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Continuous Improvement Strategies Used by Selected Investment Companies within the Financial Services in South Africa

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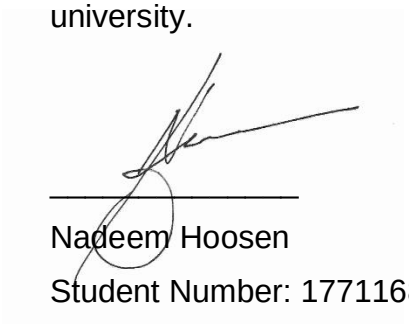
A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Science in Engineering (ECA04-MECN7018A).

Ethics Clearance Number: MIAEC 124/18

Johannesburg 2020

DECLARATION OF ORIGINAL WORK

I declare that this research report represents my original work, except where I have acknowledged ideas, statements or material of other authors which has been cited accordingly. Furthermore, I have obtained the necessary authorisation to carry out this research. It is being submitted to the Degree of Master of Science – Engineering Management to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other university.



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28 September 2020

ABSTRACT

Continuous improvement (CI) has become fundamental to the success of companies in the global marketplace in order to improve and stay ahead. Factors that lead to success are imperative when embarking on a CI strategy. The objective of this research project is to determine the CI factors that lead to success in CI strategy in selected South African investment companies by conducting an exploratory study. The approach to the study was to employ quantitative research methods to test the hypothesis. Surveys with five-point Likert scales were used in the study to gather information from participants on CI strategies and successes within their organisations. The data were analysed using factor analysis, linear regression and multiple regression.

The results of this study showed that not all factors are significant regarding the success of Continuous Improvement Strategies. Following the statistical analysis of the data only two of the factors tested were significant and could explain the variation in improvement, namely Workforce and Organisational Change. The factor that was not significant was Quality Management. The findings in this research can inform companies in the sector on what they could focus on in terms of their CI strategies to ensure a greater chance of success.

Keywords

Continuous improvement, workforce, staff engagement, quality management systems, organisational setup, change management, investment companies.

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ABBREVIATIONS / ACRONYMS

ANOVA – Analysis of Variance
CA – Change Agents
CI – Continuous Improvement
COM – Communication
CRQ: Critical Research Question
CSF – Critical Success Factors
DMAIC – Define Measure Analyse Improve and Control
ED – Employee Development
FC – Failure Classifier
EFA – Explanatory Factor Analysis
FMEA – Failure Mode and Effect Analysis
KMO – Kaiser-Meyer-Olkin
MC – Management Commitment
PCA – Principal Component Analysis
ROI – Return on Investment
TOC – Theory of Constraints
TQM – Total Quality Management
VIF – Variance Inflation Factor

1. RESEARCH CONTEXT

1.1. Background

Continuous improvement (CI) has become fundamental to the success of companies in the global marketplace (Lodgaard, et al., 2016). Companies that compete in global markets need to improve to stay ahead (Terziovski, 2002). Leading companies that fail to grow are not likely to remain on top. Furthermore, customer needs are not static and are continuously changing (Koc, 2011). Innovation today becomes routine tomorrow, and the only way a company can compete in the modern marketplace is to improve continually (Goetsch & Davis, 2016). Continuous improvement methodologies have evolved from a manufacturing focus into hybrid models that focus on all aspects of an organisation giving them a wide range of benefits as a result from constant change (Bhuiyan, et al., 2006).

Innovation is one of the aspects that drives continuous improvements and can lead to radical change in competitive markets (Terziovski, 2002). Through innovation, technological advancements and changing customer expectations, performance can improve over time (see figure 1). This is caused by reducing the range of performance and allow stakeholders to align their performances (Bereskie, et al., 2017).

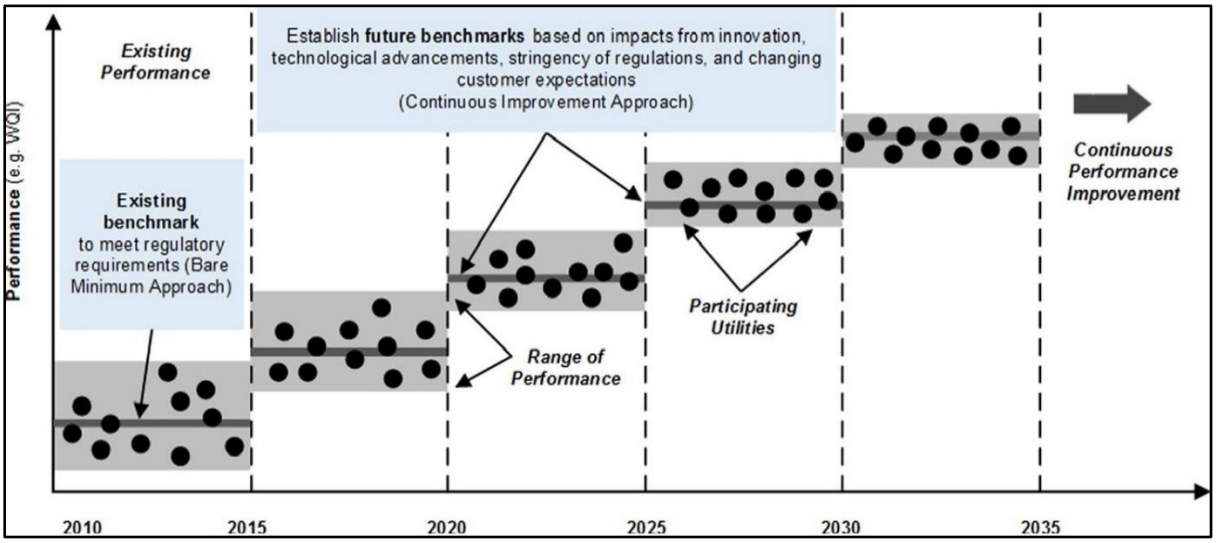


Figure 1: Continuous performance improvement framework

Source: Bereskie, et al., (2017)

Continuous improvement strategies are therefore an essential factor for the success of companies. This research project is an exploratory investigation that seeks to identify the strategic ongoing improvement factors at selected South African investment companies that have led to success. Success, in this context, is defined as either an improvement in customer satisfaction, efficiencies or an improvement in profitability.

1.2. Problem Statement

Various CI strategies exist, and each strategy leads to a varied set of outcomes. Knowing which CI strategy to implement is key to the success of the strategy.

CI is necessary for an organisation to adapt and maintain or achieve market leadership. CI is also an important strategic tool to increase competitiveness in organisations (Marin-Garcia, et al., 2008). Without continuous improvement or continuous change, organisations stagnate and either lose or never attain market leadership. Various continuous improvement methodologies such as Kaizen and Six Sigma (Gonzalez-Aleu, et al., 2018) have been implemented in organisations to achieve market leadership. Knowledge of the success factors of CI is important

as it informs the correct strategic tools to implement when embarking on a continuous improvement strategy.

Milner and Savage (2016) have highlighted the need to peruse the identification of specific success factors, barriers and characteristics indicators of CI. An alternative approach to finding continuous improvement success factors is to look at some of the barriers to success which was outlined by Lodgaard et al., (2016), which identified four perceived barriers to CI namely (1) Management; (2) Organising for CI; (3) CI method and (4) Knowledge (see appendix 8.1).

Research conducted by Oprime, et al., (2011) suggests that previous studies on continuous improvement had not identified the critical success factors of CI and more analysis was required.

Moreover continuous improvement studies are centred on manufacturing sectors (Bhuiyan, et al., 2006). A literature review done by Sanchez and Blanco (2014) on continuous improvement over the past thirty years revealed that of all the topics researched only 4% of papers were on continuous improvement factors. Furthermore, 48% of empirical articles were in the service sector; however, most articles were in the health subsector (see appendix 8.2). The overall analysis observed that only 21% of empirical papers were written in the service sector excluding health. The author's review of the existing literature for continuous improvement in the financial services sector yielded limited results noting that research in this sector is meagre. There is therefore a gap within the literature in this area that this study seeks to address.

1.3. Aim of the Research

The aim of this research project is to conduct an exploratory study by investigating the factors that lead to continuous improvement successes at selected South African investment companies.

1.4. Research Questions and Hypothesises

Critical Research Question (CRQ):

What are the key continuous improvement factors for effective continuous improvement strategies in selected South African investment companies?

- **Null hypothesis (H_0):** No significant factors exist that drive continuous improvement strategies.
- **Alternate hypothesis (H_1):** Significant factors exist that drive continuous improvement strategies.

1.5. Research Objectives

Following the aim of the study, objectives that guide the investigation in exploring the contributing factors to continuous improvement successes at selected South African investment companies can be outlined as follows:

1. To determine the continuous improvement factors in selected South African investment companies.
2. To determine the critical success factors for continuous improvement strategy in selected South African investment companies.

2. LITERATURE REVIEW

This literature review provides an in-depth analysis of the published literature related to CI strategies. The theoretical framework derived from the published literature provided the reference point to derive critical research questions and hypotheses for this study.

2.1. Continuous Improvement

Continuous improvement (CI) dates to the 1800s, where employees were encouraged to continuously improve by management via various incentives. In the late 1800s and early 1900s, CI evolved as more scientific methods were developed (Bhuiyan & Baghel, 2005). During World War II, the Americans developed service training to improve national industrial output (Robinson, 1990). These included various techniques that now form the basis of modern CI. After the war, experts like Deming (1986) exported the programmes to Japan. Japan enhanced the concepts and developed their own quality programs. These were initially used in manufacturing and then finally evolved into a management tool for CI across organisations (Imai, 1986).

The definition of Continuous Improvement (CI) was initially started by Deming (1982) to implement CI in systems of production and service. Continuous improvement literature has evolved and the definition has been adapted to various sectors or studies. Michela, et al., (2006) defined continuous improvement as a set of activities to achieve performance improvements. Samson and Terziovski (1999) focussed their CI studies on the elimination of waste in manufacturing. The scope of research extended beyond the original focus in manufacturing to include the service industries with Orlay (1993) focussing on simplification and improved customer service by employee enablement.

The concept of CI, as defined by Japanese principles, involves *kaizen* (continuous improvement in Japanese) whereby a set of problem-solving tools are used to continuously create small improvements (Terziovski, 2002). CI is defined more

generally by Bhuiyan and Baghel (2005) as a culture of sustained development and the elimination of waste. A common thread from the literature reviewed, is that CI is a continuous process implemented by organisations to constantly improve and is a core part of the organisation.

2.2. Critical Success Factors for CI

Gonzalez-Aleu and Van Aken (2016) reviewed 98 publications to create a list of critical success factors (CSF) for CI. Their research showed a list of 53 factors which were extracted from the various papers. However, further analysis is required on the information obtained as the study does not highlight which of the 53 factors identified are the most critical.

Investigating CSF further Gonzalez-Aleu, et al., (2018) looked into CSF in hospitals and found that 47 out of the 53 CSF identified by Gonzalez-Aleu and Van Aken (2016) were very important to the success of CI in hospitals. Success was measured by achieving initial results, or sustaining their findings, in the respective continuous improvement projects. It was also found that there were essential differences to CSF in hospitals relative to prior research. Moreover, the type of CI program chosen affected the level of importance of the CSF. Therefore, the CSF selected as a measure is affected by the CI program used. Further research into CI programs and CSF was recommended. This research will evaluate if similar findings by Gonzalez-Aleu, et al., (2018) are applicable to investment companies in South Africa.

Research conducted by Nguyen and Robinson (2015) looked at CSF in Vietnam, an emerging market, and set to investigate the factors leading to the effectiveness of CI within the country's manufacturing industries. The findings revealed that the following five factors supported CI programs. Top management commitment (MC) to the CI program; Management development (MD); Participation of change agents (CA); Employee development (ED) and Communication (COM). Similarly, the results of research conducted by Mazur et al., (2012) into factors of Kaizen noted important success factors are the teams' commitment to change, managements

understanding of CI and the organisations investment into building a CI knowledge base.

The limitation of Nguyen and Robinson's (2015) research is that only five factors out of a range of possible factors were tested. Nevertheless the research of Nguyen and Robinson (2015) has a link to Gonzalez-Aleu et al., (2018) in that the factors identified in the study feature in the top 20 factors of Gonzelez-Aleu et al., (2018). This research will determine if the factors are relevant to the financial service industry.

Similar to Nguyen and Robinson (2015), Stelson, et al., (2017) investigated the drivers for CI in the healthcare service industry. Success was defined as the CI project's ability to address project success and sustainability. To analyse the CI projects the research team used the following tools; Kaizen event research, project success factor theory, research on project outcome sustainability and cultural change. Their findings were that managerial and employee factors have an impact on the success of a CI project. The three success factors identified were, managerial support, communication and affective commitment. These factors are of interest to be tested in this research project.

The framework developed by Jevgeni et al., (2015) encompassed various tools and methods used in CI. They included Six Sigma; Define Measure Analyse Improve and Control (DMAIC); Failure Mode and Effect Analysis (FMEA); Theory of Constraints (TOC); and Failure Classifier (FC), which were developed within a swim-line diagram (see figure 2 below). This study will improve this framework by incorporating significant factors that enhance CI within the South African investment industry.

