



The Relationship between Corporate Entrepreneurship and Lean Six Sigma in the South African Financial Sector

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Abstract

The main objective of the study is to measure the relationship between the practices of corporate entrepreneurship (CE) and lean six sigma (LSS) within the South African financial sector. A total of 248 potential participants were contacted, using a snowball sampling method. Data was eventually collected for analysis through a self-administered questionnaire from 102 employees from South African banks. The study found out that there was a statistically significant positive correlation between CE element, environmental scanning and SLL elements variation reduction and waste reduction. Each of the other two CE elements, innovation and organisational flexibility, were found to have a statistically significant positive correlation with variation reduction and not with waste reduction. The implications of the findings are that corporate entrepreneurship and lean six sigma, though vastly different in style, objective and application can co-exist in a single organisation. The recommendation is that these two strategies can and should be implemented in conjunction, for a possible positive impact on organisational performance.

Keywords: Corporate entrepreneurship, Lean six sigma, Performance, Competitiveness, Financial sector.

Contribution of Study

There is limited studies on lean six sigma in South Africa in general and in the service industry, such as banking in particular. The study contributes in its small way to the literature in the field. The study establishes that the supposedly contradicting concepts of corporate entrepreneurship and lean six sigma can be practised in the same organisation and this can improve organisational performance.

1. Introduction

All organisations, regardless of their nature, size or scope, are striving to perform efficiently and effectively, in order to provide high quality services or products, and in turn, make higher profits. Dess *et al.* (1999) note that virtually all organisations from new start-ups to major corporations (including financial institutions) are striving to improve organisational performance by exploiting “product-market opportunities through innovative and proactive behaviour”.

Two possible primary ways that companies can increase their organisational performance, corporate entrepreneurship (CE) and lean six sigma (LSS) seem contradictory in nature at first glance. The CE strategy involves experimentation where new ideas are researched and developed with the acknowledgment that some ideas may not work out. Experimentation by its nature is wasteful and risk taking. On the other hand a LSS business methodology is built on implementing operational improvements and promoting efficiency. Efficiency is the opposite of wastefulness and risk-taking. Porter (1980) traditional strategies of low cost leadership assist to achieve this goal. In essence, LSS deals with cost reduction by using as few resources as possible and, therefore, reducing as much as possible any waste or variation in outputs. LSS is a significant continuous improvement methodology for accomplishing operational and service excellence through the elimination of waste and variation in any firm regardless of industry (Salah *et al.*, 2010).

The main assumption about the CE construct is that all firms lie along a spectrum, ranging from highly conservative to highly entrepreneurial. Firms that lie on the entrepreneurial side of the continuum are “risk-taking, innovative, and proactive” (Barringer and Bluedorn, 1999). Inversely, un-enterprising firms are risk-averse, less innovative, and adopt a more wait and see posture with regards to business management. The assumption is that those firms that are considered conservative are the ones that practice LSS. The question becomes therefore, would it be possible for a firm to practice both CE and LSS? This question arises also from the assertion by Snee (2010); Wang and Chen (2010) and Schwab (2010) that if institutions could effectively learn how to use LSS principles successfully, it could lead to a multitude of positive effects, including (a) the enhancement of innovations in new products and services, (b) Improvement in operations and possibly most importantly, (c) to the enhancements of the company’s underlying business model.

Both CE and LSS aim to improve organisational performance, though from differing vantage points. According to [Morris et al. \(2011\)](#) a primary path to achieving high performance would be through corporate entrepreneurship. These “entrepreneurial attitudes and behaviours are believed necessary for firms of all sizes to prosper and flourish” ([Barringer and Bluedorn, 1999](#)). This attitude focuses the firm around flexibility and experimentation. On the other side LSS is perceived as rigid and heavily process orientated in nature. LSS may therefore have a stifling effect on the entrepreneurial culture that businesses are trying to foster. Nevertheless, the benefits may still outweigh the negatives as lean six sigma has the potential for high cost savings benefit. This leads to the idea by [Dess et al. \(1999\)](#) that in the context of CE “controlling costs is an increasingly important aspect of a successful strategy”.

