and draws conclusions and recommendations.

Section 6.2 discusses the outcome of the study and relevant research findings.

Section 6.3 and 6.4 discusses the research conclusions and elaborates on the potential limitations of the research.

In Section 6.5, the researcher discusses the implications of the study provides recommendations for future research to support or contribute to the topic of interest.

6.2 Discussion of results

6.2.1 Discuss outcome of results of Proposition 1

From the literature review in Chapter 3, 20 potential critical success factors for successful Lean and/or Six-sigma implementations are identified: Position as a cultural change driver; there must be a shared vision and shared goals; senior leadership commitment and involvement; process management focus; must be positioned in the spirit of "continuous improvement"; the benefits must be quantifiable and known; ongoing communication – both formal and informal techniques; training - motivation and education of people; measuring and monitoring progress; change management specialist expertise; financial resources must be available over a considerable period of time; people resources must be available over a considerable period of time; employee empowerment; teamwork; performance management and reward systems; genuine focus on customer needs is key; the business strategy must be infused with the continuous improvement strategy; project management skills; project prioritisation and selection, and the new structure created by the continuous improvement initiative should be standardised.

Proposition 1 states: "The above factors are the critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

In chapter 5 the researcher discussed the findings of the survey. Data analysis was conducted on specific questions from the survey, which relate to proposition 1. From the results, it can be deduced the that the following 8

potential critical success factors are in fact the mission critical success factors for Lean and/or Six-sigma implementations in South African Banks: There must be a shared vision and shared goals; senior leadership commitment and involvement; the benefits must be quantifiable and known; ongoing communication – both formal and informal techniques; measuring and monitoring progress; teamwork; genuine focus on the customer; and, the business strategy must be infused with the continuous improvement strategy.

From the results it can be inferred that the remaining 12 potential critical success factors are also important for successful implementation, but are not mission critical for successful implementation.

6.2.2 Discuss outcome of results of Proposition 2

Proposition 2 states that the above factors have an order of priority and do not have equal weighting in terms of importance.

From the results in Chapter 5, it can be deduced that the mission critical success factors do not have equal weightings and can be ranked in order importance of as follows: Senior leadership commitment and involvement; there must be a shared vision and shared goals; genuine focus on the customer's needs is key; measuring and monitoring progress; the business strategy must be infused with the continuous improvement strategy; teamwork; the benefits must be quantifiable and known; and, ongoing communication – both formal and informal.

The important success factors have the following order of priority ranking: training - motivation and education of people; must be positioned in the spirit of continuous improvement; project prioritisation and selection; position as a cultural change driver; performance management and reward systems; process management focus; people resources must be available over a considerable amount of time; change management specialist expertise; employee empowerment; finance resources must be available over a considerable amount of time; the new structure created by the continuous improvement initiative should be standardised; and, project management skills.

6.2.3 Discuss outcome of results of Proposition 3

Proposition 3, intended to identify how well South African Banks were performing against these critical success factors. It states: “South African Banks are not performing at the optimum level in terms of ensuring that these critical success factors are effectively addressed in the implementation of Lean and/or Six-sigma implementations”.

The analysis in Chapter 5 was used to disprove/prove this proposition. All the statistical analyses indicate that South African Banks are not performing at their optimum in terms of ensuring that these critical success factors are effectively addressed within the implementation of Lean and/or Six-sigma. The performance is average for all of the 8 critical success factors. Not a single critical success factor achieved a “good performance” or “excellent performance” rating.

For the remaining 12 success factors the performance is average. However, one factor, “performance management and reward systems” performed at a “satisfactory” level.

Proposition 3 has been clearly proven. There is huge room for improvement within the South African Banking sector. Research indicates that, if these critical success factors are effectively incorporated into the programme implementation, then South African Banks will be hugely successful with the implementations and will reap the rewards/benefits of running such initiatives.

6.2.4 Discuss outcome of results of Proposition 4

Proposition 4 states: “Significant differences exist between what stakeholders believe are the critical success factors versus the banks actual performance against these, and this is reducing the benefits promised”.

Proposition 3 already proved that the banks are not performing at their optimum in terms of implementing these critical success factors. There is a significant gap that exists between what stakeholders believe are the critical success factors (very important = 5 mean) and the banks performance against these, which is average (3 mean). The perceptions of the benefits fully met or exceeded was 57.6%. This is low because only 42.3% of respondents believed that the benefits were not fully met. It is evident that the benefits achieved are much lower than promised, because of the banks low

performance against these critical success factors. Hence, proposition 4 is proven.

6.2.5 Discuss outcome of results of Proposition 5

Proposition 5 states: "The Lean and/or Six-sigma initiatives are successful and the type of benefits listed below is being experienced by South African Banks" - Reduced cycle time to delivery; improved quality; reduced waste; increased productivity; improved customer service; increased focus on customer needs; increased revenues; reduced costs; improved staff morale; improved interdepartmental connectedness; continuous improvement culture; improved flexibility; improved speed of responsiveness; improved competitive advantage; robust and stable processes; improved management of business risk; improved predictability of service delivery; and, improved innovation.

The results indicated that the Lean and/or Six-sigma initiatives were experiencing a degree of success. No respondents rated the initiatives as a total failure. Only 8.8% of respondents rated the initiatives an overall total success. This indicated that there was a lot of room for improvement. The research indicated that this improvement can be accomplished if the critical success factors established were to be implemented effectively.

South African Banks were experiencing all the potential benefits identified. The benefits realised by South African Banks have varying degrees of success between 40.3% and 73.7% (met expectations and exceeded expectations). The benefit that has been most successfully realised was "reduced waste" at 73.7% "met" and "exceeded" expectations.

The Top 5 types of benefits that South African Banks were realising from Lean and/or Six-sigma benefits are: reduced waste (73.7% met/exceeded); reduced cycle time to delivery (69.6% met/exceeded); improved quality (68.5% met/exceeded); improved speed and responsiveness (65% met/exceeded); and, robust and stable processes (63.1% met/exceeded).

The benefit type that South African Banks have the lowest realisation of is "increased revenues" (40.3% met/exceeded).

The rest of the benefits are currently being realised in the following order from highest benefit to lowest benefit: Improved productivity; increased focus on the customer; reduced cost; improved predictability of service delivery; improved customer service; improved staff morale; improved innovation; improved competitive advantage; improved interdepartmental connectedness; improved flexibility; improved management of business risk; and, continuous improvement culture.

Hence, proposition 5 has been proved to be valid.

6.2.6 Discuss outcome of results of Proposition 6

Proposition 6 states: "There is no major difference between banks in terms of the critical success factors and sources of benefits. There are no major differences among the opinions of the different stakeholders. There are no

major differences based on the improvement approach used (Lean only, Six-sigma only or combination of Lean and Six-sigma)."

It is a very important that this proposition be proved valid, because this will enable the researcher to provide generic guidelines to the banking sector on Lean and/or Six-sigma implementations.

The main assumptions of the research are that the critical success factors for effective implementation and the list of benefits realised are independent of the different banks, the different stakeholders and the different implementation approaches used.

From the results it can be deduced that no significant difference in the opinions between the 2 Banks exist when comparing to the Importance of the critical success factors. Hence, the 8 critical success factors defined are applicable to any bank within South Africa.

From the results it can be deduced that no significant difference in the opinions between the 2 Banks exist when comparing the performance data of the critical success factors. Hence, it can be deduced that all South African Banks seem to be performing at similar levels against the critical success factors.

From the results it can be deduced that no significant difference in the opinions between the 2 Banks exist when comparing with the Sources of

Benefits data, except for 1 benefit – “improved quality”. Hence, improved quality will be excluded from the list of benefits types.

From the results it can be deduced that no significant difference in the opinions between the Capacities of the respondents exists when comparing this to the Importance of the critical success factors. Hence, it can be deduced that the 8 critical success factors defined are as important to all employees of the bank, independent of the role or seniority.

From the results it can be deduced that no significant difference in the opinions between the Capacities of the respondents exists when comparing this to the performance of the critical success factors. Hence, it can be deduced that the banks seem to be performing at similar levels against the critical success factors as per the perceptions of a variety of role players.

From the results it can be deduced that no significant difference in the opinions between the Capacities of the respondents exists when comparing this to the Sources of Benefits, except for, “Improved predictability of service delivery”. Hence, the benefits type “improved predictability of service delivery” will be excluded from the Generic Source of Benefits.

From the results it can be deduced that no significant differences in the opinions between the Nature of the improvement approach (Lean only, Six-sigma only or a combination of Lean and Six-sigma) exist when comparing

this to the Importance of the critical success factors. Hence, the 8 critical success factors defined are applicable to Lean and/or Six-sigma initiatives.

An interesting result that does not have an impact on this proposition is the following: From the results it can be deduced that the is a significant difference in the opinions when comparing the Nature of the improvement approach (Lean only, Six-sigma only or a combination of Lean and Six-sigma) against the Performance of the critical success factors. There are significant differences in performance for 4 of the 8 critical success factors – Senior leadership commitment and involvement, Ongoing communication both formal and informal, Measuring and monitoring progress and The business strategy must be infused with the continuous improvement strategy. Hence, it can be deduced that the banks are not performing at similar levels against the critical success factors for when different types of improvement approaches are applied Lean and/or Six-sigma initiatives. This is an interesting insight and needs to be investigated further in another research project so as to understand why. This is not the objective of this research study to understand and does not impact on the results and conclusions of this research study.

From the results it can be deduced that no significant difference in the opinions between the Nature of the improvement approach (Lean only, Six-sigma only or a combination of Lean and Six-sigma) exist when comparing to the Sources of Benefits. Hence, it can be deduced that the list of benefit types are applicable to Lean and/or Six-sigma initiatives.

Proposition 6 states: "There is no major difference between banks in terms of the critical success factors and sources of benefits. There are no major differences among the opinions of the different stakeholders. There are no major differences based on the improvement approach used (Lean only, Six-sigma only or combination of Lean and Six-sigma)."

Hence proposition 6 can be concluded as follows:

- There are no major differences between the banks in terms of the importance of the critical success factors and sources of benefits except for one source of benefit, "improved quality".
- There are no major differences among the opinions of the different stakeholders (employees, project leaders, project team members, senior management, line management, external consultants, change specialists and process users) with regard to the importance of the critical success factors and the sources of benefits, except for one benefit "improved predictability of service delivery".
- There are no major differences in opinions based on the improvement approach used in terms of the importance of the critical success factors and sources of benefits.

Hence proposition 6 is only 100% valid for the importance of the Critical Success Factors. It is partially valid for the Sources of benefits as there are significant differences in opinions for 2 Sources of Benefits due to the Capacity of the respondent and Different Banks. Hence, these 2

Sources/Types of benefits will be excluded from the Generic List of Benefits defined under Proposition 5.

Based on the above results of the Propositions, generic guidelines will be made for South African Banks to effectively implement Lean and/or Six-sigma under the conclusion section.

6.3 Conclusion

South African Banks are not adopting Lean and/or Six-sigma to the point where it is going to make any sort of significant difference to the bottom line over a significantly meaningful period of time. So, where are they going wrong? Often it comes down to key issues that are not addressed effectively as part of the deployment.

The research objectives were:

- The primary objective was to establish what the critical success factors for Lean and/or Six-sigma implementation in banking are?
- The secondary objective was to define a list of the sources of benefits for Lean and/or Six-sigma implementation in banking.

The research questions/problems were:

- What are the critical success factors for Lean and/or Six-sigma implementations in banking?
- How will South African Banks prioritised these critical success factors?

- How are South African Banks that are already on the Lean and/or Six-sigma journey performing against these critical success factors?
- What are the gaps between the importance of the critical success factors and the banks actual performance against these and how this gap is impacting on the benefits that the banks are experiencing?
- What benefits are South African Banks experiencing?
- Can generic guidelines be provided to South African Banks for successful Lean and/or Six-sigma implementations?

The research objectives have been met and the research questions/problems have been addressed and the following are generic guidelines to banks venturing on the Lean and/or Six-sigma journey.

Mission Critical success factors (CSF's) - "The idea of identifying CSF's as a basis for determining the information needs of managers was popularised by Rockart (1979). CSF's are those factors which are critical to the success of any organisation, in the sense that, if objectives associated with the factors are not achieved, the organisation will fail – perhaps catastrophically so. (Rochart, 1979). In the context of Lean and/or Six-sigma project implementation; CSF's represent the essential ingredients without which a project stands little chance of success." (Antony & Antony, 2002).

The following are the 8 mission critical success factors that are essential for the effective implementation of Lean and/or Six-sigma implementations in South African Banks in order of priority:

- **Senior leadership commitment and involvement** - The ongoing support of senior leadership is the most important factor. From the literature, it is evident that behind most of the major success stories is a very supportive and committed CEO. Senior leadership must take a visible and authoritative stance on the continuous improvement journey. The leaders must own the business transformation and show commitment throughout. The other employees will be led by example. The leaders must challenge conventional thinking and sometimes recommend unpopular or unusual ideas.
- **There must be a shared vision and shared goals** – The executive team must agree the programme vision and rollout of the improvement strategy. Once this has been defined, the executive team must agree the net earnings, growth and customer satisfaction that the strategy must deliver in the next 5 years.
- **Genuine focus on the customer needs is key** – these initiatives should begin and end with the customer. At the heart of operational excellence is the identification of the customer and key stakeholders needs. If these are not clear at the beginning, it is difficult to set objectives and monitor improvements. Organisations need to have a robust and structured approach to gathering the "voice of the customer" and other stakeholders. The is a key principle in achieving service excellence.
- **Measuring and monitoring progress** - Typically, organisations embarking on an operational excellence journey that build three to four year route maps that show in detail how they expect each of the critical

success factors to develop, and what measures will be used to track progress and take corrective action.

- **The business strategy must be infused with the continuous improvement strategy** – the Lean and/or Six-sigma initiative cannot be treated as a stand-alone activity. This will create huge confusion in the organisation. This initiative must be integrated into the overall business strategy and performance metrics. The initiative must be positioned to have a direct impact on financial and operational goals. There must be clear alignment of improvement efforts to the strategy. Leaders must ensure that resource is not wasted on non-strategic issues.
- **Teamwor*k*** - it is critical that the programme is delivered via teamwork and should have sufficient resources. The value of teamwork formed by cross-functional teams will launch a sense of ownership, better communication, better team working value and the overall view of the organisation. Each functional department must be represented on each of the projects.
- **The benefits must be quantifiable and known** – a key measure of success is the delivery of tangible benefits. Over the years improvement initiatives have promised a lot, but often delivered little. Consequently any Lean and/or Six-sigma programme a company implements should be designed to pay its way. The delivery of benefits needs to be integrated throughout the project lifecycle. Tracking and reporting benefits in detail will help keep the project focused. There

must be a focus of delivery of measurable benefits traceable to ledgers. The business case must be delivered.

- **Ongoing communication – both formal and informal techniques** – a communication plan is an integral part to ensuring the involvement of all stakeholders. The communication of the Lean and/or Six-sigma initiative is a major part of the implementation strategy. Several communication methods can be used – email, forums, intranet, meetings and newsletters are some of the informal techniques. More formal techniques should include the annual strategic plan, interactive leadership workshops and a widely distributed deployment guideline document.

There are 14 other success factors as well that should be incorporated into the program deployment in South African Banking. The additional important success factors have the following order of priority ranking: training - motivation and education of people; must be positioned in the spirit of continuous improvement; project prioritisation and selection; position as a cultural change driver; performance management and reward systems; process management focus; people resources must be available over a considerable amount of time; change management specialist expertise; employee empowerment; finance resources must be available over a considerable amount of time; the new structure created by the continuous improvement initiative should be standardised; and, project management skills.

There is a huge performance gap within South African Banks with regards to implementing the critical success factors to ensure effective implementation of Lean and/or Six-sigma implementations. By ensuring effective implementation of the critical success factors, South African Banks will achieve huge benefits (qualitative and quantitative). This needs to be investigated in more detail by another study to understand "What are the practical ways to implement these critical success factors to ensure that they are adequately ingrained in the organisation and are effectively deployed in order to achieve maximum benefits?"

The sources of benefits that are applicable to South African Banks in order of highest benefits to lowest benefits that are currently being achieved by South African banks, are as follows:

- Reduced waste
- Reduced cycle time to delivery
- Improved speed and responsiveness
- Robust and stable processes
- Improved productivity
- Increased focus on customer needs
- Reduced costs
- Improved customer service
- Improved staff morale
- Improved innovation
- Improved competitive advantage
- Improved interdepartmental connectedness

- Improved flexibility
- Improved management of business risk
- Continuous improvement culture
- Increased revenues

These benefits are actually not being optimally achieved within South African Banks. The achievement of these benefits is pretty low and is at an average level of 57%. The Top 5 benefits defined above are all being achieved at a level between 61% and 74%. If the critical success factors are effectively implemented within South African Banks, this will positively impact on the banks profitability and service experience and will maximise on the value of the benefits being realised.

6.4 Limitations of the study

This research was conducted with some boundaries such as the number of banks involved, availability of respondents, time available, areas of industry, and more.

This study was carried out in the Financial Services Sector – Banking only. This study is based on only 2 of the Top 4 South African Banks. A broader study can be done to obtain a wider representation from all 4 banks. The 2 banks that participated in this research study represent the biggest retail banks in South Africa. No small/medium-sized banks were included.

The survey questionnaire did not allow for much qualitative explanation of the selections made. Case Study research can be conducted in the different banks to obtain richer information.

In terms of the amount of time that each bank had been involved in implementing Lean and/or Six-sigma, this ranged between approximately 2 and 5 years. Even though the one bank had only approximately 2 years of implementation experience, many of the respondents had years of experience in various companies and industries.

According to Gillham (2000), the scaled questions have disadvantages because respondents often do not use the entire scale and one does not know why exactly a particular response was chosen. It would therefore be ideal to conduct semi-structured interviews to obtain a deeper understanding of the initiatives.

6.5 Implications and recommendations for future research

Lean and/or Six-sigma has been considered as a strategic approach to improve business profitability and achieve operational excellence through the effective application of these improvement initiatives. It is claimed and demonstrated that Lean and/or Six-sigma provides competitive advantages to companies that implement them.

This research study has successfully managed to provide generic guidelines to the South African Banking industry for successful deployment of Lean and/or Six-sigma implementations. If these are successfully implemented then the benefits defined could be reaped. This needs to be tested within the banking industry. The bank that manages to get this right will potentially have a huge competitive advantage within South African borders and outside. This will enable South African banks to compete successfully, internationally. This could bring huge profitability growth to South African banks and the country as a whole.

The mission critical success factors could be applicable in other industries as well in order to reap the benefits defined. This will need to be tested in other sectors. This could bring huge growth to the South African economy.

There have been debates in the Banking sector that Lean is very different to Six-sigma and key critical success factors for implementation are vastly different. This research has proven that the mission critical success factors are the same for successful implementation. These improvement approaches fall under the umbrella of business process improvement or continuous improvement and should potentially be introduced under this umbrella. This will ensure that the programme is kept flexible to manoeuvre between the two improvement approaches as and when required.

This is research conclusions is quite key in enabling the development of an effective business case for Lean and/or Six-sigma deployments. The mission

critical key success factors should be built within the business case and costed accordingly to ensure that the programme is effectively set up for success. The potential sources of the benefits have been defined and this will enable a pretty quick "sizing exercise". Developing a business case for business process improvement has always been a challenge in the Banking industry as it is such a new philosophy.

The study has also revealed that the there is also a level of criticality of these mission critical success factors. Some of the managerial implications of this are as follows:

Senior leadership commitment and involvement – the study suggests that the most important factor for successful Lean and/or Six-sigma implementation is senior leadership commitment and involvement. Successful implementations are not possible without a concerted effort from the senior leadership in the organisation aimed at encouraging continuous improvement and involvement among the people in the organisation. These aspects of leadership are well demonstrated in companies such as GE and Allied Signal who have been successful with these deployments.

There must be a shared vision and shared goals – This is absolutely key and should be defined at the outset of the programme and should be communicated continuously by top leadership so as to ensure unity of purpose.

Genuine focus on the customer's needs is key – The literature suggests that one of the most important criteria to ensure success of the deployment is to ensure that there is a link to the customer needs. The programme should

start and end with the customer and the leadership need to encourage this and ensure that all projects adhere to this. Identifying the customer needs, requirements and expectations is key.

Measuring and monitoring progress - Top leadership must follow up on the progress of a selected project and ensure that there is visibility of the projects progress and to ensure that obstacles are removed from the projects path. This will ensure success.

The business strategy must be infused with the continuous improvement strategy – the leadership must ensure that there is a well thought out plan for the deployment. The program needs to be implemented strategically and must be infused with the business strategy in order to ensure success. The programme must not be treated as another stand alone activity. Top management needs to be absolutely clear as to how the Continuous improvement strategy and other business strategies are linked to each other.

Teamwork – top management must ensure that the programme is adequately resourced and that there is a spirit of teamwork among all team members to ensure that the objectives of the programme are realised.

The benefits must be quantifiable and known – Top management must set expectations for results and demand that the results from the efforts of the programme are achieved.

Ongoing communication – both formal and informal – communicating the details of the Lean and Six Sigma initiative is a major part of the implementation. The goals and the principles of the initiative should be communicated via both formal and informal mechanisms. Interactive

leadership workshops are key and top management must be deeply involved in ensuring that the strategic messages are stated clearly from “their voices”.

For further research, the following can be considered:

- Further research can be done to delve deeper into finding out what the actual expectations of the respondents were for the success of the Lean and/or Six-sigma initiative and the reasons they believe that they were not met.
- What are the practical ways to implement these critical success factors to ensure that they are adequately ingrained in the organisation and are effectively deployed in order to achieve maximum benefits.
- Test the actual benefits that bank are experiencing using a case study approach and define the business case for change.
- Different industries within the Services Sectors in South Africa can be involved to define the critical success factors and benefits to be realised for various South African Industries within the Services Sectors.
- What would the impact of Lean and/or Six-sigma be on an organisations performance? Surveys or semi-structured interviews could be undertaken to obtain more tangible insights on the actual benefits that the banks would be realising that actually contribute to their bottom line.
- How to measure the alignment of the organisational culture with Lean and/or Six-sigma principles? Lean and/or Six-sigma implementations

are greatly influenced by an organisations culture, values and traditions. It would be of great value to investigate this aspect further.