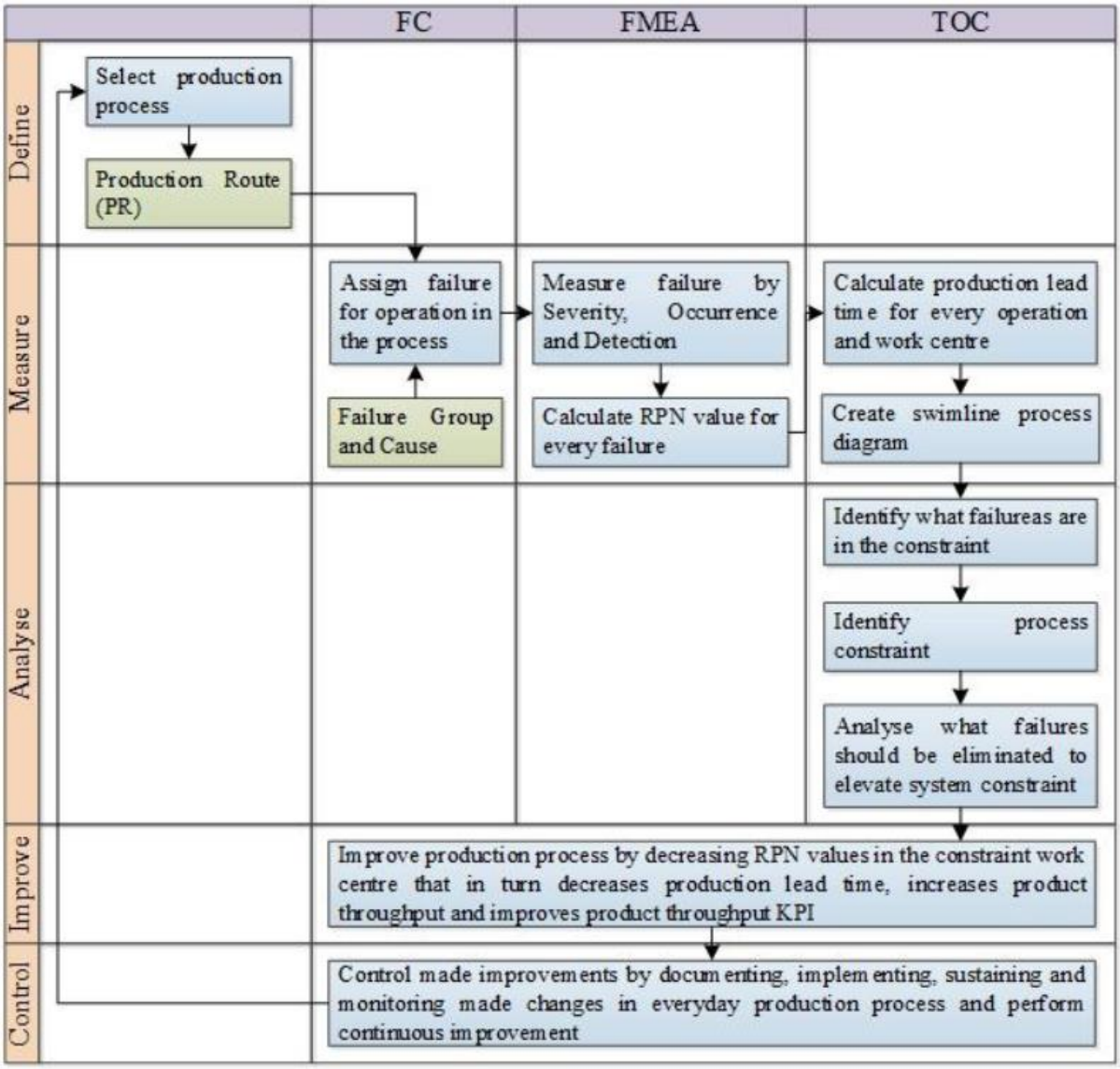


Figure 2: Framework for CI of product throughput KPI

Source: Jevgeni, et al., (2015)

García, et al., (2014) studied the human critical success factors and found that management commitment, education and training are key for successful Kaizen (CI) implementations. The success was measured as an improvement in three variables namely process, workers and customers. Jabnoun (2001) focussed on the human elements of CI by investigating values that underlie CI. He found that success of CI strategies are dependent on shared organisational values and these values lead to an improvement in customer satisfaction.

Various authors have found different factors regarding continuous improvement strategies and methodologies. A summary of the factors determined in reviewing

the literature is given in table 1 below arranged in terms of number of times encountered.

Table 1*: *Summary of factors found in the literature reviewed

	Factors from literature review											
Source	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Lodgaard et al., (2015)	1			1	1	1	1					
Oprime et al., (2011)	1	1						1		1	1	
Bessant et al., (1994)	1		1									
Imai (1986)	1											
Alvarado et al., (2018)			1									
Yokozawa et al., (2013)			1									
Singh and Singh (2013)			1									
Liker and Morgan (2006)				1								
Nonaka and Takeuchi (1995)				1								
Smadi (2009)	1											
Marin-Garcia et al., (2008)	1	1										
Berger (1997)	1											
Suárez-Barraza and Miguel-Davila (2011)		1										
Gaplin (1997)									1			
Nguyen Robinson (2015)	1	1			1			1				1
Gonzalez-Aleu et al., (2018)	1	1	1	1	1	1	1		1			
Total Occurrences	**9**	**5**	**5**	**4**	**3**	**2**	**2**	**2**	**2**	**1**	**1**	**1**

Key for the factors above:

A - Commitment from management/stakeholders

B - Staff training, motivation, development and commitment

C - Quality Management Systems & Tools

D - Organisational (involvement, teamwork, motivation, structure)

E - Participation of change agents/champions

F - CI method used

G - Knowledge (availability, sharing)

H - Incentive systems

I - Measurement Systems & data

J - Incentive suggestions

K - Communication

L - Management development

From table 1, the five most common factors are firstly commitment from management or stakeholders. Secondly, staff engagement which includes training, motivation, development and commitment. Thirdly, quality management systems

and tools used. Fourthly, organisational setup covering involvement, teamwork, motivation and structure. And finally, participation of change agents and change champions.

2.3. Continuous Improvement Strategies

Continuous improvement strategies (CIS) are the recognised methods of using incremental improvements to reduce waste. Most of the manufacturing industries are responding to changing customer needs and need to implement these strategies to stay competitive (Singh & Singh, 2013).

Singh and Singh (2013) reviewed the existing literature and researched the various CI strategies utilised by manufacturing firms. Their findings showed that CI strategies formed part of an effective manufacturing approach and that the strategies are widespread in nature within manufacturing. They also found that CI strategies can be implemented in different sectors, thereby paving the way for further research in other areas. The findings showed that successful CI strategies encompass factors like a CI culture, management commitment and awareness of the CI strategy among employees. These findings established the same basis with the conclusions in the research by Garcia, et al., (2013) and Nguyen and Robinson (2015) mentioned earlier. However, the results were untested within the financial service industry. This research focuses on constructs that supported this paradigm and build on the narrative created by García et al., (2014) as well as Nguyen and Robinson (2015).

Failure factors with respect to CI strategies also need to be considered. McLean, et al., (2017), set out to investigate why so many CI projects fail. They noted a gap in the literature whereby most of the focus in research is on success as opposed to failure factors. They also explored a degree of themes that are attributable to failed CI strategies and identified these as: motives and expectations; culture and environment; management leadership; implementation approach; training; project management; employee involvement levels; and feedback and results.

Interestingly the themes or factors associated with failed CI strategies are also noted as success factors in research papers. Thereby pointing to the case that further investigation is needed on the factors that lead to success and the consequential failure of CI strategies in organisations. Gandhi et al., (2000) investigated obstacles in CI and noted that members' time constraints, general lack of resource support, poor incentive structures and disempowered team leadership were the main impediments to success. Similar to McLean, et al., (2017) these constrains can be success factors if they are given focus as part of a CI strategy. A case study done by Lodgaard et al., (2016) that focussed on the barriers to CI success found these to be organisational and managerial. Similarly, these are also highlighted as success factors, as noted in table 1. This research report focussed on success factors however, it was anticipated that some similarities between success and failure factors could exist.

The success of CI strategies varies depending on the strategy chosen (Gonzalez-Aleu and Van Aken, 2016). Oprime et al., (2011) developed a conceptual model which showed six success outcome indicators. These were productivity increase (efficiency), quality improvement (customer satisfaction), lead time reduction (efficiency and profitability), cost reduction (profitability), customer satisfaction increases and employee ability development (efficiency).

In terms of measures of success Garcia et al., (2013) put emphasis on operational performance (efficiency) for better workers and customer satisfaction. The benefits noted by Garcia et al., (2013) are centred around efficiencies for an improved performance for the company, improved customer response and faster new product introductions. It can be deduced that these improvements ultimately improve the profitability of the company. Bhuiyan and Baghel (2005) defined CI as the elimination of waste in all systems and processes of an organisation. This definition can also be interpreted as CI leading to improved efficiencies in an organisation. It can be further inferred that an organisation implementing CI will seek to improve overall profitability.

Heavey et al., (2013) developed a framework for continuous improvement with the goal of increases return on investment (ROI). Their framework improves customer value from a CI strategy leading to an improvement on returns on investment. They link CI strategies to a financial outcome.

Research in the healthcare industry (Stelson, 2017) showed success was based on outcomes that improved service quality and patient outcomes. This is could further be supportive in improving customer experience. Gonzalez-Aleu (2018) conducted research on success factors in hospitals. The performance outcome in the research was focussed on advancements due to CI programs and this was noted as improvements in patient's satisfaction, staff engagement and profitability.

CI is forms part of the Total Quality Management (TQM) field and is a strategy that is implemented widely in manufacturing companies (Lillrank et al., 2001). However, it was found that not all TQM strategies create the expected benefits within organisations as there are significant improvements in the short term, but it is the continuous improvement element of the TQM that did not materialise (Choi & Behling, 1997; Grant et al., 1994; Spector & Beer, 1994). Lillrank et al., (2001) explored the CI aspect of TQM and set design principles for CI in industrial companies as they have found failures in TQM strategies due to the CI implementation shortcomings. CI is therefore an important aspect of TQM and a failure of CI can lead to a failure or partial success of a TQM strategy.

Dale (1996) investigated the definition of sustaining TQM and identified key features of TQM. He found that an important aspect of a TQM strategy is sustaining improvements whereby CI becomes the ongoing process once the initial TQM strategy is implemented thereby CI being an important strategic tool of success.

Sterman et al., (1997) suggested a link between the implementation of TQM methods and financial performance. Their findings were that improving quality had a positive impact on financial performance in the long run. The inference of their work to CI is that a goal of improvement programs is ultimately to increase profitability.

Chonga and Rundus (2004) found that companies with high TQM implementation displayed high levels of profitability performance. In later studies (Koc, 2011) on TQM, researchers found a link between improved product quality and financial performance. This supports the findings of Sterman et al., (1997), whereby improvement of quality is linked to financial performance.

2.4. Organisational Culture and Strategy

Dale (1996) found that organisational culture and style of management plays an important role in the success of CI strategy. Culture although not explicit in many strategies is vital to the success of the strategy. Malhi (2013) researched the elements of a quality organisation and given that in a quality organisation the aim is to continuously improve to meet customer needs, it is instructive that Malhi (2013) noted that the culture of an organisation enables attainment of strategic goals. Schein (2004) wrote on organisational culture and leadership, noted that leaders should be aware of the organisation's culture and operationalise it implying that culture should form part of the strategy. These concepts are supported by Habtoor (2014) who found that human factors positively improved organisational performance.

2.5. Conclusion to the literature review

The literature review identified which factors featured prominently in CI (see table 1). These five factors are, firstly, commitment from management and stakeholders, secondly, staff engagement, thirdly, quality management systems and tools used, fourthly, organisational setup and finally participation of change agents and change champions.

These factors were the basis for consideration against outcome indicators (success measures), also discussed in the literature review. It was noted that success measures vary according to the continuous improvement project that is initiated. However, the overall project success is measured against the desired

outcomes that the project aims to achieve. The goal of the CI programs was to generally improve the performance of the organisation. Leading performance outcome indicators were highlighted as customer satisfaction, profitability and efficiency.

Success is determined if one or more of the outcome indicators show an expected improvement within the project (Oprime, et al., 2011; García et al., 2014; Stelson, et al., 2017; Gonzalez-Aleu, et al., 2018). The study followed the same approach in determining success. The research tested whether the CI factors impact one or more of the outcome indicators.

3. RESEARCH METHODS

3.1. Research Philosophy

The research philosophy applied a positivism outlook whereby a scientific method was applied to be able to predict and explain the various relationships between the variables, being tested. The biggest criticism raised against a positivistic method, is the fact that context will be removed in the pursuit of gaining a more quantifying result in the process.

3.2. Research Design

A quantitative research method was chosen for this research project. Quantitative methods are ideal as they test the relationship between two variables, namely the independent and dependent; or an outcome variable within a population. A quantitative method can be applied to large samples and is therefore beneficial to obtaining results that form a statistically significant sample of the total population being tested. It is therefore, a suitable methodology for this study (Swanson & Holton, 2005; Zikmund, 2003).

The research in this report was executed in various phases. Initially a literature review was conducted to establish the factors leading to CI success. These factors were used as the variables to conduct the research. A questionnaire was then designed using the factors. Targeted companies were surveyed, and data collected. Finally, statistical analysis of the data collected was done. The diagram below summarises the process followed.

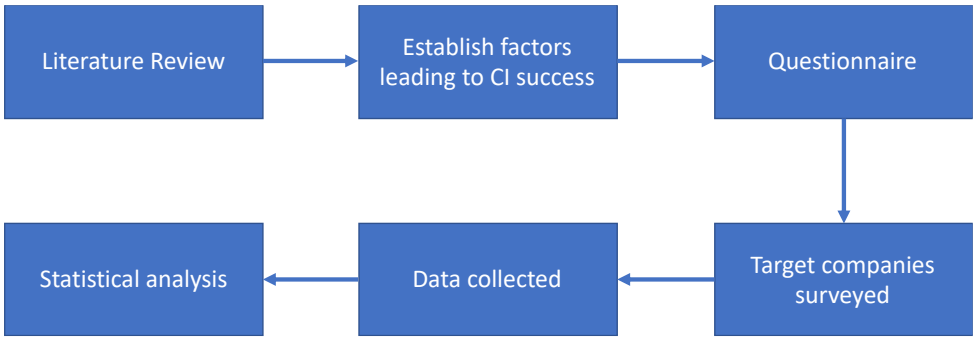


Figure 3: Research Process

A survey was designed to ask each participant the same questions in the same format. Responses were recorded consistently and was used to obtain the desired information. A five-point Likert scale was used to determine a favourable or unfavourable attitude towards the given subject that the respondent is asked to reply to. Surveys are a cost-efficient tool that can be used to collect data from several participants (Saunders & Lewis, 2012).

3.3. Sampling and population

The focus of the research is an exploratory study using selected South African investment companies. These are companies that provide investment related services to retail or institutional clients and are based in South Africa. They are commonly referred to Asset Management Companies and mostly deal with unit trusts and retirement funds. The list of companies in this sector are publicly available and listed on the Financial Sector Conduct Authority (FSCA) website. The concentration of these companies was in Cape Town and Johannesburg. These companies can be subsidiaries of larger forms like banks or insurance companies. The companies were approached via the client relationship team with the request to disseminate the survey to at least five people within the firm that has worked on CI programs across all job levels. These participants were from project teams that implement CI strategies, senior and junior managers of teams where CI strategies have been implemented and line staff that are affected by the implementation of CI strategies. The data were collected over a two-month period from 16 January 2019 to 15 March 2019.

