

UNIVERSITY OF KWAZULU-NATAL

REINVENTING AN ORGANIZATION THROUGH ITS CULTURE TO
DRIVE BUSINESS SUSTAINABILITY

By

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Abstract

South Africa has faced many challenges in recent years with regards to the supply and demand of water. A concerted effort is much needed from all contributing stakeholders in order to address issues threatening South Africa's water supply. Research and development plays an imperative role in creating new knowledge and methodologies through innovative projects. Sustainability of research organizations entails a multidimensional approach that focuses on people, profits and the environment encouraging higher productivity and the retention and attraction of skilled people. A core enabler of sustainability is innovation. A culture of innovation leverages the innovativeness of an organization by developing people and the organization. The objectives of this study were to determine the impact culture has on sustainability and to identify the building blocks of a culture of innovation. This was a cross – sectional study conducted among the whole population of 20 members of a research group. An online questionnaire with Likert type questions was used to conduct the survey. The mean analysis was used to determine the overall innovativeness of the organization as well to identify strengths and weakness of various factors. Correlation analysis was used to establish positive relationships between culture building blocks. It was found that the stability of sustainability can be achieved in individuals, the organization and the external environment by implementing a culture of innovation within the organization.

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CHAPTER ONE

Introduction

1.1 Introduction

The introduction chapter contextualises this study with respect to the industry and relevant aspects pertaining to the topic. The background touches on challenges in the water sector followed by a descriptive overview of organizational sustainability and culture. The motivation for this study emphasizes the importance this research has on the progress in the South African water industry. The focus of this study identifies specific research areas relevant to organization and industry. The problem statement identifies a problem within the study area which forms a basis for this study. The purpose, objectives and research questions outline the key goals of this study and direct the research toward solving the problem statement. The structure of the study provides a brief overview of each chapter.

1.2 Background

In recent years South Africa has had rapid growth in urbanization, industrialization and informal settlements which has caused immense strain on basic needs. (Kotze, 2014). Water is a renewable source however the available resources are becoming rapidly polluted by harmful compounds. Further to this, water shortages have also been due to widespread droughts with 2015 being one of the driest years ever experienced (Landie, 2016). The effects of a high demand coupled with supply limitations create an increasing awareness to protect and sustain the environment.

Elkington in 1994, constructed the sustainability related concept of the triple bottom line (TBL) to broaden focus of business success to managing profits, people and the environment (Alhaddi, 2015). Achievements within these dimensions are highly dependent on the output of an organizations workforce. Actual behaviour of employees is impacted on, to a degree of specificity, by values and behavioural

norms which are characteristic of an organizations culture (Brettel et al, 2015). Thus it can be derived from the aforementioned that culture can be used as a means to drive organizational sustainability.

1.3 Motivation for the study

South Africa has recently faced many challenges meeting water supply with its demand. Increasing difficulties have been experienced across the country as a result of water shortages. Research institutes based at universities make a meaningful contribution towards public and private sector research advancements which have the ability to address the needs of domestic, industrial and agricultural water requirements. Greater participation and the generation of innovative ideas are imperative.

1.4 Focus of the Study

The focus of this study was twofold with considerations towards internally maintaining an organization's sustainability whilst contributing to advancements and productivity in the external industry. Sustainability was viewed in relation to the triple bottom line and focused specifically on achieving this as an outcome. The external industry, being the global wastewater treatment and alternative sanitation industry, was used as a platform to source new ideas and contribute to existential problems.

1.5 Problem Statement

President Zuma's address at the World Water Day Summit Expo painted a bleak picture of the global water situation and prioritized improvements in services and innovation as crucial measures (Mokgothu, 2017). A major focus on elements from existing external ideology was revealed from many journal publications with a significant dearth in creating value through integration and commercialization of new ideas (West et al, 2014).

Research and development play an integral role in advancing toward innovative and sustainable solutions. Improvements in current technologies and the development of new methodologies are highly sought after globally. The Pollution Research Group (PRG), located in Durban KwaZulu-Natal, is an independent research group who specialize in wastewater and alternative sanitation research. Research organizations, such as PRG, are reliant on external funding for their future sustainability.

PRG consists of Senior Researchers, Post Doctorates, Postgraduates and visiting Researchers. The composition of the group changes constantly as projects and funding are short term. As a result of this succession planning, attracting and retaining researchers become challenging. Therefore creating a culture within the organization lays the foundation for stability and continuation. A study on the behavioural effects of sustainability oriented systems has shown that there is a moderating effect between people's intended behaviour and a sustainable oriented incentive system which results in enhanced employee attraction, motivation and cooperation (Huber et al., 2017).

1.6 Purpose and Objectives

The purpose of this study is to identify aspects of organizational culture that will enable PRG to utilize resources more effectively on a continuous basis and to create an environment that contributes positively to the consistent future profitability and longevity of the group.

Objectives:

- Investigate how organizational culture impacts on sustainability.
- Determine the culture building blocks for a culture of innovation.

1.7 Research Questions

- How is sustainability linked to an organizations culture?
- What aspects of organizational culture promote innovation?

1.8 Expected Outcomes

The significance of this study is to create an awareness of eminent global water crisis and coax people, through culture, to become more innovative and work towards solutions and advancements in their respective industry. The expected outcome of the study will be a model outlining how sustainability can be achieved through organizational culture that will ensure long term profitability. All organizations strive to maximise profitability as a major business goal, therefore any organization will stand to benefit from the outcome of the study.

1.9 Structure of Study

The structure of the research study and description of individual chapters are outlined below.

Chapter 1: Introduction

This chapter gave a description of the background to the research. It had identified a problem statement and suggested research questions and objectives with which to address and solve the problem. The purpose of the study was outlined with expected outcomes and how it will contribute towards greater good in the industry. The chapter concluded with a brief description of each chapter which highlighted the structure of the thesis.

Chapter 2: Literature review

The focus of the literature review was on conducting a review of sustainability and culture. An integrated sustainability model, inclusive of enterprise excellence and resistance, was discussed with innovation as a key enabler. The benefits of a strong organizational culture were highlighted as this was a key factor in addressing the problem statement. The literature review sought out to establish a dependency relation between sustainability and culture. The building blocks for a culture of innovation provided the conceptual model from which the key outcome variable of innovation was determined in chapter 3.

Chapter 3: Research methodology

The aim of this chapter was to develop a research methodology that was suitable to measure and analyze the research data from the study area. The literature review highlighted aspects of the dependent variable sustainability and the independent variable culture. A culture of innovation building blocks was shown as key elements towards attaining sustainability.

A research instrument was designed to collect the relevant data with accuracy. The data was collected following an ethical protocol with extra measures to ensure that the data was reliable and valid. The data was analysed using a statistical tool from which relevant conclusions were presented in chapter 4.

Chapter 4: Presentation of results

This chapter presented the research data that was obtained using the developed and administered in chapter the research methodology. The raw data collected was analysed using frequency distribution, mean and correlation. The results from the analysis were tabulated with a summarised discussion.

Chapter 5: Discussion

This chapter was an integrated discussion based on concluding evidence from the results presented in chapter four and the literature review in chapter two. The chapter starts with a review of the objectives of the study. This was followed by a discussion of the key findings which aims to satisfy the objectives. The discussion in this chapter also highlighted aspects of practical applications of the study that can be beneficially applied by stakeholders.

Chapter 6: Conclusion and recommendations

This chapter highlighted concluding aspects from the study and drew from the research study on how the problem statement could be solved. Limitations of the study were identified. Recommendations for future studies were put forward.

1.10 Summary

This study undertook to investigate how organizational culture impacts on sustainability whilst also determining the building blocks for a culture of innovation. In order for PRG to attain structural stability and retain valuable skills for increased research output, they can strive toward building a sustainable organization with attention to the triple bottom line of people, profits and the planet. The outcome of this study will provide in-depth knowledge on how sustainability can be achieved through building a culture of innovation in the organization. The following chapter presents a review of literature pertaining to sustainability and culture.

CHAPTER 2

Literature Review

2.1 Introduction

The literature review first looked at the concept of sustainability in relation to measuring sustainability in terms of the triple bottom line. Sustainability co-exists with enterprise excellence and enterprise resistance. Sustainable oriented innovation is a key enabler for achieving the triple bottom line and ultimately the triple bottom line. Developing a culture of innovation within an organization can be used as a management tool to drive an outcome of sustainability.

Several management theories have preconceived ideas that the aim of the organization is to maximise profits in relative to capacity constraints. There is a significant variation in ways in which organizations pursue profit maximisation; some place more emphasis on short term rather than long term. Eccles et al (2014) conducted a comparative study on high and low sustainability organizations by tracking their eighteen performances. It was concluded that high sustainability organizations outperformed low sustainability organizations with regards to annual performance, return on equity and return on assets.

2.2 Sustainability

There is a growing demand from business stakeholders to receive more information about the current standing and future of a business since their input is vital. This has encouraged the inclusion of sustainability information. Efforts into implementing sustainability initiatives vary from competitiveness to legitimacy (Searcy, 2014). Since its emergence more than two decades ago as a business paradigm, sustainability has gained momentum as high priority on the corporate agenda thus it can no longer be considered as a fringe issue but rather entrenched into global business consciousness.

The effectiveness of sustainability is not achievable without developing a capacity to excel across all critical domains with a degree of resilience and robustness. Challenges and competitive shocks will not pose an immediate threat as resilience has the ability to self renew through innovation, changing and reinventing itself by adapting to its responses (Edgemen, 2014). Innovation for sustainability implies that a crucial component of enterprise innovation activities are derived from ecologically and societal sources. Social ecological innovation is a resultant of a culture of innovation and is attained by embedding innovation for sustainability into values and behaviours (Lenssen et al., 2013).

2.2.1 Concept of Sustainability

Sustainability in simple terms refers to the capacity with which to endure and remain resilient or resistant to changes in various factors. The process of endurance entails structuring the way things are done to measure value and progress. In a business context sustainability takes into account the bigger picture by viewing the world around it. The origin of sustainability may have been developed some 130 years ago but it has progressed over the years to gain significant popularity (Alhaddi, 2015).

The intrinsic nature of the idea of sustainability remained as a focus on outweighing needs irrespective of limitations; this despite its evolution over the years. In a business context sustainability is known as the market-oriented success and the integration of social, economical and environmental organizational challenges (Schaltegger et al., 2013). The growing number of articles on sustainability over the last decade is proof that sustainability has become a central issue for organizations and academia (Weber et al., 2012).

The 3 major steps through its evolution have been the by Brundtland (1987), John Elkington (1997) and lastly by the Global Reporting initiative (Beckmann et al., 2014). The Brundtland definition, contained in her report *Our Common Future*, is

unspecific about the details and nature of sustainability however it lends itself to a more vague impression of looking toward the wellbeing of future generations (Bartlet, 2012). The second phase by John Elkington outlines the triple bottom line (TBL) in which the economic, social and ecological pillars are set out as a sustainability model that measure an organizations success (Beckmann et al., 2014). The third is the Ecological, Social and Governance (ESG) sustainability dimensions which were developed by the Global Reporting Initiative (Beckmann et al., 2014). The ESG criteria introduce a governance dimension in order to guarantee the integrity of internal management processes and of the organization.