- An explorative study that extracts the reasoning for the gap that exists between performance and importance factors will allow organisations to understand the issues of under-performance.

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CHAPTER 8: APPENDICES

8.1. Successful Lean and/or Six-sigma implementations in international companies

The following examples illustrate that the speed of change and benefits delivery in organisations is accelerating due to successful Lean and/or Six-sigma implementations.

"**General Electric (GE) – the cross-industry breakthrough** – GE adopted Six-sigma in 1985 and successfully deployed the method across all of its 14 business divisions, including flow manufacturing, batch manufacturing, contract manufacturing, after-sales services, broadcasting and financial services. GE proved to the world that Six-sigma was applicable to any industry and could produce strong financial results and sustainable growth."

"**ScottishPower – sustainable competitive advantage** – In 2001, Scottish Power launched a business transformation programme, underpinned by Lean and/or Six-sigma, to drive improvements across its UK retail supply business. The company wanted to grow its customer base originally while its competitors made a series of costly acquisitions aimed at building market share. In just 18 months, the company achieved a 250% return on investment (ROI). Customer numbers have risen from 3.4 million in 2002 to 5 million in 2005 with continuous improvements in the company's customer satisfaction ratings."

"**US department of defence –** The US army is using Six-sigma to streamline over 20 core processes. Using Lean and/or Six-sigma the US Army has identified opportunities to cut in half the time taken to complete in budgeting process. The US Navy is also implementing Lean and/or Six-sigma, but unlike the army, most of its efforts remain at command level rather than department level."

"**Credit Suisse (CS) – customer service-driven growth -** In 2004, following a major cost reduction programme, CS aimed to develop a unified business culture focusing on productivity and growth. Since the start in April 2004, over 400 growth and cost-savings projects have been undertaken to deliver this transformation. Over 50% of the financial benefits are growth related."

All of these success stories are predominantly in Europe and the US. South African Banks can leverage off these key learning's to enable successful implementations. This should enable quicker and more effective implementations. This will also enable higher scale of change delivered. Some South African Banks are on this similar continuous improvement journey. There have been some partial successes and failures and lessons learnt through these journeys. There is huge value to reap from these initiatives if the key ingredients for success are effectively brought together and implemented right.

Even though many authors and leaders/experts//specialists in continuous process improvement have advocated the success factors at various places in

literature, very little attempt has been made to validate them by empirical research. The objective of this research project is to determine the critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

8.2. Survey questionnaire content – not sent out for completion by respondents

SURVEY QUESTIONNAIRE

What are the critical success factors for Lean and/or Six Sigma implementations in South African Banks?

BY

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A research report presented to the Graduate School of Business Leadership at the University of South Africa, in partial fulfilment of the requirements for the MASTERS DEGREE IN BUSINESS LEADERSHIP

YEAR 2008

Increasing competitive pressure from global markets and technology developments has resulted in continual demand for business improvement philosophies and methodologies in operations management to address these challenges. (McAdam & Hazlett, 2005). Throughout history the role of

continuous improvement within organisations has changed, evolved and matured.

Process excellence is achieved through radically improving processes efficiency and effectiveness. Both reduction in process costs and simplification of the processes themselves are key elements to achieving process excellence. This in turn leads to organisational benefits – decrease in costs, increase in revenues and greater customer satisfaction.

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

All of the success stories are predominantly in Europe and the US. South African banks can leverage off these key learning's to enable successful implementations. There have been some partial successes and failures and lessons learnt through these journeys. Even though many authors and leaders/experts/specialists in continuous process improvement have advocated the success factors at various places in literature, very little attempt has been made to validate them by empirical research.

The objective of this research project is to determine the critical success factors for the effective implementation of Lean and/or Six-Sigma in South African banks.

If you have worked in the field of Lean and/or Six Sigma in a South African bank, please answer the following questions.

Please take note of the following.

- The name of your organisation will be kept confidential. It will be referred to as Bank A or Bank B or Bank C within the research report and within any publications.
- Your name will also be kept confidential. Your role in general will be referred to within any research report or within any publications e.g. External Consultant, Senior management, Employee

The survey comprises of 6 sections and should take you 20 to 30 minutes to complete:

1) Personal information
2) Background information
3) Rate the importance of the critical success factors
4) Rate the bank's actual performance against these critical success factors
5) Rate the actual benefits of the initiative
6) Provide any general qualitative comments

SECTION 1: PERSONAL INFORMATION

Personal details:

Full name:

Name of current company:

Job title in current company:

Name of bank that questionnaire will be completed on:

Job title at bank:

SECTION 2: BACKGROUND INFORMATION

1) In what capacity were you employed:
   a) Employee
   b) Project leader – Six Sigma Yellow/Green/Black Belt, Lean Value Stream Manager/Coach
   c) Project team member
   d) Senior management
   e) Management
   f) External consultant
   g) Change management specialist
   h) Human resource consultant
   i) Process user
   j) Other please specify_____

2) Did you understand the reasons for the Lean and or Six Sigma initiative?
   a) Yes
   b) No

3) What improvement approach was applied within the particular initiative?
   a) Lean only
   b) Six sigma only

c) Lean and Six sigma

4) Do you think that this initiative was an overall success?

a) Yes

b) No

5) How would you rate the level of success the initiative?

a) Total failure

b) Some success

c) Many areas were successful

d) Total success

SECTION 3: RATE THE IMPORTANCE OF CRITICAL SUCCESS FACTORS FROM YOUR POINT OF VIEW

An exploratory study on the topic was conducted as similar studies have been done in other industries across the world. The ultimate objective was to collate all the key ingredients from the existing literature on Lean and Six Sigma implementations by analysing the success and failure stories of a number of organisations. The end result is a list of critical success factors for Lean-Six Sigma implementations that are applicable to the banking industry.

It is important to understand the importance of each of these critical success factors.

Please can you rate the following critical success factors in terms of your perceptions on how important you believe they are for successful lean and six sigma implementations?

Scale to be used: (Allow a column for any comments)

A. Not important

B. Little importance

C. Average importance

D. Important

E. Very important

Critical success factors to rate:

1. Position as a cultural change driver
2. There must be a shared vision and shared goals
3. Senior leadership commitment and involvement
4. Process management focus
5. Must be positioned in the spirit of “continuous improvement”
6. The benefits must be quantifiable and known
7. Ongoing communication – both formal and informal techniques
8. Training - motivation and education of people
9. Measuring and monitoring progress
10. Change management specialist expertise
11. Financial resources must be available over a considerable period of time
12. People resources must be available over a considerable period of time
13. Employee empowerment

14. Teamwork
15. Performance management and reward systems
16. Genuine focus on customer needs is key
17. The business strategy must be infused with the continuous improvement strategy
18. Project management skills
19. Project prioritisation and selection
20. The new structure created by the continuous improvement initiative should be standardised

SECTION 4: RATE BANK'S ACTUAL PERFORMANCE AGAINST THESE CRITICAL SUCCESS FACTORS

It is important to understand how your organisation (bank) performance against each of these critical success factors.

Please can you rate the following critical success factors in terms of your perceptions on how your organisation (bank) performed against them?

Scale to be used: (allow a column for any comments)

A. Poor performance
B. Satisfactory performance
C. Average performance
D. Good performance

E. Excellent performance

Critical success factors to rate:

1) Position as a cultural change driver
2) There must be a shared vision and shared goals
3) Senior leadership commitment and involvement
4) Process management focus
5) Must be positioned in the spirit of “continuous improvement”
6) The benefits must be quantifiable and known
7) Ongoing communication – both formal and informal techniques
8) Training - motivation and education of people
9) Measuring and monitoring progress
10) Change management specialist expertise
11) Financial resources must be available over a considerable period of time
12) People resources must be available over a considerable period of time
13) Employee empowerment
14) Teamwork
15) Performance management and reward systems
16) Genuine focus on customer needs is key
17) The business strategy must be infused with the continuous improvement strategy
18) Project management skills
19) Project prioritisation and selection
20) The new structure created by the continuous improvement initiative should be standardised

SECTION 5: RATE ACTUAL BENEFITS OF THE INITIATIVE

Please rate the overall success of the initiative by rating how the initiative performance against each of the following sources of benefits.

Scale to be used: (add column for any comments)

A. Did not meet expectations

B. Partially met expectations

C. Met expectations

D. Exceeded expectations

E. Not applicable

Sources of benefits to rate:

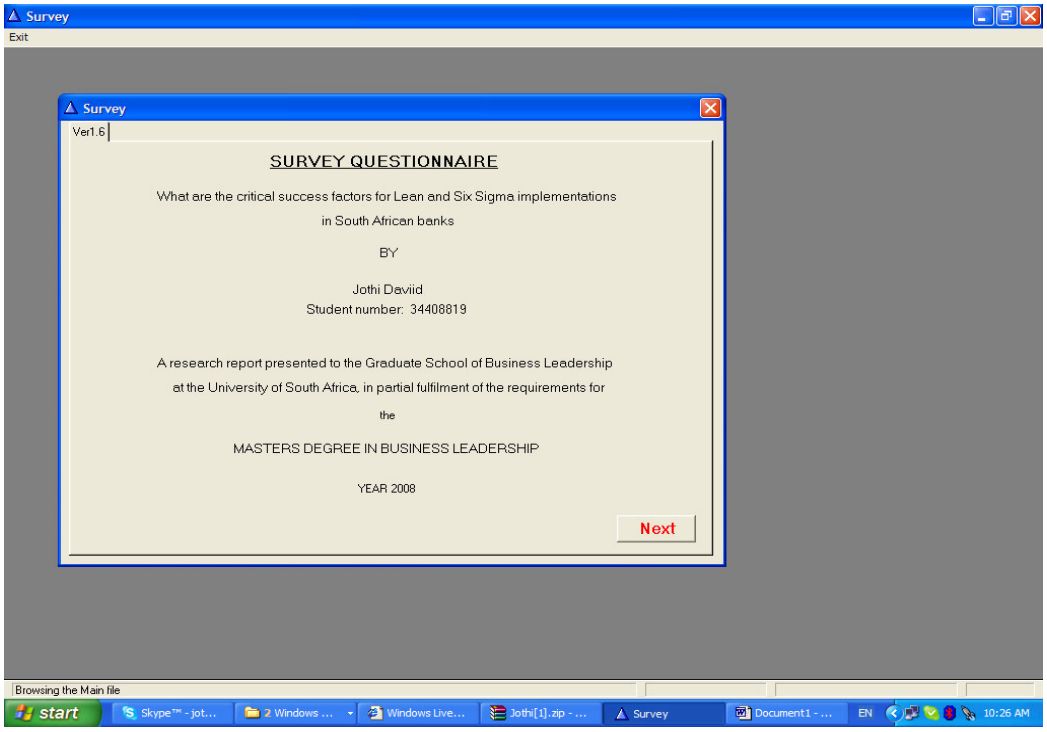
1. Reduced cycle time to delivery
2. Improved quality
3. Reduced waste
4. Increased productivity
5. Improved customer service
6. Increased focus on customer needs
7. Increased revenues
8. Reduced costs
9. Improved staff morale
10. Improved interdepartmental connectedness

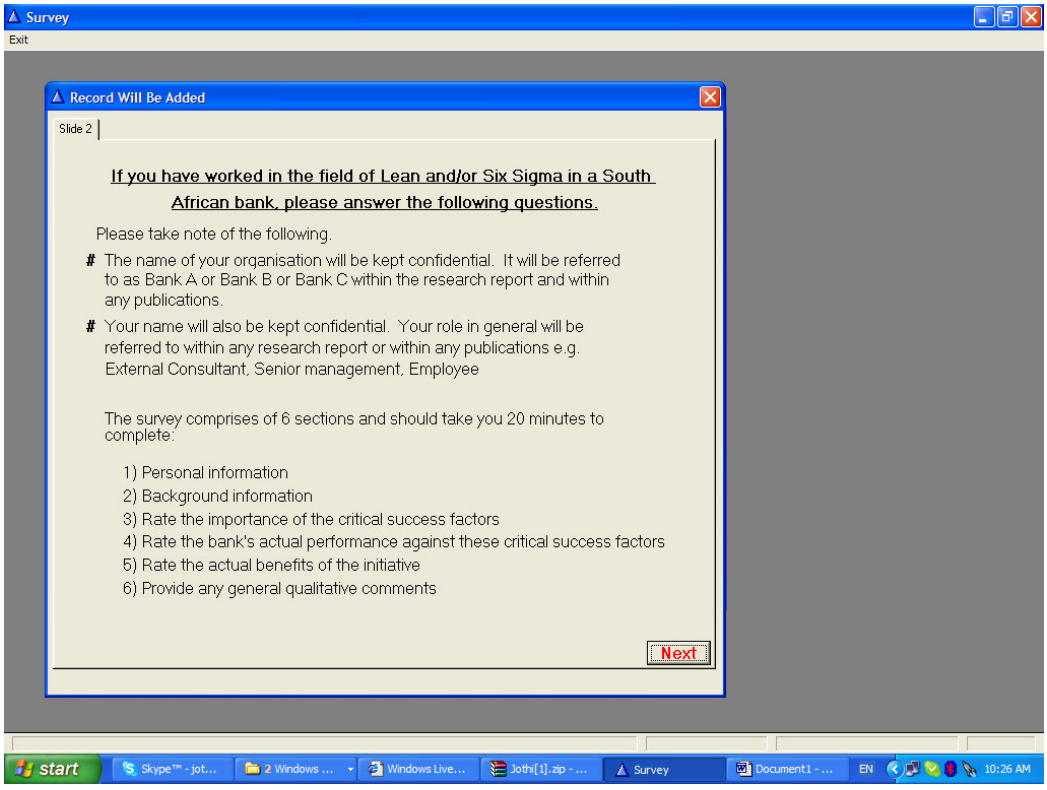
11. Continuous improvement culture
12. Improved flexibility
13. Improved speed and responsiveness
14. Improved competitive advantage
15. Robust and stable processes
16. Improved management of business risk
17. Improved predictability of service delivery
18. Improved innovation

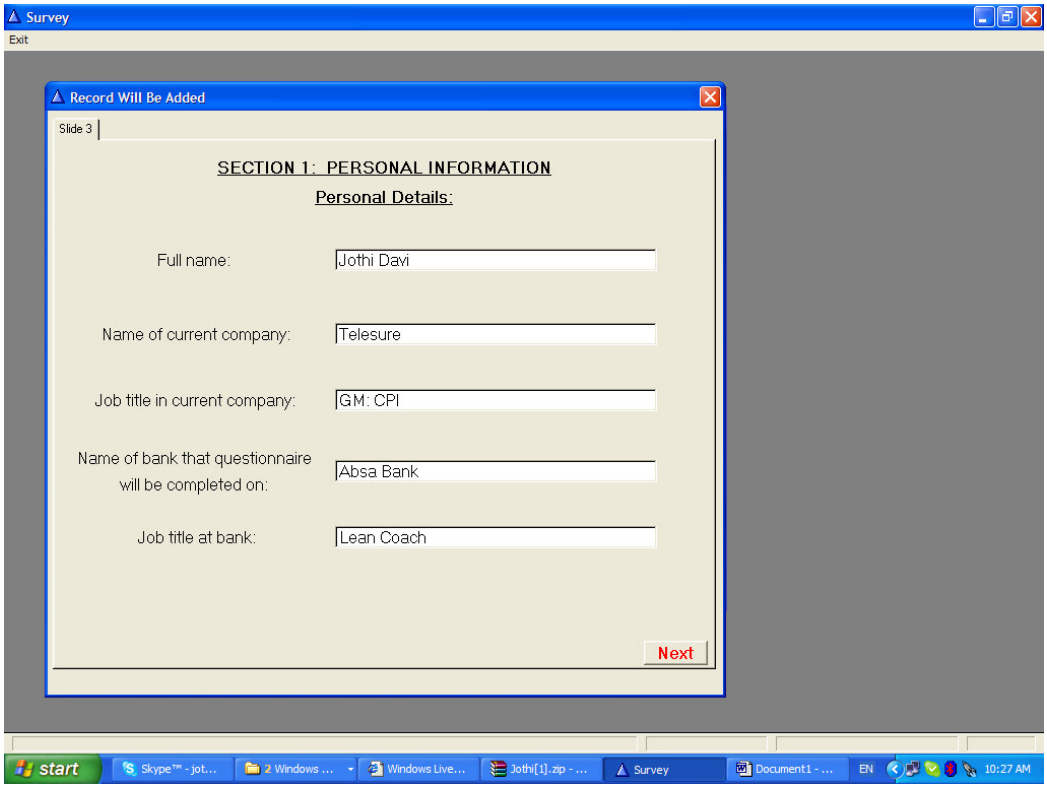
SECTION 6: QUALITATIVE COMMENTS

Any general comments based on your experience that could add to this study?