Research on factor analysis has suggested that smaller sample sizes are adequate for factor analysis. MacCallum, et al., (1999) showed that when commonalities are high (greater than 0.6) and if each factor is defined by several items, sample sizes can be relatively small. Williams, et al., (2010) conclude that there is a great deal of variation in the sample size required for factor analysis. Mundfrom, et al., (2005) found that minimum sample sizes vary between 75 to 100 in their analysis of sample sizes for factor analysis. Therefore, for this study a sample size of a minimum 100 or more is chosen as this will result in statistically significant quantitative analysis.

3.4. Instrumentation

Questionnaires were sent out via email and responses were tracked electronically. Telephonic and email follow-ups were done where no responses are received. For the research to be statistically significant it is expected that at least 100 responses be received before proceeding with analysis. According to MacCallum et al., (1999), utilising a Monte Carlo study of sample size effects, an *N:p* ratio (sample size to number of variables) needs to be a minimum of 10:1 if a high communality level is to be maintained. Therefore, to conduct a factor analysis a sample size of at least 100 respondents are required (Hair, et al., 1998).

A self-completion questionnaire was chosen so that it could be completed in the absence of the interviewer and remove any source of potential bias in the responses (Hussain, et al. 2018). A five-point Likert scale was chosen for the questionnaire as this allows for the outputs to be used in statistical analysis. Furthermore, the reliability of the questionnaire can be tested using a Cronbach Alpha analysis (Gliem & Gliem, 2003).

The questionnaire was designed into sections the aimed to gather information on the demographics of the respondent, the importance of the factors being tested and the outcome indicators as listed below. As part of the questionnaire there was

an explanatory section whereby the concepts were defined in order to assist the respondent with answering the questionnaire.

The following factors of CI were tested for significance via the questionnaires, namely commitment from management and stakeholders; staff engagement; quality management systems and tools used; organisational setup; and participation of change agents and change champions.

The factors analysed in this research report were tested against outcome indicators (success measures), which are an improvement in customer satisfaction, an improvement in efficiency and an improvement in profitability.

Each factor was carefully selected, as to enhance the existing literature and to build on the significant findings found within the manufacturing sector in the literature. In each factor, statistical analysis was used to determine whether the factor is significant in the outcome of a CI program.

The study has employed a convenience sampling technique, which is a type of non-probability sampling method. This is relevant for both the companies selected as well as the respondents to the survey. The negative aspect of this method is that the results of the study can't be extrapolated into the wider population. The benefit of this method, however, is the relative convenience and economic nature of the study, considering the time and cost constraint involved (Swanson & Holton, 2005).

3.5. Data Collection and Analysis Procedures

Data were collected electronically as the survey was web-based using Survey Monkey. Statistical software (IBM SPSS) was used to collate and analyse the data. Statistical tests were performed to determine the significance of the factors.

The statistical analysis was conducted in two stages.

Stage 1:

1) Data preparation – Data were edited by removing outliers and missing data by using a Mahalanobis distance analysis (Mahalanobis, 1936; Mansolf & Reise, 2018).
2) Normality testing – Normality of the data was established by reviewing the skewness and kurtosis of the data (Cain, Zhang, & Yuan, 2017).
3) Descriptive statistics – Relevant descriptive analysis was conducted, reviewing frequency and percentages of various aspects of the demographics of the people that completed the survey.

Stage 2:

1) Exploratory Factor Analysis (EFA) – Was done by firstly conducting a Principal Component Analysis (PCA), as to determine if the data are suitable for factor analysis.
2) A Kaiser-Meyer-Olkin (KMO) analysis was done. This is to measure the sample adequacy of the data for factor analysis (appropriateness). A KMO factor output of above 0.8 is considered exemplary and acceptable to conduct an EFA study (Renault, et al., 2018).
3) Bartlett's Test of Sphericity was conducted to compare the factors in the correlation matrix (Tracey, et al., 1999). A *p*-value of less than 0.05 will be used as significant. This will indicate that the pattern is not an identity matrix which is a prerequisite for an EFA study.
4) The number of factors to analyse was determined by reviewing the Cattell's Scree plot and applying a Keiser Eigenvalue of 1 (Ledesma & Valero-Mora, 2007). Only factors with an Eigenvalue of >1 were analysed.
5) The factors were improved by orthogonal rotation (Varimax) for more precise alignment (Kaiser, 1958; Panaretos, et al., 2018). This ensured that the number of variables was reduced. Variables were identified and loaded into a specific factor. Only factors above 0.4 were acceptable to be used in the pattern matrix of the factor structure (Kaiser, 1958). This ensured convergent validity. Discriminant validity, whereby factors are considered distinct and uncorrelated,

was evaluated by reviewing the factor correlation matrix. A correlation of above 0.7 was considered as highly correlated and required the creation of a second-order latent variable to meet the discriminant validity criteria (Asuero, et al., 2006).

6) To measure the reliability of scales a Cronbach Alpha analysis was performed (Gliem & Gliem, 2003). Values of greater than 0.8 are good and those over 0.9 excellent (Gliem and Gliem, 2003). The reliability is a measure of the consistency between the item-level errors within each factor.
7) A regression model was developed on factors vs outcome indicators using linear regression and multiple regression analysis of variance (ANOVA) testing (Boduszek, 2018).

3.6. Validity and reliability of data

Factor analysis was used to determine the construct validity according to a five-point Likert scale.

A Kaiser-Meyer-Olkin (KMO) analysis (Renault, et al., 2018) was completed to measure the appropriateness of the sample adequacy of the data for factor analysis. For a worthy outcome a KMO factor output of above 0.8 needed. The KMO output for the study is 0.925, therefore, rendering the data suitable for factor analysis (see appendix 6).

To investigate the validity and reliability of the data a Cronbach Alpha analysis was used. A five-point Likert scale was used in the survey and the Cronbach Alpha analysis was used to measure the reliability of the constructs of the survey. For a good measure of reliability, output values of greater than 0.8 was used (Gliem and Gliem, 2003). All factors with output values above 0.8 were considered reliable and used in the analysis.

3.7. Ethics considerations

Since the research was conducted via a survey, ethics clearance from the University of the Witwatersrand Ethics Committee was obtained with clearance number MIAEC 124/18.

Questionnaires were sent out via email with a cover letter and link to the survey. Responses were tracked electronically and anonymously. The participants were staff at investment companies and covered senior and junior managers of teams where CI strategies have been implemented; and line staff that were affected by the implementation of CI strategies. Consent was obtained by the participant electronically as noted in the cover letter. The letter gave a brief outline of the research and contact details of the researcher and supervisor if the participant needed additional feedback or clarification (see appendix 13).

The research is a quantitative study and therefore general results are discussed based on the statistical outputs of the analysis. There is no reference to individuals or companies in the report and details of individuals or companies that participated in the study as this has not been recorded except for certain email addresses. Some participants in the survey only had their email address collected if they chose to receive a copy of the research. No other personal information was collected. All email addresses were deleted once the research was completed.

The data presented is therefore in summary format with no links to individuals or companies participating in the survey. Data were protected by saving all information on an online storage platform (OneDrive) which is password protected and access controlled.

4. RESULTS

Data were gathered via an online survey. There were 103 respondents from 293 people surveyed giving a response rate of 35.2%.

The low response rate of the survey could be an indication of a non-response bias. A non-response bias is where there could be a systematic difference between responders and non-responders. The responders to the survey were self-selected that is that the respondent had the choice to take part in the survey. A non-response bias can affect the validity on whether the results can be generalised to the population. A possible non-response bias could be whereby a potential respondent is working for an organisation that does not have a CI strategy or the potential respondent is not familiar with the CI strategy. However, this study is generally looking for participants that are familiar with CI strategies and even if there is a non-response bias the data collected from the respondents is useful. To avoid any potential bias the questionnaire was setup electronically only in a simple easy to understand format. The required responses were multiple choice (five-point Likert scale) and the survey did not take much time (less than ten minutes).

It is also useful to note that the timing of the responses can could also impact the data collected. Most of the responses of the survey were within the first few weeks of publishing the survey and a few more responses were collected after follow ups with potential respondents. Without data it is difficult to determine the reason for late responses or whether the data collected by late responders are more useful. As noted above the study is about CI strategies and whether a response is early or late may not change the overall outcome of the study. A common possibility of a late response could be that the responder does not check emails regularly or may have been very busy at the time the notification for the survey arrived. Given that no data was gathered on the timing of the response it is assumed that the value of an early responder is equal to that of a late responder.

4.1. Data preparation

The data were arranged in a numerical format from the responses in line with the five-point Likert scale. A standard deviation was calculated for each respondent's answers (excluding the demographic questions). It was found that two respondents had a standard deviation of zero and these participants gave the same answer to all questions. These two data sets were excluded at this point leaving the remaining number of responses of 101.

There were also some respondents that did not complete all the questions in the questionnaire. The following was applied to these respondents:

- The median for the question was inserted as the answer
- This was done where the missing data made up less than 10% of the respondent's answers (Tsikriktsis, 2005).

Mahalanobis distance analysis was run on the data set with a p-value < 0.001. All the responses met the criteria and therefore none of the 101 was excluded (see appendix 3).

4.1.1. Normality testing by reviewing the skewness and kurtosis

The acceptance criteria used to test skewness and kurtosis was +/-1.96 (see appendix 4). All the questions besides one met the criteria. The question that stood out was a demographic question regarding the number of years of experience and this was weighted to >10 years. This implies that the bulk of the respondents were more experienced in the industry and given the nature of the survey it is acceptable.

4.2. Demographics

Details of the demographic analysis are contained in appendix 5.

Data were collected on the experience levels of the participants. More experienced participants would have better insight into programs and strategies.

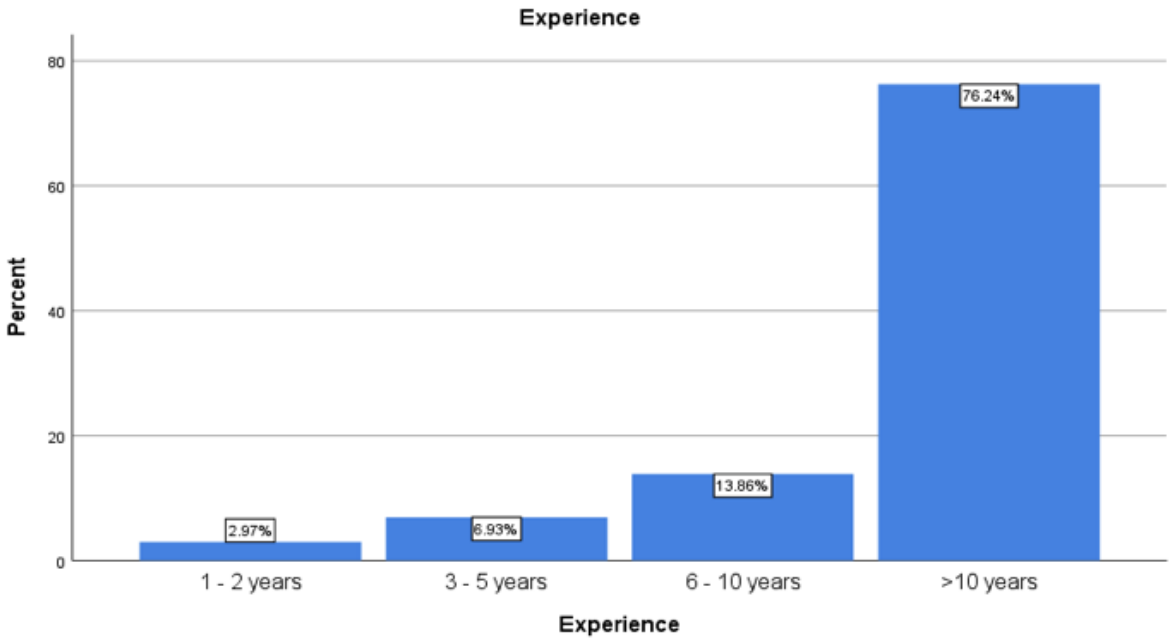


Figure 4: Demographics - Experience

The result of the experience data collected showed that 76.2% of respondents have experience of over ten years in the industry. Although this skews the experience statistics, it does not negatively affect the study as respondents with more experience could add greater insight.

The survey also looked at the employment level of the participants in the organisation. Ideally a mix of various levels in the organisation is preferred as this will give results from various perspectives within an organisation.

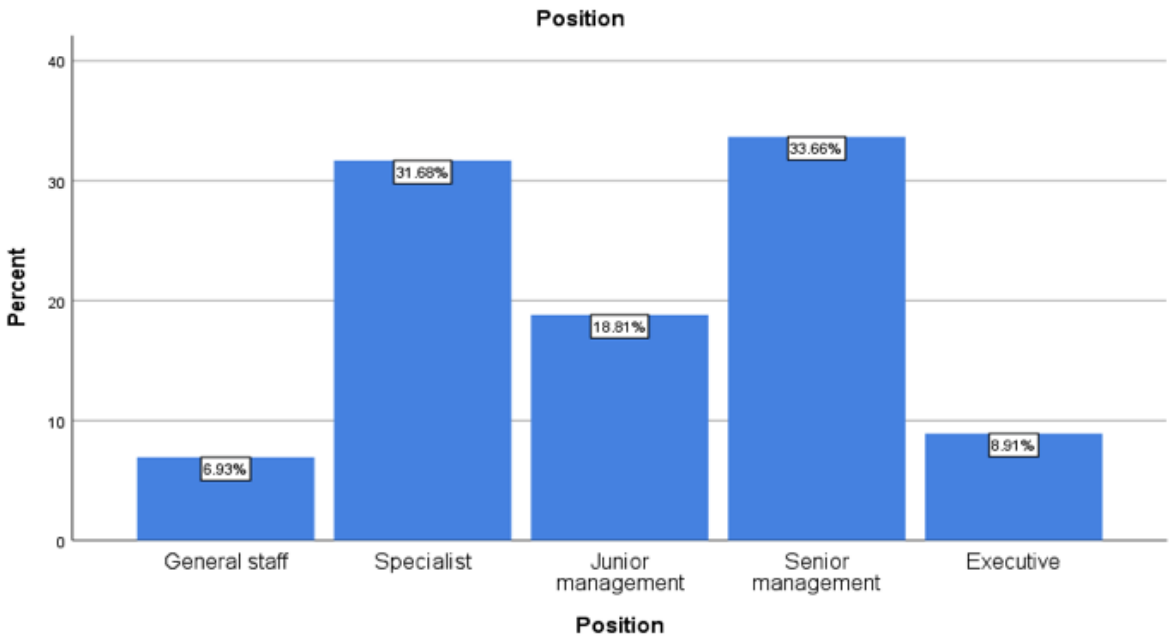


Figure 5: Demographics - Position

The positions in the organisation have a good mix of people from all levels.