The inter-relationship between CE and LSS on South African financial institutions and their possible effect upon each other is the main focus of this study. With a focus. The literature review will be presented first, then the methodology before discussing the findings and recommendations. Further areas of study are suggested as part of the conclusion.

2. Literature Review

2.1. Corporate Entrepreneurship

CE is a term used to describe entrepreneurial behaviour inside established mid-size and large organisations ([Morris et al., 2011](#)). This behaviour is described by [Stevenson and Jarillo-Mossli \(1986\)](#) as “the process of creating value by bringing together a unique combination of resources to exploit an opportunity”.

[Morris et al. \(2011\)](#) argue that the answer to today’s hyper-competitive environments is adaptability, flexibility, speed, aggressiveness and innovativeness, which they boil down to one word – entrepreneurship. CE has been found to directly influence the firm’s ability to generate wealth creation, as well as growth and profitability ([Antoncic and Hisrich, 2004](#)) and promoting and sustaining competitiveness ([Covin and Miles, 1999](#)). In this study, CE is made up of three elements, namely, *innovation, organisational flexibility and environmental scanning*, based on the work by [Barringer and Bluedorn \(1999\)](#).

2.2. Lean Six Sigma

The term ‘lean’ was coined by [Krafcik \(1988\)](#) when he used it to document the continuous improvement philosophy behind the Toyota Production System ([Standard and Davis, 1999](#)). It was later further publicised by [Womack et al. \(2007\)](#) in their book, *The Machine that Changed the World*, which sought to explain the productivity differences between the Japanese and Western automakers. LSS is one of many incarnations of a quality improvement methodology. It advances on previous manifestations of continuous improvement strategies, which can be more broadly defined as a culture of sustained improvement targeting the elimination of waste in all systems and processes of an organisation ([Bhuiyan and Baghel, 2005](#); [Andersson et al., 2006](#)).

In addition, [Shamah \(2013\)](#) notes that ‘lean thinking is all about adding value where value is defined by the customer and that focusing on value allows the organisation to get rid of activities that are wasteful. Shareholder value is maximised by improving quality, speed, customer satisfaction, and minimising costs ([Laureani and Antony, 2012](#)). Many findings propose that firms that adopt continuous improvement strategies, such as LSS, gain a performance advantage after implementing the strategy ([Shafer and Moeller, 2012](#)). LSS in this study comprises of two elements, *variation reduction and waste reduction*.

2.3. The Relationship between Corporate Entrepreneurship and Lean Six Sigma

There is an on-going debate in literature as to whether or not there is a positive or negative relationship between LSS and CE. Proponents believe that LSS and CE are not only compatible, but have a symbiotic relationship. On the other hand, some argue that the methodologies counter each other. The following section discusses arguments for both sides by comparing elements of each methodology with each other.

The main idea of the positive argument is that both CE and LSS should not be seen as a “stand alone” systems but rather as systems that need to operate alongside each other ([Hoerl and Gardner, 2010](#)) hence our research question of whether CE and LSS can be practiced or found in the same organisation at the same time. With regards to the negative argument. [Andersson et al. \(2006\)](#) state that combining CE and LSS is not always a good idea in that the principles do not always apply [especially] when customer demand is unstable and unpredictable. Other literature goes further and argues that there is a negative relationship between the two, and they should never be combined. [Prajogo and Sohal \(2001\)](#) summarise this by saying that continuous improvement process (such as LSS) are only workable when the underlying system of production is stable and repetitive. Repetitiveness and stability are rarely associated with CE.

2.4. Arguments for a Negative Relationship

One of the main areas where the literature maintains the two methodologies hamper each other is around incremental innovation (kaizen). Since kaizen promotes small victories, it can hinder novel ideas from taking root and thus preventing the establishment of more radical innovations. In contrast to kaizen, entrepreneurial firms by design exist in an environment that is unstable and unpredictable.