8.3. Survey questionnaire screen shots – Electronic Format – sent out for completion by respondents






Survey
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Record Will Be Added
Slide 3
SECTION 1: PERSONAL INFORMATION
Personal Details:
Full name:
Jothi Davi
Name of current company:
Telesure
Job title in current company:
GM: CPI
Name of bank that questionnaire will be completed on:
Absa Bank
Job title at bank:
Lean Coach
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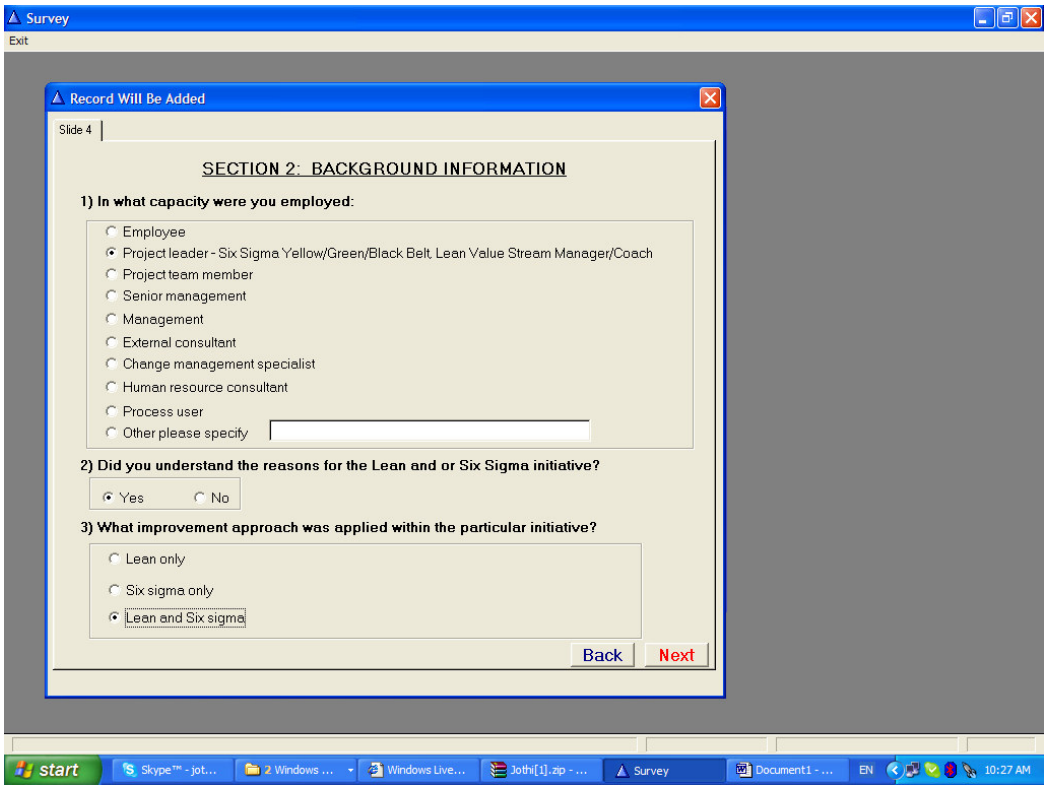
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Slide 4
SECTION 2: BACKGROUND INFORMATION
1) In what capacity were you employed:
Employee
Project leader - Six Sigma Yellow/Green/Black Belt, Lean Value Stream Manager/Coach
Project team member
Senior management
Management
External consultant
Change management specialist
Human resource consultant
Process user
Other please specify
2) Did you understand the reasons for the Lean and or Six Sigma initiative?
Yes
No
3) What improvement approach was applied within the particular initiative?
Lean only
Six sigma only
Lean and Six sigma
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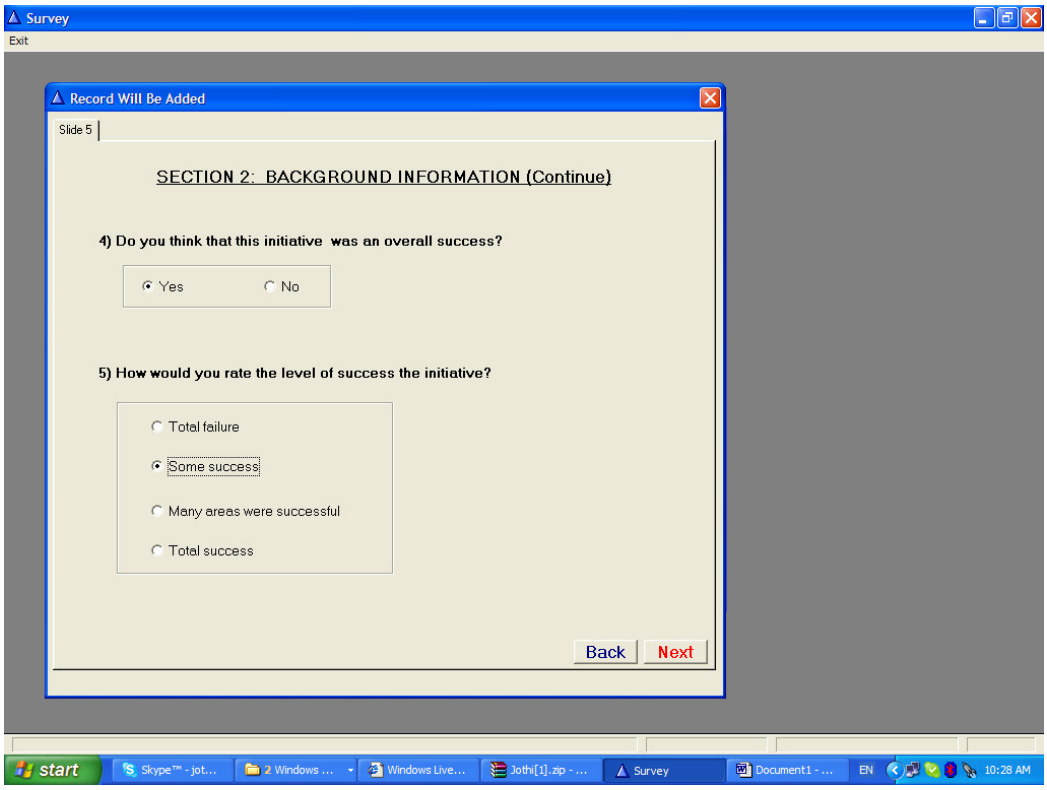
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Slide 5
SECTION 2: BACKGROUND INFORMATION (Continue)
4) Do you think that this initiative was an overall success?
Yes
No
5) How would you rate the level of success the initiative?
Total failure
Some success
Many areas were successful
Total success
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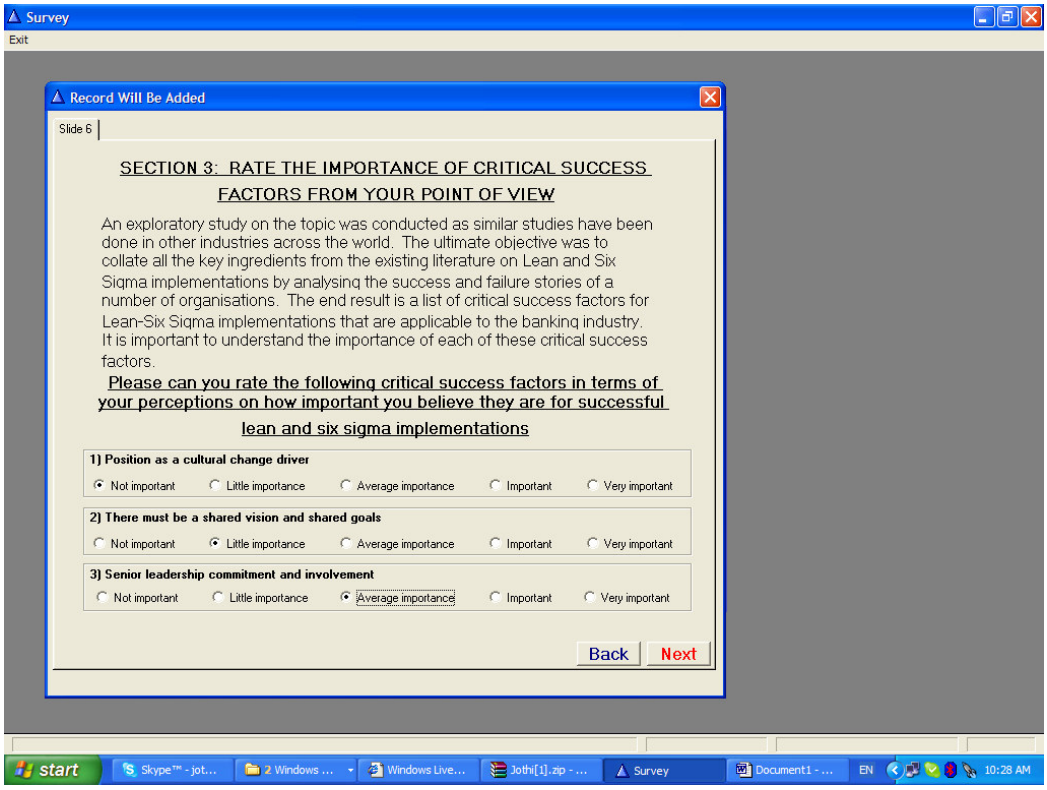
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SECTION 3: RATE THE IMPORTANCE OF CRITICAL SUCCESS FACTORS FROM YOUR POINT OF VIEW
An exploratory study on the topic was conducted as similar studies have been done in other industries across the world. The ultimate objective was to collate all the key ingredients from the existing literature on Lean and Six Sigma implementations by analysing the success and failure stories of a number of organisations. The end result is a list of critical success factors for Lean-Six Sigma implementations that are applicable to the banking industry. It is important to understand the importance of each of these critical success factors.
Please can you rate the following critical success factors in terms of your perceptions on how important you believe they are for successful lean and six sigma implementations
1) Position as a cultural change driver
Not important
Little importance
Average importance
Important
Very important
2) There must be a shared vision and shared goals
Not important
Little importance
Average importance
Important
Very important
3) Senior leadership commitment and involvement
Not important
Little importance
Average importance
Important
Very important
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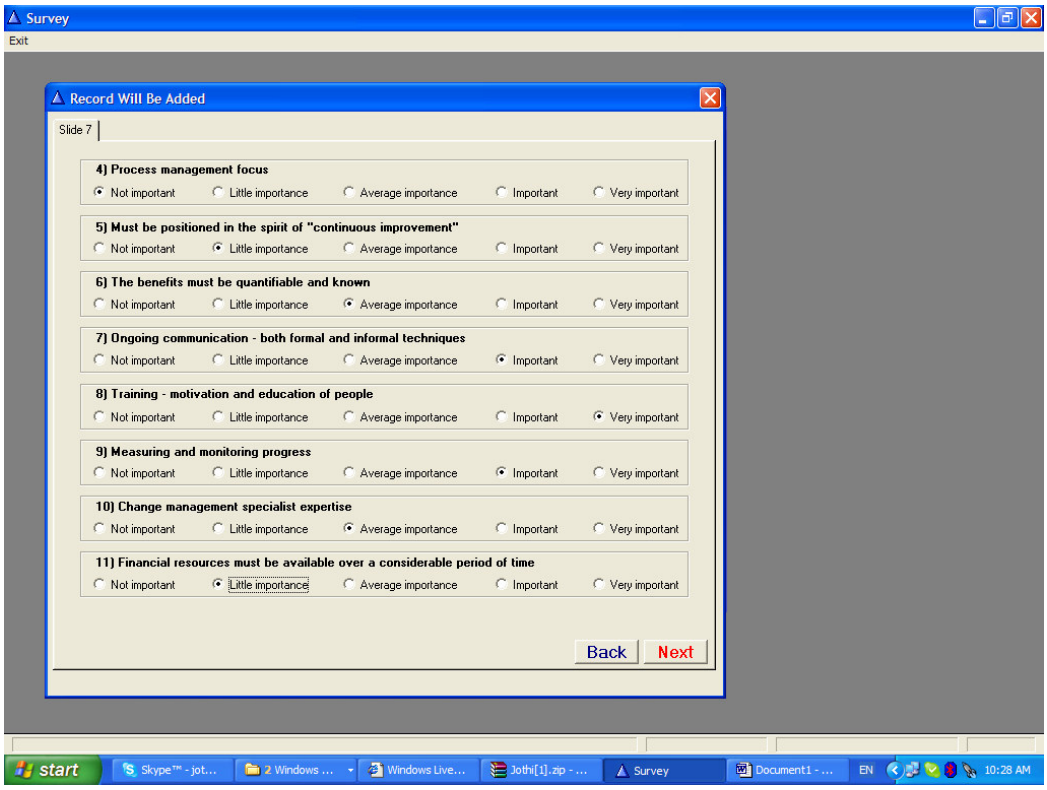
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4) Process management focus
Not important Little importance Average importance Important Very important
5) Must be positioned in the spirit of "continuous improvement"
Not important Little importance Average importance Important Very important
6) The benefits must be quantifiable and known
Not important Little importance Average importance Important Very important
7) Ongoing communication - both formal and informal techniques
Not important Little importance Average importance Important Very important
8) Training - motivation and education of people
Not important Little importance Average importance Important Very important
9) Measuring and monitoring progress
Not important Little importance Average importance Important Very important
10) Change management specialist expertise
Not important Little importance Average importance Important Very important
11) Financial resources must be available over a considerable period of time
Not important Little importance Average importance Important Very important
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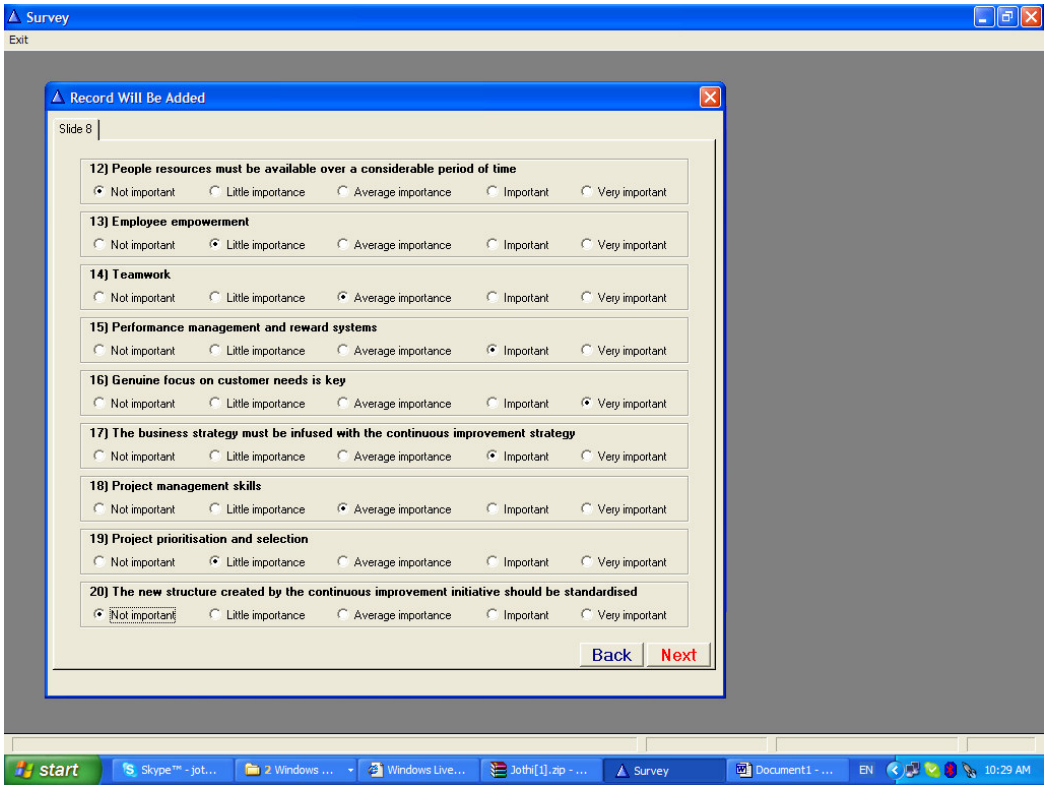
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12) People resources must be available over a considerable period of time
Not important Little importance Average importance Important Very important
13) Employee empowerment
Not important Little importance Average importance Important Very important
14) Teamwork
Not important Little importance Average importance Important Very important
15) Performance management and reward systems
Not important Little importance Average importance Important Very important
16) Genuine focus on customer needs is key
Not important Little importance Average importance Important Very important
17) The business strategy must be infused with the continuous improvement strategy
Not important Little importance Average importance Important Very important
18) Project management skills
Not important Little importance Average importance Important Very important
19) Project prioritisation and selection
Not important Little importance Average importance Important Very important
20) The new structure created by the continuous improvement initiative should be standardised
Not important Little importance Average importance Important Very important
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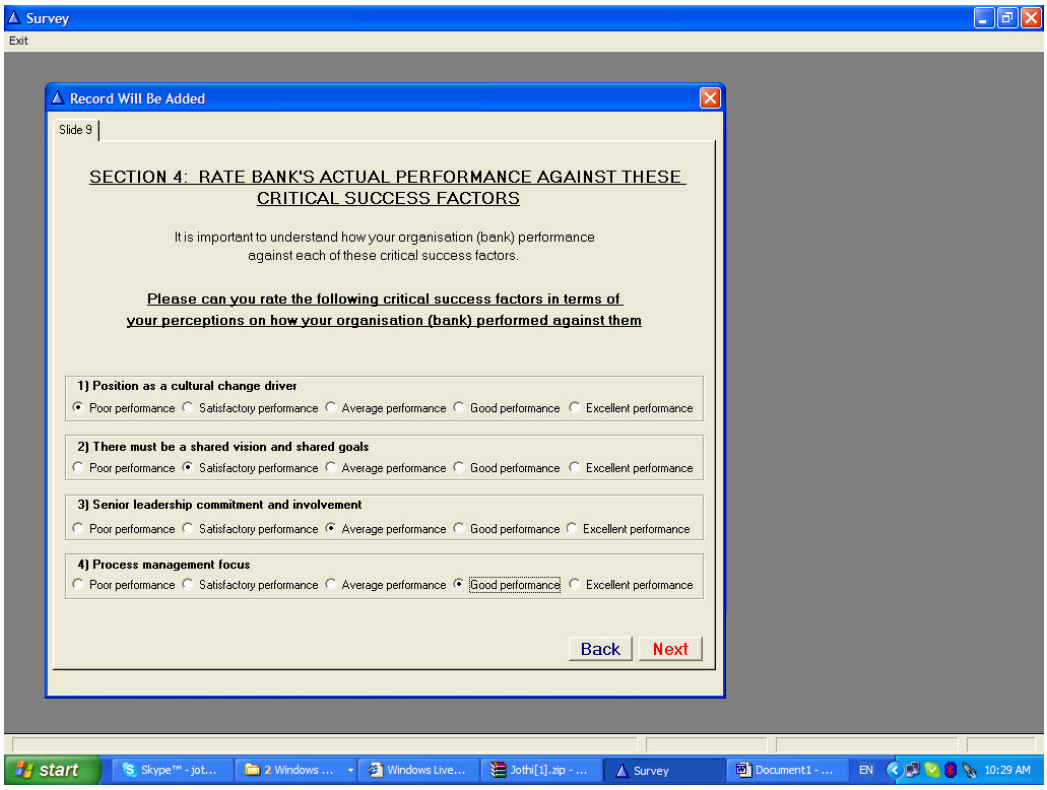
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Slide 9
SECTION 4: RATE BANK'S ACTUAL PERFORMANCE AGAINST THESE CRITICAL SUCCESS FACTORS
It is important to understand how your organisation (bank) performance against each of these critical success factors.
Please can you rate the following critical success factors in terms of your perceptions on how your organisation (bank) performed against them
1) Position as a cultural change driver
Poor performance Satisfactory performance Average performance Good performance Excellent performance
2) There must be a shared vision and shared goals
Poor performance Satisfactory performance Average performance Good performance Excellent performance
3) Senior leadership commitment and involvement
Poor performance Satisfactory performance Average performance Good performance Excellent performance
4) Process management focus
Poor performance Satisfactory performance Average performance Good performance Excellent performance
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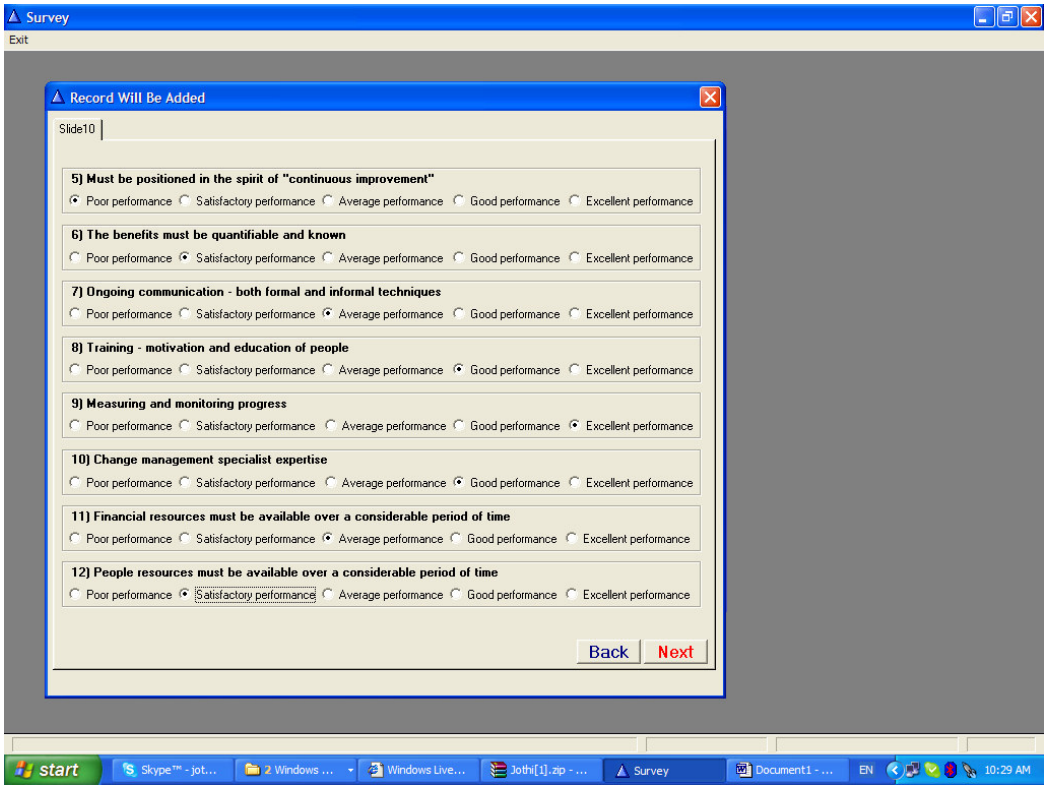
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5) Must be positioned in the spirit of "continuous improvement"
Poor performance Satisfactory performance Average performance Good performance Excellent performance
6) The benefits must be quantifiable and known
Poor performance Satisfactory performance Average performance Good performance Excellent performance
7) Ongoing communication - both formal and informal techniques
Poor performance Satisfactory performance Average performance Good performance Excellent performance
8) Training - motivation and education of people
Poor performance Satisfactory performance Average performance Good performance Excellent performance
9) Measuring and monitoring progress
Poor performance Satisfactory performance Average performance Good performance Excellent performance
10) Change management specialist expertise
Poor performance Satisfactory performance Average performance Good performance Excellent performance
11) Financial resources must be available over a considerable period of time
Poor performance Satisfactory performance Average performance Good performance Excellent performance
12) People resources must be available over a considerable period of time
Poor performance Satisfactory performance Average performance Good performance Excellent performance
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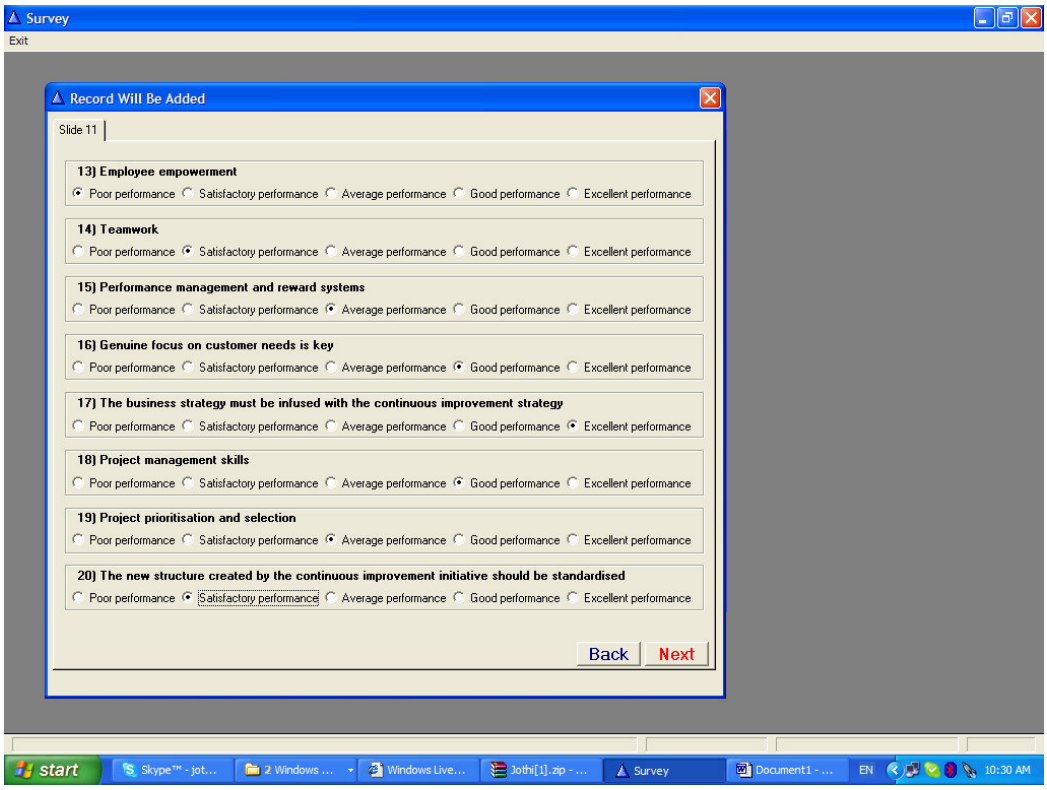
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13) Employee empowerment
Poor performance Satisfactory performance Average performance Good performance Excellent performance
14) Teamwork
Poor performance Satisfactory performance Average performance Good performance Excellent performance
15) Performance management and reward systems
Poor performance Satisfactory performance Average performance Good performance Excellent performance
16) Genuine focus on customer needs is key
Poor performance Satisfactory performance Average performance Good performance Excellent performance
17) The business strategy must be infused with the continuous improvement strategy
Poor performance Satisfactory performance Average performance Good performance Excellent performance
18) Project management skills
Poor performance Satisfactory performance Average performance Good performance Excellent performance
19) Project prioritisation and selection
Poor performance Satisfactory performance Average performance Good performance Excellent performance
20) The new structure created by the continuous improvement initiative should be standardised
Poor performance Satisfactory performance Average performance Good performance Excellent performance
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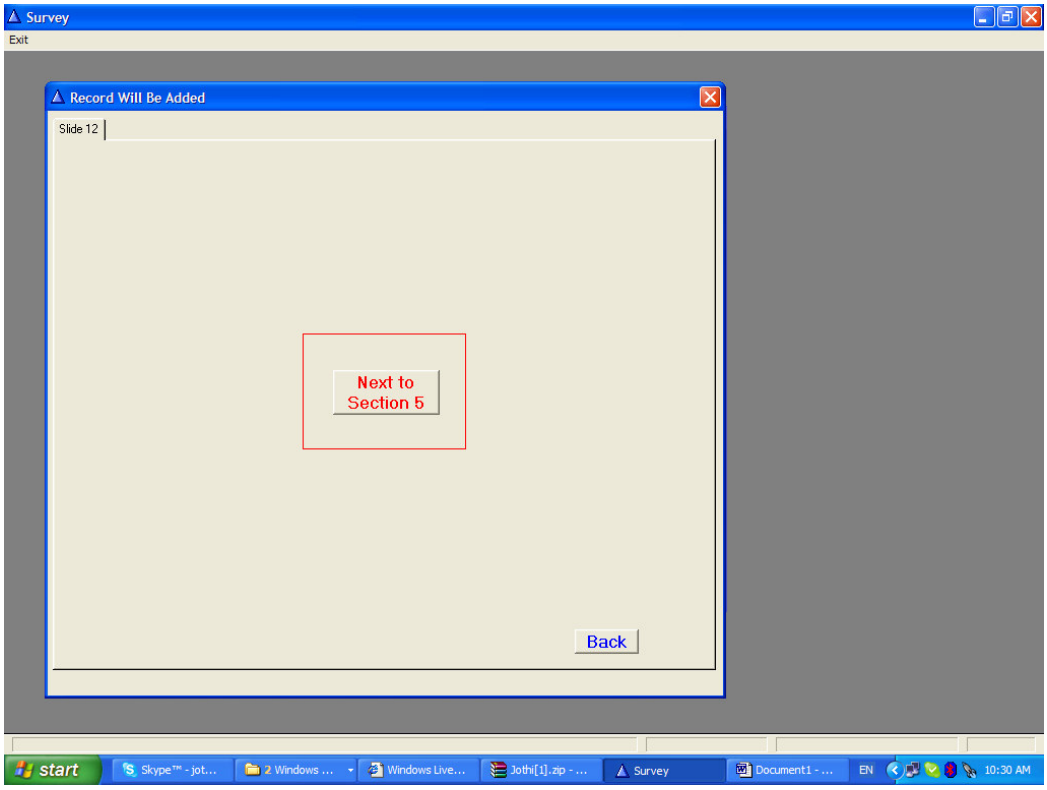
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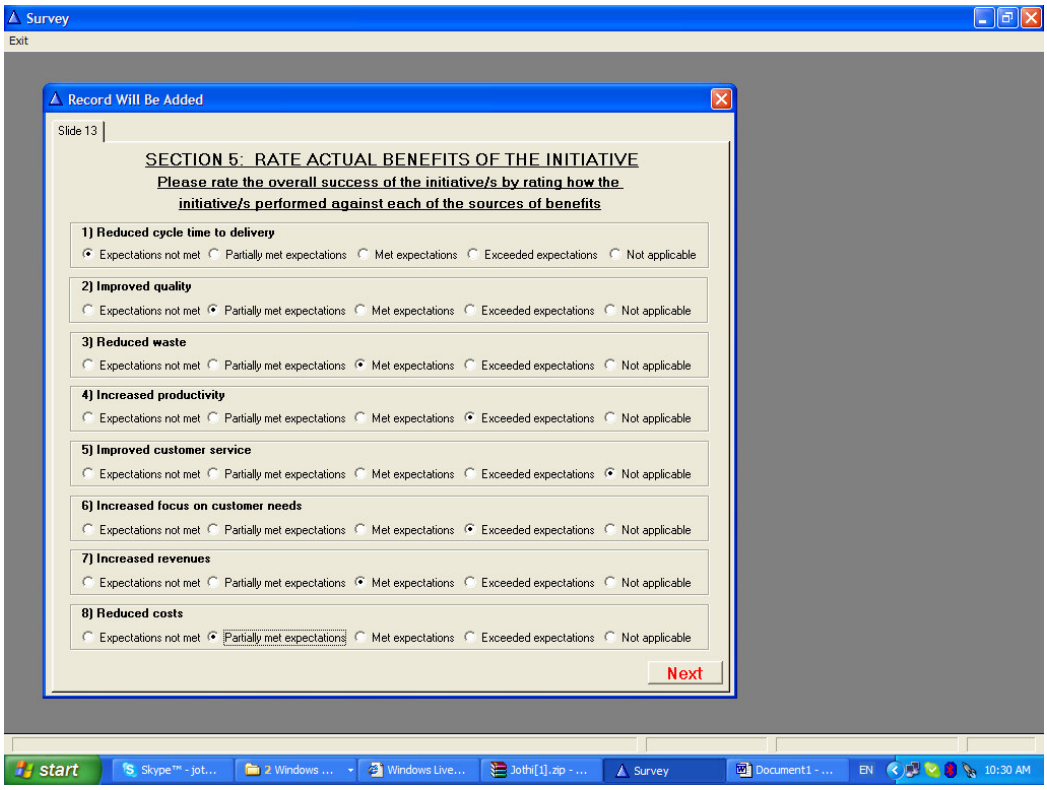
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Slide 13
SECTION 5: RATE ACTUAL BENEFITS OF THE INITIATIVE
Please rate the overall success of the initiative/s by rating how the initiative/s performed against each of the sources of benefits
1) Reduced cycle time to delivery
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
2) Improved quality
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
3) Reduced waste
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
4) Increased productivity
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
5) Improved customer service
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
6) Increased focus on customer needs
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
7) Increased revenues
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
8) Reduced costs
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
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Record Will Be Added
Slide 14
9) Improved staff morale
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
10) Improved interdepartmental connectedness
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
11) Continuous improvement culture
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
12) Improved flexibility
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
13) Improved speed and responsiveness
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
14) Improved competitive advantage
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
15) Robust and stable processes
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
16) Improved management of business risk
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
17) Improved predictability of service delivery
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
18) Improved innovation
Expectations not met | Partially met expectations | Met expectations | Exceeded expectations | Not applicable
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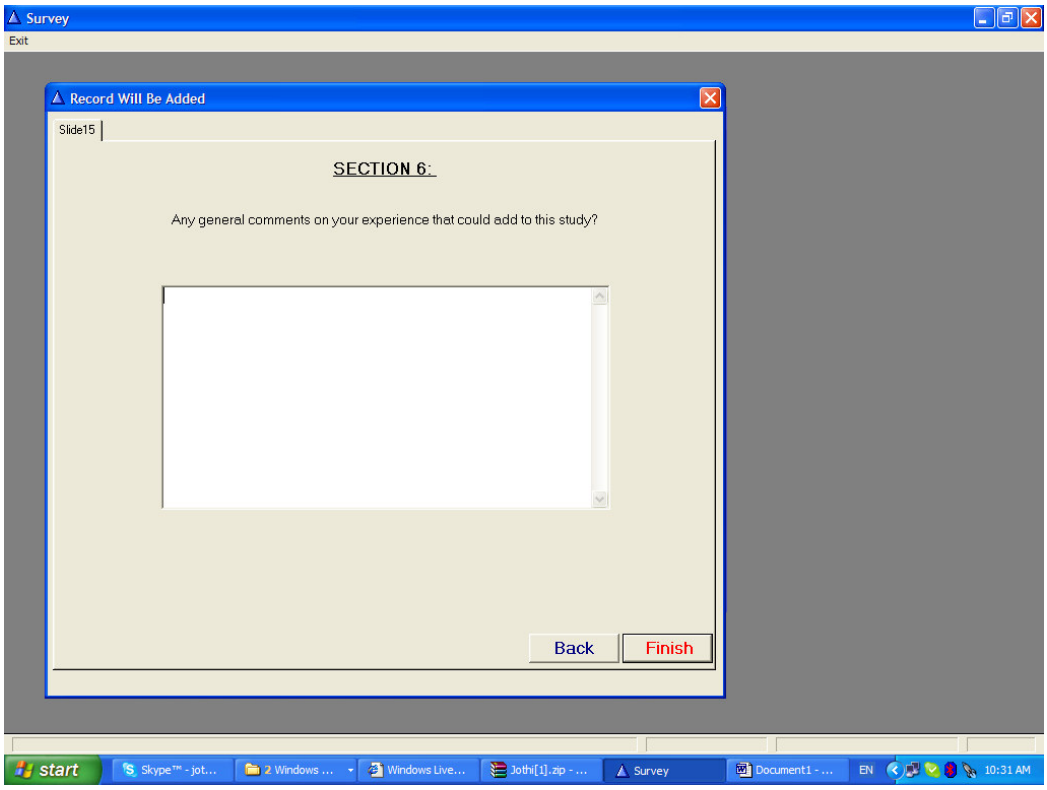
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SECTION 6:
Any general comments on your experience that could add to this study?
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8.4. Results of completed survey questionnaires