The survey also looked at the size of the organisation. It is expected that different size companies would embark on different programs given the scale and budgets within an organisation.

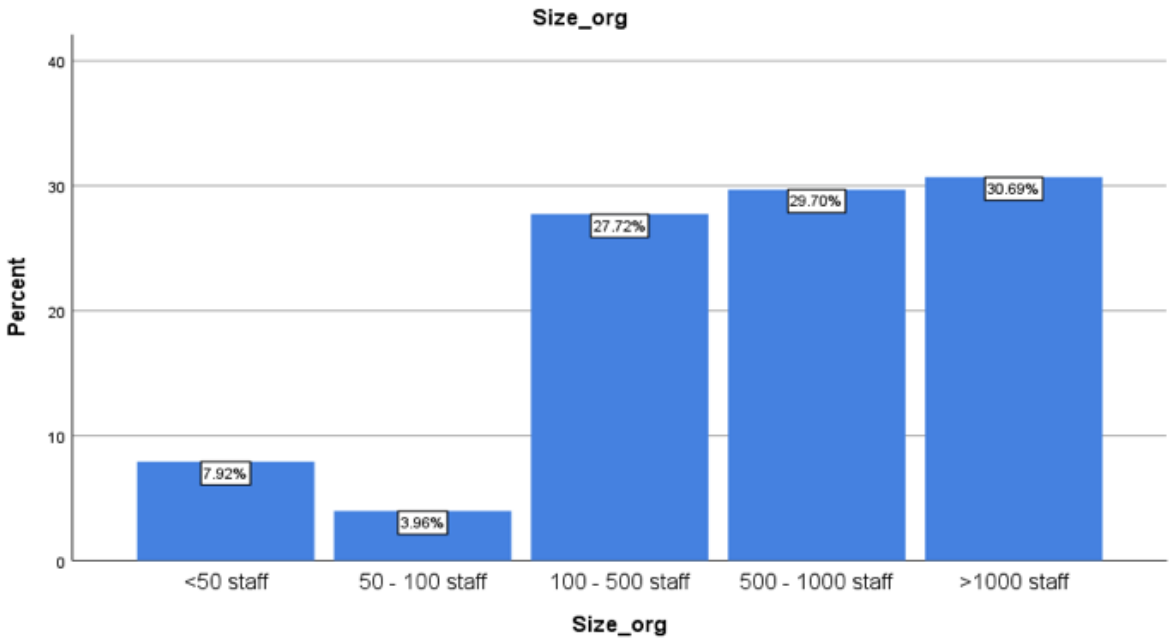


Figure 6: Demographics – Organisational Size

Most of the respondents were from organisations greater than 100 staff and therefore centred on medium to large organisations. It could be deduced that smaller companies may be less likely to have defined programs related to CI and therefore the respondents are centred around medium and large organisations.

The demographic data of the study suggest that there is a meaningful mix of respondents from various positions. The demographics also point to most of the respondents being from larger organisations and having more than ten years of experience. Larger organisations generally have more defined structures and programs hence it is expected that CI programs would be more prevalent in larger organisations. The majority of respondents having more than ten years of experience adds more value to the study as CI strategies do generally run over extended periods of time and these employees would be the best suited as respondents for the survey.

4.3. Exploratory factor analysis (EFA)

4.3.1. Kaiser-Myer-Olkin analysis

A Kaiser-Meyer-Olkin (KMO) analysis was performed to measure the sample adequacy of the data for factor analysis. For a worthy outcome a KMO factor output of above 0.8 is needed. The KMO output for the study is 0.925 (see appendix 6), therefore, rendering the data suitable for factor analysis.

4.3.2. Bartlett's test of Sphericity

To test whether the matrix is not an identity matrix Bartlett's test of Sphericity was conducted to compare the factors in the correlation matrix. The significant level for the test resulted in a p-value<0.001 (see appendix 6) making the dataset significant in terms of Bartlett's Test of Sphericity.

4.3.3. Principal component analysis

In order to interpret the output data in a meaningful way a Principal Component Analysis (PCA) was chosen to reduce the dimensionality of the data whilst preserving the variability of the data (Jolliffe & Cadima, 2016). Smaller data sets are easier to analyse and by using PCA the dataset is reduced without a significant loss of variability. To determine the number of factors to analyse a principal component analysis was run. In this test results with an Eigenvalue of >1 is considered significant. From the analysis (see appendix 7) only four components met the criteria and explained 66.986% of the variation and therefore the rest of the components are not significant for this study. The output values are plotted on the graph below.

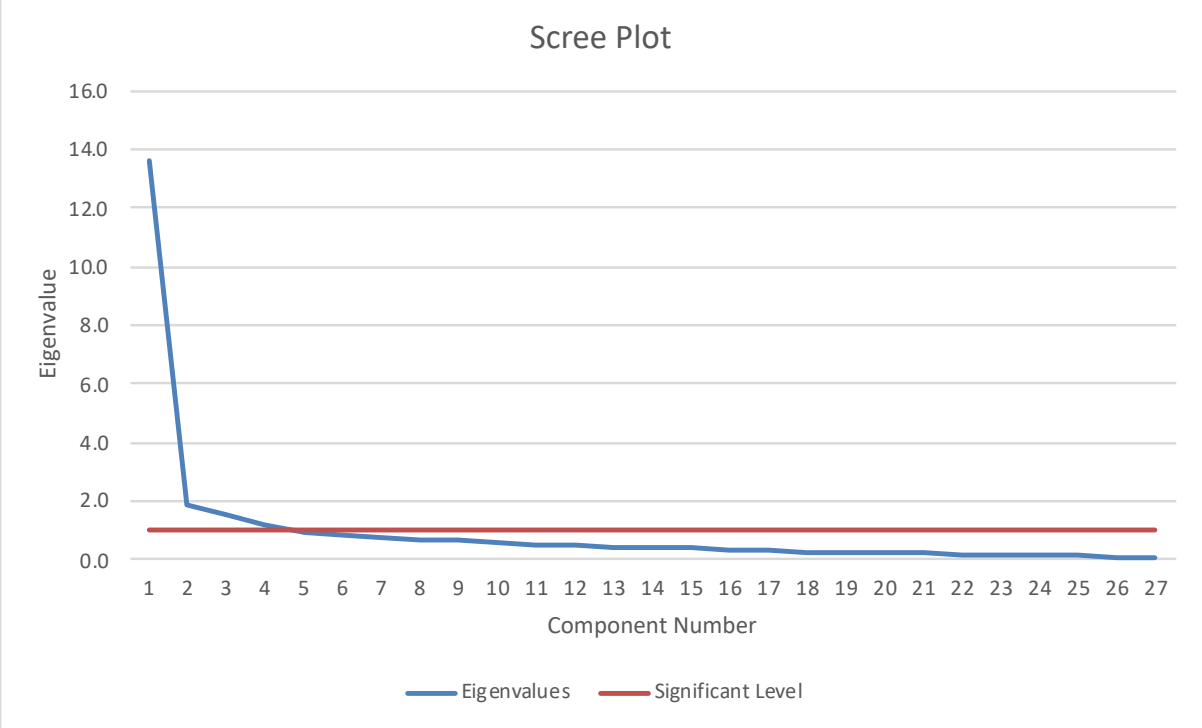


Figure 7: Scree Plot Analysis

As illustrated in figure 7, only 4 components returned an Eigenvalue of greater than 1 (the red line). This means that only 4 factors will be analysed further.

4.3.4. Orthogonal rotation (Varimax)

Orthogonal rotation (Varimax) was performed to reduce the complexity of the factor loadings and to make the data simpler to interpret by reducing the number of variables and to simplify loading of a variable to a specific factor (Osborne, 2015). Orthogonal rotation was used to ensure that the factors remain uncorrelated and easier to interpret.

For the study only factors above 0.4 were accepted for use in the pattern matrix of the factor structure to ensure convergent validity. The results are recorded in appendix 8.

The following constructs emerged from the study:

1. Questions relating to 'Management and stakeholder commitment to continuous improvement' and 'Staff engagement' clustered together. This is seen as a single factor called '**Workforce'**.
2. 'Quality management systems and tools' questions clustered together however some of the questions did not meet the significant criteria of 0.4 and were excluded. This factor is termed '**Quality Management**'.
3. 'Organisational setup' and 'Participation of change agents and change champions' questions clustered together and is grouped as a single factor going forward called '**Organisational Change**'.
4. Questions relating the success factors relating to customer satisfaction, efficiency and profitability clustered together. This is labelled as a single factor going forward call '**Successes**.'

4.3.5. Correlation matrix

A correlation matrix to ensure factors are considered distinct and uncorrelated was performed (see appendix 9). A correlation value of above 0.7 is considered highly correlated (Asuero, et al., 2006). In the analysis of the data, it was found that only five questions marginally exceeded the limit of 0.7. It is, therefore,

determined that there are no highly correlated questions in the study and factors can be considered distinct.

4.3.6. Cronbach alpha analysis

The four constructs that were highlighted in the varimax analysis were used in a Cronbach Alpha analysis to measure reliability. Values of greater than 0.8 were acceptable (Gliem and Gliem, 2003).

Table 2: Cronbach Alpha Analysis

Reliability of Constructs		
	Cronbach's Alpha	Significant Level
Workforce	0.920	0.000
Quality management	0.887	0.117
Organisational change	0.892	0.000
Successes	0.927	0.000

The results indicate that:

1. Workforce returned a Cronbach Alpha score of 0.92. It was observed that if an item was deleted the Cronbach Alpha returned a score of <0.92 across all the questions. It therefore means that the score cannot be stronger if any questions were removed. The significant level of the workforce Cronbach Alpha is <0.001 making the score highly significant.
2. Quality management returned a Cronbach Alpha score of 0.887 with a significance level of 0.117. There were only two questions in this construct and therefore none could be removed in the analysis.
3. The organisational change had a Cronbach Alpha score of 0.894 with a highly significant level of <0.001. Deleting any specific question gives a score of <0.894 resulting in no increase in score if any of the questions is removed.
4. Successes had a score of 0.927 at a highly significant level of <0.001. Removing specific questions in the test does not result in the score increasing making all the questions significant.

Therefore, the overall result from the Cronbach Alpha analysis displayed that all the constructs are reliable, and the dataset is suitable for regression analysis (see appendix 10 for details).

4.4. Regression Analysis

To see the extent to which the constructs are linearly correlated a Pearson Correlation study was done.

Table 3: Regression Analysis

Correlations					
		WORKFORCE AVG	QUALITY MANAGEMENT AVG	ORGANISATION CHANGE AVG	SUCCESSES AVG
WORKFORCE AVG	Pearson Correlation	1	.613**	.728**	.737**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	101	101	101	101
QUALITY MANAGEMENT AVG	Pearson Correlation	.613**	1	.624**	.583**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	101	101	101	101
ORGANISATION CHANGE AVG	Pearson Correlation	.728**	.624**	1	.694**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	101	101	101	101
SUCCESSES AVG	Pearson Correlation	.737**	.583**	.694**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	101	101	101	101
***. Correlation is significant at the 0.01 level (2-tailed).*					

The results show that there are significant correlations between the constructs. The constructs can, therefore, be used in a regression model.

4.4.1. Linear Regression

Workforce Linear Regression

Table 4: Linear Regression Results - Workforce

Workforce Linear Regression Results	
R squared	0.5381
Significant level	0.0000
a. Predictors: (Constant), Workforce_AVG	
b. Dependent Variable: Successes_AVG	

The correlation between the variables workforce (independent) and successes (dependent) explains 53.8% of the variance at a significance level of p<0.001, which is significant and meets the criteria of 0.05 (see appendix 11).

Table 5: Linear Regression Model - Workforce

		Coefficients	
Model		B	Std. Error
1	(Constant)	1.129	0.205
	Workforce_AVG	0.638	0.059

a. Dependent Variable: Successes_AVG

The result of the model led to the workforce having a coefficient of 0.638 which is significant and a low standard error of 0.059.

Organisational Change Linear Regression

Table 6: Linear Regression Results – Organisation Change

Organisation Change Linear Regression Results	
R squared	0.4767
Significant level	0.0000
a. Predictors: (Constant), Organisational Change_AVG	
b. Dependent Variable: Successes_AVG	

The correlation between the variables organisational change (independent) and successes (dependent) explains 47.7% of the variance at a significance level of p<0.001 which is highly significant and meets the criteria of 0.05. It is lower than workforce but still significant (see appendix 11).

Table 7: Linear Regression Model – Organisation Change

		Coefficients	
Model		B	Std. Error
1	(Constant)	1.544	0.189
	Organisation Change_AVG	0.605	0.063

a. Dependent Variable: Successes_AVG

The result of the model led to Organisation Change having a coefficient of 0.605 which is significant and a low standard error of 0.063.

Quality Management Linear Regression

Table 8: Linear Regression Results – Quality Management

Quality Management Linear Regression Results	
R squared	0.3332
Significant level	0.0000
a. Predictors: (Constant), Quality Management_AVG	
b. Dependent Variable: Successes_AVG	

The correlation between the variables Quality Management (independent) and successes (dependent) explains 33.32% of the variance at a significance level of $p<0.001$ which is very significant and meets the criteria of 0.05. It is the lowest regression of all the variables (see appendix 11).

Table 9: Linear Regression Model – Quality Management

		Coefficients	
Model		B	Std. Error
1	(Constant)	2.012	0.188
	Quality Management_AVG	0.408	0.057
a. Dependent Variable: Successes_AVG			

The result of the model led to Quality Management having a coefficient of 0.408 which is significant and a low standard error of 0.057.

4.4.2. Multiple Regression

In order to better understand how the variables, interact with each other a multiple regression model was run using all the variables in the linear regression (see appendix 12). Multiple regression allows the determination of the overall fit of the model relative to the contribution of all independent variables in explaining the total variance. The R Square output of the model is the proportion of variance that is explained by the independent variables. The significant level shows whether the overall regression model is a good fit for the data. A p-value of <0.05 is considered to be statistically significant.