2.2.2 Enterprise Resistance

The concept behind the word resist may be considered to be a blend of revive, thrive, survive and strive. Revival is restorative strategy and action which is suggestive of refreshing the natural environment. Striving is essential as environments are fraught with human influenced problems. Survival doesn't have an assurance or the expectation of eternity but is basically continued existence with the hope of longevity. Thriving simply implies flourishing and is highly desirable but is not perpetually guaranteed (Costanza, 2012).

These four connotations of resistance can be connected to synonymous enterprise aspirations. Resistance holds the ability to repeatedly adapt to changes with strategic responses (Haeckel, 2013). The advancements on the path towards these aspirations are insufficient in itself to occur since competitive landscapes influence viability. Resilience and revival are interconnected in that resilience is an enterprises ability to reinvent itself as a response to stimuli from challenges in its competitive market by self-renewing through innovation.

Survivability is related to resilience, thriving to excellence and sustainability to both resilience and excellence. Sustainability, resilience and excellence often move in a similar direction however strategies, practices and policies aiming at optimising one doesn't necessarily optimise the others. This promulgates the desire to simultaneously leverage synergies for an integrated and aligned approach. Sustainability is an enterprises ability to create and maintain such that, in both its short and long terms, enterprises sustainability is its survival capacity. If so then excellence is its capacity to strive and thrive across performance areas that comprise of results and impact.

Although resistance can be perceived negatively such as clinging to ineffective beliefs irrespective of proven superior alternatives, its elements here are interpreted positively which suggest solid competitive grounding and future superior footing. The notion of resistance is derived as navigating circumstances with wisdom toward a more prosperous future. The approach toward this relevant to enterprise resistance is through an integrated viable strategy aimed at sustainable excellence (Edgeman et al, 2014).

2.2.3 Enterprise Excellence

Sustainable enterprise excellence (SEE) reaches beyond becoming only sustainable but rather cultivating to become continuously relevant and responsible. The inclusion of the triple top line (TTL) and triple bottom line (TBL) communicates their connective nature and drives the alignment and convergence between sustainability and enterprise excellence. An ethical, efficient and effective governance (3E) and TTL strategy lays the foundation for TBL performance of people, profits and planet (3P). Therefore SEE aims to optimise performance and organizational progress (Edgeman et al., 2014). The SEE model in figure 2.1 shows common business model

components such as customer segments, service and product offerings, cost structures and revenue streams.

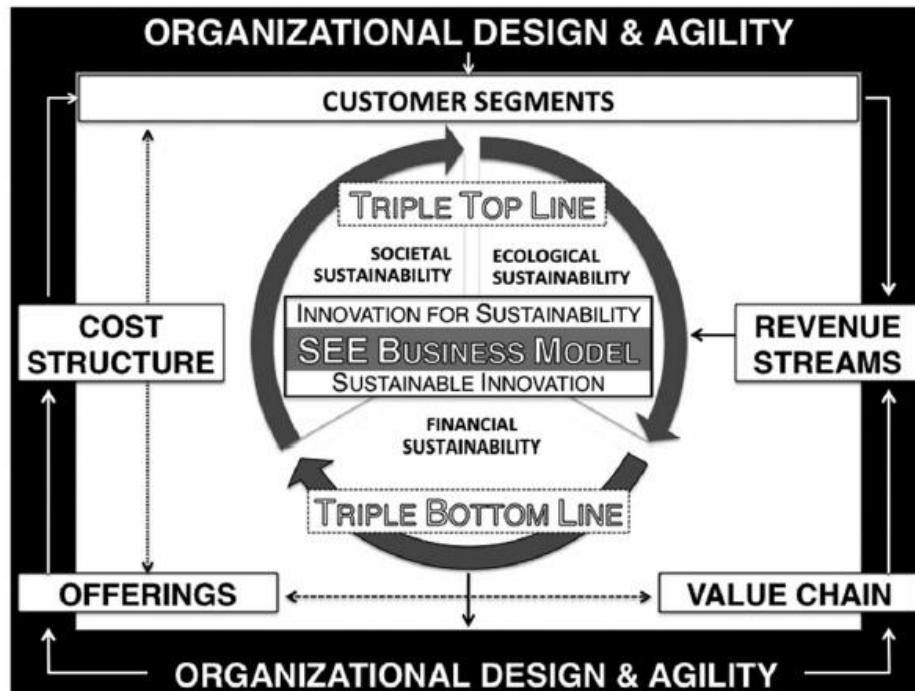


Figure 2.1: Sustainable Enterprise Excellence model (Edgeman et al, 2014)

The adaptability and fit of an organizations structure to its needs is configured through organizational design. Sustainable innovation contributes to financial wellbeing of the organization and is regular and systematic. Innovation for sustainability targets societal considerations and is sometimes referred to as green innovation. A strategic integration from the TTL and TBL of sustainable innovation and innovation for sustainability results in socio – ecological innovation (Edgeman et al., 2014).

2.2.4 Sustainability Enterprise Excellence Resilience Model

Declining resources and environmental degradation are realities that have to be confronted whilst simultaneously emphasizing enterprise longevity and financial security. Organizational elements that are critical to its health and vitality have commonly been treated as distinct rather than interrelated. There are integrated synergies in the construct of resistance among revival, survival, striving and thriving. However with regards to sustainability and excellence the same can't be said; this often leads to a failure in understanding aspects of their competing and complementary nature.

The sustainable enterprise excellence resilience model (SEER2) creates a unified path to maximise synergies and minimize dissonance among elements of sustainability, excellence and resilience for the purpose of simultaneously advancing these and to further generate economic, societal and ecological benefits (Faaji et al, 2013). For this approach to be viable joint enablers need to be identified. Enablers of SEER2 are inclusive of human relations, operational proficiency, governance and, general and social ecological innovation (Malhotra et al, 2013). The SEER2 model has merged enterprise excellence with enterprise sustainability by driving a triple top line strategy to produce the triple bottom line.

Sustainable competitive positioning followed by long term success is leveraged by a balance in competing and complementary interests of key stakeholders, the environment and society through sustainable enterprise excellence, resilience and robustness (Edgeman, 2014). SEER2 makes prior assumptions toward ongoing responsible, strategy, governance, performance, actions and subsequent impact. Ethical, effective and efficient (E3) strategy and governance is pursued through SEER2. Enablers of strategy and governance such as innovation and organizational design, shown in figure 2.2, leads to superior performance and impact elements such as financial and marketplace.

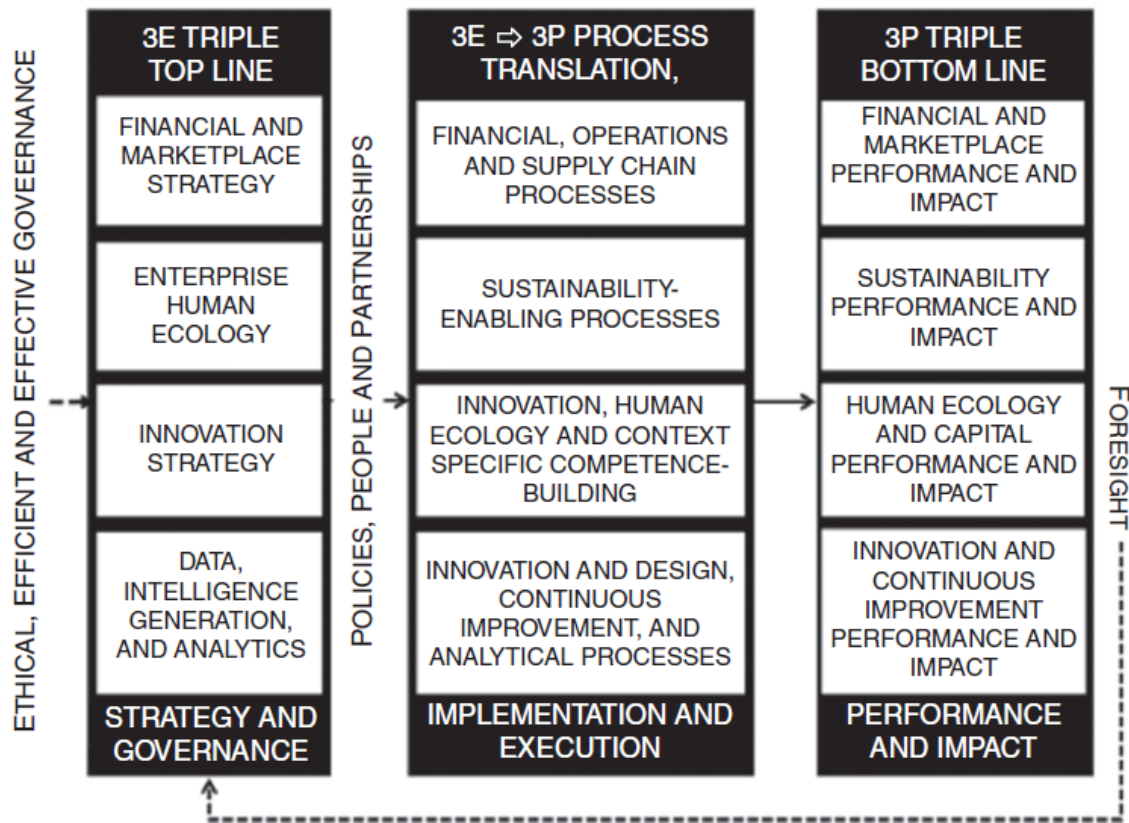


Figure 2.2: Springboard to SEER2 Sustainability model (Edgeman, 2015)

2.2.6 Sustainability oriented innovation

Sustainability oriented innovation (SOI) entails tailoring an organizations values, products and processes in order to create and realize ecological and societal value with the addition of an economic benefit (Adams et al, 2016). The incremental shift towards a more sustainable society and economy has been a result of increasing concerns with over-consumption of resources, environmental degradation and social inequity. Fluctuating markets and economic agents are generally part of the problem thus requiring positive changes to the economic paradigm positioned toward

sustainability. Therefore innovation is an integral enabler that can help businesses transition toward achieving sustainable economic growth.

It is widely understood that innovation plays an important role in renewing the organization whilst also refreshing products and services. The key link to sustainability is determining innovation activities that an enterprise would typically engage in to become sustainable. This implies continuous organizational change with different models of activity whereby ideas can be usefully captured through the transitions. In order to address this, an initial architecture can be constructed to give contexts of SOI (D'Este et al., 2012).

This architecture is part of framework synthesis approach where the initial architecture is iteratively developed as it shaped and tested (Thomas et al., 2013). The SOI model was designed to respond to regulatory stimuli with an incremental change at the level of the enterprise. The three dimensions of SOI that emerge from Adams (2016), draw on theories from fields cognate to sustainability to form the building blocks for an initial SOI conceptual framework. The dimensions, represented in Figure 2.3, are technical/people, insular/systematic, stand-alone/integrated.