Table 8.1. Responses for Section 1 and Section 2 of Questionnaire

Record No	Full Name	Current Company	Job title	Name of Bank	Job at Bank	Capacity	Reason	Improvement	Overall Success	Rate of Success
1	Confidential	Bank A	IT Portfolio Manager	Bank A	IT Portfolio Manager	E	Yes	A	Yes	C
2	Confidential	Bank B	Manager: Product & Operations	Bank B	Manager: Product & Operations	B	Yes	B	Yes	C
3	Confidential	Bank B	Head of Operations	Bank B	Head : Cust Data Ops	E	Yes	C	Yes	C
4	Confidential	Consultant	Management Consultant	Bank A	Lead Lean Coach	F	Yes	C	Yes	C
5	Confidential	Bank B	Manager Projects & Ops Support	Bank B	Process Manager	D	Yes	C	Yes	C
6	Confidential	Bank B	Director Home Loans Operations	Bank B	Director Home Loans Operation	D	Yes	C	Yes	C
7	Confidential	Bank B	Shared Services Manager	Bank B	Shared Services Manager	E	Yes	A	Yes	B
8	Confidential	Bank B	product manager	Bank B	head of business analaysi	B	Yes	C	Yes	C
9	Confidential	Bank A	Projects Accountant	Bank A	Projects Accountant	C	Yes	A	Yes	C
10	Confidential	Bank B	Head, Integrated Processing	Bank B	Head, Integrated Procession	A	Yes	C	Yes	C
11	Confidential	Bank A	Project Manager	Bank A	Project Manager	B	Yes	A	Yes	D
12	Confidential	Bank A -	Process Analyst	Bank A	Process Analyst	A	Yes	A	Yes	C
13	Confidential	Bank A	Manager Infrastructure	Bank A	Manager	A	Yes	A	NO	B
14	Confidential	Bank A	Employee	Bank A	See above	A	Yes	A	Yes	B
15	Confidential	Bank B	Manager - Card Delivery	Bank B	Manager - Card Delivery	E	Yes	C	Yes	C
16	Confidential	Bank B	Six Sigma Green Belt	Bank B	Six Sigma Green Belt	A	Yes	C	Yes	C
17	Confidential	Bank A	HR Project Manager	Bank A	HR Business Partner	B	Yes	A	NO	B
18	Confidential	Bank B	Head: VAF Processing Support	Bank B	Head: VAF Processing Supp	D	Yes	C	NO	B
19	Confidential	Consultant	Senior Manager	Bank A	Lead Lean Coach	F	Yes	C	Yes	C
20	Confidential	Bank B	Director BFC	Bank B	Director BFC	A	Yes	C	Yes	C
21	Confidential	Bank B	Business Process Management	Bank B	BPM Consultant	B	Yes	C	Yes	C
22	Confidential	Bank A	Sector Technology Officer	Bank A	STO	D	Yes	C	Yes	C
23	Confidential	Bank A	Business Analyst/Lean Coach	Bank A	Business Analyst	B	Yes	A	Yes	C
24	Confidential	Bank B	Process Consultant	Bank B	Process Consultant	B	Yes	C	Yes	D
25	Confidential	Bank A	Project Manager	Bank A	Project Manager	B	Yes	A	Yes	B

26	Confidential	Bank A	Change Manager	Bank A	Change Manager	G	Yes	C	Yes	C
27	Confidential	Bank A	Project Manager	Bank A	Project Manager	A	Yes	A	NO	B
28	Confidential	Bank A	HR Business Partner	Bank A	HR Business Partner	C	Yes	C	Yes	C
29	Confidential	Bank B	Six Sigma Green Belt	Bank B	Six Sigma Green Belt	E	Yes	C	NO	B
30	Confidential	Bank A	Supervisor Group technology	Bank A	Group Technology	A	Yes	C	Yes	D
31	Confidential	Bank A	Service Recovery Consultant	Bank A	Change Team Member	C	Yes	A	Yes	D
32	Confidential	Bank A	Manager G.T. Infrastructure PI	Bank A	Manager	E	Yes	A	Yes	B
33	Confidential	Bank A	Homeloans consultant	Bank A	Home loans consultant	I	Yes	A	Yes	D
34	Confidential	Bank A	VSM	Bank A	VSM	B	Yes	A	Yes	C
35	Confidential	Consultant	Progamme Manager	Bank A	Consultant	F	Yes	A	Yes	B
36	Confidential	Bank B	Business Process Consultant	Bank B	Business Process Consulta	B	Yes	C	Yes	C
37	Confidential	Bank A	Business Analyst / VSM	Bank A	Business Analyst / VSM	B	Yes	C	Yes	C
38	Confidential	Bank B	Head: Business Process Mgmt	Bank B	Black Belt	B	Yes	C	NO	B
39	Confidential	Bank B	head output management	Bank B	head output management	E	Yes	C	Yes	C
40	Confidential	Bank A	SAP SRM Administrator	Bank A	SAP SRM Administrator	A	Yes	A	Yes	C
41	Confidential	Consultant	Managing Consultant	Bank A	Lean Coach	B	Yes	C	Yes	C
42	Confidential	Bank A	Delivery Assurance Manager	Bank A	Delivery Assurance Manage	A	Yes	C	NO	C
43	Confidential	Bank B	Director - Card Operations	Bank B	Director	D	Yes	B	NO	B
44	Confidential	Bank B	Six Sigma Technical Lead	Bank B	Six Sigma Technical Lead	B	Yes	C	Yes	C
45	Confidential	Consultant	Managing Consultant	Bank A	External Consultant	F	Yes	C	Yes	C
46	Confidential	Bank B	Technical Lead	Bank B	Technical Lead	B	Yes	C	Yes	C
47	Confidential	Bank B	Head - Integrated Ops Support	Bank B	Head - Integrated Ops Sup	D	Yes	C	NO	B
48	Confidential	Bank B	Manager, Centralised Metrics	Bank B	Manager, Centralised Metr	B	Yes	C	Yes	C
49	Confidential	Bank B	Head VAF Opeartions JHB	Bank B	Senior Manager VAF OPS JH	E	Yes	C	Yes	C
50	Confidential	Bank A	Systems Manager	Bank A	Systems Manager	E	Yes	A	NO	B
51	Confidential	Bank A	Director	Bank A	Strategic Programme Mgr	D	Yes	A	NO	C
52	Confidential	Bank B	Senior HR Manager	Bank B	Senior HR Manager	D	Yes	C	Yes	C
53	Confidential	Bank C	Senior Mgr:Transaction Product	Bank B	Head of product dev:HL	E	Yes	C	Yes	C
54	Confidential	Bank B	Head - Card Support Services	Bank B	Head - Card Support Servi	D	Yes	B	Yes	C
55	Confidential	Bank B	Six Sigma Consultant	Bank B	Six Sigma Consultant	B	Yes	C	Yes	B
56	Confidential	Bank D	Credit Portfolio Manager	Bank B	Process Manager	B	Yes	C	Yes	C

57	Confidential	Bank C	Snr Mnger:Business Innovation	Bank B	Process Engineer	B	Yes	B	NO	B

Table 8.2. Responses for Section 3of Questionnaire

Record No	Name of Bank	Sect 3_Q1	Sect 3_Q2	Sect 3_Q3	Sect 3_Q4	Sect 3_Q5	Sect 3_Q6	Sect 3_Q7	Sect 3_Q8	Sect 3_Q9	Sect 3_Q10	Sect 3_Q11	Sect 3_Q12	Sect 3_Q13	Sect 3_Q14	Sect 3_Q15	Sect 3_Q16	Sect 3_Q17	Sect 3_Q18	Sect 3_Q19	Sect 3_Q20
1	Bank A	C	E	E	D	D	E	D	D	D	C	E	D	C	D	D	E	D	E	D	C
2	Bank B	E	E	E	D	E	E	E	E	E	E	D	D	D	E	D	E	E	D	E	D
3	Bank B	E	E	E	E	D	E	E	D	D	C	C	D	D	E	E	D	E	E	E	D
4	Bank A	E	E	E	D	D	E	D	C	D	C	D	D	D	E	A	E	D	D	C	E
5	Bank B	E	D	E	D	C	D	D	D	D	C	B	D	E	D	C	C	C	C	C	B
6	Bank B	C	D	E	D	D	E	E	C	D	D	D	D	D	D	C	C	D	C	C	C
7	Bank B	D	E	E	C	D	E	E	D	C	D	C	D	D	D	D	D	E	D	D	D
8	Bank B	D	E	E	E	D	E	D	C	D	C	C	C	C	D	C	D	D	D	C	C
9	Bank A	E	E	E	D	D	E	E	D	D	E	E	D	C	E	C	E	D	E	D	D
10	Bank B	E	E	E	E	E	E	E	E	E	D	D	E	E	D	E	E	E	D	D	E
11	Bank A	D	E	E	E	E	E	E	E	E	D	D	D	E	E	D	E	E	E	E	E
12	Bank A	D	E	E	D	D	E	E	E	E	D	E	E	D	D	D	E	D	C	E	D
13	Bank A	E	E	E	D	D	C	D	D	E	E	D	D	D	E	D	E	D	E	E	E
14	Bank A	D	E	E	D	D	E	E	E	E	D	D	E	D	E	E	D	D	C	D	D
15	Bank B	D	E	E	D	D	D	D	E	E	D	D	D	C	D	D	D	E	D	D	D
16	Bank B	D	E	E	C	D	D	E	E	D	D	D	D	E	E	D	E	E	D	C	D
17	Bank A	E	D	E	D	D	E	D	E	C	E	D	D	C	D	E	D	D	D	E	D
18	Bank B	E	E	E	E	E	E	D	D	E	C	D	D	D	D	D	E	E	D	E	C
19	Bank A	E	D	E	C	C	D	C	D	D	C	C	D	C	D	C	E	D	C	C	C
20	Bank B	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	D	D
21	Bank B	E	E	E	E	E	D	D	D	D	E	C	D	D	D	C	E	E	E	E	E
22	Bank A	E	E	E	E	E	E	E	E	E	D	E	E	E	E	E	E	D	D	E	D
23	Bank A	E	D	E	D	E	D	E	D	E	D	D	D	D	E	E	E	D	D	D	C
24	Bank B	D	E	E	E	E	E	D	D	E	D	D	E	D	E	E	E	E	D	D	D

25	Bank A	B	E	E	D	E	E	D	D	D	D	D	E	C	D	B	E	E	C	E	B
26	Bank A	C	D	E	D	C	E	E	D	E	E	E	E	D	D	C	D	C	D	E	E
27	Bank A	D	E	E	D	E	E	E	E	E	E	E	E	E	E	E	D	E	D	E	D
28	Bank A	C	E	E	E	E	D	E	E	E	D	E	E	D	E	D	E	E	D	E	D
29	Bank B	E	E	E	E	E	E	E	E	E	E	C	D	C	D	E	E	E	D	E	C
30	Bank A	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	E	E
31	Bank A	E	E	E	E	D	D	E	E	E	D	E	E	E	E	E	E	E	E	D	D
32	Bank A	E	E	E	E	E	E	E	E	E	E	D	E	C	D	E	E	E	E	E	D
33	Bank A	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	D	D
34	Bank A	D	E	D	D	B	C	D	D	D	C	C	E	D	E	C	E	D	D	D	B
35	Bank A	C	E	E	D	D	E	E	E	E	C	D	E	D	E	D	E	E	D	E	E
36	Bank B	C	E	E	D	E	B	D	D	E	D	D	D	E	E	E	E	E	E	E	D
37	Bank A	E	E	E	D	E	C	E	E	E	C	D	C	D	E	C	E	E	D	E	E
38	Bank B	D	D	E	B	D	D	C	D	D	A	B	E	D	E	C	E	C	E	E	E
39	Bank B	E	E	E	D	D	E	E	E	E	E	D	D	D	E	E	E	E	C	D	D
40	Bank A	B	E	E	D	D	D	D	E	D	D	E	D	D	E	D	E	E	D	D	D
41	Bank A	E	D	E	E	E	D	D	D	E	E	D	E	D	D	D	E	D	D	D	D
42	Bank A	E	E	E	C	D	B	D	E	D	C	C	E	E	E	E	E	E	D	D	C
43	Bank B	D	E	E	E	E	E	E	E	E	E	D	E	E	E	E	E	E	D	E	E
44	Bank B	E	E	E	E	E	D	D	E	E	E	D	D	E	E	E	E	E	D	E	E
45	Bank A	E	E	E	D	E	E	D	E	E	E	E	E	D	D	D	D	D	E	E	C
46	Bank B	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
47	Bank B	D	E	E	D	E	D	D	D	E	E	D	D	D	E	E	E	E	D	D	D
48	Bank B	E	E	E	E	E	E	E	E	E	E	D	D	D	E	E	E	E	E	E	E
49	Bank B	E	D	E	D	D	E	D	D	E	D	C	D	C	D	E	E	D	C	D	D
50	Bank A	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	D	D	E
51	Bank A	E	E	E	E	E	D	D	D	D	D	D	D	D	D	E	E	E	D	D	C
52	Bank B	E	E	E	D	D	D	E	D	D	D	D	E	E	E	D	E	D	C	D	D
53	Bank B	D	E	D	D	E	E	E	E	D	D	D	D	D	D	D	E	E	D	E	D
54	Bank B	D	C	E	E	E	D	D	E	E	E	E	D	D	E	D	E	E	D	D	E
55	Bank B	C	E	E	E	D	D	E	E	E	D	E	D	D	E	D	E	E	D	E	D