Table 10: Multiple Regression Results – All Variables

Multiple Regression Results (All Variables)	
R squared	0.5928
Significant level	0.0000
Durbin Watson	1.7896
a. Predictors: (Constant), Workforce_AVG, Organisational Change_AVG, Quality Management_AVG	
b. Dependent Variable: Successes_AVG	

Running a multiple regression model with all the variables has improved the output with the model now explaining 59.3% of the variation. This model is also highly significant with a p-value <0.001. The model returned a Durbin-Watson result of 1.79 which is between 1.5 and 2.5 showing that no autocorrelation exists between the constructs.

Table 11: Multiple Regression Model – All Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	0.969	0.197		4.921	0.000	0.578	1.360					
	Workforce_AVG	0.388	0.084	0.448	4.603	0.000	0.221	0.556	0.737	0.423	0.294	0.429	2.332
	Quality Management_AVG	0.090	0.060	0.129	1.504	0.136	-0.029	0.209	0.583	0.151	0.096	0.557	1.795
	Organisational Change_AVG	0.251	0.086	0.288	2.922	0.004	0.080	0.421	0.694	0.284	0.186	0.420	2.381

a. Dependent Variable: SUCCESS_AVG

The collinearity statistics from the model returned Variance Inflation Factor (VIF) values for all constructs of <10, therefore, all of them are acceptable. The model does, however, fail one of the variables, Quality Management as this shows a marginal influence and the variable is not statistically significant.

Removing the variable Quality Management and rerunning the multiple regression model yields the following results (see appendix 12):

Table 12: Multiple Regression Results – Improved Model

Improved Multiple Regression Results	
R squared	0.5876
Significant level	0.0000
Durbin Watson	1.7916
a. Predictors: (Constant), Workforce_AVG, Organisational Change_AVG	
b. Dependent Variable: Successes_AVG	

There is no change in the R squared results in the improved model showing that the variable Quality Management added no value to the regression. The results are also highly significant with a p-value of <0.001.

Table 13: Multiple Regression Model – Improved Model

		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.001	0.197		5.082	0.000	0.610	1.392					
	WORKFORCE_AVG	0.426	0.081	0.492	5.255	0.000	0.265	0.587	0.737	0.469	0.337	0.470	2.126
	ORGANISATIONAL CHANGE_AVG	0.293	0.082	0.336	3.590	0.001	0.131	0.455	0.694	0.341	0.231	0.470	2.126

a. Dependent Variable: SUCCESS_AVG

The beta of Workforce at 0.49 shows a much better influence than Organisational Change; however, the combination of both variables is stronger. Both factors are very significant with p values <0.001.

4.5. Summary of Results

The Critical Research Question of the study was to determine what the key continuous improvement factors are for effective CI strategies in selected South African investment companies.

The null hypothesis (H0) was that no significant factors exist that drive continuous improvement strategies and the alternative hypothesis (H1) was that significant factors exist that drive continuous improvement strategies.

The results of this study show that not all factors have a positive impact on the success of CI Strategies. Of all the components tested, only four showed to be statistically significant. On running multiple regression models two of the factors were statistically significant and could explain the variation, namely Workforce and Organisational Change. Quality Management is shown as not being statistically significant in the success of Continuous Improvement strategies.

5. DISCUSSION

Workforce

In this research ‘Management and stakeholder commitment to continuous improvement’ and ‘Staff Engagement’ were clustered together, so the importance of both management and staff are significant. The investigation in the survey (see appendix 13) regarding workforce commitment was particularly centred around management and stakeholder commitment to continuous improvement and staff engagement. Workforce commitment and participation is also noted by Stelson et al., (2017) who looked at CI success in healthcare and found managerial and employee factors to affect success. Furthermore, their study found that managerial restrictions limited project team effectiveness, which supports the finding in this research that commitment by the workforce is important. Although the finding in this research points to workforce commitment in general, from the research it is noted that there is an emphasis placed on management commitment as a driver for success (Garcia et al., 2013; Gonzalez et al., 2016; Nguyen, 2015; Stelson et al., 2017).

Regarding management and stakeholder commitment, participants were surveyed on whether there was consistent feedback by management on several factors. These included, continuous improvement and whether management encouraged innovation and prioritised critical improvements of the organisation. Further considerations were whether there was staff development to improve expertise in continuous improvement and whether these commitments led to the success of the program. Regarding staff engagement, the questions asked in the survey focused on aspects such as, consistent communication in the organisation, process improvement and training opportunities; and whether these led to the success of the CI program.

The significant factor of “Workforce” encompasses all the key concepts mentioned above and a comprehensive definition should be applied when referring to this factor in the research. From the research it can be noted for organisations to

achieve success in CI strategies, there needs to be commitment among the workforce which is in line with the findings of Lillrank et al., (2001). This commitment stems from the executive level and needs to be implemented throughout all levels of the organisation.

Dale (1996), noted that an effective organisational structure needs to be in place and over time it is embedded into the organisation. There also needs to be an open communication framework whereby staff and management can engage. This feedback must be considered and forms part of the strategy and its implementation. The constructs in this research that are grouped into the "Workforce" factor are made up of management's commitment to continuous improvement, which implies an ongoing commitment to the change program of CI. This needs to be embedded in the organisation as Dale (1996) also noted and that the commitment needs to be from the most senior level and then implemented throughout the organisation. Thereby, essentially CI becomes part of the culture of the organisation as noted by Malhi (2013). His research outlined the elements of a quality organisation. A quality organisation is based on the concept of Total Quality Management which in turn is a CI strategy (Dale, 1996).

The findings in this research report were that management commitment and training have a positive impact on the success of continuous improvement. Milner (2016) modelled CI improvement evolution in the service sector and looked at critical success factors (CSF) as part of the investigation. The findings in this study support Milner (2016), in that leadership strategy, resources and support for CI are needed (matching the workforce finding). Furthermore, Milner (2016) noted that establishing and embedding a CI system in the organisation reinforces continuous change as the corporate culture, supporting the findings in this study of the importance of organisational change.

Milner (2016) noted that when the CI program is initiated from the leadership team and cascaded down via training and distinct programs, CI becomes embedded within the organisation. In studying corporate culture, Schein (2004) indicated that leadership is an important factor and is responsible for embedding the culture. CI

forms part of this culture and hence the finding of commitment by the workforce in this study is an important factor. Culture within an organisation is a way of ensuring the commitment at all levels within the organisation (Malhi, 2013). Organisational culture is effective in ensuring a comprehensive workforce participation in CI strategies and can ultimately lead to success. These distinct factors from Milner (2016), Schein (2004) and Malhi (2013) are highlighted in the findings of this research, whereby commitment from management and stake holders has led to the success of CI.

Organisational change

The factor highlighted as significant in this research, organisational change, ties in with the culture of the organisation. The two constructs 'Organisational Setup' and 'Participation of Change Agents and Change Champions' were clustered together to form the factor "Organisational Change". From the survey (see appendix 13) the questions relating to these sections were seeking to discover whether the organisation emphasised and supported a culture of change. The items asked if there was consistent communication regarding continuous improvement, a defined CI strategy and whether new staff received CI training and were inspired to improve quality. Organisational change regarding CI should stem from the culture.

CI therefore needs to form part of the fabric of the organisation. Habtoor (2016) found that human factors positively influenced the quality of improvement, and this led to an increase in performance. The organisation also needs to encourage innovation and have the structures and mechanisms in place for change and CI. Part of the framework developed by Heavey et al., (2014) noted that the components should include an improvement specialist highlighting the need for CI to be part of the organisational structure. CI is a strategy of constant change, hence focussing on the factor of organisational change is intuitive and backed by the findings in this research. By ingraining change into the culture of the organisation, continuous improvement becomes part of the organisation's goals. In order to do this, commitment from the leadership of the organisation is needed to assign resources to execute the strategy.

Research by Gandhi et al., (2000) looking at obstacles to CI noted that team member time constraints, general lack of resource support, poor incentive structures and disempowered team leadership were the main impediments to success. These aspects talk to an organisation's culture and therefore underline the findings of this research. Once again, we see that the factors highlighted in this research work together to achieve CI successes.

The relationship between Workforce and Organisational change

The result of this research noted that the workforce and organisational change are important success factors, however they can be precursors to failure as well. Mazur et al., (2012) conducted research on the factors in Kaizen. They recommended that a team's commitment to change, managements understanding of CI and the organisations investment into building a CI knowledge base, are important success factors. Further supporting the constructs that defined the significant 'Workforce' factor.

Jabnoun (2001) investigated the organisational values that underlie continuous improvement and found that the development of an explicit behaviour change program with measured improvements targets and reward system supports successful CI programs. Lodgaard et al., (2016) investigated the main organisational and managerial barriers to CI success. They found a disparity between the perceptions of CI between top management and workers. Whereby top management see shortcomings to be information systems and improvement methods. However, workers see the lack of commitment from management as a shortcoming.

These shortcomings contrast with the findings in this research, whereby the core constructs of 'Workforce', namely management commitment and staff engagement, are significant to the success of CI. Further support into these findings of significant factors i.e. workforce and organisational change, is the study of CI in an emerging market by Nguyen and Robinson (2015). They identified top

management commitment, change agent participation and management and employee development as critical in facilitating CI practices.

Continuous improvement also needs to be prioritised within the organisation and staff and management are required to be adequately trained and to understand the role they play. Management commitment and training was a key finding for successful continuous improvement according to the study by Garcia et al., (2013). The two significant factors in this study, being Workforce and Organisational change, are supported by the findings in Garcia, et al., (2013). Namely, the element of management commitment to the CI programs is significant as well as the organisational change. These factors together lay the groundwork for a successful CI strategy. From the commitment of management an organisation can create the framework for CI programs. With this framework management can assign resources to the program. Commitment results in a vested interest ensuring the success of the CI programs. This is where the commitment is translated into organisational change programs. Awareness and training are how the commitment is communicated within the organisation. Eventually the nature of the organisation becomes one of continuous improvement. By focussing on the right factors, the necessary outcomes of a CI program can be achieved and becomes part of the culture of the organisation, as noted in the findings (see table 13) of this research.

Quality management system and tools are not initially important

The factor “Quality Management” that formed part of the regression analysis was not statistically significant. This factor focussed on the tools, used as methodologies, in CI programs. The methods included the resources allocated, the processes executed and the performance metrics and measurements of the CI program. From the literature discussed thus far, quality management or quality tools were found to have shortcomings when it comes to implementation of the programs (Choi & Behling, 1997; Grant et al., 1994; Lillrank et al., 2001; Spector & Beer, 1994). When considering quality management as a factor it cannot be successfully executed as part of a strategy if there is no commitment from leadership.

Malhi (2013) in his paper on creating a quality culture, highlights workforce and organisational change factors as being part of the core values of a quality culture. In this framework quality tools are not mentioned, only value, norms and beliefs are included in the basic components and organisational culture model. The steps outlined in developing quality culture focused the change initiative being driven by leadership having a strategy in place to achieve their CI goals (Malhi, 2013).

It can therefore be deduced that without the right organisational culture, quality tools in isolation will not work. This re-emphasises that the factors highlighted as significant in this research are essential first steps to a successful CI program. Therefore, workforce and organisational change are the foundational factors to be executed in terms of a CI strategy, prior to any additional factors being implemented.

6. CONCLUSION

The key focus of this study was to investigate which factors lead to successful CI strategies in South African investment companies. A study of this nature had not yet been done before in the South African context. From the literature review the leading factors for CI successes were identified and used to conduct the research project.

6.1. Research Question

The critical research question for this study was to determine the key continuous improvement factors for effective CI strategies in selected South African investment companies. The Null hypothesis (H0) was that no significant factors exist that drive CI strategies. The alternate hypothesis (H1) was that significant factors exist that drive continuous improvement strategies. From the results it was determined that there were factors that contributed to the success of CI strategies. The statistically significant factors identified in the study were “Workforce” and “Organisational Change.” Therefore, the null hypothesis was rejected in favour of the alternative hypothesis, which was confirmed.

6.2. Research Objectives

The objectives of this research were to determine the significant aspects that contributed towards continuous improvement. The first objective was to determine whether there were CI factors present in investment companies. The study investigated various constructs based on five factors that were common in the literature. Of the constructs investigated four were found to be significant CI factors in investment companies in South Africa. The first objective of the study was therefore satisfied.

The second objective was to determine the critical success factors for continuous improvement in selected South African investment companies. Four factors were analysed, and the study determined that two factors were significant for the

success of CI strategies in investment companies in South African. The second objective was therefore also met.

6.3. Major Findings

The major finding of this research paper confirmed that there are factors that play a significant role in CI strategies in investment companies in South Africa. The factors that were the most significant following the statistical analysis were “Workforce” and “Organisational Change”. Other factors highlighted in the survey were deemed to be statistically insignificant and did not materially explain the variance in the data.

The first significant factor highlighted in the study, “Workforce” consisted of various constructs that were clustered together, which included ‘Management and stakeholder commitment to continuous improvement’ and ‘Staff Engagement.’ Workforce commitment was particularly centred around management and stakeholder commitment to continuous improvement and staff engagement. The findings from the research regarding this factor is that workforce across all levels of the organisation is part of the critical success of a CI strategy. Success stems from the commitment that management has in the program, the buy in and execution of the program across all staff in the organisation.

The second significant factor highlighted in the study was “Organisational Change”. This consisted of two constructs that were clustered together, namely ‘Organisational Setup’ and ‘Participation of Change Agents and Change Champions.’ These constructs were centred on whether the organisation emphasised and supported a culture of change. The conclusion was that a supported culture of change leads to the success of the CI strategy.

6.4. Implications for organisations

The significant factors highlighted in this research, namely “Workforce” and “Organisational Change” are important focus areas for South African investment companies. These two factors are needed by South African investment companies to successfully implement CI strategies or programs.

Workforce is an important factor to consider when implementing continuous improvement strategies in South African investment companies. An organisation needs commitment from senior management when embarking on a CI strategy. Furthermore, an organisation needs to involve the entire workforce in the CI strategy as the success of the strategy is determined by buy-in from everyone in the organisation and they understand the strategy and are part of the change.