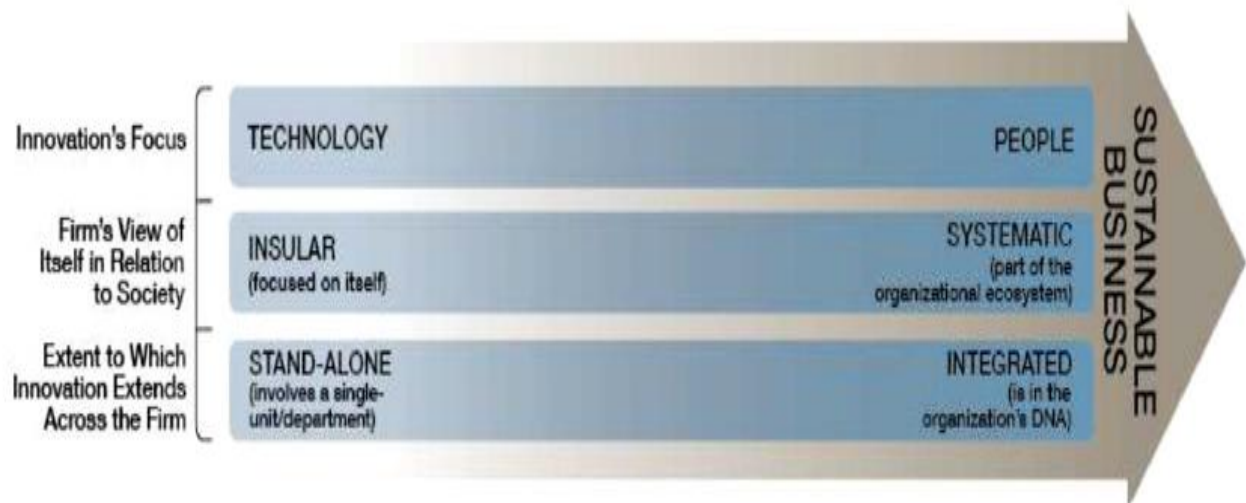


Figure 2.3: SOI dimensions (Adams et al, 2016)

Innovations focus is usually technical and product oriented. Contrasting this is the sustainability socio – technical challenge where the focus shifts to more people centred innovation. The stand alone/integrated dimension extends internally across the enterprise and lends itself to SOI thinking either as ‘stand alone’ within individual departments or integrated throughout the enterprise. In this dimension SOI is seen as moving towards a strategic sustainable behaviour by diffusing throughout the enterprise (Klewitz et al., 2013). The insular/systematic dimension looks at the enterprise relative to wider society beyond its immediate boundaries.

Progressive SOI enterprises’ have been noted to facilitate change in external systems by possibly engaging with NGOs and governments (Schiederig et al., 2012). It can be concluded from the SOI dimensions (Figure 2.3), that the dimensions make a progressive shift towards sustainability the centric focus is on people and the organization. Following a study based on 759 companies in 17 markets, it was concluded that organizational culture was the most important driver innovation rather labour, government, national culture or capital (Rao et al, 2013). An enterprise supports a culture of sustainable innovation by systematically, rigorously and

persistently pursuing innovation and whilst leveraging strategic importance to enterprise impact and performance.

2.3 Organizational Culture

The culture of an organization is expressed as assumptions that a group learns and share during its problems of external adaptation and internal integration (Venter, 2014). A collection of values and norms have been established as a valid behaviour in relation to the organization and are therefore taught to new members as the appropriate manner in which to perceive, think and feel. It will also govern the response groups will have to envisage changes. It is these underlying values and beliefs that serve as a foundation for management systems and practices to be built upon and the expressed behaviour reinforces and exemplifies those basic principles (Wang et al., 2014).

2.3.1 The Importance of a strong Organizational Culture

As a result of increasing speed and scale of changes in organizations, new ways of securing employees commitment are constantly sought after (Liou et al., 2012). Every organization will have a culture, irrespective of its size. This refers to the values and attitudes of employees. A weak culture will cause employees to act to their own benefit as individuals, performing their duties to meet their own needs, such as for a salary. A strong culture creates a sense of togetherness where each employee in the organization feels valued regardless of their job function, which results in an alignment of an employee's personal needs and the company's needs thus working as a team to satisfy both the company's needs along their own personal needs simultaneously. Management controls can be used to bring forward employees to undertake sustainability activities that were previously no go areas by creating core values. A strong culture improves the performance of an organization in a numerous ways such as employee retention, reputation, productivity and quality.

2.3.1.1 Employee Retention

Employees will most likely experience high morale and a positive attitude in an environment where their efforts and contribution towards the business is valued. Some of the most valued factors resulting from feeling valued are self realization and status enhancement which correlated strongly to career management (Chaturvedi, 2013). A sense of loyalty towards the organizations develops in employees with a positive attitude which reduces workforce turnover. High costs relating to recruitment, hiring and training will be controlled. A strong culture can contribute towards retaining highly valued employees and reduce costs in human resources.

2.3.1.2 Reputation

A strong organizational culture portrays a company with having a good reputation with prospective employees. This could attract talented individuals who are highly skilled workers to the organization. Reputable companies within an industry are generally well known. A well regarded business reputation forges a preconceived relationship with prospective customers where higher prices for products and services are acceptable; and in turn increases the company's financial value in the market. A good reputation also creates a solid bond of customer confidence where customers take preference with whom to conduct business with and influences the way they buy (Gorenak et al., 2012).

2.3.1.3 Productivity

A strong organizational culture has the ability to develop the internal capacity of an organization to be effective in its endeavours throughout the short, medium and long terms (Kelepile, 2015). This signifies a link between organizational culture and productivity. The morale of employees greatly improves within an organization with a strong culture which increases productivity. The business stands to benefit from this increased productivity with an increased financial well being and profitability. This highlights productivity as a measure of effectiveness and efficiencies. As a result of

increased productivity and profitability, employees stand to benefit with higher salary increases and more benefits.

2.3.1.4 Quality

The way in which an organization develops products and provides customer services are positively impacted on by a strong culture (Kelepile, 2015). Good culture systems and environments encourage employees to output quality products and provide quality services. Organizations with cultures that benchmark high standard create an atmosphere for employees to meet those expectations by delivering products and services that meet or exceed those standards. These standards of excellence are an imperative factor in the ongoing development of a respected reputation for high quality.

2.3.2 Characteristics of Organizational Culture

Organizations that hold a strong identity support their outlined principals thus thrive well in its business environment. Whilst there are many concepts relating to ideology of sharing and holding in common, the word 'culture' adds many crucial elements such as depth, breadth, integration and structural stability (Schein, 2004).

2.3.2.1 Depth

Culture manifests itself in the deepest, often unconscious parts of the group and less tangible and visible than other parts. One of the fundamentals of organizational culture is its impact on the growth of individuals within the organization (Gorenak et al., 2012). It is essential to recognize that employees are first individuals then members of the organizations. It is with identifying individuality that a common ground can be formed in order to transform individual employees to a common group that identify with being similar individuals of an organization. This is important in

crafting a culture as values are deeply embedded resulting in the manner of the group's natural behaviours.

2.3.2.2 Breadth

Once a culture has been crafted it covers all functioning of the group and extends itself across the breadth of the enterprise. It is influential in an enterprise's internal operations as well as in various related environments and the manner in which primary tasks are addressed. Not all groups interpret culture in this context however the concept suggests that culture of a group encompasses all of its operations. The realization of organizational goals strongly relies on employees having common goals and contributing towards team efforts (Goic, 2013). Strong organizational cultures encourage project and process structures that enable the interpretation of common goals and feature a formalization of roles and duties. This provides organizational direction towards efficiency and effectiveness.

2.3.2.3 Integration

Culture further lends itself to stability by tying the various elements through integration onto a larger paradigm on a deeper level. It implies that elements such as values, behaviours and climate are interlinked and together form a coherent whole. Ultimately human need derives a sense of order in our environment. The culture that is initially shaped to define an organization can be reshaped repeatedly to suit the needs of the organization's fluctuations. Disorder can make people anxious so they will work at reducing anxiety by developing consistency and predictability. Effective and efficient management of employees is greatly influenced by norms and values which suggest that organizational culture improves performance by integrating values management controls such as resources and processes (Awadh et al., 2013).

2.3.2.4 Structural Stability

The term 'cultural' not only implies shared but also defines the group as being stable. A major stabilizing force cannot easily forgo once a sense of group identification has been established. Culture remains fixed although group members may come and go. The stability that culture enforces is valued by group members since it becomes predictive in nature thus making it difficult to change (Schein, 2004). It is also important to note that if something is has depth and is deeply embedded it also gains stability.

2.3.3 Building Blocks of a Culture of Innovation

A culture of innovation is constructed from six building blocks; values, behaviours, climate, resources, processes and success (Rao et al., 2013). Enterprises have given substantial consideration towards resources and processes in measuring success out of convenience. Lesser attention has been given to the harder to measure people oriented building blocks; climate, values and behaviours. Anything that involves values, behaviours and climate are intangible with a slight difficulty in controlling however these have the greatest power to create a culture of innovation and a sustained competitive advantage.

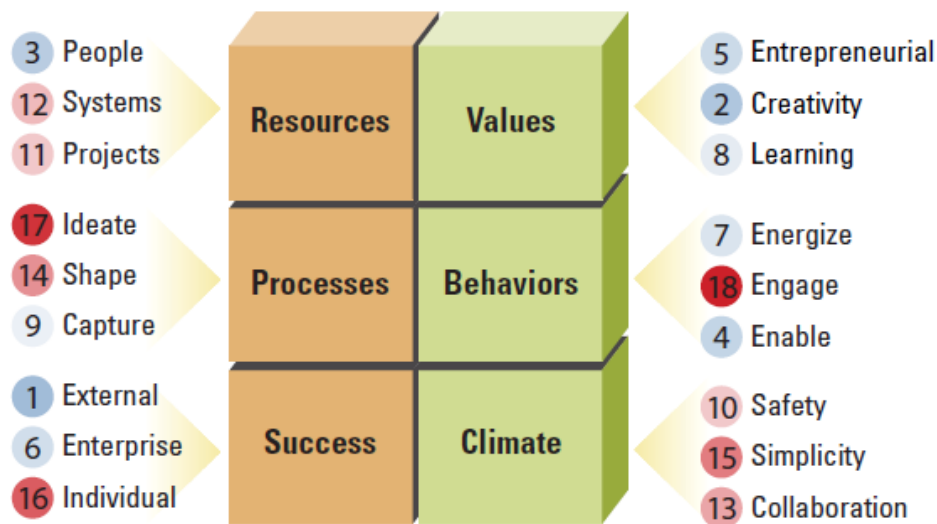


Figure 2.4: Culture building blocks and elements (Rao et al., 2013)

Each building block comprises of 3 elements which makes innovative culture less abstract and easier to measure and manage (figure 2.4). Each element can be quantified with relative questions. An average score from all six building blocks yields an innovation quotient which can be a useful benchmark.

2.3.3.1 Values

Values that are constituted from an organizations culture play a vital role in guiding the actions of the organizations members through the perception of a common goal and collective best interest (Buschgens et al., 2013). Decision making and prioritisation are highly influenced by values and is a reflection on how an enterprise spends their time and money. Values are seen more in what leaders invest in and do rather than in what they say and write in periodic reports. Thus values are more evident in how people behave and spend rather than how they speak. Core values prompt employees to search for actions that are in line with their purpose (Jollands et al., 2015). Enterprises that have an innovative inclination promote creativity, spend generously on entrepreneur advancements and encourage continuous learning. Values and practices collectively prescribe the environment where people

interact by establishing ground rules for communication and behaviours (Wiewiora et al., 2014).