Supporters of Kaizen believe an incremental approach to innovation emanates from the aspiration of continuously adapting to the evolution of current customer needs. However, in meeting

the current needs, LSS cancels out the idea of ever achieving more radical projects that could meet the not yet identified future needs of potential customers. In this instance, the literature argues that Kaizen fosters an environment that squelches ambition and the entrepreneurial spirit (Santos-Vijande and González-Alvarez, 2007). Harari (1993) sums up this harmful effect by noting that the obsession of achieving a zero-defect “do-it-right-first-time” routine is a dangerous luxury that often slows down new breakthrough development in products and services.

Prajogo and Sohal (2001) state that lean six sigma leads the organisation to be reactive in responding to current customer needs. Being reactive limits the firm’s ability to engage in the entrepreneurial element of opportunity recognition. It reduces the chance that the firm will explore unserved needs and markets. Serving your current customers in a reactive manner decreases the chance that the firm will develop radical new products and be a first-mover. In essence, according to these authors, if a firm implements Kaizen (via lean six sigma), its ability to also implement CE will suffer.

One way of improving cost according to the LSS philosophy is to reduce slack, but this goes against the CE belief that the availability of slack resources are in fact an essential prerequisite for innovation (Prajogo and Sohal, 2001). If one believes this line of reasoning, it’s not possible to both reduce slack and be innovative at the same time. Likewise, it wouldn’t be feasible to be innovative and frugal at the same time. While focusing on cost improvement is important for LSS, it may have a stifling effect on the CE (Mokaya, 2012).

2.5. Arguments for a Positive Relationship

Many authors make a compelling case for a favourable relationship between LSS and CE. Both philosophies have a strong focus on customers and processes as means of improving business outputs. Although there is a fundamental difference in timing between these two philosophies, the literature outlined below shows how they complement each other in a beneficial way.

While CE does not affect organisational performance often, when it does happen, it occurs at a rapid pace. In contrast, given that LSS is incremental in nature, implementing this methodology advances the firm at a far slower pace. Establishing LSS’s incremental adjustments on a daily basis helps keep firms running at an optimal stable level. This allows the interruption of a breakthrough entrepreneurial idea to be implemented without causing a disabling disruption. Hammer and Champy (2003) state that LSS should be used to keep a company’s processes tuned up between the periodic process replacements that only reengineering (CE) can accomplish. The main idea of the positive argument is that both CE and LSS should not be seen as a “stand alone” systems but rather as systems that need to operate alongside each other (Hoerl and Gardner, 2010).

O’Reilly and Tushman (2004) assert that LSS has the ability to address both efficiency and innovation. They believe that the stability offered by LSS can grant organisations additional flexibility that facilitates experimentation and allows businesses to focus on both incremental change (Kaizen via LSS) and radical change (through entrepreneurship). Thus, LSS enables the creation of a flexible environment that in turn creates an enabling environment for corporate entrepreneurship. As described below, the two methodologies are both compatible and can even enable situations where implementing both philosophies together has the ability to produce even greater positive results than had a company implemented only one on its own.

The question as to whether CE and LSS have a statistically significant positive relationship is the basis of this study. It should be noted that an identified correlation does not imply causation. However, if a positive relationship is found, it may mean that implementing one methodology could facilitate the establishment or expansion of the other. The counter argument also could be made, in which it is determined that when corporate entrepreneurship increases, lean six sigma decreases and vice versa. It is also of interest to establish the effect each of these constructs has on performance, since the aim of implementing either is to enhance performance.

Based on the outlined components of the two constructs, the study makes the following hypothesis;

(H_o^1) : States that there is no statistical significant correlation between ‘innovation’ and (H_o^{1a}) : ‘variation reduction’, (H_o^{1b}) : ‘waste reduction’, (H_o^{1c})

(H_o^2) : States that there is no statistical significant correlation between ‘organisational flexibility and (H_o^{2a}) : ‘variation reduction’, (H_o^{2b}) : ‘waste reduction’, (H_o^{2c})

(H_o^3) : States that there is no statistical significant correlation between ‘environmental scanning’ and (H_o^{3a}) : ‘variation reduction’, (H_o^{3b}) : ‘waste reduction’