The other important factor from this research is Organisational Change. This includes all continuous improvement change strategies across the organisation and includes the culture of the organisation. Success is achieved when everyone in the organisation lives the culture of CI and understands that they are part of the strategy to make the CI program a success.

When organisations embark on CI programs there are a set of desired outcomes which determines the success of the program. The analysis done in this research paper concludes that the two most significant factors for organisations to concentrate on when embarking on a CI program or strategy is workforce and organisational change. These factors, identified in the literature review, are supported by the results of this research.

For a CI program to be successful, an organisation needs to support the strategy from the top and cascade it down to all levels of the organisation. The leadership of the organisation needs to sponsor the initiative and have the willpower for it to succeed. This in turn results in resources being allocated to the CI program. Everyone in the organisation needs to be onboard with the program. Success for a CI program means a shift in the organisation and a continuous improvement

culture needs to be created. To do this a change program needs to be implemented whereby staff involvement and awareness and training of the CI program is executed. The result is an organisation whereby the entire workforce is part of a continuous improvement culture.

6.5. Significance of findings

Research into success factors of continuous improvement strategies in selected investment companies within the financial services sector in South Africa has not been done before. The findings of this research set the groundwork for other studies in a sector that had been under researched as noted in the literature review. The findings in this research can inform companies in the sector on what they could focus on in terms of their CI strategies to ensure a greater chance of success.

6.6. Limitations of the Research

Although this study has statistically significant results the sample size is small, relative to the entire industry. So, drawing inferences to other organisations in the investment sector needs to be made with caution.

The research had a predetermined number of factors that were investigated which were drawn from previous research done on the topic. There may be other factors that could influence the industry that were not uncovered in this research.

The study has employed a convenience sampling technique, which is a type of non-probability sampling method. The negative aspect of this method is that the results of the study cannot be extrapolated into the wider population.

The survey participants were responding to scenarios within their organisation at a point in time. Organisations could be in different stages of CI implementations or programs and therefore the results could change if taken again at a different point in time.

There is a lack of prior research in this area relating to South African investment companies thereby limiting the comparisons. However, this report can serve as a baseline study for future research on South African investment companies.

6.7. Recommendations for Future Research

This study was done on the South African investment sector and covered a set number of factors. Further research can be done by differentiating between companies of different sizes, and then see if there are diverse factors that are more significant for various sized companies.

Factors relating to CI strategies that are not part of this research can also be investigated to see if there are more significant factors that could be considered. Factors unique to the South African investment context may be uncovered through future research in this field.

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APPENDICES

Appendix 1: Perceived Barriers to Continuous Improvement

Table 14: Perceived barriers to CI

Category	Perceptions of barriers	Top managers	Middle managers	Workers
Management	Limited management commitment		x	x
	Limited support from management		x	x
	CI not a daily focus		x	x
Organizing for CI	Roles/responsibilities not defined	x	x	
	Lack of involvement		x	x
	Lack of teamwork		x	x
	Lack of motivation		x	x
CI method	Not according to best practice	x		
	Not user-friendly system [technical]	x	x	
	Not covering all relevant CI initiatives	x		
	Not adding sufficient value		x	x
Knowledge	Lack of knowledge about CI method	x	x	x
	Lack of capturing and sharing of knowledge	x	x	x

Appendix 2: Topics Researched in Continuous Improvement

Table 15: Topics researched in CI from 1980 to 2011

Topics	Number of articles
Implementation	550
Methodologies	279
Human resources	146
Management philosophies	166
Culture	101
Control	96
Concept	78
Factors	59
Innovation	20
Total articles	**1495**

Source: Sanchez and Blanco (2014)

Appendix 3: Mahalanobis Analysis

Table 16: Results of Mahalanobis Analysis

Mahalanobis	Criteria	p < 0.001	df (22) =	62.487	
passed	101	failed	0		
ID	**Result**	**ID**	**Result**	**ID**	**Result**
97	59.29670	50	37.32678	91	26.23597
24	58.66442	82	36.74359	16	25.88768
74	58.43766	69	36.46955	68	25.77576
20	58.00798	13	35.84820	71	25.06079
72	57.67087	18	35.45407	70	24.28588
54	56.28246	96	35.38255	80	24.16567
60	54.16262	3	35.17120	41	24.04477
32	53.52736	21	34.94523	7	23.79637
46	51.02342	87	34.64874	2	23.54425
27	48.50795	19	34.45597	65	23.39602
9	48.36147	88	33.96202	6	22.93438
44	46.37103	30	33.85555	49	22.64929
10	45.05019	66	33.50634	17	22.32096
57	44.39551	76	33.43569	92	22.25106
25	44.24674	39	33.14103	98	21.02640
61	43.84811	22	33.03248	101	20.83926
26	43.71281	35	32.75109	28	20.38846
14	43.31508	48	32.68559	64	20.01399
89	43.03048	33	32.42977	40	19.94343
103	42.97911	52	31.92147	83	19.54013
4	42.92766	77	30.71236	73	19.27425
15	41.75784	81	30.66472	58	18.87213
47	41.21840	94	30.57331	79	18.33973
55	39.07807	62	30.13516	99	17.22302
78	39.07323	59	29.75222	93	16.76577
34	39.04188	1	29.70089	75	16.62622
5	39.03216	23	29.32395	84	15.75890
11	38.99912	8	29.30806	45	14.26411
67	38.80003	86	28.42022	12	13.17473
95	38.77621	56	28.16380	36	12.92648
29	38.61734	42	27.99989	43	12.61630
53	38.04536	51	27.96231	63	11.76508
38	38.00614	100	26.53557	102	9.89876
85	37.37873	90	26.33051		

Appendix 4: Skewness – Kurtosis

Table 17: Skewness and Kurtosis statistics

		Skewness	Kurtosis	
				criteria ±2
Statistics	MAN Q1	-0.508	-0.812	pass
	MAN Q2	-0.523	-0.808	pass
	MAN Q3	-0.743	-0.212	pass
	MAN Q4	-0.049	-1.045	pass
	MAN Q5	-0.187	-0.894	pass
	STAFF Q1	-0.295	-1.019	pass
	STAFF Q2	0.144	-1.186	pass
	STAFF Q3	-0.713	-0.075	pass
	STAFF Q4	-0.240	-0.819	pass
	QM Q1	-0.399	-0.802	pass
	QM Q2	-0.178	-1.042	pass
	QM Q3	-0.259	-0.973	pass
	QM Q4	-0.243	-1.031	pass
	QM Q5	0.070	-0.876	pass
	ORG Q1	-0.691	-0.364	pass
	ORG Q2	-0.218	-1.159	pass
	ORG Q3	-0.558	-0.389	pass
	ORG Q4	-0.140	-0.880	pass
	ORG Q5	-0.061	-0.955	pass
	CHANGE Q1	-0.172	-0.877	pass
	CHANGE Q2	0.080	-1.233	pass
	CHANGE Q3	0.483	-0.548	pass
	CHANGE Q4	-0.546	-0.742	pass
	CHANGE Q5	-0.168	-0.703	pass
	CUST Q1	-0.777	-0.120	pass
	CUST Q2	-0.191	-0.403	pass
	CUST Q3	0.065	-0.230	pass
	EFFIC Q1	-0.549	-0.321	pass
	EFFIC Q2	-0.638	-0.160	pass
	EFFIC Q3	-0.162	-1.016	pass
	PROF Q1	-0.496	-0.068	pass
	PROF Q2	-0.251	-0.294	pass
	PROF Q3	-0.027	0.109	pass

Table 18: Skewness and Kurtosis results

	Position	Size_org	Experience
Skewness	-0.035	-0.769	-2.103
Kurtosis	-1.068	0.002	3.741
	Pass	Pass	Failed

Appendix 5: Demographics

Table 19: Demographic Statistics

		Position	Size_org	Experience
N	Valid	101	101	101
	Missing	0	0	0
Mean		3.06	3.71	4.63
Std. Error of Mean		0.113	0.117	0.074
Median		3.00	4.00	5.00
Mode		4	5	5
Std. Deviation		1.139	1.178	0.745
Variance		1.296	1.387	0.554
Skewness		-0.035	-0.769	-2.103
Std. Error of		0.240	0.240	0.240
Kurtosis		-1.068	0.002	3.741
Std. Error of		0.476	0.476	0.476
Range		4	4	3
Minimum		1	1	2
Maximum		5	5	5

Table 20: Demographic Analysis

Position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General staff	7	6.9	6.9	6.9
	Specialist	32	31.7	31.7	38.6
	Junior management	19	18.8	18.8	57.4
	Senior management	34	33.7	33.7	91.1
	Executive	9	8.9	8.9	100.0
	Total	101	100.0	100.0	
Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 2 years	3	3.0	3.0	3.0
	3 - 5 years	7	6.9	6.9	9.9
	6 - 10 years	14	13.9	13.9	23.8
	>10 years	77	76.2	76.2	100.0
	Total	101	100.0	100.0	
Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 2 years	3	3.0	3.0	3.0
	3 - 5 years	7	6.9	6.9	9.9
	6 - 10 years	14	13.9	13.9	23.8
	>10 years	77	76.2	76.2	100.0
	Total	101	100.0	100.0	

Appendix 6: KMO and Bartlett's Test

Table 21: Results of KMO and Bartlett's Tests

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.925
Bartlett's Test of Sphericity	Approx. Chi-Square	2045.936
	df	351
	Sig.	0.00

Appendix 7: Principal Component Analysis

Table 22: Scree Plot Data

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.578	50.290	50.290	13.578	50.290	50.290	5.570	20.629	20.629
2	1.840	6.815	57.105	1.840	6.815	57.105	5.283	19.567	40.196
3	1.522	5.638	62.743	1.522	5.638	62.743	4.762	17.635	57.831
4	1.146	4.243	66.986	1.146	4.243	66.986	2.472	9.155	66.986
5	0.953	3.531	70.517						
6	0.837	3.102	73.619						
7	0.776	2.875	76.494						
8	0.706	2.614	79.108						
9	0.625	2.313	81.421						
10	0.539	1.995	83.416						
11	0.491	1.820	85.236						
12	0.450	1.667	86.903						
13	0.408	1.510	88.413						
14	0.376	1.392	89.805						
15	0.365	1.350	91.155						
16	0.320	1.187	92.342						
17	0.311	1.150	93.492						
18	0.251	0.929	94.421						
19	0.232	0.858	95.279						
20	0.224	0.831	96.110						
21	0.205	0.760	96.870						
22	0.182	0.676	97.546						
23	0.173	0.641	98.186						
24	0.149	0.551	98.738						
25	0.139	0.516	99.253						
26	0.105	0.390	99.643						
27	0.096	0.357	100.000						

Extraction Method: Principal Component Analysis.

Appendix 8: Varimax Rotation

Table 23: Varimax Rotation

Rotated Component Matrix [a]				
	Component			
	1	2	3	4
MAN Q1	0.660			
MAN Q2	0.768			
MAN Q3	0.653			
MAN Q4	0.735			
MAN Q5	0.641			
STAFF Q1	0.563			
STAFF Q2	0.735			
STAFF Q3	0.637			
STAFF Q4	0.585			
QM Q3				0.726
QM Q4				0.809
ORG Q2			0.432	
ORG Q4			0.513	
ORG Q5			0.728	
CHANGE Q1			0.729	
CHANGE Q2			0.685	
CHANGE Q3			0.677	
CHANGE Q5			0.779	
CUST Q1		0.631		
CUST Q2		0.660		
CUST Q3		0.466		
EFFIC Q1		0.676		
EFFIC Q2		0.785		
EFFIC Q3		0.438		
PROF Q1		0.807		
PROF Q2		0.739		
PROF Q3		0.762		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 9: Correlation Matrix

Table 24: Correlation Matrix

Reproduced Correlations

		MAN Q1	MAN Q2	MAN Q3	MAN Q4	MAN Q5	STAFF Q1	STAFF Q2	STAFF Q3	STAFF Q4	QM Q3	QM Q4	ORG Q2	ORG Q4	ORG Q5	CHANGE Q1	CHANGE Q2	CHANGE Q3	CHANGE Q5	CUST Q1	CUST Q2	CUST Q3	EFFIC Q1	EFFIC Q2	EFFIC Q3	PROF Q1	PROF Q2	PROF Q3
Reproduced Correlation	MAN Q1	.616[a]																										
	MAN Q2	0.626	.682[a]																									
	MAN Q3	0.562	0.602	.543[a]																								
	MAN Q4	0.641	0.662	0.607	.726[a]																							
	MAN Q5	0.637	0.645	0.603	0.698	.717[a]																						
	STAFF Q1	0.600	0.580	0.513	0.565	0.585	.650[a]																					
	STAFF Q2	0.629	0.661	0.580	0.649	0.628	0.609	.659[a]																				
	STAFF Q3	0.570	0.603	0.541	0.594	0.600	0.543	0.589	.547[a]																			
	STAFF Q4	0.601	0.596	0.552	0.636	0.655	0.577	0.594	0.557	.609[a]																		
	QM Q3	0.487	0.367	0.347	0.430	0.478	0.597	0.445	0.388	0.500	.770[a]																	
	QM Q4	0.511	0.393	0.356	0.444	0.467	0.632	0.482	0.400	0.501	0.794	.844[a]																
	ORG Q2	0.510	0.475	0.455	0.545	0.574	0.496	0.483	0.460	0.535	0.495	0.485	.495[a]															
	ORG Q4	0.520	0.465	0.455	0.554	0.598	0.514	0.479	0.462	0.559	0.555	0.536	0.531	.580[a]														
	ORG Q5	0.523	0.472	0.483	0.623	0.656	0.455	0.468	0.468	0.587	0.494	0.452	0.571	0.626	.749[a]													
	CHANGE Q1	0.427	0.342	0.376	0.481	0.567	0.410	0.349	0.377	0.514	0.535	0.470	0.530	0.604	0.698	.730[a]												
	CHANGE Q2	0.448	0.378	0.397	0.525	0.566	0.408	0.387	0.389	0.514	0.496	0.456	0.515	0.575	0.678	0.658	.628[a]											
	CHANGE Q3	0.312	0.191	0.228	0.380	0.395	0.301	0.236	0.222	0.372	0.513	0.494	0.418	0.486	0.579	0.578	0.565	.621[a]										
	CHANGE Q5	0.403	0.357	0.395	0.508	0.576	0.321	0.333	0.376	0.496	0.372	0.293	0.501	0.562	0.711	0.700	0.646	0.528	.739[a]									
	CUST Q1	0.486	0.450	0.439	0.457	0.569	0.527	0.449	0.467	0.536	0.534	0.488	0.498	0.548	0.538	0.589	0.499	0.339	0.524	.668[a]								
	CUST Q2	0.495	0.471	0.444	0.442	0.549	0.554	0.473	0.480	0.526	0.529	0.498	0.472	0.512	0.468	0.516	0.431	0.263	0.439	0.655	.662[a]							
	CUST Q3	0.474	0.408	0.394	0.439	0.520	0.535	0.437	0.425	0.508	0.602	0.585	0.482	0.534	0.508	0.549	0.484	0.396	0.452	0.590	0.580	.571[a]						
	EFFIC Q1	0.491	0.479	0.467	0.475	0.591	0.509	0.460	0.490	0.545	0.465	0.408	0.494	0.538	0.543	0.583	0.490	0.290	0.548	0.678	0.664	0.571	.708[a]					
	EFFIC Q2	0.336	0.343	0.355	0.314	0.467	0.344	0.298	0.374	0.412	0.286	0.194	0.377	0.420	0.435	0.520	0.392	0.163	0.515	0.634	0.615	0.475	0.688	.761[a]				
	EFFIC Q3	0.480	0.464	0.465	0.529	0.604	0.439	0.440	0.464	0.540	0.409	0.353	0.503	0.547	0.621	0.611	0.555	0.389	0.620	0.583	0.541	0.499	0.612	0.570	.606[a]			
	PROF Q1	0.445	0.437	0.410	0.360	0.497	0.523	0.429	0.454	0.478	0.471	0.428	0.419	0.455	0.382	0.464	0.352	0.151	0.382	0.674	0.695	0.566	0.697	0.693	0.523	.770[a]		
	PROF Q2	0.418	0.408	0.374	0.323	0.444	0.509	0.410	0.421	0.437	0.464	0.437	0.378	0.408	0.318	0.394	0.296	0.122	0.300	0.613	0.643	0.527	0.625	0.607	0.451	0.713	.670[a]	
	PROF Q3	0.499	0.502	0.459	0.418	0.534	0.572	0.495	0.502	0.516	0.487	0.460	0.439	0.466	0.387	0.439	0.348	0.143	0.360	0.665	0.695	0.568	0.686	0.655	0.518	0.760	0.710	.765[a]