2.3.3.2 Behaviours

Culture is inclusive of morality and outlines the manner in which things should be carried out. Irrespective of the domain within the organization, culture has a positive influence on the nature of employees contribution towards business development (Militaru et al., 2012). Behaviours describe the actions of people especially relative to innovation for a culture of innovation. Leaders' actions include developing new and better products with continuous improvement always at the forefront. They energize subordinates with descriptive future horizons and encourage them to break through barriers. Employees act in favour of innovation by overcoming technical roadblocks, optimising resources when budgets are low and listening to customers so that the most viable products are developed.

2.3.3.3 Climate

The tenor of a workplace environment is its climate. Aspects of an innovative climate are engagement and enthusiasm. It encourages people to explore risk taking within a safe environment. An innovative climate encourages independent thinking and fosters learning. An employee understanding of the organizations culture is the responsibility of management which should ultimately lead to improved performance. Learning should always be at the forefront of management's agenda (Shahazad et al., 2012).

2.3.3.4 Resources

Resources include people, systems and projects. The most critical resources are people who are known as the innovation champions since they contribute the most to values and the climate. Recruiting and retaining individuals that are highly talented

and are the best fit form an integral role in developing a culture that is engaged and ambitious (Momani et al., 2015).

2.3.3.5 Processes

Processes are the path innovative efforts follow through as they achieved. This may be inclusive of capturing ideas, reviewing and prioritizing projects. Managerial control that lead to specific outcomes are initially aimed at influencing an employee's behaviour which suggests that these controls are related to processes that involve the generation of new ideas, the implementation of practices and the incorporation of artifacts within organizations (Buschgens et al., 2013).

2.3.3.6 Success

An enterprise that gains success with innovations does so in three categories; the external environment, enterprise and organizational individuals. The external environment is recognition relative to competitors and customers with the level of financial benefit. Success reinforces values and behaviours which has a positive influence on subsequent actions and decisions on recruitment, rewards and project approvals.

2.4 Conclusion

Sustainability has gained increasing popularity over the years and has been highlighted as the strategic imperative of the new millennium and key to long term success (Galpin et al., 2015). A systematic approach to sustainability is therefore required to ensure a competitive standing over a long period. Without a concerted effort to support the sustainable strategy the successful implementation within the organization will be severely hindered.

Organizational sustainability activities signal positive organizational values and norms which portray perceptions of a company in a good light. Current and prospective employees may feel a sense of enhanced self-concept from pro-sustainable organizations which lead to positive outcomes. On the basis of social identity it is assumed that a sustainability oriented system will contribute positively to the attraction of new employees and retention of existing employees, employee motivation and cooperation through of an association of enhanced self concept and self image (Huber et al., 2017).

Leaders who foster a culture of sustainability within the organization create beneficial outcomes for the environment, society and the enterprise by developing innovative sustainable solutions. Innovation embraces change by not only responding to change but also creating a capability to adapt to changes. Although the focus of innovation is usually technically oriented with new initiatives towards products and services it is the workforce of an organization that is responsible for generating and executing ideas.

Culture influences employee performance and integrates across the organization, therefore it is imperative to address each level. Although culture is initiated by top level management it must complemented processes and resources for it to permeate throughout the organization (Atkinson, 2012). Developing a culture of innovation within an organization contributes towards advancements in innovation efforts.

2.5 Summary

The literature review focused on sustainability and culture whilst a common thread was established to link the two paradigms. The concept of sustainability was discussed relative to the triple bottom line. Sustainability was also described to co-exist with enterprise resistance and enterprise excellence. Enterprise resistance was discussed as the ability of the organization to gain a degree of resilience to maintain

stability of the organization. Enterprise excellence highlighted the importance of staying relevant and responsible by optimising performance and progress.

The SEER2 model was chosen as a proposed structure for sustainability which discussed an ethical, efficient and effective strategy and governance in order to achieve the implementation and execution of the triple bottom line. A key enabler of the SEER2 model was found to be innovation. Sustainable oriented innovation noted a shift from a technology basis toward people and the organization as the organization moves towards sustainability.

A culture of innovation was sought as a strategic tool that develops people and the organization for the purpose of leveraging innovation. The characteristics of culture as well as its benefits were discussed to extend an understanding of the nature of culture. The building blocks for a culture of innovation brought forward an integrated approach towards influencing innovation performance. The next chapter presents the methodology for the research study.

CHAPTER 3

Research Methodology

3.1 Introduction

The literature review highlighted aspects of culture and sustainability. The possible relationship between these variables could prove that culture can be used as a driving force to attain sustainability. The research methodology outlines the design with which dependent and independent variables are related and interpreted for this study.

A sample that was representative of the population was selected in order to draw conclusive evidence and reasoning of the study. A suitable research design instrument was administered to participants of the sample to gather the required data. This data was transferred to a statistical analytical tool from which conclusive results were obtained. The research methodology that was designed for this study aimed to measure and interpret research variables in a manner to which was aligned towards attaining conclusive results for the research questions.

3.2 Research Approach and Design

3.2.1 The Selected Research Approach

There are three types of research approaches outlined by Cresswell (2014); quantitative, qualitative and mixed methods. Qualitative and quantitative approaches both include a single description of interpreting data. Quantitative designs are derived from psychology or an applied behaviour analysis where the results are quantified and represented by numerical figures. Qualitative designs originate from sociology, anthropology and humanities and utilize methods such as case studies and narratives as its interpretation.

An imperative parameter from a study on the culture of innovation is a determination of the innovation quotient of the test environment. It was therefore decided to utilize a quantitative research design. The quantitative method is very suitable for statistically analysing correlations and test obtaining pre-determined outcomes. The two types of quantitative designs outline by Cresswell (2014) are experimental and non-experimental designs. Experimental aims to decipher an outcome from specific treatment influences. An example of a non-experimental design is survey research; this quantifies trends, opinions or attitudes with a numeric description. Survey design was selected as the most apt choice for this study as it was aligned with the gaining a numeric description from participants regarding their opinions on aspects of culture in the respective study environment.

3.2.2 Research quality plan

The accuracy of results and findings of any study are highly dependent on the quality of its research methods (Creswell, 2014). Research quality considerations are therefore imperative component in the research design. The three effects that posed potential risks were identified as mortality effects, history effects and selection bias effects (Sekaran and Bougie, 2013).

Mortality effects refer to the lifespan of answering the questionnaire. The questionnaire was relatively lengthy with 54 questions; this may have resulted in participant losing interest and opting out of the survey prior to completion. This was overcome by clearly dividing the questions into sections and phrasing each question to the point for ease. In addition the online survey settings made all questions compulsory as a condition to completing the survey. The participants responded by selecting options on a Likert scale, this simplified answering the questions (Sekaran and Bougie, 2013).

History effects from longitudinal studies were noted to be common (Creswell, 2014). The nature of longitudinal studies involves research over a period of time which increases the chances of occurrences during this time that may hinder the survey responses. This was overcome by opting to carry out a cross sectional study within a specified time frame.

Selection bias was not possible to achieve if randomization was not used (Sekaran and Bougies, 2013). This was overcome during this study by using the whole population as the sample. This gave all members of the study area an equal opportunity to participate in the study.

Ethical considerations were of importance in this study. This entailed respecting all participants confidentiality through anonymity. No personal details of the participants were recorded during the online survey, they remain anonymous and all responses are safely stored. Responses were generated through a Likert scale thus no responses could be linked to any participant.

3.2.3 Sampling

2.2.3.1 Study setting

The Pollution Research Group was chosen as the study area. The time constraints of the MBA did not accommodate the search for other water professional bodies. The chosen study area was familiar to the researcher and permission was granted to conduct this study, based on these factors it was selected as the study area. The group comprises of Postgraduates, Junior Technical staff, Senior Technical staff, Postdoctorate Researchers and Senior Researchers. The group's core function is technical research associated with national and international research institutes.

3.2.3.2 Sampling techniques

A cross sectional study measures a unit of analysis instantaneously whereas a longitudinal study measures a unit of analysis over a period of time (Creswell, 2014). Types of probability and non – probability sampling techniques were discussed and considered in this section. This study entailed gathering opinions from participants based on pre-selected study areas and not on observing trends. Therefore a cross sectional was an ideal choice over a longitudinal study.

3.2.3.2.1 Probability sampling

The probability sampling design is used when the chances of elements in the population are chosen as subjects in the population are nonzero and known. Probability sampling can be classified into having a nature of being either restricted or unrestricted (Sekaran and Bougie, 2013). Unrestricted probability sampling includes simple random sampling and restricted probability sampling includes complex probability sampling. Simple random sampling involves every element having a known and equal chance of being selected from a population as subject.

Complex random sampling can obtain more information thus improving efficiency. The most common designs of complex probability sampling are double sampling, area sampling, systematic sampling, cluster sampling and stratified random sampling. Double sampling involves collecting additional information further to the study. Cluster sampling first divides the sample in clusters from which random clusters are drawn. Area sampling is a form of cluster sampling that confines sampling to a designated area. Systematic sampling randomly chooses elements during sampling by drawing every n th element in the population. Stratified random sampling first segregates then randomly selects subjects.

3.2.3.2.2 Non-Probability sampling

The non-probability sampling designs cannot be strongly generalized to the population since probabilities are not attached to sample subjects being chosen from elements in the population (Sekaran and Bougie, 2013). Non-probability sampling also offers a more time and cost effective manner of obtaining information with a lesser concern towards a broader generalizability. The common types of non-probability sampling designs are convenience sampling and purposive sampling.

Convenience sampling makes reference to gathering information from participants who are most easily accessible. Purposive sampling aims to collect information from specific target groups. The two main types of purposive sampling are judgement sampling and quota sampling. Judgement sampling calls for making a judgement in the choosing particular subjects who may be advantageously placed or could provide the best information. Quota sampling identifies subgroups in the population and ensures that particular groups have adequate representation by the assigning of a quota in the study.

3.2.3.3 Selection of sampling technique

The most suitable sampling technique was identified as convenience sampling. The chosen population was easily accessible. The culture of the group extends across all members therefore it was assumed that all members identified with the content of the survey. Although the population was fairly small all members had the ability to respond to all areas of the survey. Therefore all members of the group were chosen as the sample out of convenience.

3.2.3.4 Selection of sample size

The population of the Pollution Research Group is 20. This was considered to be a fairly small population. The number of members with similar job titles varied with very small denominations in each. The time and cost of searching for alternative populations or populations that could add to the Pollution Research Group was considered and found to be unfavourable. It was therefore decided to include all 20 members of the Pollution Research Group in the selected sample to ensure a better sample representation.

3.3 Data Collection

The data was collected using the most suitable instrument and procedures as outlined in this section.

3.3.1 Data Collection Instrument

An online questionnaire was selected as the data collection instrument. This was the most accurate and feasible method of collecting all the data within the desired time frame. It is also very easy method to administer since respondents have easy access at any time with anonymity. Although the online questionnaire covered a vast array of questions it was designed to take 15 – 20 minutes to complete, encouraging maximum participation.