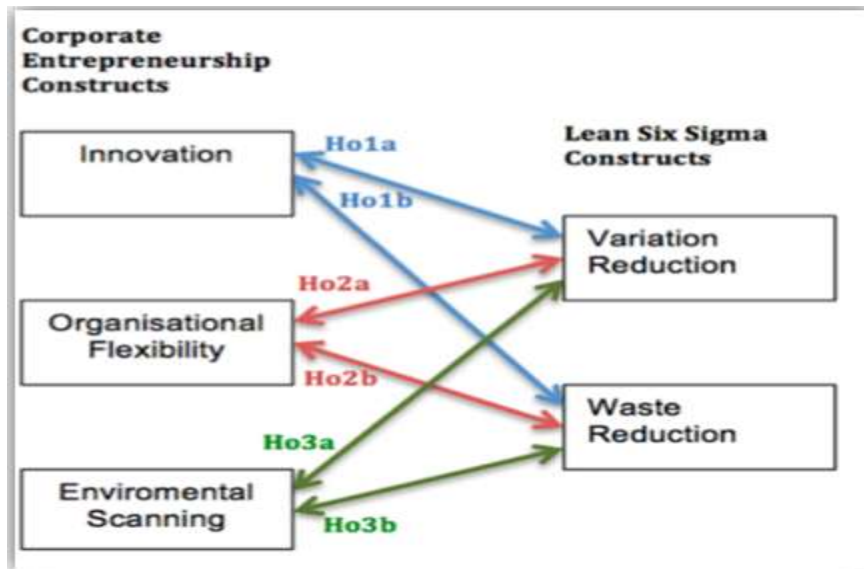


Fig-1. The Hypothesis

3. Methodology

A quantitative study design was selected, as it is the best means to undertake the research question at hand, namely the empirical assessment of the practice of CE and LSS in the South African financial sector.

3.1. Population and Sampling Design

3.1.1. Study Population

For this study the population consisted of employees working at a South African Registered Bank in either an analytical team or dealing with special projects, including research and development. Employees with specialised knowledge in the field of study were targeted, with a special focus on getting individuals who work in the relevant departments at their financial institutions. For example, people who work in innovation or process improvement were actively sought to participate and complete the questionnaire.

There are 17 registered banks in South Africa. Ten of these banks are locally controlled while the other seven are foreign controlled. The locally controlled banks were the focus of the study, with Absa Bank Limited being an exception as the only foreign controlled bank to be included. Standard Bank was also included, but is still considered to be locally controlled with only 40% of shares being foreign controlled (Standard Bank, 2009). The reason to include Absa Bank Limited is due to them being considered one of the 'big four' banks in South Africa (Reserve Bank of South Africa, 2013).

3.2. Sampling Design

This study used the non-probability sample method of Snowball or Network sampling. This is a purposive sample method picking individuals who are most important to the study. The researcher followed a multi-step process to implement the snowball sampling method. The start-up point was first identifying a known group of individuals who could be used as a 'seed'. This list of individuals is usually a homogenous group comprising of a list of members of the population. In this instance, one of the researchers has worked at a number of banks and has a moderate network of individuals who either work at other banks or know of people who work there. Thus this initial list was targeted through this personal network of colleagues and friends. In addition, a web search on LinkedIn for bank employees that fit the inclusion criteria was conducted. This led to recruiting a few additional participants who were targeted via cold calling a number of strangers. The contacts provided from this group produced the first wave, which in turn, provided the names of additional colleagues that produced wave two.

3.3. Study Sample

The study has a particular focus on South African banks with the unit of analysis being individual bank employees and not banks. Respondents were required to not only be knowledgeable about LSS (continuous improvement strategies) and CE, but also had to be currently working at a South African bank (thus have adequate knowledge of the financial industry in general). The final number of participants contacted was 248 and the number of eventual respondents were 102, giving a response rate of 41%.

3.4. Measuring Instrument

Data was collected from the respondents by use of a self-administered questionnaire which was sent via e-mail. Responses were made online. The survey solicited opinions based on the professional experience of respondents with regards to the practice of corporate entrepreneurship and lean six sigma in their respective institutions.