Extraction Method: Principal Component Analysis.

a. Reproduced communalities

Appendix 10: Cronbach Alpha Analysis

Table 25: Cronbach Alpha results: Workforce

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.920	0.920	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
MAN Q1	27.00	44.480	0.719	0.587	0.910
MAN Q2	26.83	44.821	0.735	0.611	0.909
MAN Q3	26.87	45.253	0.642	0.480	0.916
MAN Q4	27.38	43.017	0.770	0.672	0.907
MAN Q5	27.11	44.538	0.773	0.683	0.907
STAFF Q1	27.21	44.426	0.690	0.508	0.912
STAFF Q2	27.45	43.030	0.727	0.674	0.910
STAFF Q3	26.85	45.928	0.667	0.558	0.914
STAFF Q4	27.19	44.654	0.722	0.608	0.910

Table 26: Cronbach Alpha ANOVA table: Workforce

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		619.025	100	6.190		
Within People	Between Items	41.534	8	5.192	10.458	0.000
	Residual	397.133	800	0.496		
	Total	438.667	808	0.543		
Total		1057.692	908	1.165		

Grand Mean = 3.39

Table 27: Cronbach Alpha results: Quality Management

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.887	0.887	2

Item-Total

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
QM Q3	3.19	1.194	0.797	0.634	.
QM Q4	3.08	1.154	0.797	0.634	.

Table 28: Cronbach Alpha ANOVA table: Quality Management

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		210.891	100	2.109		
Within People	Between Items	0.599	1	0.599	2.506	0.117
	Residual	23.901	100	0.239		
	Total	24.500	101	0.243		
Total		235.391	201	1.171		

Grand Mean = 3.13

Table 29: Cronbach Alpha results: Organisational change

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.892	0.894	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
ORG Q2	17.09	24.822	0.618	0.415	0.886
ORG Q4	17.18	24.788	0.664	0.515	0.880
ORG Q5	17.23	24.118	0.783	0.644	0.865
CHANGE Q1	17.20	24.100	0.780	0.659	0.866
CHANGE Q2	17.45	24.710	0.712	0.545	0.874
CHANGE Q3	17.69	26.015	0.567	0.349	0.891
CHANGE Q5	17.24	25.403	0.726	0.574	0.873

Table 30: Cronbach Alpha ANOVA table: Organisational change

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		474.685	100	4.747		
Within People	Between Items	25.692	6	4.282	8.372	0.000
	Residual	306.880	600	0.511		
	Total	332.571	606	0.549		
Total		807.256	706	1.143		

Grand Mean = 2.88

Table 31: Cronbach Alpha results: Successes

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.927	0.928	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CUST Q1	26.31	32.675	0.760	0.624	0.917
CUST Q2	26.42	33.365	0.762	0.615	0.917
CUST Q3	26.50	34.912	0.663	0.592	0.923
EFFIC Q1	26.07	32.765	0.782	0.644	0.916
EFFIC Q2	26.01	32.770	0.724	0.616	0.920
EFFIC Q3	26.46	33.710	0.646	0.444	0.925
PROF Q1	26.37	32.394	0.793	0.699	0.915
PROF Q2	26.32	33.719	0.704	0.613	0.921
PROF Q3	26.39	33.359	0.789	0.668	0.916

Table 32: Cronbach Alpha ANOVA table: Successes

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		464.018	100	4.640		
Within People	Between Items	22.946	8	2.868	8.500	0.000
	Residual	269.943	800	0.337		
	Total	292.889	808	0.362		
Total		756.906	908	0.834		

Grand Mean = 3.29

Appendix 11: Linear Regression

Workforce

Table 33: Linear regression results: Workforce

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.129	0.205		5.503	0.000	0.722	1.536					
	WORKFORCE_AVG	0.638	0.059	0.737	10.839	0.000	0.521	0.755	0.737	0.737	0.737	1.000	1.000

a. Dependent Variable: SUCCESSES_AVG

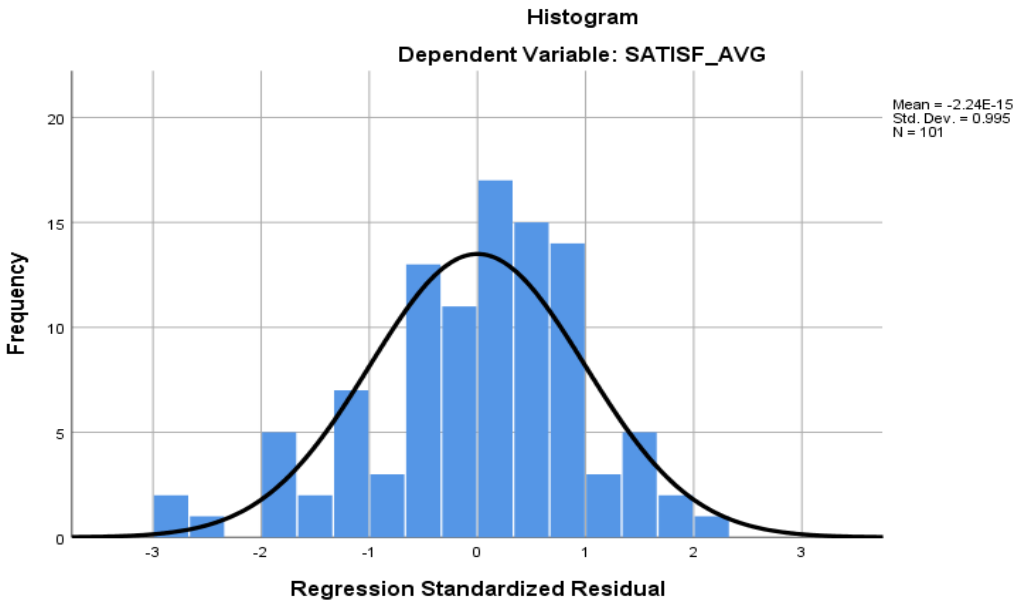


Figure 8: Linear regression: Workforce histogram

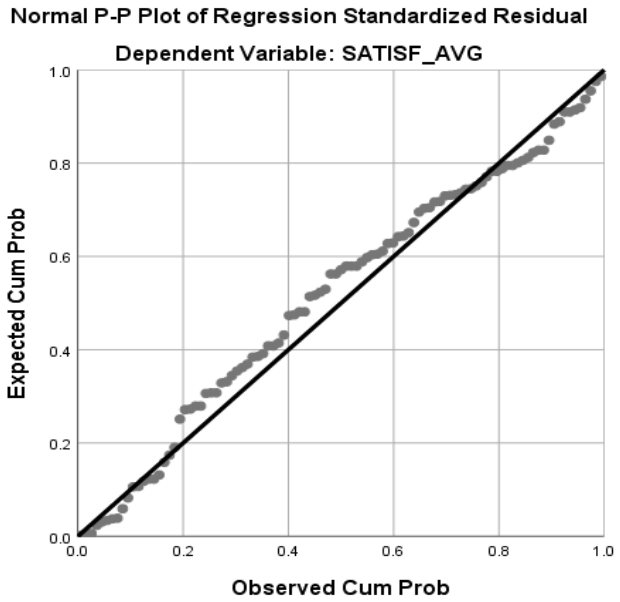


Figure 9: Linear regression: Workforce regression graph

Organisational Change

Table 34: Linear regression results: Organisational Change

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.544	0.189		8.170	0.000	1.169	1.919					
	ORGCH_AVG	0.605	0.063	0.694	9.597	0.000	0.480	0.730	0.694	0.694	0.694	1.000	1.000

a. Dependent Variable: SUCCESSES_AVG

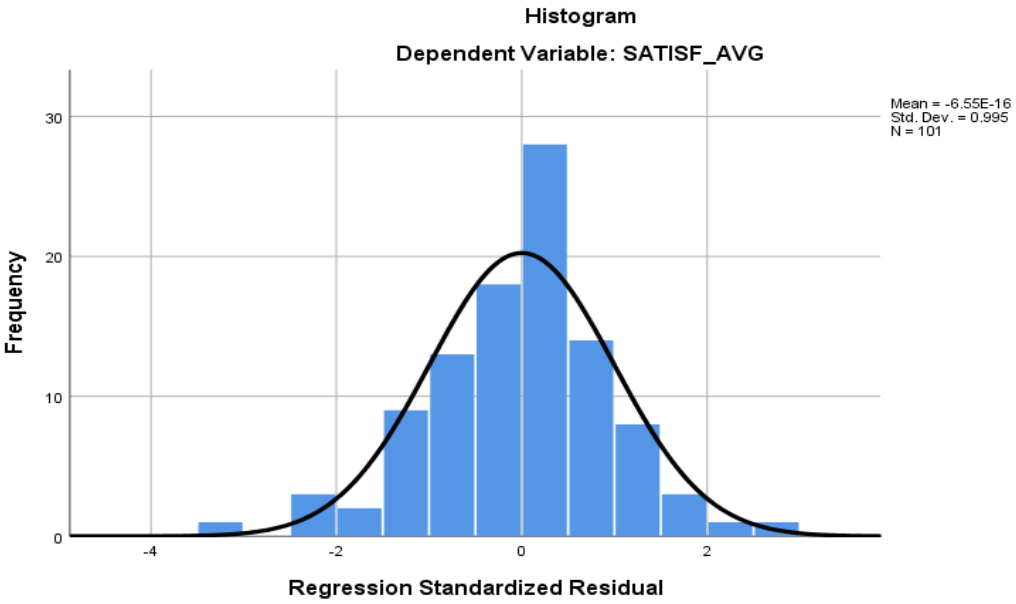


Figure 10: Linear regression: Organisational Change histogram

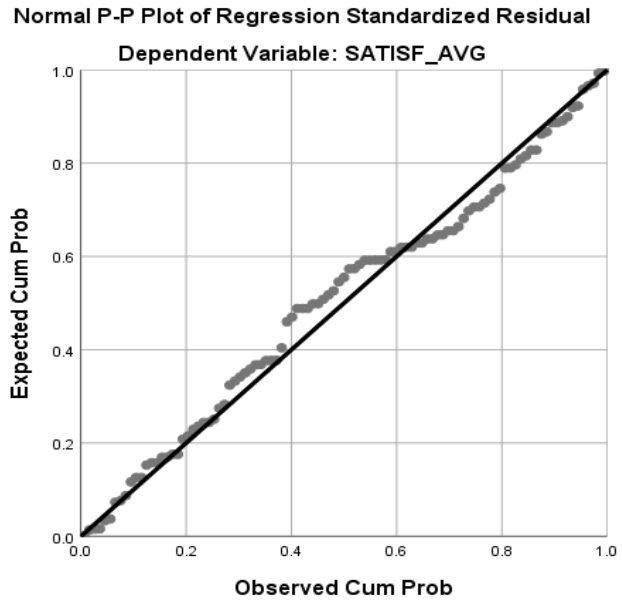


Figure 11: Linear regression: Organisational Change regression graph

Quality Management

Table 35: Linear regression results: Quality Management

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.012	0.188		10.690	0.000	1.639	2.385					
	QUALITY MAN_AVG	0.408	0.057	0.583	7.139	0.000	0.294	0.521	0.583	0.583	0.583	1.000	1.000