3.3.2 Data Collection Procedure

The survey questions were divided into six main sections with nine questions per section. This was captured on QuestionPro surveys by the researcher. The data collection period was anticipated to be two weeks or less pending the completion of the questionnaire by all participants. All communication was made via a designated

individual through email who then distributed the email communication to all participants in the sample population.

The questionnaire was administered in a three stage process. An initial email with details of the study was sent in order to prepare and inform participants prior to the questionnaire. The second email sent contained a direct link to the survey. Finally a reminder email was sent one week later urging participants who had not yet completed the survey to do so by the end of the week.

3.3.3 Measurement Scale

Each question in the questionnaire was quantified by means of a uniform measurement scale. This entailed a graphical representation in QuestionPro which ranged from strongly disagree to strongly agree. This particular type of measurement scale is an example of an ordinal scale where answers are rank-ordered in a meaningful way (Sekaran et al, 2013). This was chosen since each question denoted the participants preference from best to worst. The ordinal scale aids the researcher in determining the percentage of participants' preferences towards selected culture characteristics.

Preferences were coded to rank from 1 – 5. A five point Likert scale was used to interpret this code in order to quantify the behavioural responses. Participants were given the freedom to choose a neutral answer since some participants may have been part of the study area for a much shorter period than others which may not have allowed them enough exposure to all cultural aspects of the group. The numerical value of each answer is shown in Table 3.1.

Table 3.1: Questionnaire response codes

Code	Questionnaire Response
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

3.3.4 Pretesting of the Questionnaire

It is important for the survey instrument to be pretested to ensure that that all questions are clearly understood by the participants and that there are no issues with the phrasing or measurement of questions (Sekaran et al., 2014). After the questionnaire was designed, 5 participants were randomly selected from the study area. They were requested to complete the online questionnaire and note any difficulties in answering the question with respect to time and clarity. All participants reported that the questions were phrased clearly and were well structured in appropriate sections; the time to time complete the survey was also reported to be manageable. No changes were made to the questionnaire as the pretesting proved to questionnaire to be acceptable.

3.4 Data Analysis Methods

The three statistical methods selected to analyse the data were frequency, mean and correlation. This was generated using SPSS. The raw data collected from the online survey was used as input data to SPSS.

3.4.1 Frequency Distribution

A frequency distribution represents various outcomes by categorizing counts. Each category contains the frequency of the occurrence of values within a chosen group. The data that was collected was categorised accordingly with the frequency distribution, this ensured that each question clearly highlighted highest and lowest frequency of counts for accurate interpretation. Highlighting the frequency of counts within each question helps identify strengths, weakness and inconsistencies in the organizations innovation culture (Rao et al., 2014).

3.4.2 Mean

The mean is a statistical descriptive that approximates the average counts within a particular category which describes the central tendencies of a sample. The mean was used to find the average score of all factors, elements and building blocks. The mean of all building blocks was used to identify the innovation quotient of the overall sample. This innovation quotient is an imperative value that benchmarks innovation within the company. In addition the innovation assessment has the ability to create a scorecard with which to identify factors and elements that support innovation and allows for strengths and weaknesses to be identified in an organizations innovation culture (Roa et al., 2014).

3.4.3 Correlation

Correlation describes a relationship between two variables. This was ideal as correlation is indicative of a predictive relationship that can be utilized in actual practice. Several correlation coefficients are available however the Pearson correlation coefficient was selected as most apt since it only identifies linear dependencies between variables. Although the Pearson correlation coefficient does not entirely characterize a relationship between two variables it provided the required information of the strength of their linear relationship which was sufficient.

Two independent correlation data analyses were performed. The first correlation test involved relating all six building to each to other in order to identify which two building blocks hold a linear relationship to each other. The second correlation test was performed by relating each of the building blocks to the overall innovation in order to identify whether a strong relationship existed between any of the buildings and the overall innovation.

3.5 Reliability

Reliability of measurement is the extent to which data is error free thus ensuring consistent measure across time and various items within the research instrument (Sekaran et al., 2013). Therefore reliability of an instrument measure can be considered as an indication of the consistency and stability of the concept and assists in ascertaining the goodness of a measure.

Reliability of the research instrument was assured by pretesting the questionnaire. The five participants that answered the online questionnaire during pretesting reported that the sentences were clearly phrased and could be well understood. It was also reported that the questionnaire was well structured and could be answered

within a reasonable time. All these factors were considered. No changes were made to the research instrument and the research instrument was accepted to be reliable.

3.6 Validity

Validity measures the accuracy with which the designed research instrument tests the actual research objectives in relation to its intended objectives (Creswell, 2014). It is the best approximation to the strength of our conclusions ensuring that the right concepts are measured by the research. There are several types of validity tests which are denoted by terms however validity tests can be grouped under three broad headings of construct validity, content validity and criterion-related validity (Sekaran and Bougie, 2014).

Criterion – related validity can be determined by establishing the strength of the measure of the differentiation between two individuals who have been predetermined to be different. This can be achieved by predictive validity and concurrent validity. Concurrent validity is achieved when individuals are discriminated against by the scale although they are known to be different.

Content validity ensures that there are adequate materials from which the concept can be explored from. The concept validity of the research instrument will increase significantly as the volume of material that represents the concept increases. This study has drawn upon a vast array of topics that represent areas of the concept. The literature review has included an empirical review of prior studies has represented such concepts within those studies. The questionnaire was divided into six main sections each of which was further divided into three elements and further into three factors each. Each question gave a fair representation to the content.

Construct validity is descriptive of the accuracy of the research instrument design in measuring the theoretical hypothesis from the results gathered from the study. Discriminant and convergent validity best assess this. Convergent validity is occurs when the same concept is tested and there is a high correlation between two different research instruments. Discriminant validity is a theory based approach that predicts two variables don't correlate by the illustrated viable or not by the scores obtained. Convergent validity was used in this study by comparing the results from the field study to research results from prior studies.

3.7 Ethical Considerations

A formal gatekeeper's letter was obtained from the University of KwaZulu Natal's Registrar's office. In addition permission to conduct the study was obtained from the Head of the Pollution Research Group (PRG) via email. All participants were over the age of 21. They were made aware in the informed consent form and the initial email that their participation in the survey was voluntary and that they may withdraw at any given time without penalties.

The participants were made aware that their responses on the online questionnaire remain anonymous and that the data will be stored in a safe place for five years. This will also be kept confidential and will be in line with the research policy of the University of KwaZulu-Natal.

The online questionnaire that was used was submitted to the University of KwaZulu-Natal's Research Ethics Committee as part of the researchers ethical clearance documents. The field study commenced upon the ethical clearance being granted (Protocol reference number: HSS/0269/017M).

3.8 Summary

Survey design was selected as the research approach since a numeric outcome was desired. The effects of mortality, history and selection bias were considered and interventions were sought after to overcome these risks in order to achieve a higher research quality. Types of probability and non-probability sampling techniques were discussed. Convenience sampling, a type of no-probability sampling, was selected as the most suitable sampling technique. Since the population was fairly small the whole population was selected as the sample size. An online questionnaire containing a Likert scale was administered to the participants as a means of data collection. The methods used to analyze the data were frequency, mean and correlation. The reliability, validity and ethical considerations were discussed and ensured during the development of the research methodology. The following chapter presents the results and interpretation of the survey.

CHAPTER 4

Presentation of Results

4.1 Introduction

The conceptual framework designed was to relate dependent and independent variable which was extracted from the literature review. The dependent variables were sustainability and innovation. The independent variables were culture, values, behaviours, climate, resources and success. This framework was derived from the aim of the study which attempts to prove that sustainability can be moderated by culture. From the literature review innovation was chosen as a key component of sustainability and the key components of culture were noted as values, behaviours, climate, resources, processes, success.

4.2 Survey Participation Statistics

The survey was administered via QuestionPro, an online survey tool. The online survey link was initially emailed to participants on the 10th of May 2017 following the approval from ethics committee. A reminder email was sent on the 15th of May 2017. The survey was closed on the 19th of May 2017 at which all 20 participants completed the survey. The statistics of the survey participation are illustrated below in Table 4.1.

Table 4.1: Survey Participation Statistics

Parameter	Count
Number of Participants invited	20
Number of times the questionnaire was viewed	32
Number of Participants that started the questionnaire	20
Number of Participants that completed the questionnaire	20
Participation Rate	100%
Completion Rate	100%
Drop outs	0
Average time taken to complete the questionnaire	17 minutes

4.3 Presentation of Results

The questionnaire was divided into six major sections each representing a culture building block. Each culture building block was further divided into three elements. Each element was further divided into three factors. The survey questions corresponded to the relevant factor description. Participants scored each question thus giving each factor a score. The element and building block averages were calculated from the factor scores recorded. The results for the frequency mean and correlation generated in SPSS from the survey data are presented in this section.

4.3.1 Likert scale type questions

The responses to the behavioural type questions from the online questionnaire relating to the independent variables of the study are presented in tables 4.2 – 4.7 .with the corresponding frequency distribution and mean. The frequency distribution shows the percentages of responses within a category and represents responses of very dissatisfied (VD), dissatisfied (D), neutral (N), satisfied (S), and very satisfied (VS). The maximum mean for each factor is 5, each element is 15 and each building block is 45.

The values building block, shown in table 4.2, included elements of the group's entrepreneurial, creativity and learning tendencies. The overall mean of the values building block was 34.05 out of a total score of 45. The element mean values for entrepreneurial, creativity and learning were 10.95, 11.25 and 11.85 respectively out of a total score of 15.

The entrepreneurial element score received a similar score of 3.45 for both ambiguity and being action oriented. The highest mean within entrepreneurial was 4.05 for being hungry to explore new opportunities. There was a 65% satisfaction with being hungry and a 45% satisfaction with ambiguity. However 45% remained neutral and 30% were satisfied with being action oriented.

The creativity element received an equal mean of 3.85 for being imaginative and autonomous. The lowest mean in creativity was 3.55 for being playful and spontaneous. There was 40% satisfaction for being imaginative and 75% satisfaction for autonomy. The majority of 40% remained neutral on spontaneity and being playful.

The learning element score received the mean of 3.9 for curiosity, 3.95 for experimenting innovation and 4.0 for being ok with failing. There was an overall satisfaction with learning where curiosity received 60%, experimenting received 75% and accepting failure 60% satisfaction.