56	Bank B	D	D	E	E	D	D	D	D	E	E	C	D	D	E	E	D	D	E	E	D
57	Bank B	D	E	E	D	D	E	E	D	E	D	D	D	D	C	D	D	E	D	E	D

Table 8.3. Responses for Section 4 of Questionnaire

Record No	Name of Bank	Sect 4_Q1	Sect 4_Q2	Sect 4_Q3	Sect 4_Q4	Sect 4_Q5	Sect 4_Q6	Sect 4_Q7	Sect 4_Q8	Sect 4_Q9	Sect 4_Q10	Sect 4_Q11	Sect 4_Q12	Sect 4_Q13	Sect 4_Q14	Sect 4_Q15	Sect 4_Q16	Sect 4_Q17	Sect 4_Q18	Sect 4_Q19	Sect 4_Q20
1	Bank A	C	D	C	C	C	D	D	B	B	B	A	A	B	B	B	B	B	B	B	A
2	Bank B	D	C	C	D	C	B	C	C	B	C	B	C	D	C	D	D	C	B	C	C
3	Bank B	C	D	D	C	C	D	D	D	C	C	B	C	C	C	C	B	D	C	B	D
4	Bank A	D	D	E	D	D	D	E	E	D	C	C	C	C	D	B	E	D	D	D	D
5	Bank B	E	D	D	D	B	D	C	D	D	A	B	D	D	C	A	B	B	B	D	D
6	Bank B	C	C	D	D	C	D	C	B	B	B	B	C	C	C	D	A	C	B	B	C
7	Bank B	B	B	C	B	D	A	C	A	C	A	C	A	A	C	C	A	D	C	D	B
8	Bank B	C	C	C	D	D	C	C	C	D	D	B	C	C	C	D	D	C	C	C	C
9	Bank A	C	C	C	B	C	A	B	C	C	B	A	A	C	C	A	B	B	C	B	B
10	Bank B	C	C	D	D	C	D	C	D	C	C	C	C	C	C	C	D	C	D	D	C
11	Bank A	B	C	B	C	C	C	B	B	C	C	C	C	B	C	B	C	B	C	D	C
12	Bank A	C	A	A	A	A	B	B	A	A	B	A	A	A	A	A	B	A	B	A	A
13	Bank A	C	A	B	C	C	C	A	C	B	A	A	A	B	A	A	C	C	B	A	A
14	Bank A	A	A	A	A	A	B	A	A	B	A	A	A	B	B	A	B	A	C	B	A
15	Bank B	D	D	E	E	D	E	D	C	D	C	C	C	D	D	D	D	D	D	C	D
16	Bank B	D	C	C	D	D	D	B	D	D	B	C	C	B	B	B	B	D	C	D	C
17	Bank A	C	C	B	D	C	D	A	A	C	D	B	A	C	C	B	D	D	D	C	C
18	Bank B	C	C	D	A	C	A	A	C	A	A	A	A	A	A	A	B	D	C	A	A
19	Bank A	E	D	E	D	C	C	C	C	C	C	C	C	D	D	C	C	C	C	C	C
20	Bank B	D	D	D	D	E	E	D	D	D	D	D	D	D	D	D	D	D	D	D	D
21	Bank B	D	D	C	D	D	C	D	E	D	D	C	C	D	D	C	C	D	D	C	D
22	Bank A	D	C	D	D	D	D	D	C	D	C	C	C	D	D	C	D	C	D	C	D
23	Bank A	D	D	E	D	D	E	D	D	C	D	C	C	D	E	D	E	D	D	E	C
24	Bank B	D	C	C	D	D	D	C	D	D	C	C	C	C	D	C	D	D	D	E	C
25	Bank A	A	A	C	C	A	B	C	C	C	C	B	D	B	D	B	D	B	C	B	B
26	Bank A	C	D	C	C	C	D	D	D	D	D	C	C	B	B	B	D	C	C	D	D
27	Bank A	C	C	C	D	B	B	B	C	B	B	B	B	B	C	A	B	B	B	A	A
28	Bank A	C	C	A	D	D	D	B	D	C	D	A	C	D	D	B	D	C	C	C	C
29	Bank B	D	C	D	D	B	C	A	B	C	C	A	B	C	B	A	A	D	C	A	D
30	Bank A	E	E	E	E	E	D	C	C	C	D	E	C	D	C	D	E	E	D	E	D
31	Bank A	C	D	C	C	B	D	C	C	B	B	A	A	A	C	B	A	C	B	B	B
32	Bank A	D	C	C	C	C	C	B	C	B	C	C	C	C	C	C	C	B	C	C	B
33	Bank A	E	D	D	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
34	Bank A	C	C	C	D	B	B	C	D	D	D	B	A	C	B	C	D	B	D	D	C
35	Bank A	C	C	C	B	B	B	C	B	B	E	B	A	B	C	B	C	C	C	B	A
36	Bank B	B	A	A	D	A	D	C	E	D	A	B	B	D	A	A	D	A	D	C	B

37	Bank A	C	D	E	D	D	C	D	D	D	C	C	C	D	D	C	D	D	D	D	D
38	Bank B	C	B	A	D	D	A	E	D	D	B	B	A	C	B	D	D	B	A	A	A
39	Bank B	D	C	D	E	D	D	D	D	E	C	C	D	E	D	C	D	E	B	C	C
40	Bank A	C	C	D	D	D	D	C	D	D	D	C	D	D	D	C	E	D	D	D	D
41	Bank A	C	C	E	C	C	D	D	D	B	B	C	B	B	C	B	C	C	B	C	C
42	Bank A	A	A	A	A	A	D	C	C	D	D	D	B	A	D	A	B	A	B	C	D
43	Bank B	D	D	C	C	C	B	B	B	B	C	C	C	C	C	C	B	B	B	B	B
44	Bank B	B	C	D	D	C	E	C	E	C	A	C	D	E	E	A	D	C	A	A	B
45	Bank A	D	D	E	C	C	D	E	E	C	D	D	D	D	D	C	D	C	C	D	C
46	Bank B	D	D	C	D	D	D	D	D	D	D	C	D	D	D	C	B	D	D	C	D
47	Bank B	C	C	C	B	C	B	D	C	B	C	B	B	C	C	B	B	B	C	C	C
48	Bank B	B	B	C	C	D	D	C	C	C	B	C	C	C	D	A	B	D	C	B	A
49	Bank B	C	D	E	D	C	C	D	D	C	D	C	C	C	C	D	D	E	D	C	C
50	Bank A	B	C	C	D	C	E	E	E	E	D	A	A	A	B	A	C	C	D	D	B
51	Bank A	A	B	C	C	A	D	A	A	B	A	A	A	C	C	A	D	A	B	D	C
52	Bank B	D	C	D	D	D	C	D	C	C	D	E	C	D	D	C	C	D	D	D	D
53	Bank B	C	C	D	D	C	D	C	D	D	D	C	C	B	C	B	C	B	D	C	B
54	Bank B	D	C	E	E	E	E	D	E	E	D	D	D	C	E	C	E	E	D	D	E
55	Bank B	C	B	B	B	C	C	B	C	C	B	B	B	A	A	A	A	B	B	A	B
56	Bank B	C	D	C	C	C	B	B	C	B	B	C	C	C	D	B	C	B	D	C	B
57	Bank B	C	C	D	D	D	D	D	B	C	C	C	C	C	C	C	C	D	D	C	C

Table 8.4. Responses for Section 5 of Questionnaire

Record No	Name of Bank	Sect 5_Q1	Sect 5_Q2	Sect 5_Q3	Sect 5_Q4	Sect 5_Q5	Sect 5_Q6	Sect 5_Q7	Sect 5_Q8	Sect 5_Q9	Sect 5_Q10	Sect 5_Q11	Sect 5_Q12	Sect 5_Q13	Sect 5_Q14	Sect 5_Q15	Sect 5_Q16	Sect 5_Q17	Sect 5_Q18
1	Bank A	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
2	Bank B	D	C	D	C	C	C	B	D	A	B	C	C	D	D	C	D	D	C
3	Bank B	D	D	C	D	C	C	C	D	C	C	C	D	D	C	C	C	C	C
4	Bank A	D	D	D	C	D	D	B	B	C	C	D	C	C	D	D	B	C	C
5	Bank B	C	C	C	C	B	B	B	C	C	D	C	E	C	B	C	C	C	C
6	Bank B	D	B	C	D	B	B	D	B	B	B	C	B	B	C	B	B	B	B
7	Bank B	B	B	B	B	C	D	E	A	B	C	B	B	C	C	B	D	C	B
8	Bank B	C	C	C	B	C	B	B	C	C	B	B	C	C	B	B	C	B	C
9	Bank A	C	C	B	B	B	B	A	B	C	C	B	B	B	B	C	C	B	B
10	Bank B	C	C	D	D	D	C	C	C	C	C	C	C	D	C	C	C	C	C
11	Bank A	D	D	D	D	D	D	E	C	D	D	C	D	D	C	C	C	C	C
12	Bank A	A	D	D	D	C	B	B	B	D	D	D	D	D	C	C	C	C	C
13	Bank A	B	B	A	A	B	B	A	A	B	A	B	B	B	B	A	B	A	B
14	Bank A	D	D	C	C	C	C	E	E	C	B	B	B	C	B	B	B	B	B
15	Bank B	D	A	D	A	D	A	D	D	C	C	A	A	A	D	D	D	D	A
16	Bank B	B	B	C	C	C	D	D	C	C	B	D	B	B	C	B	B	C	C
17	Bank A	D	C	C	D	D	D	A	C	D	D	C	B	D	C	C	B	D	D
18	Bank B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	Bank A	C	C	C	C	D	D	C	B	C	D	C	C	C	C	C	C	C	C

20	Bank B	D	D	D	C	C	C	C	D	D	D	D	C	C	D	D	D	D	D
21	Bank B	C	C	D	C	C	C	D	C	C	C	C	C	D	C	C	C	C	C
22	Bank A	C	C	C	C	B	B	B	C	B	B	B	C	B	B	B	B	B	B
23	Bank A	D	D	C	C	C	D	D	C	D	C	B	C	C	C	C	C	C	D
24	Bank B	D	C	C	D	D	D	C	C	C	B	C	C	D	D	D	C	C	D
25	Bank A	B	B	C	B	C	C	A	B	C	B	B	B	B	A	C	E	B	B
26	Bank A	C	C	C	B	B	C	B	B	B	C	C	B	C	C	C	C	C	B
27	Bank A	A	A	A	A	A	A	A	A	A	A	A	A	C	C	A	A	A	A
28	Bank A	C	D	C	C	D	D	C	C	C	D	C	C	C	C	C	D	D	C
29	Bank B	D	D	D	D	C	B	C	C	B	E	B	B	C	C	C	B	C	D
30	Bank A	D	D	D	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B
31	Bank A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	A	B	A	B
32	Bank A	B	B	B	B	B	A	A	A	E	A	E	A	A	A	A	A	A	A
33	Bank A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	C	D	D
34	Bank A	D	C	D	C	D	C	B	C	C	B	A	E	B	B	C	B	D	C
35	Bank A	C	E	C	E	E	C	E	E	E	E	E	E	C	E	E	E	E	C
36	Bank B	C	B	C	C	C	D	B	D	B	B	C	C	C	C	C	D	D	C
37	Bank A	C	C	C	C	C	C	B	B	C	C	C	C	C	C	C	B	B	B
38	Bank B	B	B	B	B	B	C	B	B	B	B	C	C	C	B	B	E	B	B
39	Bank B	D	C	D	D	C	D	C	C	D	D	D	C	C	D	D	D	D	D
40	Bank A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A
41	Bank A	D	D	D	D	C	C	B	B	D	C	B	C	C	B	C	C	C	B
42	Bank A	B	C	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	C
43	Bank B	C	C	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
44	Bank B	C	C	C	D	C	D	C	D	D	D	D	D	D	D	D	C	C	C
45	Bank A	D	C	D	D	D	D	C	D	D	C	B	C	C	B	C	B	C	B
46	Bank B	C	C	C	D	B	B	C	C	B	C	C	C	C	C	C		C	C
47	Bank B	B	B	B	B	A	B	A	A	B	B	B	B	B	B	A	A	B	B
48	Bank B	B	B	C	D	B	B	D	D	B	A	B	B	C	C	B	B	B	B
49	Bank B	C	C	C	C	B	C	C	D	C	D	C	C	B	B	C	C	C	D
50	Bank A	B	D	D	C	D	D	D	D	C	C	B	C	D	C	D	B	C	D
51	Bank A	D	D	D	D	D	D	B	D	B	C	B	B	C	B	C	B	B	B
52	Bank B	C	C	B	C	B	B	B	C	B	B	C	C	C	C	C	C	B	D
53	Bank B	C	C	C	C	B	B	B	C	B	C	B	B	B	B	C	C	C	B
54	Bank B	C	C	C	A	C	C	B	B	C	D	D	C	C	B	C	C	C	C
55	Bank B	C	B	C	B	B	B	A	D	B	A	B	A	B	D	C	B	B	E
56	Bank B	C	C	D	C	B	C	C	C	D	D	B	B	D	D	B	C	D	C
57	Bank B	B	C	B	C	B	C	C	D	C	C	D	C	C	B	C	D	C	D

8.5. Statistical analysis

8.5.1. Descriptive statistics

8.5.1.1. Descriptive percent statistics

Table 8.5. S1.1: Name of the Respondents Bank

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ABSA Bank	28	49.1	49.1	49.1
	Standard Bank	29	50.9	50.9	100.0
	Total	57	100.0	100.0	

Interpretation

The above table results reveal different banks groups dispersion of participated respondents in this project, these are 49.1 % from ABSA bank, 50.9 % from Standard bank in this research project.

Table 8.6. S2.1 : In what capacity were you employed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employee	10	17.5	17.5	17.5
	Project Leader	19	33.3	33.3	50.9
	Project team member	3	5.3	5.3	56.1
	Senior Management	9	15.8	15.8	71.9
	Management	10	17.5	17.5	89.5
	External Consultant	4	7.0	7.0	96.5
	Change Management specialist	1	1.8	1.8	98.2
	Process user	1	1.8	1.8	100.0
	Total	57	100.0	100.0	

Table 8.7. S2.2: Did you understand the reasons for the Lean and or Six Sigma initiative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	57	100.0	100.0	100.0

Table 8.8. S2.3: What improvement approach was applied within the particular initiative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lean only	19	33.3	33.3	33.3
	Six sigma only	4	7.0	7.0	40.4
	Lean & Six sigma	34	59.6	59.6	100.0
	Total	57	100.0	100.0	

Table 8.9. S2.5: How would you rate the level of success the initiative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some success	16	28.1	28.1	28.1
	Many areas were successful	36	63.2	63.2	91.2
	Total success	5	8.8	8.8	100.0
	Total	57	100.0	100.0	

8.5.1.2. Central tendency statistics

Table 8.10. Central Tendency Statistics (Section 3)

		s3.1	s3.2	s3.3	s3.4	s3.5
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		4.00	5.00	5.00	4.00	4.00
Median		5.00	5.00	5.00	4.00	5.00
Mode		5	5	5	4	5
Std. Deviation		.827	.453	.186	.690	.680
Variance		.684	.205	.034	.476	.462
Range		3	2	1	3	3
Minimum		2	3	4	2	2
Maximum		5	5	5	5	5

Interpretation

The above table reveals central tendency stats results of research statements S3.1 to S3.5

The measurement scale code interpreted as 1 = Not Important

2 = Little Important

3 = Average important

4 = Important

5 = Very Important

1) Mean

The mean results as follows:

The research statements s3.1, s3.4, s3.5 have mean value is 4.00, this reveal the respondents participated in this project have articulated average perception is important towards the above mentioned study statements.

The research statements s3.2, s3.3 have mean value is 5.00, this reveal the respondents participated in this project have articulated average perception is very important towards the above mentioned study statements.

2) Median

The research statements s3.1, s3.2, s3.3, s3.5 have median value 5.00, this indicates very important is the median perception of respondent.

The research statement s3.4 has median value 4.00, this indicates important is the median perception of respondent.

3) Mode

The research statements s3.1, s3.2, s3.3, s3.5 have mode value 5.00, this indicates very important is mode perception of respondents.

The research statement s3.4 has mode value 4.00, this indicates important is mode perception of respondents.

4) The Standard Deviation

The research statements s3.1, s3.2, s3.3, s3.4, s3.5 have standard deviation from 0.186 to 0.827, it reveals these variables have difference in respondent's perception.

5) Variance

The research statements s3.1, s3.2, s3.3, s3.4, s3.5 have variance from 0.034 to 0.684., it reveals these variables have variation in respondent's perception.

6) Range

The research statements s3.1, s3.2, s3.3, s3.4, s3.5 have range values 1, 2, 3 and it indicates these variables have difference in respondent's perceptions and respondents have expressed all types of opinions towards study questions.

7) Minimum

The research statements s3.1, s3.4, s3.5 have minimum value 2 and it indicates respondents have articulated minimum perception is little important.

The research statement s3.2 has minimum value 3 and it indicates respondents have articulated minimum perception is average important.

The research statement s3.4 has minimum value 4 and it indicates respondents have articulated minimum perception is important.

8) Maximum

The research statements s3.1, s3.2, s3.3, s3.4, s3.5 has maximum value 5 and it indicates respondents have articulated maximum perception is very important.

Table 8.11. Central Tendency Statistics (Section 3)

		s3.6	s3.7	s3.8	s3.9	s3.10
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		4.00	5.00	4.00	5.00	4.00
Median		5.00	5.00	5.00	5.00	4.00
Mode		5	5	5	5	4
Std. Deviation		.758	.570	.601	.559	.854
Variance		.575	.325	.362	.313	.730
Range		3	2	2	2	4
Minimum		2	3	3	3	1
Maximum		5	5	5	5	5

Table 8.12. Central Tendency Statistics (Section 3)

		s3.11	s3.12	s3.13	s3.14	s3.15
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		4.00	4.00	4.00	5.00	4.00
Median		4.00	4.00	4.00	5.00	4.00
Mode		4	4	4	5	5
Std. Deviation		.789	.559	.693	.530	.915
Variance		.622	.313	.480	.281	.837
Range		3	2	2	2	4
Minimum		2	3	3	3	1
Maximum		5	5	5	5	5

Table 8.13. Central Tendency Statistics (Section 3)

		s3.16	s3.17	s3.18	s3.19	s3.20
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		5.00	5.00	4.00	4.00	4.00
Median		5.00	5.00	4.00	5.00	4.00
Mode		5	5	4	5	4
Std. Deviation		.518	.596	.635	.678	.824
Variance		.269	.355	.403	.459	.679
Range		2	2	2	2	3
Minimum		3	3	3	3	2
Maximum		5	5	5	5	5

Table 8.14. Central Tendency Statistics (Section 4)

		s4.1	s4.2	s4.3	s4.4	s4.5
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		3.00	3.00	3.00	4.00	3.00

Mode		3	3	3	4	3
Std. Deviation		.972	.953	1.170	1.000	1.060
Variance		.944	.908	1.369	1.001	1.123
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.15. Central Tendency Statistics (Section 4)

		s4.6	s4.7	s4.8	s4.9	s4.10
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		4.00	3.00	3.00	3.00	3.00
Mode		4	3	3	3	4
Std. Deviation		1.128	1.123	1.133	.990	1.113
Variance		1.273	1.260	1.284	.980	1.239
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.16. Central Tendency Statistics (Section 4)

		s4.11	s4.12	s4.13	s4.14	s4.15
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	2.00
Median		3.00	3.00	3.00	3.00	2.00
Mode		3	3	3	3	3
Std. Deviation		1.053	1.085	1.093	1.043	1.101
Variance		1.110	1.177	1.194	1.087	1.212
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.17. Central Tendency Statistics (Section 4)

		s4.16	s4.17	s4.18	s4.19	s4.20
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		3.00	3.00	3.00	3.00	3.00
Mode		4	4	4	3	3
Std. Deviation		1.172	1.132	.920	1.149	1.109
Variance		1.373	1.281	.846	1.320	1.230
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.18. Central Tendency Statistics (Section 5)

		s5.1	s5.2	s5.3	s5.4	s5.5
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		3.00	3.00	3.00	3.00	3.00
Mode		3	3	3	3	2
Std. Deviation		.954	.944	.925	1.025	.984
Variance		.910	.892	.856	1.051	.969
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.19. Central Tendency Statistics (Section 5)

		s5.6	s5.7	s5.8	s5.9	s5.10
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		3.00	2.00	3.00	3.00	3.00
Mode		3	2	3	3	2
Std. Deviation		.996	1.190	1.087	.996	1.098
Variance		.992	1.415	1.181	.992	1.205
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.20. Central Tendency Statistics (Section 5)

		s5.11	s5.12	s5.13	s5.14	s5.15
N	Valid	57	57	57	57	57
	Missing	0	0	0	0	0
Mean		3.00	3.00	3.00	3.00	3.00
Median		3.00	3.00	3.00	3.00	3.00
Mode		2	3	3	3	3
Std. Deviation		.996	1.020	.902	.950	.921
Variance		.991	1.041	.814	.903	.848
Range		4	4	4	4	4
Minimum		1	1	1	1	1
Maximum		5	5	5	5	5

Table 8.21. Central Tendency Statistics (Section 5)

		s5.16	s5.17	s5.18
N	Valid	56	57	57
	Missing	1	0	0
Mean		3.00	3.00	3.00
Median		3.00	3.00	3.00
Mode		2	3	2

Std. Deviation	1.022	.964	.964
Variance	1.044	.929	.929
Range	4	4	4
Minimum	1	1	1
Maximum	5	5	5

8.5.2. Inferential statistics

8.5.2.1. Cronbach alpha test (reliability test)

Interpretation Rules:

1) If Cronbach Alpha value is between 0.4 to 0.7, indicates of medium internal consistency and reliability.