a. Dependent Variable: SUCCESSES_AVG

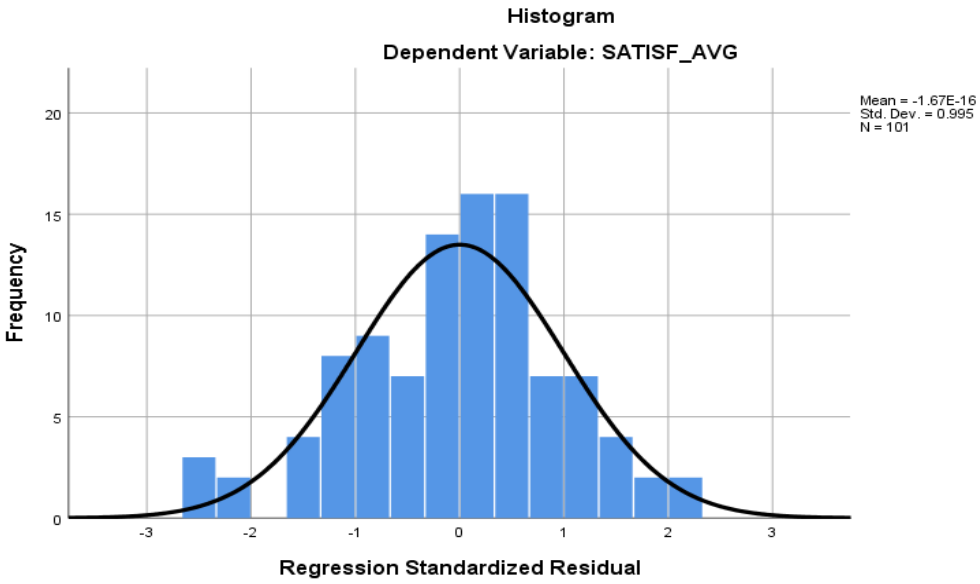


Figure 12: Linear regression: Quality Management histogram

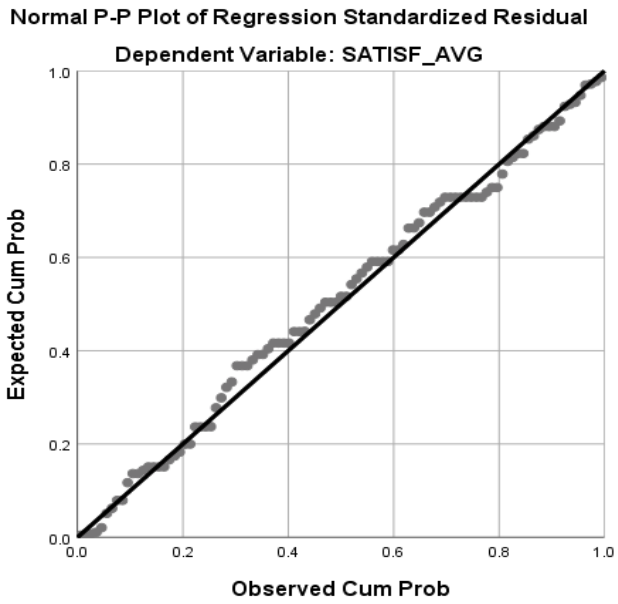


Figure 13: Linear regression: Quality Management regression graph

Appendix 12: Multiple Regression

Initial Model: All Variables

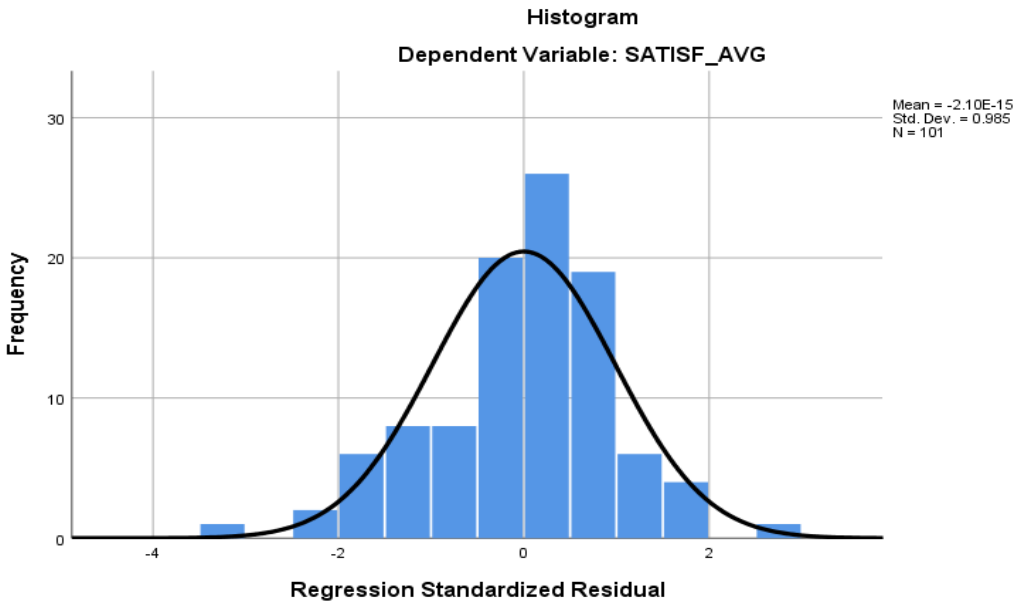


Figure 14: Multiple regression: All Variables histogram

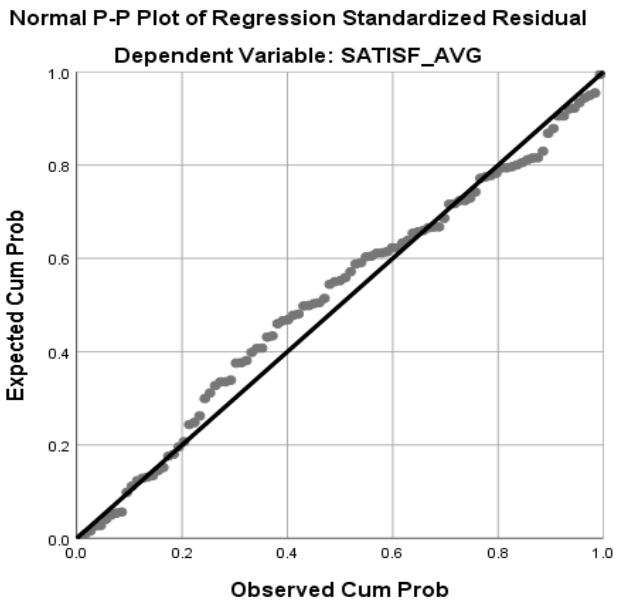


Figure 15: Multiple regression: All Variables regression graph

Improved Model: Selected Variables

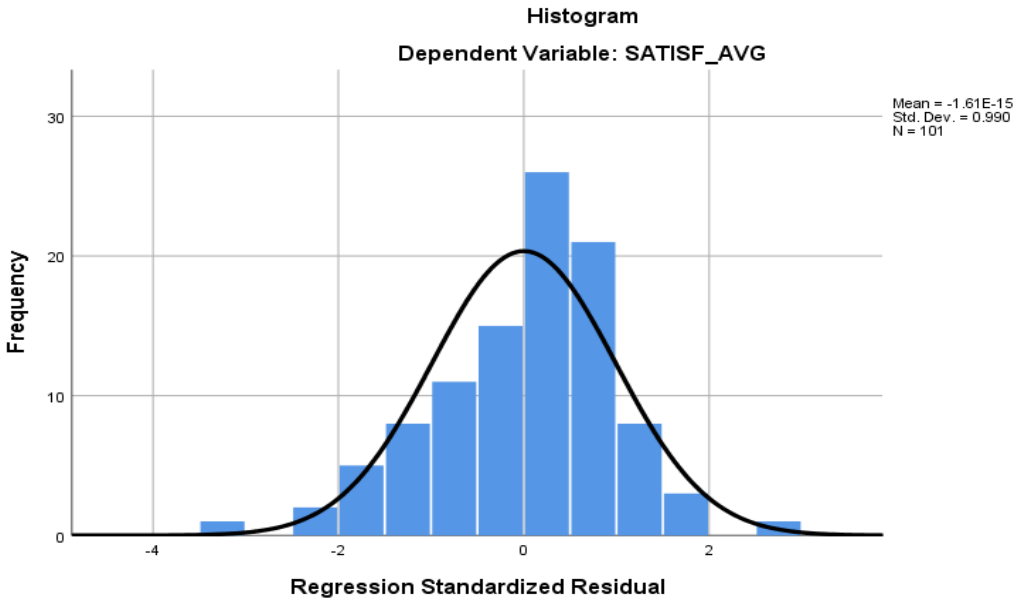


Figure 16: Multiple regression: Improved Model histogram

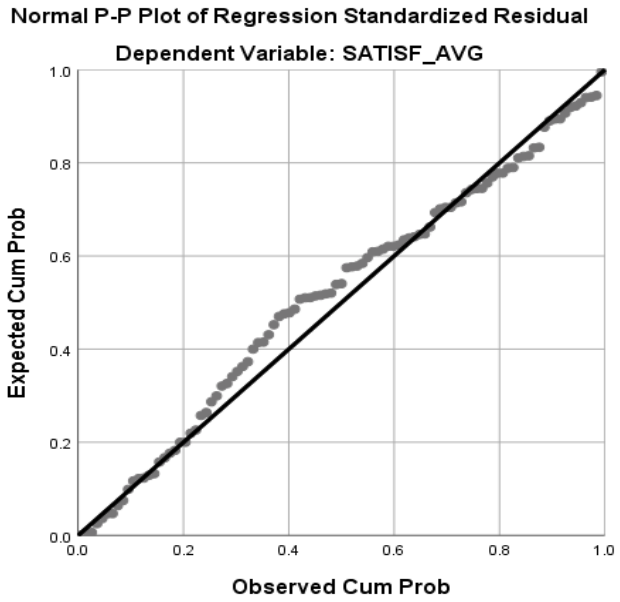


Figure 17: Multiple regression: Improved Model regression graph

Appendix 13: Research Questionnaire

Research Questionnaire – Continuous Improvement in Investment Companies

The aim of this research questionnaire is to conduct an exploratory study by investigating the factors that lead to continuous improvement successes at selected South African investment companies.

Definitions

Continuous improvement

Continuous improvement are strategies, projects or processes that aims to continuously improve production or services. These strategies, projects or processes may be explicitly termed continuous improvement based on a continuous improvement framework in an organisation. Or they may be implicit whereby the aim of strategies, projects or process is to achieve improvements but are not explicitly tabled as a continuous improvement strategy, project or process. When evaluating continuous improvement in terms of this questionnaire, both explicit and implicit continuous improvement strategies, projects and processes need to be considered.

Continuous improvement factors

The aim of this questionnaire is to test whether various factors are applicable to your organisation and whether these factors played a part in the success of a continuous improvement strategy, project or process.

1. Commitment from management and stakeholders. There is a definitive commitment from management and stakeholders in the organisation.
2. Staff engagement. Staff are continuously engaged regarding continuous improvement. This includes ongoing information sessions and staff training on continuous improvement strategies and processes.
3. Quality management systems and tools used. Defined quality management systems and tools are used in the organisation. These include:
    a. Cause-and-effect diagram (also called Ishikawa or fishbone chart): Identifies many possible causes for a problem and sorts ideas into useful categories.
    b. Check sheet: A structured, prepared form for collecting and analysing data.
    c. Control charts: Graphs used to study how a process changes over time.
    d. Histogram: Shows frequency distributions relating to a process.
    e. Pareto chart: Shows on a bar graph which factors are more significant.
    f. Scatter diagram: Graphs pairs of numerical data to determine relationships.
    g. Stratification: Separates data from a various source so that patterns can be highlighted.
4. Organisational setup. The organisation has a clear continuous improvement strategy and the organisation is setup to deliver continuous improvements.
5. Participation of change agents and change champions. An active change management strategy is in place in the organisation to aid continuous improvement.

Success Factors

Success factors in terms of this questionnaire is to determine whether a continuous improvement strategy, project or process has resulted in one of the following outcomes:

1. An improvement in customer satisfactions
2. An improvement in efficiency
3. An improvement in profitability

Please note that by submitting the completed questionnaire your agreement to participation in the research is assumed and that you have the necessary consent.

Demographics					
1. What is your position in the organisation	General Staff	Specialist	Junior Management	Senior Management	Executive
2. How large is your organisation	< 50 staff	50 – 100 staff	100 – 500 staff	500 – 1000 staff	> 1000 Staff
3. Years of experience in financial services	<1 year	1-2 years	3-5 years	6-10 years	>10 years

Management and stakeholder commitment to continuous improvement	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
4. Management consistently provides feedback about continuous improvement.					
5. Management encourages innovation.					
6. Management prioritizes critical improvement needs within the organization.					
7. Management identifies staff to develop continuous improvement expertise and ensures they receive training.					
8. Commitment from management and stakeholders has led to the success of continuous improvement in my organisation					

Staff Engagement	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
9. The organisation consistently communicates process improvement expectations.					
10. Continuous improvement training opportunities is available and accessible for all staff.					
11. Staff are encouraged to come up with new ideas to continuously improve.					
12. Staff engagement has led to the success of continuous improvement in my organisation					

Quality Management Systems & Tools	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
13. Resources are dedicated to support continuous improvement within your organization (e.g. staff, time, training, tools).					
14. Processes are in place to ensure rapid implementation of process improvements, including business and operational process changes. (e.g. rapid weeks, agile project management, regular change forums).					
15. Performance improvement metrics are defined and visible in your organization.					
16. The organisation regularly measures and evaluates performance improvement metrics.					
17. Quality management systems and tools has led to the success of continuous improvement in my organisation					

Organisational Setup	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
18. The organisation emphasizes and supports a culture of change.					
19. There is consistent communication about continuous improvement.					
20. The organisation encourages innovation.					
21. My organisation has a defined continuous improvement strategy					
22. Organisational setup has led to the success of continuous improvement in my organisation					

Participation of Change Agents and Change Champions	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
23. Change agents consistently communicates about continuous improvement.					
24. Staff feedback is continuously gathered and taken into account in the continuous improvement strategy.					
25. New staff receives continuous improvement training as part of his/her orientation.					
26. Staff are inspired to make changes to improve quality.					
27. Participation of change agents has led to the success of continuous improvement in my organisation					

Success Factors – Customer Satisfaction	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
1. Continuous improvement in my organisation has led to an improvement in customer satisfaction.					
2. Continuous improvement in my organisation has led to led to higher customer survey scores.					
3. Continuous improvement in my organisation has led to increased customer referrals.					

Success Factors - Efficiency	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
1. Continuous improvement in my organisation has led to an improvement in efficiency.					
2. Continuous improvement in my organisation has led to reduced process time (e.g. an increase in the straight through processing rate in transactions)					
3. Continuous improvement in my organisation has led to an improvement in the change management process and quicker implementations.					

Success Factors - Profitability	1 – Strongly disagree	2 – Somewhat disagree	3 – Neither agree or disagree	4 – Somewhat agree	5 – Strongly agree
1. Continuous improvement in my organisation has led to an improvement in profitability.					
2. Continuous improvement in my organisation has led to a reduction in operating costs.					
3. Continuous improvement in my organisation has led to an improvement in product margins.					