The questionnaire was made up of closed pre-coded questions. The questionnaire was made up of four sections, namely;

- Demographics
- Corporate Entrepreneurship (made up of three sub constructs / scales)

- Innovation and Risk Scanning Scale
- Opportunity Recognition Scale
- Organisational Flexibility Scale
- Lean Six Sigma (made up of two sub constructs /scales)
 - Variation Reduction Scale
 - Waste Reduction Scale

4. Research Results

4.1. Descriptive Statistics

There was a gender split of 69% male and 31% female. This split seems reasonable in context of the 2013 report titled *Gender Statistics in South Africa*. The report shows that the proportion of men is about twice that of women among the population that was being studied, namely the top specialised skilled categories (Statistics South Africa, 2013).

There was an age split of 53.92% of the sample between 18 – 35 years old with 32.35% being in the 36 – 45 years age group 46 – 55 year olds make up 7.84% and over 55 years represent only 5.88% of the sample. When investigating the age profile of persons in the working-age population and labour force in 2011 (Statistics South Africa, 2012) it was seen that the age group 15–34 years made up 50.1% of the labour force. The population in the study is reflective of what statistics South Africa, shows as the average spread of the workforce in South Africa.

The company size split was that 62.75% of the respondents work at banks with over 5000 employees and 24.51% work at banks with 500 – 5000 employees. Only 12.75% work at banks with less than 500 employees. The big four banks in South Africa and a few of the specialist banks all have over 5000 employees. It is not then surprising that over 60% of respondents were from these banks. More than half the banks in South Africa that were included in this study employ more than 5000 employees.

4.2. Construct Validation Results

Confirmatory factor analysis, was used in this study according to Sharma (2007) to assess the extent to which the hypothesised set of identified factors indeed fits the data.

The Varimax Rotation, an orthogonal method style was used in this factor analysis. The goal is to simplify the columns of the un-rotated factor-loading matrix. Varimax maximises the variance of the loadings within the factor. Higher loadings are made higher and lower loadings are made lower (Sharma, 2007).

Table-1. Data structure (confirmatory factor analysis)

Questions	Cronalpha	Eigenvalue
Environmental Scanning (CE)	0,889	5,44
Innovation (CE)	0,805	3,95
Organisational Flexibility (CE)	0,789	2,50
Variation Reduction (LSS)	0,930	3,24
Waste Reduction (LSS)	0,907	9,44

The factor analysis produced three factors for CE, two factors for LSS. Once these factors have been produced the next stage is to determine what relationship they hold with each other. The factors lead to eleven possible relationships that can be conducted between the factors. The next section will detail the nature of these relationships as hypothesised in the study. The tests will be done utilising Pearson’s correlation coefficient.

4.3. Hypothesis Tests

The study’s hypothesis were tested using Pearson’s correlation test and the results are shown in Table 2. Each of the hypotheses is going to be restated and the result analysed and thereafter discussed in detail.

Table-2. The Relationship between the various factors

		Innovation	Organisational Flexibility	Environmental Scanning	Variation Reduction	Waste Reduction
Innovation	Pearson Correlation	1.000	.	.	.132	.212
	Sig. (2-tailed)	.	.	.	.186	.033***
	N	.	.	.	102	102
Organisational Flexibility	Pearson Correlation	.	1.000	.	.361	.040
	Sig. (2-tailed)	.	.	.	.000***	.931
	N	.	.	.	102	102
Environmental Scanning	Pearson Correlation	.	.	1.000	.422	.463
	Sig. (2-tailed)	.	.	.	<.0001***	<.0001***
	N	.	.	.	102	102
Variation Reduction	Pearson Correlation	.132	.361	.422	1.000	.
	Sig. (2-tailed)	.186	.000***	<.0001***	.	.
	N	102	102	102	.	.
Waste Reduction	Pearson Correlation	.212	.040	.463	.	1.000
	Sig. (2-tailed)	.033***	.931	<.0001***	.	.
	N	102	102	102	.	.

***P-value indicates significance if $\alpha = 0.05$

5. Discussion

(H_o^1) : States that there is no statistical significant correlation between 'innovation' and (H_o^{1a}) : 'variation reduction', (H_o^{1b}) : 'waste reduction'

5.1. Innovation and Variation Reduction (H_o^{1a})

When reviewing the correlation between innovation and variation reduction, it can be seen (Table 2) that there is a positive but non-significant relationship between innovation and variation reduction as shown by a p-value of 0.186. We therefore accept H_o^{1a} which stated that there was not a statistically significant relationship.