Table 4.2: Frequency distribution of the Values building block

				VD	D	N	S	VS	Mean		
Values	Entrepreneurial	Hungry	We have a burning desire to explore opportunities and to create new things.	0	10	0	65	25	4.05	10.95	34.05
		Ambiguity	We have a healthy appetite and tolerance for ambiguity when pursuing new opportunities	0	10	40	45	5	3.45		
		Action-oriented	We avoid analysis paralysis when we identify new opportunities by exhibiting a bias towards action	5	5	45	30	15	3.45		
	Creativity	Imagination	We encourage new ways of thinking and solutions from diverse perspectives.	5	5	20	40	30	3.85	11.25	
		Autonomy	Our workplace provides us the freedom to pursue new opportunities.	5	0	10	75	10	3.85		
		Playful	We take delight in being spontaneous and are not afraid to laugh at ourselves.	0	10	40	35	15	3.55		
	Learning	Curiosity	We are good at asking questions in the pursuit of the unknown.	5	0	15	60	20	3.90	11.85	
		Experiment	We are constantly experimenting in our innovation efforts.	5	0	5	75	15	3.95		
		Failure OK	We are not afraid to fail, and we treat failure as a learning opportunity	0	10	5	60	25	4.00		

The behaviours building block, shown in table 4.3, had elements of enable, engage and energize. The overall mean for the behaviours building block was 29.8 out of a total score of 45. The element mean values for energize, engage and enable were 9.4, 9.85 and 10.55 respectively out of a total score of 15.

The element energize had varied means with 3.35 for inspire, 3.10 for challenge and 2.95 model behaviour. The majority remained neutral on all factors with 45% for leaders who inspire with vision, 45% for leaders who challenge employees and 40% neutral on leaders modelling good innovation behaviours for others to follow.

The engage element had varied means with 3.15 for coach, 2.95 initiative and 3.75 for support. There was a 35% dissatisfaction with leaders not providing enough coaching and feedback. There was a 50% neutral response for taking initiatives towards innovation and a 55% satisfaction with support from leaders.

The enable element had means of 3.2 for influence, 3.65 for adapt and 3.7 for grit. There was an overall satisfaction with 40% satisfied with the use of influential strategies, 35% satisfied with the adaptability when needed and 40% was satisfied with the persistence by leaders under any circumstances.

Table 4.3: Frequency distribution of the Behaviours building block

				VD	D	N	S	VS	Mean		
BEHAVIOURS	Energize	Inspire	Our leaders inspire us with a vision for the future and articulation of opportunities for the organization	0	15	45	30	10	3.35	9.4	29.80
		Challenge	Our leaders frequently challenge us to think and act entrepreneurially.	0	25	45	25	5	3.10		
		Model	Our leaders model the right innovation behaviors for others to follow.	0	35	40	20	5	2.95		
	Engage	Coach	Our leaders devote time to coach and provide feedback in our innovation efforts.	5	35	15	30	15	3.15	9.85	
		Initiative	In our organization, people at all levels proactively take initiative to innovate.	5	20	50	25	0	2.95		
		Support	Our leaders provide support to project team members during both successes and failures	5	10	10	55	20	3.75		
	Enable	Influence	Our leaders use appropriate influence strategies to help us navigate around organizational obstacles	5	20	30	40	5	3.20	10.55	
		Adapt	Our leaders are able to modify and change course of action when needed.	0	10	35	35	20	3.65		
		Grit	Our leaders persist in following opportunities even in the face of adversity.	5	10	20	40	25	3.70		

The climate building block, shown in table 4.4, had elements of simplicity, safety and collaboration. The overall mean for climate was 30.05 out of a total score of 45. The element mean values for collaboration, safety and simplicity were 10.05, 10.55 and 9.45 respectively out of a total score of 15.

The collaboration element had means of 3.5 for a sense of community, 3.2 for diversity and 3.5 for teamwork. There was a 40% satisfaction with having a common language towards innovation and a 45% satisfaction with teamwork. However 45% remained neutral and 40% were satisfied with leveraging diversity.

The safety element had means of 3.5 for trust, 3.75 for integrity and 3.3 for openness. There was a 55% satisfaction in trusting that what was said will be done and a 35% satisfaction that decisions and actions were made with integrity. However regarding being free to voice their opinions the majority of 40% remained neutral and 30% were satisfied.

The simplicity element had means of 3.05 for no bureaucracy, 3.2 for accountability and 3.2 for decision-making. There was a 45% dissatisfaction that the workplace was not simplified enough regarding rules and policies. There was 45% satisfaction that people would take accountability for their actions. There was an equal split with the majority on decision-making with 35% satisfied and 35% dissatisfied with ability to make decisions and move swiftly through the organization.

Table 4.4: Frequency distribution of the Climate building block

				VD	D	N	S	VS	Mean		
CLIMATE	Collaboration	Community	We have a community that speaks a common language about innovation.	0	25	25	40	10	3.35	10.05	30.05
		Diversity	We appreciate, respect and leverage the differences that exist within our community.	5	10	45	40	0	3.20		
		Teamwork	We work well together in teams to capture opportunities.	0	15	30	45	10	3.50		
	Safety	Trust	We are consistent in actually doing the things that we say we value.	5	5	30	55	5	3.50	10.55	
		Integrity	We question decisions and actions that are inconsistent with our values.	0	20	15	35	30	3.75		
		Openess	We are able to freely voice our opinions, even about unconventional or controversial	0	20	40	30	10	3.30		
	Simplicity	No Beaurcauocacy	We minimize rules, policies, bureaucracy and rigidity to simplify our workplace.	0	45	20	20	15	3.05	9.45	
		Accountability	People take responsibility for their own actions and avoid blaming others.	5	15	35	45	0	3.20		
		Decision-making	Our people know exactly how to get started and move initiatives through the organization.	0	35	20	35	10	3.20		

The resources building block, shown in table 4.5, had elements of projects, systems and people. The overall mean of resources was 30.55 out of a total score of 45. The element mean values for people, systems and projects were 11.3, 9.8 and 9.45 respectively out of a total score of 15.

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The element people had means 3.7 for champions, 3.8 for experts and 3.8 for talent. There was an overall satisfaction with 55% satisfied with leaders taking the role of innovators, 50% satisfied with the accessibility to experts and 65% satisfied with internal talent.

The systems element had means of 2.7 for section, 3.65 for communication and 3.45 for ecosystem. The majority was split on recruitment and hiring systems where 30% were dissatisfied and 30% remained neutral. There was a 55% satisfaction with communication tools and a 45% satisfaction with leveraging relationships with suppliers.

The projects element had means 3.25 for time, 3.15 for money and 3.05 for space. There was a majority neutral response on all three factors with 40% and 30% satisfied allowing time for innovation. However, only 25% were satisfied whilst 45% remained neutral that dedicated finances were available for new opportunities. There was a 25% satisfaction and 35% remained neutral on dedicated space for innovation.

Table 4.5: Frequency distribution of the Resources building block

				VD	D	N	S	VS	Mean		
RESOURCES	People	Champions	We have committed leaders who are willing to be champions of innovation.	0	15	15	55	15	3.70	11.3	30.55
		Experts	We have access to innovation experts who can support our projects.	0	10	20	50	20	3.80		
		Talent	We have the internal talent to succeed in our innovation projects.	0	5	20	65	10	3.80		
	Systems	Selection	We have the right recruiting and hiring systems in place to support a culture of innovation.	15	30	30	20	5	2.70	9.8	
		Communication	We have good collaboration tools to support our innovation efforts.	5	10	15	55	15	3.65		
		Ecosystem	We are good at leveraging our relationships with suppliers and vendors	5	20	15	45	30	3.45		
	Projects	Time	We give people dedicated time to pursue new opportunities.	5	15	40	30	10	3.25	9.45	
		Money	We have dedicated finances to pursue new opportunities.	10	10	45	25	10	3.15		
		Space	We have dedicated physical and/or virtual space to pursue new opportunities.	10	20	35	25	10	3.05		

The processes building block, shown in table 4.6, had elements of capture, shape and ideate. The overall mean for processes was 28.2 out of a total score of 45. The element mean for ideate, shape and capture were 9.9, 8.95 and 9.35 respectively out of a total score of 15.

The ideate element had means of 3.5 for generate, 3.3 for filter and 3.1 for prioritize. There was mostly a neutral response with 45% remaining neutral on filtering ideas for opportunity identification and 70% neutral on the prioritization of projects. There was an even split regard to generating ideas systematically with 50% remaining neutral and 50% satisfied.

The shape element had means of 2.7 for prototyping, 3.4 for iterate and 2.85 for fail smart. There were mixed responses for shape with 45% dissatisfied with the speed of prototyping and 35% satisfied with effective feedback loops with customers. However, 50% remained neutral on being able to stop projects that may be known to fail.

The capture element had means of 3.3 for flexibility, 2.85 for launch and 3.2 for scale. There was a 40% satisfaction with the flexibility of processes allowing for a more contextual control. There was 55% neutral response on launching opportunities quickly and a 40% neutral response on scaling initiatives by allocating resources.

Table 4.6: Frequency distribution of the Processes building block

				VD	D	N	S	VS	Mean		
PROCESSES	Ideate	Generate	We systematically generate ideas from a vast and diverse set of sources.	0	0	50	50	0	3.50	9.9	28.2
		Filter	We methodically filter and refine ideas to identify the most promising opportunities.	0	15	45	35	5	3.30		
		Prioritize	We select opportunities based on a clearly articulated risk portfolio.	0	10	70	20	0	3.10		
	Shape	Prototype	We move promising opportunities quickly into prototyping.	5	45	25	25	0	2.70	8.95	
		Iterate	We have effective feedback loops between our organization and the voice of the customer	5	15	30	35	15	3.40		
		Fail smart	We quickly stop projects based on predefined failure criteria.	5	25	50	20	0	2.85		
	Capture	Flexibility	Our processes are tailored to be flexible and context-based rather than control- and bureaucracy-based.	10	10	30	40	10	3.30	9.35	
		Launch	We quickly go to market with the most promising opportunities.	0	30	55	15	0	2.85		
		Scale	We rapidly allocate resources to scale initiatives that show market promise.	0	25	40	25	10	3.20		

The success building block, shown in table 4.7, had the elements of individual, enterprise and external. The overall mean of success was 31.95 out of a total score of 45. The element mean values for the external, enterprise and individual were 11.5, 11.15 and 9.55 respectively out of a total score of 15.

The external element had mean values of 4.0 for customers, 3.6 for competitors and 3.65 for financial. There was a 40% satisfaction with customers' perception that the group was innovative. There was a 40% satisfaction that the group outperform competitors in innovation. However 50% remained neutral on increased financial gain from innovation.

The enterprise building block had mean values of 3.8 for purpose, 3.5 for discipline and 3.85 for capabilities. There was an overall majority satisfaction in the element with 40% satisfied with innovation having a long term purpose and 40% satisfied that there is a disciplined approach toward innovation. There was a 55% satisfaction that new capabilities were developed from innovation.

The individual element had mean values of 3.6 for satisfaction, 3.1 for growth and 2.85 for rewards. There was a 35% satisfaction for level of participation and being rewarded for participation irrespective of the outcome. However, 40% remained neutral and 35% were satisfied with the growth received from their participation in new initiatives.