2) If Cronbach Alpha value is between 0.7 to 1.0, indicates of high or good internal consistency and reliability

Table 8.22. Overall Cronbach Alpha Test

Case Processing Summary

		N	%
Cases	Valid	56	98.2
	Excluded	1	1.8
	Total	57	100.0

Table 8.23. Overall reliability statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.925	58

Interpretation:

Reliability analysis of the questionnaire continuous study statements reveal cronbach's alpha value is 0.925 and it indicates this research instrument's

(Questionnaire) continuous study variables have adequate internal consistency and reliability.

Table 8.24. Section 3 Cronbach Alpha Test

Case Processing Summary

		N	%
Cases	Valid	57	100.0
	Excluded	0	.0
	Total	57	100.0

Table 8.25. Section 3 reliability statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.836	20

Table 8.26. Section 4 Cronbach Alpha Test

Case Processing Summary

		N	%
Cases	Valid	57	100.0
	Excluded	0	.0
	Total	57	100.0

Table 8.27. Section 4 reliability statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.940	20

Table 8.28. Section 5 Cronbach Alpha Test

Case Processing Summary

		N	%
Cases	Valid	56	98.2
	Excluded	1	1.8
	Total	57	100.0

Table 8.29. Section 5 reliability statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.949	18

8.5.2.2. Anova tests

Interpretation Rules:

1. If p value is less than or equal p≤ 0.05, statistically there is Significance difference between groups' opinions.
2. If p value is greater than p>0.05, statistically there is NO Significance difference between groups opinions.

Note: p indicates probability

Table 8.30. Anova Tests – Different Banks vs. Section 3

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s3.1	Between Groups	.050	1	.050	.790
	Within Groups	38.266	55	.696	
	Total	38.316	56		
s3.2	Between Groups	.056	1	.056	.605
	Within Groups	11.417	55	.208	
	Total	11.474	56		
s3.3	Between Groups	.000	1	.000	.980
	Within Groups	1.930	55	.035	
	Total	1.930	56		
s3.4	Between Groups	.125	1	.125	.613
	Within Groups	26.542	55	.483	
	Total	26.667	56		
s3.5	Between Groups	.225	1	.225	.491
	Within Groups	25.670	55	.467	
	Total	25.895	56		

Table 8.31. Anova Tests – Different Banks vs. Section 3

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s3.6	Between Groups	.112	1	.112	.663
	Within Groups	32.099	55	.584	
	Total	32.211	56		
s3.7	Between Groups	.005	1	.005	.904
	Within Groups	18.206	55	.331	
	Total	18.211	56		
s3.8	Between Groups	.354	1	.354	.327
	Within Groups	19.892	55	.362	
	Total	20.246	56		
s3.9	Between Groups	.003	1	.003	.928
	Within Groups	17.506	55	.318	
	Total	17.509	56		
s3.10	Between Groups	.000	1	.000	.983
	Within Groups	40.877	55	.743	
	Total	40.877	56		

Table 8.32. Anova Tests – Different Banks vs. Section 3

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s3.11	Between Groups	5.103	1	5.103	.003
	Within Groups	29.739	55	.541	
	Total	34.842	56		
s3.12	Between Groups	1.893	1	1.893	.013
	Within Groups	15.616	55	.284	
	Total	17.509	56		
s3.13	Between Groups	.261	1	.261	.465
	Within Groups	26.616	55	.484	
	Total	26.877	56		
s3.14	Between Groups	.118	1	.118	.521
	Within Groups	15.601	55	.284	
	Total	15.719	56		
s3.15	Between Groups	.813	1	.813	.329
	Within Groups	46.064	55	.838	
	Total	46.877	56		

Table 8.33. Anova Tests – Different Banks vs. Section 3

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s3.16	Between Groups	.394	1	.394	.229
	Within Groups	14.659	55	.267	
	Total	15.053	56		
s3.17	Between Groups	.724	1	.724	.155
	Within Groups	19.171	55	.349	
	Total	19.895	56		
s3.18	Between Groups	.021	1	.021	.823
	Within Groups	22.541	55	.410	
	Total	22.561	56		
s3.19	Between Groups	.035	1	.035	.787
	Within Groups	25.685	55	.467	
	Total	25.719	56		
s3.20	Between Groups	.281	1	.281	.525
	Within Groups	37.719	55	.686	
	Total	38.000	56		

Table 8.34. Anova Tests – Different Banks vs. Section 4

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s4.1	Between Groups	1.361	1	1.361	.233
	Within Groups	51.516	55	.937	
	Total	52.877	56		
s4.2	Between Groups	.152	1	.152	.686
	Within Groups	50.690	55	.922	
	Total	50.842	56		
s4.3	Between Groups	.780	1	.780	.455
	Within Groups	75.887	55	1.380	
	Total	76.667	56		
s4.4	Between Groups	2.769	1	2.769	.097
	Within Groups	53.266	55	.968	
	Total	56.035	56		
s4.5	Between Groups	4.414	1	4.414	.046
	Within Groups	58.463	55	1.063	
	Total	62.877	56		

Table 8.35. Anova Tests – Different Banks vs. Section 4

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s4.6	Between Groups	.033	1	.033	.874
	Within Groups	71.230	55	1.295	
	Total	71.263	56		
s4.7	Between Groups	.423	1	.423	.567
	Within Groups	70.138	55	1.275	
	Total	70.561	56		
s4.8	Between Groups	1.329	1	1.329	.313
	Within Groups	70.601	55	1.284	
	Total	71.930	56		
s4.9	Between Groups	1.084	1	1.084	.297
	Within Groups	53.793	55	.978	
	Total	54.877	56		
s4.10	Between Groups	1.718	1	1.718	.242
	Within Groups	67.650	55	1.230	
	Total	69.368	56		

Table 8.36. Anova Tests – Different Banks vs. Section 4

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s4.11	Between Groups	1.255	1	1.255	.292
	Within Groups	60.885	55	1.107	
	Total	62.140	56		
s4.12	Between Groups	4.732	1	4.732	.044
	Within Groups	61.163	55	1.112	
	Total	65.895	56		
s4.13	Between Groups	2.144	1	2.144	.183
	Within Groups	64.698	55	1.176	
	Total	66.842	56		
s4.14	Between Groups	.000	1	.000	.986
	Within Groups	60.877	55	1.107	
	Total	60.877	56		
s4.15	Between Groups	2.353	1	2.353	.166
	Within Groups	65.542	55	1.192	
	Total	67.895	56		

Table 8.37. Anova Tests – Different Banks vs. Section 4

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s4.16	Between Groups	3.509	1	3.509	.111
	Within Groups	73.368	55	1.334	
	Total	76.877	56		
s4.17	Between Groups	4.453	1	4.453	.062
	Within Groups	67.266	55	1.223	
	Total	71.719	56		
s4.18	Between Groups	.000	1	.000	.988
	Within Groups	47.368	55	.861	
	Total	47.368	56		
s4.19	Between Groups	1.113	1	1.113	.363
	Within Groups	72.817	55	1.324	
	Total	73.930	56		
s4.20	Between Groups	.473	1	.473	.540
	Within Groups	68.404	55	1.244	
	Total	68.877	56		

Table 8.38. Anova Tests – Different Banks vs. Section 5

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s5.1	Between Groups	.017	1	.017	.893
	Within Groups	50.966	55	.927	
	Total	50.982	56		
s5.2	Between Groups	3.422	1	3.422	.049
	Within Groups	46.507	55	.846	
	Total	49.930	56		
s5.3	Between Groups	.000	1	.000	.996
	Within Groups	47.930	55	.871	
	Total	47.930	56		
s5.4	Between Groups	.019	1	.019	.893
	Within Groups	58.823	55	1.070	
	Total	58.842	56		
s5.5	Between Groups	3.354	1	3.354	.062
	Within Groups	50.892	55	.925	
	Total	54.246	56		

Table 8.39. Anova Tests – Different Banks vs. Section 5

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s5.6	Between Groups	.822	1	.822	.368
	Within Groups	54.757	55	.996	
	Total	55.579	56		
s5.7	Between Groups	.953	1	.953	.417
	Within Groups	78.310	55	1.424	
	Total	79.263	56		
s5.8	Between Groups	1.461	1	1.461	.270
	Within Groups	64.680	55	1.176	
	Total	66.140	56		
s5.9	Between Groups	2.894	1	2.894	.088
	Within Groups	52.685	55	.958	
	Total	55.579	56		
s5.10	Between Groups	.001	1	.001	.980
	Within Groups	67.473	55	1.227	
	Total	67.474	56		

Table 8.40. Anova Tests – Different Banks vs. Section 5

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s5.11	Between Groups	.322	1	.322	.574
	Within Groups	55.187	55	1.003	
	Total	55.509	56		
s5.12	Between Groups	.050	1	.050	.829
	Within Groups	58.266	55	1.059	
	Total	58.316	56		
s5.13	Between Groups	.175	1	.175	.647
	Within Groups	45.404	55	.826	
	Total	45.579	56		
s5.14	Between Groups	1.842	1	1.842	.155
	Within Groups	48.719	55	.886	
	Total	50.561	56		
s5.15	Between Groups	.001	1	.001	.976
	Within Groups	47.473	55	.863	
	Total	47.474	56		

Table 8.41. Anova Tests – Different Banks vs. Section 5

ANOVA

		Sum of Squares	df	Mean Square	Sig.
s5.16	Between Groups	2.571	1	2.571	.117
	Within Groups	54.857	54	1.016	
	Total	57.429	55		
s5.17	Between Groups	.917	1	.917	.325
	Within Groups	51.118	55	.929	
	Total	52.035	56		
s5.18	Between Groups	2.212	1	2.212	.124
	Within Groups	49.823	55	.906	
	Total	52.035	56		

8.5.2.3. z-Tests

Interpretation Rules:

3. If p value is less than or equal p≤ 0.05, statistically there is Significance difference between groups' opinions.
4. If p value is greater than p>0.05, statistically there is NO Significance difference between groups opinions.

Note: p indicates probability

Table 8.42. z-Tests – Improvement Approach vs. Section 3

Test Statistics[a]

	s3.1	s3.2	s3.3	s3.4	s3.5
Mann-Whitney U	263.500	281.000	315.500	281.500	295.000
Z	-1.216	-1.149	-.421	-.854	-.581
Asymp. Sig. (2-tailed)	.224	.250	.673	.393	.562

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.43. z-Tests – Improvement Approach vs. Section 3

Test Statistics[a]

	s3.6	s3.7	s3.8	s3.9	s3.10
Mann-Whitney U	278.000	273.500	285.500	289.000	295.500
Z	-.953	-1.050	-.787	-.743	-.546
Asymp. Sig. (2-tailed)	.341	.294	.431	.457	.585

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.44. z-Tests – Improvement Approach vs. Section 3

Test Statistics[a]

	s3.11	s3.12	s3.13	s3.14	s3.15
Mann-Whitney U	232.000	267.500	274.000	309.000	306.500
Z	-1.819	-1.172	-.990	-.306	-.330
Asymp. Sig. (2-tailed)	.069	.241	.322	.759	.742

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.45. z-Tests – Improvement Approach vs. Section 3

Test Statistics[a]

	s3.16	s3.17	s3.18	s3.19	s3.20
Mann-Whitney U	311.000	322.500	297.000	321.000	290.500
Z	-.306	-.011	-.541	-.041	-.651
Asymp. Sig. (2-tailed)	.760	.991	.589	.967	.515

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.46. z-Tests – Improvement Approach vs. Section 4

Test Statistics[a]

	s4.1	s4.2	s4.3	s4.4	s4.5
Mann-Whitney U	206.500	229.500	192.000	203.500	201.000
Z	-2.310	-1.857	-2.531	-2.423	-2.382
Asymp. Sig. (2-tailed)	.021	.063	.011	.015	.017

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.47. z-Tests – Improvement Approach vs. Section 4

Test Statistics[a]

	s4.6	s4.7	s4.8	s4.9	s4.10
Mann-Whitney U	249.000	210.000	178.500	207.500	303.000
Z	-1.452	-2.172	-2.797	-2.245	-.384
Asymp. Sig. (2-tailed)	.146	.030	.005	.025	.701

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.48. z-Tests – Improvement Approach vs. Section 4

Test Statistics[a]

	s4.11	s4.12	s4.13	s4.14	s4.15
Mann-Whitney U	180.000	167.000	190.000	248.000	250.500
Z	-2.804	-3.059	-2.553	-1.458	-1.392
Asymp. Sig. (2-tailed)	.005	.002	.011	.145	.164

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.49. z-Tests – Improvement Approach vs. Section 4

Test Statistics[a]

	s4.16	s4.17	s4.18	s4.19	s4.20
Mann-Whitney U	305.000	220.500	291.000	308.500	173.000
Z	-.346	-1.968	-.627	-.278	-2.884
Asymp. Sig. (2-tailed)	.729	.049	.531	.781	.004

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.50. z-Tests – Improvement Approach vs. Section 5

Test Statistics[a]

	s5.1	s5.2	s5.3	s5.4	s5.5
Mann-Whitney U	277.500	289.000	282.500	292.500	264.500
Z	-.887	-.662	-.800	-.591	-1.132
Asymp. Sig. (2-tailed)	.375	.508	.424	.555	.258

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.51. z-Tests – Improvement Approach vs. Section 5

Test Statistics[a]

	s5.6	s5.7	s5.8	s5.9	s5.10
Mann-Whitney U	303.000	298.000	276.500	263.000	309.500
Z	-.386	-.477	-.897	-1.165	-.259
Asymp. Sig. (2-tailed)	.699	.633	.369	.244	.796

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.52. z-Tests – Improvement Approach vs. Section 5

Test Statistics[a]

	s5.11	s5.12	s5.13	s5.14	s5.15
Mann-Whitney U	277.000	297.000	314.500	261.000	306.000
Z	-.903	-.507	-.167	-1.212	-.337
Asymp. Sig. (2-tailed)	.367	.612	.867	.225	.736

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

Table 8.53. z-Tests – Improvement Approach vs. Section 5

Test Statistics[a]

	s5.16	s5.17	s5.18
Mann-Whitney U	277.500	285.000	284.000
Z	-.721	-.741	-.759
Asymp. Sig. (2-tailed)	.471	.459	.448

a. Grouping Variable: S2.3: What improvement approach was applied within the particular initiative

8.5.2.4. Chi-square tests

Interpretation Rules:

5. If p value is less than or equal p≤ 0.05, statistically there is Significance difference between groups' opinions.
6. If p value is greater than p>0.05, statistically there is NO Significance difference between groups opinions.

Note: p indicates probability

Table 8.54. S2.1 : In what capacity were you employed * s3.1

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.298	21	.693
N of Valid Cases	57		

Table 8.55. S2.1 : In what capacity were you employed * s3.2

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.974	14	.380
N of Valid Cases	57		

Table 8.56. S2.1 : In what capacity were you employed * s3.3

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.435	7	.932
N of Valid Cases	57		

Table 8.57. S2.1 : In what capacity were you employed * s3.4

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.025	21	.822
N of Valid Cases	57		

Table 8.58. S2.1 : In what capacity were you employed * s3.5

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.219	21	.056
N of Valid Cases	57		

Table 8.59. S2.1 : In what capacity were you employed * s3.6

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.236	21	.859
N of Valid Cases	57		

Table 8.60. S2.1 : In what capacity were you employed * s3.7

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.466	14	.416
N of Valid Cases	57		

Table 8.61. S2.1 : In what capacity were you employed * s3.8

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.600	14	.406
N of Valid Cases	57		

Table 8.62. S2.1 : In what capacity were you employed * s3.9

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.821	14	.988
N of Valid Cases	57		

Table 8.63. S2.1 : In what capacity were you employed * s3.10

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.483	21	.798
N of Valid Cases	57		

Table 8.64. S2.1 : In what capacity were you employed * s3.11

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.226	21	.238
N of Valid Cases	57		

Table 8.65. S2.1 : In what capacity were you employed * s3.12

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.693	14	.473
N of Valid Cases	57		

Table 8.66. S2.1 : In what capacity were you employed * s3.13

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.320	14	.120
N of Valid Cases	57		

Table 8.67. S2.1 : In what capacity were you employed * s3.14

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.252	14	.507
N of Valid Cases	57		

Table 8.68. S2.1 : In what capacity were you employed * s3.15

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.845	28	.371
N of Valid Cases	57		

Table 8.69. S2.1 : In what capacity were you employed * s3.16

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.373	14	.190
N of Valid Cases	57		

Table 8.70. S2.1 : In what capacity were you employed * s3.17

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.955	14	.035
N of Valid Cases	57		

Table 8.71. S2.1 : In what capacity were you employed * s3.18

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.711	14	.549
N of Valid Cases	57		

Table 8.72. S2.1 : In what capacity were you employed * s3.19

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.927	14	.132
N of Valid Cases	57		

Table 8.73. S2.1 : In what capacity were you employed * s3.20

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.359	21	.499
N of Valid Cases	57		

Table 8.74. S2.1 : In what capacity were you employed * s4.1

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.930	28	.203
N of Valid Cases	57		

Table 8.75. S2.1 : In what capacity were you employed * s4.2

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.621	28	.432
N of Valid Cases	57		

Table 8.76. S2.1 : In what capacity were you employed * s4.3

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.067	28	.199
N of Valid Cases	57		

Table 8.77. S2.1 : In what capacity were you employed * s4.4

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.959	28	.575
N of Valid Cases	57		

Table 8.78. S2.1 : In what capacity were you employed * s4.5

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.500	28	.255
N of Valid Cases	57		

Table 8.79. S2.1 : In what capacity were you employed * s4.6

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.983	28	.826
N of Valid Cases	57		

Table 8.80. S2.1 : In what capacity were you employed * s4.7

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.468	28	.074
N of Valid Cases	57		

Table 8.81. S2.1 : In what capacity were you employed * s4.8

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.964	28	.630
N of Valid Cases	57		

Table 8.82. S2.1 : In what capacity were you employed * s4.9

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.189	28	.229
N of Valid Cases	57		

Table 8.83. S2.1 : In what capacity were you employed * s4.10

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.788	28	.005
N of Valid Cases	57		

Table 8.84. S2.1 : In what capacity were you employed * s4.11

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54.004	28	.002
N of Valid Cases	57		

Table 8.85. S2.1 : In what capacity were you employed * s4.12

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	64.916	28	.000
N of Valid Cases	57		

Table 8.86. S2.1 : In what capacity were you employed * s4.13

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.407	28	.110
N of Valid Cases	57		

Table 8.87. S2.1 : In what capacity were you employed * s4.14

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.836	28	.175
N of Valid Cases	57		

Table 8.88. S2.1 : In what capacity were you employed * s4.15

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	72.937	28	.000
N of Valid Cases	57		

Table 8.89. S2.1 : In what capacity were you employed * s4.16

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.479	28	.255
N of Valid Cases	57		

Table 8.90. S2.1 : In what capacity were you employed * s4.17

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.696	28	.151
N of Valid Cases	57		

Table 8.91. S2.1 : In what capacity were you employed * s4.18

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	74.754	28	.000
N of Valid Cases	57		

Table 8.92. S2.1 : In what capacity were you employed * s4.19

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.519	28	.184
N of Valid Cases	57		

Table 8.93. S2.1 : In what capacity were you employed * s4.20

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	51.804	28	.004
N of Valid Cases	57		

Table 8.94. S2.1 : In what capacity were you employed * s5.1

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.594	28	.335
N of Valid Cases	57		

Table 8.95. S2.1 : In what capacity were you employed * s5.2

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.793	28	.475
N of Valid Cases	57		

Table 8.96. S2.1 : In what capacity were you employed * s5.3

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.153	28	.230
N of Valid Cases	57		

Table 8.97. S2.1 : In what capacity were you employed * s5.4

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.984	28	.574
N of Valid Cases	57		

Table 8.98. S2.1 : In what capacity were you employed * s5.5

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.099	28	.097
N of Valid Cases	57		

Table 8.99. S2.1 : In what capacity were you employed * s5.6

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.792	28	.148
N of Valid Cases	57		

Table 8.100. S2.1 : In what capacity were you employed * s5.7

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.524	28	.254
N of Valid Cases	57		

Table 8.101. S2.1 : In what capacity were you employed * s5.8

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.164	28	.310
N of Valid Cases	57		

Table 8.102. S2.1 : In what capacity were you employed * s5.9

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.353	28	.111
N of Valid Cases	57		

Table 8.103. S2.1 : In what capacity were you employed * s5.10

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.703	28	.179
N of Valid Cases	57		

Table 8.104. S2.1 : In what capacity were you employed * s5.11

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.906	28	.469
N of Valid Cases	57		

Table 8.105. S2.1 : In what capacity were you employed * s5.12

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.612	28	.335
N of Valid Cases	57		

Table 8.106. S2.1 : In what capacity were you employed * s5.13

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.635	28	.249
N of Valid Cases	57		

Table 8.107. S2.1 : In what capacity were you employed * s5.14

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.762	28	.425
N of Valid Cases	57		

Table 8.108. S2.1 : In what capacity were you employed * s5.15

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.109	28	.167
N of Valid Cases	57		

Table 8.109. S2.1 : In what capacity were you employed * s5.16

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.549	28	.844
N of Valid Cases	56		

Table 8.110. S2.1 : In what capacity were you employed * s5.17

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43.524	28	.031
N of Valid Cases	57		

Table 8.111. S2.1 : In what capacity were you employed * s5.18

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.522	28	.386
N of Valid Cases	57		

8.6. Article for publication

What are the critical success factors for Lean and/or Six-sigma implementations in South African Banks?