From this, the findings show that the output of CE in the form of innovation has a positive link in reducing variation within the organisation. Having standardised processes and levels of service offering eliminates some uncertainty in the organisation. This lets the organisation have the space to be more innovative. This standardisation does not negatively impact on the ability to be innovative and take risks but rather accommodate it. This leads to the notation that both activities can co-exist in a single organisation without having a negative impact on each other. They have a potential positive impact, but it can only be considered a potential relationship, as the relationship is not significant in value.

According to the literature when an organisation aims to achieve variation reduction there are certain strategies and procedures that are undertaken. Some of these would enhance innovation and others will hamper it. Results show that variation reduction will improve innovation within the organisation, though, not in a significant way.

5.2. Innovation and Waste Reduction (H_o^{1b})

In Table 2, it can be seen that there is a weak positive correlation between innovation and waste reduction as shown by a p-value of 0.33. The hypothesis is rejected, as the correlation is positive, and it is just significant.

In the literature there were discussions of the impact of slack on the ability for an organisation to be innovative. The data implies that some control over the level of waste in the organisation does aid in the innovation process. The result implies that through innovative activities there is some positive impact on the ability to reduce waste in the system.

It is worthy to note that there is not a negative correlation between the aspects of LSS and innovation, as some of the literature claimed. An overall recommendation would be to continue to pursue the methodologies relating to LSS and attempt to implement them concurrently, as the two methodologies do not negatively impact on each other (Prajogo and Sohal, 2001).

(H_o^2) : States that there is no statistical significant correlation between 'organisational flexibility and (H_o^{2a}) : 'variation reduction', (H_o^{2b}) : 'waste reduction'

5.3. Organisational Flexibility and Variation Reduction (H_o^{2a})

Results showing a p-value of 0.361 indicate that innovation and risk and waste reduction have a weak correlation, though it is significant. The hypothesis is thus rejected. This indicates that there is a direct positive relationship between organisational flexibility and variation, even though it is not that strong. This can be seen to imply a weak link between the controls required keeping variations in products and processes to a minimum, and the control required to have a flexible organisation.

When opportunities for CE arise the organisation wants to be flexible enough to move in that new unexpected direction. These organisational shifts will impact on the current processes and services offered to customers. The data shows that there is a relationship between being flexible and keeping quality variations at a minimum. The reverse will hold true in keeping quality variations at a minimum is an indicator that the organisation is ready for any shifts in the internal or external environment i.e. flexible.

The literature explains that there is an organisational challenge to provide both structure and flexibility. Flexible organisations often exemplify team and individual empowerment (Englehardt and Simmons, 2002). This puts the power of control on individuals to manage variation deduction.

5.4. Organisational Flexibility and Waste Reduction (H_o^{2b})

The correlation between organisational flexibility and waste reduction is non-significant and the hypothesis is therefore accepted. This means that there is no relationship between organisational flexibility and waste reduction. Excess waste in the system or a fully implemented lean strategy has no significant relationship with a flexible organisation. The same is true for the other way around.

The data suggests that the strategies that are required to reduce excess resources in the organisation have no impact on the organisations ability to be flexible. The discussions in the literature that assumed some form of negative relationship implied that excess resources would make the organisation less agile and unable to be flexible. Other literature discussed how these resources would be required in order to be flexible, as they would need to be consumed in the additional effort in changing strategies. Neither assumption seems to be relevant when reviewing the data, as there is no correlation found in the analysis.

Even though the data shows no significant correlation between organisational flexibility and variation reduction, the literature provides benefits for both variation reduction (Pande et al., 2000) and organisational flexibility (Barringer and Bluedorn, 1999). Organisations should pursue both strategies without worrying if any negative impact will occur on the other, as they are not correlated.