Table 4.7: Frequency distribution of the Success building block

				VD	D	N	S	VS	Mean		
SUCCESS	External	Customers	Our customers think of us as an innovative organization.	0	0	30	40	30	4.00	11.25	31.95
		Competitors	Our innovation performance is much better than other firms in our industry.	0	10	35	40	15	3.60		
		Financial	Our innovation efforts have led us to better financial performance than others in our industry	0	0	50	35	15	3.65		
	Enterprise	Purpose	We treat innovation as a long-term strategy rather than a short-term fix.	5	10	15	40	30	3.80	11.15	
		Discipline	We have a deliberate, comprehensive and disciplined approach to innovation.	5	10	30	40	15	3.50		
		Capabilities	Our innovation projects have helped our organization develop new capabilities that we did not have three years ago	0	10	15	55	20	3.85		
	Individual	Satisfaction	I am satisfied with my level of participation in our innovation initiatives.	0	15	30	35	20	3.60	9.55	
		Growth	We deliberately stretch and build our people’s competencies by their participation in new initiatives.	0	25	40	35	0	3.10		
		Reward	We reward people for participating in potentially risky opportunities, irrespective of the outcome.	15	20	30	35	0	2.85		

The final innovation quotient, which was the key variable in this study, was obtained from the mean of all six building blocks. The culture of innovation was found to have an innovation quotient of 184.6 out of a maximum of 270 with the level of innovative at 68.37% as shown in table 4.8.

Table 4.8: Innovation quotient

	MEAN
INNOVATION QUOTIENT	184.6
Maximum	270
%	68.37

4.3.3 Correlation

There were two separate correlation tests performed. The first probed into determining whether there was any correlation between any two of the six culture building blocks. The results from which is shown in table 4.9. Correlations were noted between values and behaviours as well as values and climate. Behaviours correlated with climate and processes. Climate correlated with processes and success. Resources correlated with processes and success. Process correlated with success.

Table 4.9: Correlation values relating all culture building blocks

	VALUES	BEHAVIOURS	CLIMATE	RESOURCES	PROCESSES	SUCCESS
VALUES	1	.679**	.580**	.209	.468*	.528*
BEHAVIOURS	.679**	1	.750**	.384	.773**	.545*
CLIMATE	.580**	.750**	1	.503*	.814**	.706**
RESOURCES	.209	.384	.503*	1	.628**	.734**
PROCESSES	.468*	.773**	.814**	.628**	1	.715**
SUCCESS	.528*	.545*	.706**	.734**	.715**	1

**=p<0.01

The second correlation test aimed at uncovering a possible relationship between each of the culture building block with the overall innovation. As shown in table 4.10 all six culture building blocks correlated with the overall innovation.

Table 4.10: Correlation values relating culture building blocks to innovation

	INNOVATION
VALUES	.718**
BEHAVIOURS	.843**
CLIMATE	.881**
RESOURCES	.711**
PROCESSES	.886**
SUCCESS	.861**

**=p<0.01

4.4 Summary

This chapter first highlighted the participation statistics for the online survey. The survey consisted of six building blocks with each having three elements and each element having three factors. The survey questions corresponded to each factor. A frequency distribution was done for each factor. The mean was determined for factor, element and building block. The results were tabulated with a summarised discussion and presented. The next chapter will discuss details of the results in relation to the literature and the study objectives.

CHAPTER 5

Discussion

5.1 Introduction

The results presented in the previous chapter showed significant relationships. This chapter aims to discuss conclusive evidence from the results and the literature review in order to translate these into actual recommendations that could satisfy the objectives set out in the introduction of the study. In addition the discussion in this chapter attempts to contribute towards new knowledge in this area of research for the purpose of identifying key areas of further research and utilizing this information towards culture building in an organization.

5.2 Research objectives overview

There were two research objectives that were envisaged for this study and formed the basis during this research study.

- a) The first objective was to investigate the impact culture has on sustainability.
- b) The second objective sought out to determine the building blocks for a successful culture of innovation.

5.3 Key Findings

The key findings integrated information from the literature review in chapter two and the results presented in chapter four in attempts to address the research objectives of this study.

5.3.1 Objective 1

The sustainability of an organization can be viewed as an assurance of longevity with respect to internal and external factors. Sustainability exists with both a degree of resistance and excellence. The triple bottom line incorporates a reporting system that encompasses social, environmental and economic aspects and is often used as a measure of sustainability. The triple bottom line (TBL) was a construct derived from the concept of sustainability (Alhaddi, 2015). This stresses on an integration of societal, economic and ecological dimensions although many TBL advocates is more attentive to the social-ecological dimensions rather than the economic dimension even though this is the cornerstone to enterprise excellence.

The SEER2 model for sustainability integrates enablers of sustainability, resistance and excellence and utilizes ethical, efficient and effective policies in strategy and governance to drive the implementation and execution of initiatives of people, profits and the planet. A key enabler of across the SEER2 model is innovation. Sustainability oriented innovation highlights dimensions that are usually technically inclined however as the organization shifts towards sustainability the focus moves towards people and the organization. A culture of innovation can be used as a strategic tool to facilitate the success of individuals and the organization.

The frequency distribution highlighted the level of satisfaction on various factors pertaining to innovativeness of the organizations culture. The majority sample population, 65%, was satisfied with the desire the group has to create new opportunities. However 45% were satisfied and 40% remained neutral on ambiguity. Values can be affect the entrepreneurial nature, creativity and learning of employees. An entrepreneurial orientation can be described as the proactiveness towards problems, changes and needs. It anticipates new ventures that allow new products and services ahead of its competitors (Brettel et al., 2015). To realize new opportunities it is imperative for the group to be action oriented and avoid analysis

paralysis since the majority of 45% were uncertain, 35% satisfied and 15% very satisfied with their action orientation.

Creativity encourages new ways of thinking and provides a fresh space to pursue new opportunities. Rapid changes in global competing markets have led to managers having to find novel ways and ideas to adapt to developments and changes. The statistical analysis showed that 40% of the sample population were satisfied that solutions were diversified although 75% felt they were given the freedom to pursue new opportunities. Spontaneity and comfort levels were split with 40% neutral and 35 % satisfied. An increased creativity with new ideas creates maintains customer relations and market share (Karamipour et al., 2015).

A research environment creates new knowledge and learning is the cornerstone of its success. Learning showed an overall majority satisfaction with 60% satisfied with being curious and ok with failing and 75% satisfied with innovation experimentation within the group. Maximising employees' values supports their logical participation in the organizational and their individual learning which forms new knowledge and cultivates sharing with others (Shahazad et al., 2012).

Behaviours inspire by energizing, engaging and enabling. Historic enterprise excellence has underestimated the importance of the TBL's social-ecological dimensions. The multi-dimensional goals of the TBL demands more control over existing management systems. The majority of the sample population remained uncertain on all three traits of energizing; inspiring, challenging and model behaviour; with 45% were uncertain whether leaders inspire them with a vision or challenge them with frequently. There was 35% dissatisfaction and 40% were undecided on the innovation behaviours that leaders model. This extends towards the need for a sustainability performance measurement systems (Johnson, 2013).

Leaders play an important role towards development of the organization and incorporate into social influence. Engagement by leaders with the rest of the group in terms of coaching, initiatives and support, received mixed responses. The time leaders took to coach individuals was split with 35% dissatisfied and 30% satisfied. The initiatives shown by group members were undecided with 50% remaining neutral, 25% satisfied and 20% dissatisfied. The engagement from leaders towards the group members in the form of support in all situations received a good response with 55% being satisfied. From the results leadership has not found a strong footing. Culture is developed by leaders and transformational leaders have the ability to bring about change in order to strike a balance between personal and group objectives for the correct path to be sought after (Veisesh et al., 2014).

In an organization that is democratic and has a good value system there will be relationships that are true and reliable. There was a less than 50% overall satisfaction with leaders enabling the group through influencing, adapting and persistence. Enterprise excellence through organizational design and agility integrates the triple top line and the triple bottom line to ensure the organization is systematic and regular (Edgemen et al., 2014). Influential strategies that aid the group in deterring from obstacles showed a satisfaction of 40%, a neutral response of 30% and dissatisfaction of 30%. The majority was evenly split on ability of leaders to adapt situations and change course with 35% satisfied and 35% remaining neutral. There was a 40% satisfaction and 25% were very satisfied with leaders being able to persist even during adversity. Enabling the group provides the group with perseverance to strive to achieve their objectives irrespective of pitfalls.

The statistical analysis has shown that climate has a positive correlation to values, behaviours, processes and success. The traits that can describe an innovative organizational climate are collaboration, safety and simplicity. The ability to collaborate efficiently enhances team spirit, leverages diversity and creates a sense

of community. Values and behaviours form the foundation of teamwork whilst processes provide structure for efficient collaboration. The sample population showed a 40% satisfaction with having a common language towards innovation. Diversity during collaboration was split with 45% remaining neutral and 40% satisfied. Collaboration can be improved through human capital theory where individual abilities and competencies are not initially recognised but rather all employees' first observe from employers the way the job is done (Farahmand, 2013).

The traits that encourage a feeling of safety are trust, integrity and openness. There was an overall majority that were satisfied with trust where 55% satisfied with trusting what was said to be done. Integrity that was consistent with their values showed a 35% satisfaction and 30% were very satisfied. The majority of 40% were uncertain about the openness and ability to freely voice their opinion however 30% were satisfied and 20% dissatisfied. The traits of safety are moral concepts that stem from values. Organizational values prompts a reaction to do what is believed to be right (Gorenak et al., 2012); in this context always act with integrity, trust others and openly discuss pressing matters.

Simplicity of the climate creates an easy environment that provides clarity with which to do things. The traits of simplicity are no bureaucracy, accountability and decision making need much improvement as shown in the results. Behaviour drawn from culture creates a predictable behaviour with a consistent character (Sarafranz et al., 2014). The majority of 45% was dissatisfied with rules not being minimized however 45% were also satisfied that people took accountability for their actions. The majority was evenly split on decision-making with 35% satisfied that people know how to get initiatives started and executed although 35% were also dissatisfied. In efforts by managers to maintain organizational hierarchy, managers try to obtain efficiency in bureaucratic systems which may create superficial and unreliable relations between people (Sarafranz et al., 2014). Culture creates a sense of togetherness forming transparent relations for good interactions and communication at all levels. Strong

cultural values drive responsible behaviours of being accountable and making viable decisions.

The statistical analysis has shown that resources are positively correlated to processes and success. The three types of organizational resources are people, systems and projects. Recruiting the right people create the core to a culture that is engaged and ambitious (Shahazad et al., 2012). There was an overall satisfaction with people where 55% were satisfied with leaders championing innovation, 50% were satisfied with having access to experts and 65% were satisfied with having internal talent to succeed. Systems aid resources with selection processes, collaborative tools for good communication and an ecosystem that leverages supplier relationships. The majority was equally split with 50% dissatisfied and 50% satisfied with selection processes that support a culture of innovation. There was a 55% satisfaction with communication tools that support innovation. There was a 45% satisfaction with respect leveraging relationships with suppliers.

Projects form an integral part of a successful research environment. A culture of innovation in this study is aimed at developing more ideas to contribute to increased projects which inevitably contribute towards development in the water sector. Sufficient time, money and space are imperative toward creating new opportunities. There was an overall majority uncertainty with innovation with projects as 40% remaining neutral on acknowledging dedicated time to pursue new opportunities and 45% neutral on dedicated finances and 35% on neutral on dedicated space. Projects were found to lack on all aspects of time, money and space. Culture creates a high performing teamwork environment resulting in improved project performance (Yaziki, 2015); to reap the benefits of this more increased financial gain from more projects more attention should be given to dedicating time, money and space to developing new projects.