Jothilutchmee David

Abstract

Purpose – *Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom then to failure. The primary objective of this study is to determine the critical success factors for Lean and/or Six-sigma implementations in South African Banking. The secondary objective is to determine a list of the sources of benefits for Lean and/or Six-sigma implementations in South African Banking.*

Design/methodology/approach *– A review of relevant literature is used to identify potential critical success factors for Lean and/or six sigma implementations in banking and to identify the list of potential benefits that banks can possibly achieve. An email survey was done to obtain perceptions of various parameters from two of the big four retail banks in South Africa.*

Findings *– Statistical analysis of the survey was conducted to analyse the different perceptions and generic guidelines are given to South African Banks to effectively implement Lean and/or Six-sigma initiatives.*

Originality/value *– The generic guidelines for Lean and/or Six-sigma implementation and the potential benefits from such initiatives is of interest to South African Banking. South African Banks are not adopting Lean and/or Six-sigma to the point where it is going to make any sort of significant difference to the bottom line over a significantly meaningful period of time. So where are they going wrong? Often it comes down to key issues that are not addressed effectively as part of the deployment. This research will provide recommendations on what to address to ensure effective deployment and what potential sources of benefits banks can truly achieve.*

Keywords *– Continuous improvement, Lean manufacturing, Six-sigma*

Paper type *– Research paper*

The authors

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Introduction

Increasing competitive pressure from global markets and technology developments has resulted in continual demand for business improvement philosophies and methodologies in operations management to address these challenges. (McAdam & Hazlett, 2005)

Global companies such as Motorola, Toyota, General Electric and Raytheon have successfully implemented each of these methodologies. "However, these successful implementations were not without some difficulty. Subsequent implementations of Lean and Six-sigma have benefited from the literature and experiences produced by these pioneering companies." (O' Rouke, 2005).

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

Utilisation of Lean and/or Six-sigma is a recent continuous improvement strategy in South African Banks and this provides a fresh area for research. The aim of this research is to identify the critical success criteria or factors for successful Lean and/or Six-sigma implementations in South African Banks. A secondary objective is to identify the sources of benefits that South African Banks are achieving by utilising these continuous improvement mechanisms.

Delimitations of this study: This study focuses on two continuous improvement methodologies – Lean and Six-sigma when used in combination or independently. It focuses on the deployment and implementation phases only. This study focuses on the Banking Industry in South Africa only and only 2 of the Top 4 South African banks that implemented Lean and/or Six-sigma have participated in the study.

The research questions/problems to be addressed are:

- What are the critical success factors for Lean and/or Six-sigma implementations in South African Banking?
- How do South African Banks prioritise these critical success factors?
- How do South African Banks that are already on the Lean and/or Six-sigma journey perform against these critical success factors?
- What are the gaps between the importances of the critical success factors versus the banks actual performance against these, and how is this gap impacting on the benefits that the banks are experiencing?
- What sources of benefits are South African Banks experiencing?
- Can generic guidelines be provided to the South African Banks for successful Lean and/or Six-sigma implementation?

Literature review

Lean Thinking

In the 1980's a new, tightly integrated, form of work organisation called lean manufacturing became common as a result of Japanese philosophy and

influence. Based on a just-in-time approach in which buffer stocks were removed and suppliers were expected to supply parts on demand. It greatly increased efficiency and speed of production (Mumford, 1999). "Lean can be a major strategic initiative focused on major cost efficiencies managed from the top of the business, or it can evolve in smaller discrete initiatives lower down the organisation." (Atkinson, 2004)

According to Atkinson, managers can be literally overwhelmed by the sheer range and scale of information available on Lean and may be discouraged by the information available on Lean strategies and methodologies.

Lean is an incredible opportunity for improvement in most service organisations. Estimates are that more that 40% of staff operating costs are spent on wasteful activities. Hence this is a major benefit to service organisations as the majority of the costs in this type of organisation are attributed to staff costs.

In summary, Atkinson (2004) considers the following 4-step approach to work well: selling and communicating the Lean Philosophy, senior management commitment, design of projects and selling the benefits of Lean thinking.

Six-sigma

Six-sigma is a management philosophy that attempts to improve customer satisfaction to near perfection. A Six-sigma company has a little more than three bad customer experiences for every million opportunities. Six-sigma is for most organisations a major change from how they typically managed their business. Movement towards managing with fact and data and aggressively

pursuing greater efficiencies and effectiveness is a dramatic change. Six-sigma focuses on identifying, quantifying and driving out errors in business processes. Change, even the positive change associated with Six-sigma, will be resisted (Eckes, 2001).

Six-sigma was originally developed at Motorola in the 1980's for production processes. However, today service firms – and service functions within almost every sector – are using Six-sigma methods to boost performance (Biolus, 2002).

Not all companies are achieving the same benefits as Motorola and GE did are still achieving. Fewer than 10% of the companies doing it to the point where it's going to significantly affect the balance sheet and the share price in any meaningful period of time (Coronado & Antony, 2002).

According to Byrne (2003), one of the biggest reasons why six-sigma initiatives fail is that company's lack strong and visionary leadership. Another key reason for failure is that it is not seen as an entirely new way of working which relies on the collection and analysis of data and the use of numerous statistical tools for correcting defects – it is not a quick fix and results do not follow very quickly.

Six-sigma is attractive to services due to its customer-driven methodology. The benefits that six-sigma has experienced in manufacturing should be

translatable to services organisations. Services organisations have scrap and waste just like manufacturing. (Hensley and Dobie, 2005)

Coronado & Antony (2002), define the following critical success factors for successful Six-sigma project implementations: Management involvement and commitment, cultural change, Communication, organisational structure, training, linking Six-sigma to business strategy, linking Six-sigma to customer, linking Six-sigma to human resources, linking Six-sigma to suppliers, understanding tools and techniques within Six-sigma, project management skills and project prioritisation and selection.

Lean Six-sigma (Lean and Six-sigma)

The concept of Six-sigma has been combined with Lean Thinking to create a complimentary methodology, called Lean and Six-sigma, utilising the strengths of both approaches. George (2002) defines Lean and Six-sigma as a methodology that maximises shareholder value by achieving the fastest rate of improvement in customer satisfaction, cost, quality, process speed, and invested capital. The fusion of Lean and/or Six-sigma is required because:

- Lean cannot bring a process under statistical control
- Six-sigma alone cannot dramatically improve process speed or reduce invested capital

The principle of Lean and Six-sigma is the activities that cause customer's critical-to-quality issues and create the longest time delays in any process offer the greatest opportunity for improvement in cost, quality, capital, and lead time" (George, 2002: 4).

""In a system that combines two philosophies, Lean creates the standard and Six-sigma investigates and resolves any variation from the standard" (Breyfogle, 2001). A leading Six-sigma advocate, Michael George from the George Group, states that the purpose of Lean and/or Six-sigma is twofold. First, "to transform the CEO's overall business strategy from vision to reality by the execution of appropriate projects," and second, "to create new operational capabilities that will expand the CEO's range of strategy choices going forward"." (O' Rouke, 2005).

According to IBM (2006), the following are the 10 critical success factors for sustainable success for Lean Sigma implementations: Committed leadership, customer focus, strategic alignment of projects, business process management, systematic approach to change, benefits realisation and tracking, performance management, capabilities - learning and knowledge, deployment management and full time resources.

Summary of the Literature Survey

In summary, the Top 20 potential critical success factors, for Lean and/or Six-sigma Implementations in South African Banking are:

- Position as a cultural change driver
- There must be a shared vision and shared goals
- Senior leadership commitment and involvement
- Process management focus
- Must be positioned in the spirit of "continuous improvement"

- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques
- Training - motivation and education of people
- Measuring and monitoring progress
- Change management specialist expertise
- Financial resources must be available over a considerable period of time
- People resources must be available over a considerable period of time
- Employee empowerment
- Teamwork
- Performance management and reward systems
- Genuine focus on customer needs is key
- The business strategy must be infused with the continuous improvement strategy
- Project management skills
- Project prioritisation and selection
- The new structure created by the continuous improvement initiative should be standardised

In summary, the potential sources of benefits realised during Lean and/or Six-sigma implementations in South African Banking are:

- Reduced cycle time to delivery
- Improved quality
- Reduced waste
- Increased productivity
- Improved customer service

- Increased focus on customer needs
- Increased revenues
- Reduced costs
- Improved staff morale
- Improved interdepartmental connectedness
- Continuous improvement culture
- Improved flexibility
- Improved speed and responsiveness
- Improved competitive advantage
- Robust and stable processes
- Improved management of business risk
- Improved predictability of service delivery
- Improved innovation

The research methodology

The method used to conduct the research was quantitative in nature. Collecting data by means of a survey questionnaire was used. The parameters for the research are outlined in the research propositions. The survey detail is attached in the Appendix.

The first step was to conduct an exploratory study on the topic as similar studies have been done in other industries across the world. The ultimate objective was be to coalesce all the key ingredients from the existing literature

on Lean and/or Six-sigma implementations by analysing the success and failure stories of a number of organisations.

This research sought to identify which key issues should be addressed to successfully manage or eliminate the barriers and challenges of implementing Lean and/or Six-sigma continuous improvement initiatives.

This study utilised judgement sampling to identify the respondents to the survey. Judgement sampling is also called purposive sampling. Judgement sampling is where an experienced individual selects the sample on his or her judgement about some appropriate sample characteristics required by the sample unit.

Only South African banking organisations were selected that have or are implementing Lean and/or Six-sigma. The people selected were based on the researcher's familiarity with the organisations and its people. Consultants that are involved in the Lean and/or Six-sigma deployments were also targeted.

The sample selection was based on the following process.
Two large South African Retail banks were specifically selected where Lean and/or Six-sigma deployments have taken place. The researcher has worked in these banking organisations so access to people and information was easy and direct contact was be made by email or telephone. The people involved in the deployment were targeted to complete the survey questionnaire.

People in all capacities were targeted: employees, project leaders – Six Sigma Yellow/Green/Black Belts, Lean Value Stream Managers/Coaches, project team members, senior management, line management, external consultants, change management specialists, human resource consultants and process users.

Sample size was determined due to the limited time and budget available. 100 surveys were sent out (50 surveys to each bank). 57 responses were received (28 from one about 29 from the second bank).

Statistical tests were done on the data received from the survey results. Descriptive statistics tests were conducted in particular descriptive percent statistics, overall descriptive statistics and central tendency statistics. Inferential statistics tests were conducted in particular Cronbach Alpha Test, Anova Tests, z-Tests and Chi-square Tests.

Results and analysis of results

Questionnaire reliability

The Cronbach coefficient alpha was produced for the overall questionnaire. The coefficient of reliability was significantly high (0.925), thus indicating a high level of reliability. The Cronbach coefficient alpha was produced for the importance factors. The coefficient of reliability was high (0.836) thus indicating a high level of reliability. The Cronbach coefficient alpha was produced for the Performance Factors. The coefficient was significantly high (0.940), thus indicating a high level of internal consistency. The Cronbach

coefficient alpha was produced for the Sources of benefits factors. The coefficient was significantly high (0.949), thus indicating a high level of internal consistency.

The demographics of the research

Table 1 Responses from the banks

Bank	Frequency	Valid Percent
Bank A	28	49.1
Bank B	29	50.9
TOTAL	**57**	**100**

Bank A and Bank B were almost equally represented. A key objective of the study was to ensure that both banks were equally represented.

All stakeholders, except human resources were represented. The view of the change management specialist compensates for the lack of a human resources response as the change management specialist represents the "people change" element of the implementation. Employees, project leaders, senior management and line management were the critical stakeholders and were well represented. Process users will form part of the employee grouping so this low number was not a problem.

The following table gives of view of the improvement approaches that were applied at both these banks in the different areas of the banks.

Table 2 Improvement approach applied

Improvement approach	Frequency	Valid Percent
Lean only	19	33.3
Six-sigma only	4	7.0
Lean and Six-sigma	34	59.6
TOTAL	57	100

The objective of the research was to give generic guidelines on the critical success factors for Lean and/or Six-sigma in the banking industry. All combinations of the improvement approaches have received valid responses. Lean and Six-sigma combination received 59.6% of the responses. Hence it will be possible to give generic guidelines to the banks, provided that there are no major variances with regards to the perceptions among these groupings.

Results of Proposition 1

P1: The above factors defined under the literature review are the critical success factors for the effective implementation of Lean and/or Six-sigma in South African Banks.

The following table reveals the results of the research for Proposition 1.

Table 3 Respondent's perceptions of the importance of the critical success factors

Potential critical success factors	Not/ Little importance %	Average importance %	Important %	Very important %	Average perception	Ranking [1 to 20]
Position as a cultural change driver	3.5	12.3	33.3	50.9	Important	12
There must be a shared vision and shared goals	0	1.8	17.5	80.7	V important	2
Senior leadership commitment and involvement	0	0	3.5	96.5	V important	1
Process management focus	1.8	7.0	47.4	43.9	Important	14
Must be positioned in the spirit of continuous improvement	1.8	5.3	42.1	50.9	Important	10
The benefits must be quantifiable and known	3.5	5.3	31.6	59.6	V Important	7
Ongoing communication – formal and informal	0	3.5	40.4	56.1	V important	8
Training – motivation and education of people	0	5.3	40.4	54.4	Important	9
Measuring and monitoring progress	0	3.5	31.6	64.9	V important	4
Change management specialist expertise	1.8	19.3	40.4	38.6	Important	16
Finance resources must be available over a considerable amount of time	3.5	17.5	49.1	29.8	Important	18
People resources must be available over a considerable amount of time	0	3.5	54.4	42.1	Important	15
Employee empowerment	0	17.5	50.9	31.6	Important	17
Teamwork	0	1.8	36.8	61.4	V important	6
Performance mug and reward systems	3.6	17.5	33.3	45.6	Important	13
Genuine focus on the customer	0	3.5	19.3	77.2	V important	3
The business strategy must be infused with the continuous improvement strategy	0	5.3	31.6	63.2	V important	5
Project management skills	0	15.8	59.6	24.6	Important	20
Project prioritisation and selection	0	10.5	38.6	50.9	Important	11
The new structure created by the continuous improvement initiative should be standardised	5.3	17.5	49.1	28.1	Important	19

From the results above, all the potential critical success factors have relevance to South African Banks. None of the critical success factors have been identified as "Not Important/Little Importance". 8 of the 20 potential critical success factors received an average perception by respondents as being "Very important", whilst 12 of the 20 potential critical success factors received an average perception by the respondents as being "Important".

Results of Proposition 2

P2: The above factors have an order of priority and do not have equal weighting in terms of importance.

From Table 3, the following are the critical success factors (Very important) in rank order:

- Senior leadership commitment and involvement
- There must be a shared vision and shared goals
- Genuine focus on the customer needs is key
- Measuring and monitoring progress
- The business strategy must be infused with the continuous improvement strategy
- Teamwork
- The benefits must be quantifiable and known
- Ongoing communication – both formal and informal techniques

From Table 3, the following are additional success factors (Important) in rank order:

- Training – motivation and education of people
- Must be positioned in the spirit of continuous improvement
- Project prioritisation and selection
- Position as a cultural change driver
- Performance management and reward systems
- Process management focus
- People resources must be available over a considerable period of time
- Change management specialist
- Employee empowerment
- Financial resources must be available over a considerable period of time
- The structure created by the continuous improvement initiative should be standardised
- Project management skills

Results of Proposition 3

P3: South African Banks are not performing at the optimum level in terms of ensuring that these critical success factors are effectively addressed in the implementation of Lean and/or Six-sigma implementations.

The following table reveals the results of the research.

Table 4 Respondent's perceptions of the performance of the banks against these CSF's (8 critical success factors highlighted)

Critical success factors	Poor perf %	Satisfactory perf %	Avg perf %	Good perf %	Excellent perf %	Average perceptions
Position as a cultural change driver	7.0	10.5	45.6	29.8	7.0	Average
There must be a shared vision and shared goals	10.5	8.8	47.4	31.6	1.8	Average
Senior leadership commitment and involvement	10.5	7.0	38.6	26.3	17.5	Average
Process management focus	7.0	8.8	24.6	52.6	7.0	Average
Must be positioned in the spirit of continuous improvement	10.5	10.5	40.4	31.6	7.0	Average
The benefits must be quantifiable and known	7.0	17.5	19.3	43.9	12.3	Average
Ongoing communication – formal and informal	10.5	17.5	33.3	29.8	8.8	Average
Training – motivation and education of people	8.8	12.3	33.3	31.6	14.0	Average
Measuring and monitoring progress	3.5	24.6	33.3	31.6	7.0	Average
Change management specialist expertise	14.0	21.1	29.8	31.6	3.5	Average
Finance resources must be available over a considerable amount of time	19.3	24.6	43.9	7.0	5.3	Average
People resources must be available over a considerable amount of time	24.6	12.3	45.6	15.8	1.8	Average
Employee empowerment	12.3	19.3	35.1	28.1	5.3	Average
Teamwork	8.8	14.0	38.6	31.6	7.0	Average
Performance management and reward systems	26.3	24.6	31.6	15.8	1.8	Satisfactory
Genuine focus on the customer	8.8	24.6	21.1	35.1	10.5	Average
The business strategy must be infused with the continuous improvement strategy	8.8	24.6	26.3	31.6	8.8	Average
Project management skills	3.5	24.6	31.6	38.6	1.8	Average
Project prioritisation and selection	14.0	17.5	33.3	28.1	7.0	Average
The new structure created by the continuous improvement initiative should be standardised	15.8	21.1	33.3	26.3	3.5	Average

From Table 4, Excellent Performance is low for all the success factors. The respondents average perceptions of the performance of the banks against

these potential critical success factors, is that the banks are performing on an "average performance" against all the success factors. Hence, proposition 3 is valid.

Results of Proposition 4

P4: Significant differences exist between what stakeholders believe are the critical success factors and the banks actual performance against these and this is reducing the benefits promised.

The following results were used to establish if there are significant differences in:

- The performance of the banks against the critical success factors (means of the perceptions calculated)
- The average (mean) of the perceptions of the benefits achieved (expectations met + expectations exceeded)

Table 5 below shows the means of the banks actual performance against the CSF's.

Table 5 Banks performance against the critical success factors

Critical success factors	Performance of the banks
Senior leadership commitment and involvement	Average
There must be a shared vision and shared goals	Average
Genuine focus on the customer needs is key	Average
Measuring and monitoring progress	Average
The business strategy must be infused with the continuous improvement strategy	Average
Teamwork	Average
The benefits must be quantifiable and known	Average
Ongoing communication – both formal and informal techniques	Average

From the results above, significant difference exists against the performance of the critical success factors. The perception of the percentage of benefits "met and exceeded" is only 57.6% (see Table 6. below). 42.3% of respondents believed that the benefits are not being met fully. Hence proposition 4 is valid – the optimum benefits is not being realised and this has a link to the ineffective implementation of the CSF's as Proposition 3 is valid also.

Results of Proposition 5

P5: The Lean and/or Six-sigma initiatives are successful and the type of benefits listed below is being experienced by South African Banks.

Only 8.8% of the respondents believed that the initiative was a total success whilst 63.2% believed that there were many areas of success and 28.1% believed that there were some areas of success. None of the respondents believed that the initiatives were a total failure.

Table 6 below gives a view of what respondents believe are the benefits that the banks are actually achieving.

Table 6. Respondent's perceptions of the sources of benefits that banks are achieving

Sources of benefits	Did not meet expectations %	Partially met expectations %	Met expectations %	Exceeded expectations %	Met + exceeded %	Average perceptions %
Reduced cycle time to delivery	7.0	21.1	36.8	33.3	69.6	Met expect…
Improved quality	7.0	21.1	43.9	24.6	68.5	Met expect…
Reduced waste	7.0	17.5	42.1	31.6	73.7	Met expect…
Improved productivity	10.5	19.3	38.6	28.1	61.4	Met expect…
Improved customer service	7.0	33.3	33.3	22.8	56.1	Met expect…
Increased focus on customer needs	8.8	29.8	31.6	28.1	59.7	Met expect…
Increased revenues	17.5	33.3	26.3	14.0	40.3	Met expect…
Reduced costs	12.3	22.8	35.1	24.6	59.7	Met expect…
Improved staff morale	7.0	31.6	36.8	19.3	56.1	Met expect…
Improved interdepartmental connectedness	12.3	29.8	29.8	22.8	52.6	Met expect…
Continuous improvement culture	7.0	40.4	31.6	15.8	47.4	Met expect…
Improved flexibility	10.5	33.3	40.4	8.8	49.2	Met expect…
Improved speed and responsiveness	7.0	26.3	43.9	21.1	65.0	Met expect…
Improved competitive advantage	7.0	35.1	36.8	17.5	54.3	Met expect…
Robust and stable processes	8.8	24.6	49.1	14.0	63.1	Met expect…
Improved management of business risk	7.0	35.1	35.1	14.0	49.1	Met expect…
Improved predictability of service delivery	8.8	29.8	40.4	17.5	57.9	Met expect…
Improved innovation	7.0	35.1	35.1	19.3	54.4	Met expect…

The respondent's average perceptions are that the banks met the benefits expectations. The range for every benefit source is 4, which reveals that the

respondents have expressed varied of opinions. Between 40.3% and 73.3% of the respondents perceived that the performance against these sources of benefits are either being "met" or "exceeded". An average of 57.6% of respondents perceived that the performances against these benefits are being "met" or "exceeded". There is huge room for improvement to ensure that the benefits are fully realised.

Results of Proposition 6

P6: There are no major differences between banks in terms of the critical success factors and sources of benefits. There are no major differences among the opinion of the different stakeholders. There are no major differences based on the improvement approach used (Lean only, Six-sigma only or combination of Lean and Six-sigma)

Table 7 below shows the results of different banks opinions of the critical success factors.

Table 7 Different Banks vs. Importance of Critical Success Factors (Anova-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.980	No significant difference in opinions
There must be a shared vision and shared goals	0.605	No significant difference in opinions
Genuine focus on the customer needs is key	0.229	No significant difference in opinions
Measuring and monitoring performance	0.928	No significant difference in opinions
The business strategy must be infused with the continuous improvement strategy	0.155	No significant difference in opinions
Teamwork	0.521	No significant difference in opinions
The benefits must be quantifiable and known	0.663	No significant difference in opinions
Ongoing communication – both formal and informal techniques	0.904	No significant difference in opinions

Another interesting finding is that there is statistically no significant difference in opinions between the two banks with regard to all the success factors except for the following two:

- Financial resources must be available over a considerable period of time
- People resources must be available over a considerable period of time.