(H_o^3) : States that there is no statistical significant correlation between 'environmental scanning' and (H_o^{3a}) : 'variation reduction', (H_o^{3b}) : 'waste reduction'

5.5. Environmental Scanning and Variation Reduction (H_o^{3a})

When reviewing the correlation between environmental scanning and variation reduction it can be seen (Table 2) that there is a positive significant relationship between environmental scanning and variation reduction as shown by a p-value of 0.422. We therefore reject H_o^{3a} which stated that there was not a statistically significant relationship. This implies that there is a direct relationship between organisational flexibility and variation reduction though this relationship is weak (moderate in nature). There is therefore a link between the controls required keeping variations in products and processes to a minimum, and the control required to have a flexible organisation.

The recommendation here is to develop the skills required to actively scan the external environment for opportunities. The reason for this is that these skills are similar to the skills required to scan the internal environment for improvements. When scanning the internal environment through tools such as DMAIC, root cause analyses could be conducted in order to detect issues that cause variation reduction (Van Iwaarden *et al.*, 2008). Developing these skills aid organisations two fold in being able to both reduce variation and find external opportunities that facilitate innovation and improve overall corporate entrepreneurship

5.6. Environmental Scanning and Waste Reduction (H_o^{3b})

The correlation between environmental scanning and waste reduction shows a p-value of 0.463. This is above the threshold for a weak correlation and quite close to being considered a moderate correlation. The null hypothesis is thus rejected. This reveals a direct relationship between environmental scanning and variation reduction though this relationship is about moderate. This can be seen to imply a moderate link between the discipline of reviewing the external environment for opportunities to increase the company's value and the discipline required to review internal practices that need altering in order to reduce waste, which then would increase organisational value.

A focus on six sigma strategies and variation reduction will create an organisation that has a proactive mind-set and that has an increased understanding of customer needs (Antony, 2006). This ties in closely with the skills that are developed in environmental scanning such as sharing knowledge amongst colleagues (Mascitelli, 2000).

An overall recommendation would be to invest in strengthening employees' skills and training them to observe both their internal and external environment critically. Employees should continually be questioning the current way things are being done. From an external perspective, they should be reviewing the political, environmental, social, technological and legal landscape on an on-going basis. Changes in the external environment pose threats, but more importantly, they provide opportunities to be entrepreneurial. From an internal perspective scanning the internal environment is critical to enable the isolation of issues that may cause variations in the quality of service or the way processes run. Also, scanning the internal environment for excess waste contributes to the improving the organisation and raising the organisational performance (this is looked at in the analysis of the next hypothesis).

6. Conclusion

The purpose of the study was to assess the practice of CE and LSS within South African financial institutions. The research investigated the nature of the relationship between the two methods. Both CE and LSS were broken down into smaller constructs for analysis purposes. The data analysis determined if indeed there was a relationship between the three corporate entrepreneurship constructs (Innovation, organisational flexibility and environmental scanning) and the two lean six sigma constructs (variation reduction and waste reduction).

The first hypothesis dealt with Innovation which is considered to be an output of CE. There was no relation to variation reduction. This would make sense, as being innovative is not related to being stable and ensuring consistency in product and process. There was a weak relation to waste reduction. Though being resourceful and cost conscious with regards to waste in some instances may force the organisation to be innovative to achieve this goal of being cost conscientious.

The second hypothesis dealt with organisational flexibility and its correlation with waste reduction, variation reduction. There was a weak relation to variation reduction. In keeping services and processes constant, it can make the space required to be flexible when adding a new service or process. There was an insignificant relation to waste reduction.

The third hypothesis was about environmental scanning. There was a weak relation between scanning and waste reduction. Scanning the environment externally may give insights how others control waste and these practices can be implemented internally.

Future studies could focus on the organisation as the unit of study. This would take into account issues regarding the size and type of the financial institution. A larger sample size could be taken to get a more representative data set. Other financial institutions could be studied such as insurance companies or smaller micro lenders that are not officially banks. This study could be carried out in other countries with a similar financial system as South Africa (e.g. developing economy) as well as in countries with different systems for comparative purposes. It would be interesting to find out if similar results would be found, especially with regards to the performance of the organisation as a result of the application of corporate entrepreneurship and lean six sigma. The recommended areas of future studies are the current limitations of this study.

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