Table 8 below shows different banks opinions of the sources of benefits.

Table 8 Different Banks vs. Sources of benefits (Anova-test result)

Critical success factors	p-value	Result
Reduced cycle time to delivery	0.893	No significant difference in opinions
Improved quality	0.049	There is significant difference in opinions
Reduced waste	0.996	No significant difference in opinions
Improved productivity	0.893	No significant difference in opinions
Improved customer service	0.062	No significant difference in opinions
Increased focus on customer needs	0.368	No significant difference in opinions
Increased revenues	0.417	No significant difference in opinions
Reduced costs	0.270	No significant difference in opinions
Improved staff morale	0.088	No significant difference in opinions
Improved interdepartmental connectedness	0.980	No significant difference in opinions
Continuous improvement culture	0.574	No significant difference in opinions
Improved flexibility	0.829	No significant difference in opinions
Improved speed and responsiveness	0.647	No significant difference in opinions
Improved competitive advantage	0.155	No significant difference in opinions
Robust and stable processes	0.976	No significant difference in opinions
Improved management of business risk	0.117	No significant difference in opinions
Improved predictability of service delivery	0.325	No significant difference in opinions
Improved innovation	0.124	No significant difference in opinions

Table 9 below shows the impact of the nature of the improvement approach on the importance of the critical success factors.

Table 9 Nature of improvement approach vs. Importance of Critical Success Factors (z-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.673	No significant difference in opinions
There must be a shared vision and shared goals	0.250	No significant difference in opinions
Genuine focus on the customer needs is key	0.760	No significant difference in opinions
Measuring and monitoring performance	0.457	No significant difference in opinions
The business strategy must be infused with the continuous improvement strategy	0.991	No significant difference in opinions
Teamwork	0.759	No significant difference in opinions
The benefits must be quantifiable and known	0.341	No significant difference in opinions
Ongoing communication – both formal and informal techniques	0.294	No significant difference in opinions

Table 10 below shows the impact of the nature of the improvement approach on the sources of benefits.

Table 10 Nature of improvement approach vs. Sources of benefits (z-test result)

Critical success factors	**p-value**	**Result**
Reduced cycle time to delivery	0.375	No significant difference in opinions
Improved quality	0.508	No significant difference in opinions
Reduced waste	0.424	No significant difference in opinions
Improved productivity	0.555	No significant difference in opinions
Improved customer service	0.258	No significant difference in opinions
Increased focus on customer needs	0.699	No significant difference in opinions
Increased revenues	0.633	No significant difference in opinions
Reduced costs	0.369	No significant difference in opinions
Improved staff morale	0.244	No significant difference in opinions
Improved interdepartmental connectedness	0.796	No significant difference in opinions
Continuous improvement culture	0.376	No significant difference in opinions
Improved flexibility	0.612	No significant difference in opinions
Improved speed and responsiveness	0.867	No significant difference in opinions
Improved competitive advantage	0.225	No significant difference in opinions
Robust and stable processes	0.736	No significant difference in opinions
Improved management of business risk	0.471	No significant difference in opinions
Improved predictability of service delivery	0.459	No significant difference in opinions
Improved innovation	0.448	No significant difference in opinions

The table below shows the difference in opinions based on the different roles (capacities) of the stakeholders against the critical success factors.

Table 11 Capacity of respondent vs. Importance of Critical Success Factors (Chi-square-test result)

Critical success factors	p-value	Result
Senior leadership commitment and involvement	0.932	No significant difference in opinions.
There must be a shared vision and shared goals	0.380	No significant difference in opinions.
Genuine focus on the customer needs is key	0.190	No significant difference in opinions.
Measuring and monitoring process	0.988	No significant difference in opinions.
The business strategy must be infused with the continuous improvement strategy	0.549	No significant difference in opinions.
Teamwork	0.507	No significant difference in opinions.
The benefits must be quantifiable and known	0.859	No significant difference in opinions.
Ongoing communication – both formal and informal techniques	0.416	No significant difference in opinions.

Table 12 below shows the difference in opinions based on the different roles (capacities) of the stakeholders against the sources of the benefits.

Table 12 Capacity of respondent vs. Sources of benefits (Chi-square-test result)

Critical success factors	p-value	Result
Reduced cycle time to delivery	0.335	No significant difference in opinions
Improved quality	0.475	No significant difference in opinions
Reduced waste	0.230	No significant difference in opinions
Improved productivity	0.574	No significant difference in opinions
Improved customer service	0.097	No significant difference in opinions
Increased focus on customer needs	0.148	No significant difference in opinions
Increased revenues	0.254	No significant difference in opinions
Reduced costs	0.310	No significant difference in opinions
Improved staff morale	0.111	No significant difference in opinions
Improved interdepartmental connectedness	0.179	No significant difference in opinions
Continuous improvement culture	0.469	No significant difference in opinions
Improved flexibility	0.335	No significant difference in opinions
Improved speed and responsiveness	0.249	No significant difference in opinions
Improved competitive advantage	0.425	No significant difference in opinions
Robust and stable processes	0.167	No significant difference in opinions
Improved management of business risk	0.844	No significant difference in opinions
Improved predictability of service delivery	0.031	There is a significant difference in opinions
Improved innovation	0.386	No significant difference in opinions

Hence, Proposition 6 is valid except for benefit types “improved quality” and “improved predictability of service offering. These two sources of benefits will be excluded from the list of potential sources of benefits.

Conclusions

South African Banks are not adopting Lean and/or Six-sigma to the point where it is going to make any sort of significant difference to the bottom line over a significantly meaningful period of time. So where are they going wrong? Often it comes down to key issues that are not addressed effectively as part of the deployment.

The research objectives have been met and the research questions/problems have been addressed and the following are generic guidelines to banks venturing on the Lean and/or Six-sigma journey.

Mission Critical success factors (CSF's) - "The idea of identifying CSF's as a basis for determining the information needs of managers was popularised by Rockart (1979). CSF's are those factors which are critical to the success of any organisation, in the sense that, if objectives associated with the factors are not achieved, the organisation will fail – perhaps catastrophically so. (Rochart, 1979). In the context of Lean and/or Six-sigma project implementation; CSF's represent the essential ingredients without which a project stands little chance of success." (Banuelas & Antony, 2002)..

The following are the 8 mission critical success factors that are essential for the effective implementation of Lean and/or Six-sigma implementations in South African Banks in order of priority:

9. **Senior leadership commitment and involvement** - The ongoing support of senior leadership is the most important factor. From the literature, it is evident that behind most of the major success stories is a very supportive and committed CEO. Senior leadership must take a visible and authoritative stance on the continuous improvement journey. The leaders must own the business transformation and show commitment throughout.
10. **There must be a shared vision and shared goals** – The executive team must agree the programme vision and rollout of the improvement strategy. Once this has been defined, the executive team must agree the net

earnings, growth and customer satisfaction that the strategy must deliver in the next 5 years

11. **Genuine focus on the customer needs is key** – these initiatives should begin and end with the customer. At the heart of operational excellence is the identification of the customer and key stakeholders needs. If these are not clear at the beginning, it is difficult to set objectives and monitor improvements
12. **Measuring and monitoring progress** - Typically, organisations embarking on an operational excellence journey that build three to four year route maps that show in detail how they expect each of the critical success factors to develop, and what measures will be used to track progress and take corrective action
13. **The business strategy must be infused with the continuous improvement strategy** – the Lean and/or Six-sigma initiative cannot be treated as a stand-alone activity. This will create huge confusion in the organisation. The initiative must be positioned to have a direct impact on financial and operational goals
14. **Teamwor*k*** - it is critical that the programme is delivered via teamwork and should have sufficient resources. The value of teamwork formed by cross-functional teams will launch a sense of ownership, better communication, better team working value and the overall view of the organisation. Each functional department must be represented on each of the projects
15. **The benefits must be quantifiable and known** – a key measure of success is the delivery of tangible benefits. Over the years improvement initiatives have promised a lot, but often delivered little. Consequently any Lean

and/or Six-sigma programme a company implements should be designed to pay its way. The delivery of benefits needs to be integrated throughout the project lifecycle. Tracking and reporting benefits in detail will help keep the project focused

16. **Ongoing communication – both formal and informal techniques** – a communication plan is an integral part to ensuring the involvement of all stakeholders. The communication of the Lean and/or Six-sigma initiative is a major part of the implementation strategy. Several communication methods can be used – email, forums, intranet, meetings and newsletters are some of the informal techniques. More formal techniques should include the annual strategic plan, interactive leadership workshops and a widely distributed deployment guideline document

There are 14 other success factors as well that should be incorporated into the program deployment in South African Banking. The additional important success factors have the following order of priority ranking: training - motivation and education of people; must be positioned in the spirit of continuous improvement; project prioritisation and selection; position as a cultural change driver; performance management and reward systems; process management focus; people resources must be available over a considerable amount of time; change management specialist expertise; employee empowerment; finance resources must be available over a considerable amount of time; the new structure created by the continuous improvement initiative should be standardised; and, project management skills.

There is a huge performance gap within South African Banks with regards to implementing the critical success factors to ensure effective implementation of Lean and/or Six-sigma implementations. There is evidence that this is impacting negatively on the benefits being achieved. The optimum benefits are not being achieved. By ensuring effective implementation of the critical success factors, South African Banks will achieve optimum benefits (qualitative and quantitative). A recommendation is that another study investigates "What are the practical ways to implement these critical success factors to ensure that they are adequately ingrained in the organisation and are effectively deployed in order to achieve maximum benefits?"

The sources of benefits that are applicable to South African Banks in order of highest benefits to lowest benefits that are currently being achieved by South African banks are as follows:

- Reduced waste
- Reduced cycle time to delivery
- Improved speed an responsiveness
- Robust and stable processes
- Improved productivity
- Increased focus on customer needs
- Reduced costs
- Improved customer service
- Improved staff morale
- Improved innovation

- Improved competitive advantage
- Improved interdepartmental connectedness
- Improved flexibility
- Improved management of business risk
- Continuous improvement culture
- Increased revenues

These benefits are actually not being optimally achieved within South African Banks. The achievement of these benefits is pretty low and is at an average level of 57%. The Top 5 benefits defined above are all being achieved at a level between 61% and 74%. If the critical success factors are effectively implemented within South African Banks, this will positively impact on the banks profitability and service experience and will maximise on the value of the benefits being realised.

Some limitations of the study:

This research was conducted with some boundaries such as the number of banks involved, availability of respondents, time available, areas of industry, and more. This study was carried out in the Financial Services Sector – Banking only. This study is based on only 2 of the Top 4 South African Banks. The survey questionnaire did not allow for much qualitative explanation of the selections made. Case Study research can be conducted in the different banks to obtain richer information.

Implications of the research

Lean and/or Six-sigma has been considered as a strategic approach to improve business profitability and achieve operational excellence through the effective application of these improvement initiatives. It is claimed and demonstrated that Lean and/or Six-sigma provides competitive advantages to companies that implement them.

This research study has successfully managed to provide generic guidelines to the South African Banking industry for successful deployment of Lean and/or Six-sigma implementations. If these are successfully implemented then the benefits defined could be reaped. This needs to be tested within the banking industry. The bank that manages to get this right will potentially have a huge competitive advantage within South African borders and outside. This will enable South African banks to compete successfully, internationally. This could bring huge profitability growth to South African banks and the country as a whole.

The mission critical success factors could be applicable in other industries as well in order to reap the benefits defined. This will need to be tested in other sectors. This could bring huge growth to the South African economy.

There have been debates in the Banking sector that Lean is very different to Six-sigma and key critical success factors for implementation are vastly different. This research has proven that the mission critical success factors are the same for successful implementation. These improvement approaches

fall under the umbrella of business process improvement or continuous improvement and should potentially be introduced under this umbrella. This will ensure that the programme is kept flexible to manoeuvre between the two improvement approaches as and when required.

This is research conclusions is quite key in enabling the development of an effective business case for Lean and/or Six-sigma deployments. The mission critical key success factors should be built within the business case and costed accordingly to ensure that the programme is effectively set up for success. The potential sources of the benefits have been defined and this will enable a pretty quick "sizing exercise". Developing a business case for business process improvement has always been a challenge in the Banking industry as it is such a new philosophy.

The study has also revealed that the there is also a level of criticality of these mission critical success factors. Some of the managerial implications of this are as follows:

Senior leadership commitment and involvement – the study suggests that the most important factor for successful Lean and/or Six-sigma implementation is senior leadership commitment and involvement. Successful implementations are not possible without a concerted effort from the senior leadership in the organisation aimed at encouraging continuous improvement and involvement among the people in the organisation. These aspects of leadership are well demonstrated in companies such as GE and Allied Signal who have been successful with these deployments.

There must be a shared vision and shared goals – This is absolutely key and should be defined at the outset of the programme and should be communicated continuously by top leadership so as to ensure unity of purpose.

Genuine focus on the customer's needs is key – The literature suggests that one of the most important criteria to ensure success of the deployment is to ensure that there is a link to the customer needs. The programme should start and end with the customer and the leadership need to encourage this and ensure that all projects adhere to this. Identifying the customer needs, requirements and expectations is key.

Measuring and monitoring progress - Top leadership must follow up on the progress of a selected project and ensure that there is visibility of the projects progress and to ensure that obstacles are removed from the projects path. This will ensure success.

The business strategy must be infused with the continuous improvement strategy – the leadership must ensure that there is a well thought out plan for the deployment. The program needs to be implemented strategically and must be infused with the business strategy in order to ensure success. The programme must not be treated as another stand-alone activity. Top management needs to be absolutely clear as to how the Continuous improvement strategy and other business strategies are linked to each other.

Teamwork – top management must ensure that the programme is adequately resourced and that there is a spirit of teamwork among all team members to ensure that the objectives of the programme are realised.

The benefits must be quantifiable and known – Top management must set expectations for results and demand that the results from the efforts of the programme are achieved.

Ongoing communication – both formal and informal – communicating the details of the Lean and Six Sigma initiative is a major part of the implementation. The goals and the principles of the initiative should be communicated via both formal and informal mechanisms. Interactive leadership workshops are imperative and top management must be deeply involved in ensuring that the strategic messages are stated clearly from "their voices".

Recommendations for future research

- Further research can be done to delve deeper into finding out what the actual expectations of the respondents were for the success of the Lean and/or Six-sigma initiative and the reasons they believe that they were not met
- What are the practical ways to implement these critical success factors to ensure that they are adequately ingrained in the organisation and are effectively deployed in order to achieve maximum benefits?
- Test the actual benefits that bank are experiencing using a case study approach and define the business case for change
- Different industries within the Services Sectors in South Africa can be involved to define the critical success factors and benefits to be realised for various South African Industries within the Services Sectors

- What would the impact of Lean and/or Six-sigma be on an organisations performance? Surveys or semi-structured interviews could be undertaken to obtain more tangible insights on the actual benefits that the banks would be realising that actually contribute to their bottom line
- How to measure the alignment of the organisational culture with Lean and/or Six-sigma principles? Lean and/or Six-sigma implementations are greatly influenced by an organisations culture, values and traditions. It would be of great value to investigate this aspect further
- An explorative study that extracts the reasoning for the gap that exists between performance and importance factors will allow organisations to understand the issues of under-performance

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Appendix: Survey Questionnaire

SURVEY QUESTIONNAIRE

What are the critical success factors for Lean and Six Sigma implementations in South African Banks?

BY

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A research report presented to the Graduate School of Business Leadership at the University of South Africa, in partial fulfilment of the requirements for the MASTERS DEGREE IN BUSINESS LEADERSHIP

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Increasing competitive pressure from global markets and technology developments has resulted in continual demand for business improvement philosophies and methodologies in operations management to address these challenges. (McAdam & Hazlett, 2005). Throughout history the role of continuous improvement within organisations has changed, evolved and matured.

Process excellence is achieved through radically improving processes efficiency and effectiveness. Both reduction in process costs and simplification of the processes themselves are key elements to achieving process excellence. This in turn leads to organisational benefits – decrease in costs, increase in revenues and greater customer satisfaction.

Although most organisations want to improve quality and reduce costs, the deployment and implementation of continuous improvement methodologies is commonly viewed as a daunting journey. Many organisations fail to properly structure and/or support continuous improvement initiatives, which ultimately doom them to failure.

All of the success stories are predominantly in Europe and the US. South African banks can leverage off these key learning's to enable successful implementations. There have been some partial successes and failures and lessons learnt through these journeys. Even though many authors and leaders/experts/specialists in continuous process improvement have advocated the success factors at various places in literature, very little attempt has been made to validate them by empirical research.

The objective of this research project is to determine the critical success factors for the effective implementation of Lean and/or Six Sigma in South African banks.

If you have worked in the field of Lean and/or Six Sigma in a South African bank, please answer the following questions.

Please take note of the following:

- The name of your organisation will be kept confidential. It will be referred to as Bank A or Bank B or Bank C within the research report and within any publications
- Your name will also be kept confidential. Your role in general will be referred to within any research report or within any publications e.g. External Consultant, Senior management, Employee

The survey comprises of 6 sections and should take you 20 to 30 minutes to complete:

7) Personal information
8) Background information
9) Rate the importance of the critical success factors
10) Rate the bank's actual performance against these critical success factors
11) Rate the actual benefits of the initiative
12) Provide any general qualitative comments

SECTION 1: PERSONAL INFORMATION

Personal details:

Full name:

Name of current company:

Job title in current company:

Name of bank that questionnaire will be completed on:

Job title at bank:

SECTION 2: BACKGROUND INFORMATION

6) In what capacity were you employed:
   a) Employee
   b) Project leader – Six Sigma Yellow/Green/Black Belt, Lean Value Stream Manager/Coach
   c) Project team member
   d) Senior management
   e) Management
   f) External consultant
   g) Change management specialist
   h) Human resource consultant
   i) Process user
   j) Other please specify_____

7) Did you understand the reasons for the Lean and or Six Sigma initiative?
   a) Yes
   b) No

8) What improvement approach was applied within the particular initiative?
   a) Lean only
   b) Six sigma only
   c) Lean and Six sigma
9) Do you think that this initiative was an overall success?
   a) Yes
   b) No

10) How would you rate the level of success the initiative?
   a) Total failure
   b) Some success
   c) Many areas were successful
   d) Total success

SECTION 3: RATE THE IMPORTANCE OF CRITICAL SUCCESS FACTORS FROM YOUR POINT OF VIEW

An exploratory study on the topic was conducted as similar studies have been done in other industries across the world. The ultimate objective was to collate all the key ingredients from the existing literature on Lean and Six Sigma implementations by analysing the success and failure stories of a number of organisations. The end result is a list of critical success factors for Lean-Six Sigma implementations that are applicable to the banking industry.

It is important to understand the importance of each of these critical success factors.

Please can you rate the following critical success factors in terms of your perceptions on how important you believe they are for successful lean and six sigma implementations?

Scale to be used: (Allow a column for any comments)

F. Not important

G. Little importance

H. Average importance

I. Important

J. Very important

Critical success factors to rate:

21. Position as a cultural change driver
22. There must be a shared vision and shared goals
23. Senior leadership commitment and involvement
24. Process management focus
25. Must be positioned in the spirit of “continuous improvement”
26. The benefits must be quantifiable and known
27. Ongoing communication – both formal and informal techniques
28. Training - motivation and education of people
29. Measuring and monitoring progress
30. Change management specialist expertise
31. Financial resources must be available over a considerable period of time

32. People resources must be available over a considerable period of time
33. Employee empowerment
34. Teamwork
35. Performance management and reward systems
36. Genuine focus on customer needs is key
37. The business strategy must be infused with the continuous improvement strategy
38. Project management skills
39. Project prioritisation and selection
40. The new structure created by the continuous improvement initiative should be standardised

SECTION 4: RATE BANK'S ACTUAL PERFORMANCE AGAINST THESE CRITICAL SUCCESS FACTORS

It is important to understand how your organisation (bank) performance against each of these critical success factors.

Please can you rate the following critical success factors in terms of your perceptions on how your organisation (bank) performed against them?

Scale to be used: (allow a column for any comments)

F. Poor performance
G. Satisfactory performance

H. Average performance

I. Good performance

J. Excellent performance

Critical success factors to rate:

21) Position as a cultural change driver

22) There must be a shared vision and shared goals

23) Senior leadership commitment and involvement

24) Process management focus

25) Must be positioned in the spirit of “continuous improvement”

26) The benefits must be quantifiable and known

27) Ongoing communication – both formal and informal techniques

28) Training - motivation and education of people

29) Measuring and monitoring progress

30) Change management specialist expertise

31) Financial resources must be available over a considerable period of time

32) People resources must be available over a considerable period of time

33) Employee empowerment

34) Teamwork

35) Performance management and reward systems

36) Genuine focus on customer needs is key

37) The business strategy must be infused with the continuous improvement strategy

38) Project management skills

39) Project prioritisation and selection

40) The new structure created by the continuous improvement initiative should be standardised

SECTION 5: RATE ACTUAL BENEFITS OF THE INITIATIVE

Please rate the overall success of the initiative by rating how the initiative performance against each of the following sources of benefits.

Scale to be used: (add column for any comments)

F. Did not meet expectations

G. Partially met expectations

H. Met expectations

I. Exceeded expectations

J. Not applicable

Sources of benefits to rate:

17. Reduced cycle time to delivery
18. Improved quality
19. Reduced waste
20. Increased productivity
21. Improved customer service
22. Increased focus on customer needs
23. Increased revenues
24. Reduced costs

25. Improved staff morale
26. Improved interdepartmental connectedness
27. Continuous improvement culture
28. Improved flexibility
29. Improved speed and responsiveness
30. Improved competitive advantage
31. Robust and stable processes
32. Improved management of business risk
33. Improved predictability of service delivery
34. Improved innovation