Processes are important managerial tools that can be used to generate new ideas towards innovation (Buschgens et al., 2013). It has been shown that processes are positively correlated to behaviours, climate, resources and success. Processes create structure for an organized climate, systematic predictive behaviours, a platform for resources to thrive and ultimately contribute towards the organizational success. The three traits of processes are ideate, shape and capture; all of which was shown to lack in the organization. There was an overall majority neutral response with generating ideas. The systematic generation of ideas was equally split with 50% neutral and 50% satisfied. The filtering of ideas received mostly neutral 45% and prioritizing also received 70% neutral majority response. Although there was a high prioritizing of projects, improvements are essential on processes relative to generating and filtering ideas to increase the number of projects.

Processes that shape innovation received mixed responses with 45% dissatisfied with the speed of prototyping new ideas, 35% were satisfied with feedback loops with customers and 50% remained neutral on the ability to stop projects on failure criteria. Processes that capture innovation, 40% were satisfied with flexibility but 55% remained neutral on quickly launching ideas and 40% remained neutral, 25% were satisfied and 25% were dissatisfied with allocating resources towards scaling promising initiatives. Control theory can be used as a management tool to enhance processes that shape and capture innovation. Organizational control is aimed at influencing employees to act in manner that is consistent with the objectives of the organization (Buschgens et al., 2013); such as reacting towards prototyping, stopping projects and being proactive towards scaling promising projects.

Success was statistically correlated with climate, resources and processes. A distinct characteristic of a modern organization with efforts towards sustainability is an integration of environmental and social impact into its governance structure as an addition to its financial performance. This long term approach maximises inter-temporal profits and provides a more developed reporting and measurement system.

The tale of intrinsic value of new corporations should hold accountable multiple categories of wealth generation by evolving capitalism to respond to social and environmental crises (Coulson, 2016). Success can be identified in three areas of the external, the enterprise and individuals. The external environment focuses on customers, competitors and financial. There was a 40% satisfaction that customers view the group as innovative and a 40% satisfaction that innovation efforts are better than competitors. However 50% remained neutral and 35% are satisfied that innovation efforts have led to better financial performance.

There was an overall majority satisfaction with the enterprise having purpose, discipline and capabilities with 40% satisfied and 30% very satisfied with innovation being treated as a long term strategy and 40% satisfied that the enterprise has a disciplined approach to innovation. There was a majority 55% satisfaction with new capabilities being developed from innovation that previously did not exist within the enterprise. A strong culture is supportive and people oriented towards enabling its members since it is based on humanistic principals and can result in strengthening their commitment towards their own development thus contributing to organizational goals (Liou et al., 2012).

The elements that contribute towards an individual's success are satisfaction, growth and rewards. Culture can be seen as an integration of social behaviour and a set of knowledge structures (Sok et al., 2014). There was a majority of 35% satisfaction and 30% remained neutral on being satisfied with their participation on innovation efforts. However 40% remained neutral and 35% were satisfied with the growth received during their participation in innovation efforts. There was a 35% satisfaction with individuals being rewarded whilst 30% remained neutral on individuals being rewarded irrespective of the outcome.

5.3.2 Objective 2

The literature review discussed the depth, breadth, integration and structural stability as forms as characteristics of culture and values, behaviours, climate, resources, process and success as the building blocks for a culture of innovation. The construct in figure 5.1 was derived from the literature review and the statistical analysis which related elements of the characteristics of culture to the building blocks of a culture of innovation.

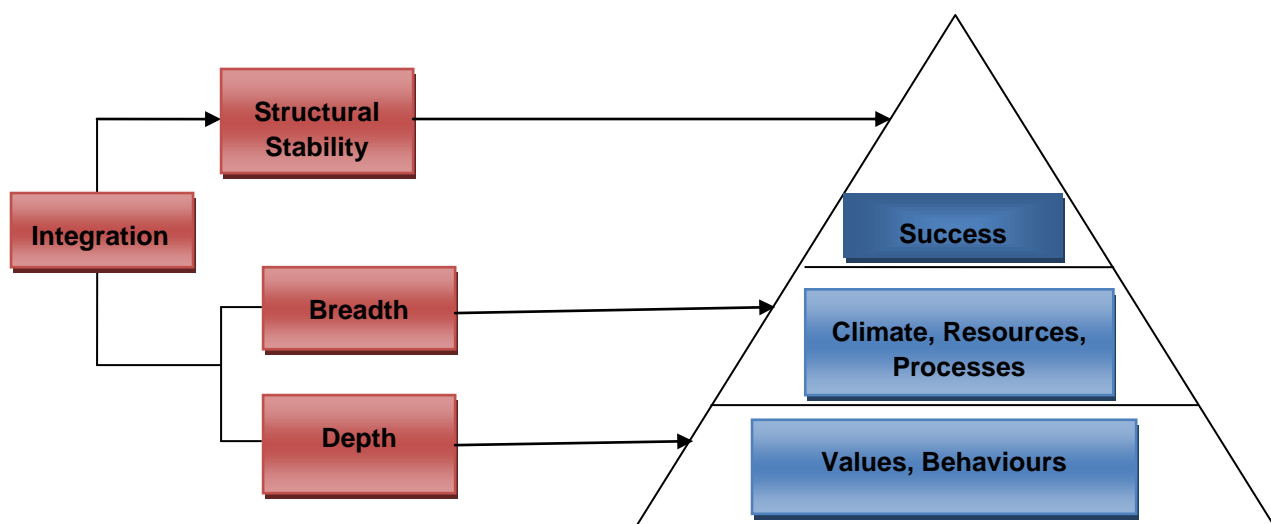


Figure 5.1: Culture characteristics and innovative build blocks

The depth of culture is instilled and present on unconscious level. Values are deeply embedded that when adapted to impacts on a person's natural behaviour when faced with situations. The depth of culture impacts on the growth of individuals as prescribed by a common value system that creates a predictive behaviour that not

only shapes the character of individuals but also may enhance productivity. The statistical analysis showed a positive correlation between values and behaviours suggesting that values and behaviours show a positive relationship. Values and behaviours occur on a natural unconscious level and therefore can be described as the depth of culture.

The innovation quotient was the key outcome variable of this study. Organizations can use the innovation quotient assessment to leverage the innovativeness of their culture. The assessment was able to identify strengths and weakness of the culture of innovation in factors, elements and buildings in the form of a scorecard (Roa et al., 2013). The average or the mean value of each factor, element and building block determines its strength.

The elements and factors of values building block is the driving force behind how decisions are made and what actions are taken. The average mean for values were 34.05 out of 45. The strongest factor mean is 4.05 for hungry, suggesting that is a strong inherent desire to innovate. However there can be improvements made to being more open to different ways of thinking and being more action-oriented in order to realize an entrepreneurial spirit in the group. Creativity and learning scored higher mean values however fostering a stronger entrepreneurial spirit within employees' the creativity and learning will greatly enhance creativity and learning initiatives. Learning systems are integral in developing technical professionalization which is important for reputation management (Momani et al., 2015)

The elements and factors of the behaviours building block influence people's natural reactions in situations. Culture acts as an intellectual and emotional model which distinguishes immaterial aspects such as values by defining employees' personality and behaviour (Militaru et al., 2012). The average mean for behaviours was 29.8 out of 45. Contributing to this low score was two factors. The first was from the energize element where it was shown that leaders behaviours don't sufficiently model the right innovation behaviours. The second was from the engage element, where people

from all levels don't make a concerted effort to innovate. This is an imperative factor towards generating new ideas which was part of the problem statement.

The culture characteristic of breadth extends across the organization and covers all functionality of the group. Essentially on a functional level the operations represent the level in an enterprise where functional work is done. This encompasses team efforts towards realizing organizational goals (Goic, 2013). The three culture building blocks that can be related to the functionality of an enterprise are climate, resources and processes as shown in figure 5.1. The statistical correlation showed a positive relationship between processes with resources and climate.

The elements of the climate building block create a complacent work environment for efficiency and effectiveness to thrive. The lowest element mean was simplicity in the workplace with 9.45. Contributing to this was a mean of 3.05 for simplifying rules and policies in order to allow for more flexibility. Other improvements to the climate from the simplicity element were people taking accountability for their actions and a decision map for ideas to move swiftly ahead. Simplicity is key for easy collaboration and for employees to move ahead efficiently without bottlenecks. Productivity is rife in highly motivated environment thus a good climate is important to keep employees motivated (Kelepile, 2015).

The elements of the resources building block are important tools that leverage are used to leverage the outcome of organizational goals. Organizational performance not only identifies problems but also finds solutions and is the capability of the organization as a whole to achieve its goals efficiently and effectively by using its resources (Shahazad et al., 2012). The average mean for resources building block was 30.55. The lowest element mean was projects with 9.45. This is an important element towards solving the problem statement as to enable the attraction and

retention of skilled people there has to be a constant increase in projects. Therefore the factors of projects, time, money and space need to improve.

The elements of processes form the pathways that effectively take innovation ideas from the initial stage to its final launch. Exploration and exploitation are considered competing activities however balance is achieved through structural separation (Wang et al., 2015). The average mean for processes was 28.2. All three elements of ideate, shape and capture all had means of less than 10 out of 15. The weakest points of processes that need improvement were quick prototyping, stopping projects that are foreseen to fail and launching products in the market with speed. Effective processes are essential for well developed organization that can help build a good reputation.

The culture characteristic of integration lends itself towards attaining structural stability on a larger paradigm by linking elements through joint synchronisations. In figure 5.1, values and behaviours form the core characteristics of individuals which influence the type of climate, efficient resources and effective processes aligned with the organizations goals. The statistical correlation showed a positive relationship between climate with values and behaviours as well as a positive relationship between processes with behaviours.

The success building block is most important as achieving success in the individual, enterprise and with customers creates structural stability from the integration of values and behaviours with climate, resources and processes as seen in figure 5.1. The success building block had an average mean of 31.95. The lowest mean was for the element individual. Improvements can be made on including individuals from all levels in innovation so that they can also have exposure for their own growth. Rewards for innovations efforts also need to improve in order to motivate employees

to strive for better performance which also has an impact on employee loyalty and perception of the organization (Gorenak et al., 2012).

Structural stability derived from culture can be seen as a major stabilizing force that contributed towards attaining organizational success from all elements of individuals, the enterprise and external environment. The overall innovation was shown to be statically correlated to all six building blocks from the culture of innovation showing positive relationships. Thus the sustainability of an organization can be achieved when success is attained in all its elements.

5.4 Summary

The literature review and the presentation of results in chapters two and four provided the necessary information to meet the research objectives of this study. The research objectives were first highlighted followed by an integrated approach to determining the key findings of this study relative to its objectives.

CHAPTER 6

Conclusion and Recommendations

6.1 Introduction

The aim of this study was to determine how sustainability could be reached by using an intervention of culture. The main variables considered in this study were sustainability which was the dependent variable and culture as the independent variable. The conclusion of this study highlights the relationship between sustainability and culture which shown in the literature review and in the discussion. This positively impacted on solving the problem statement of utilizing culture to drive sustainability.

6.2 Conclusion

The construct depicted in figure relates sustainability to a culture of innovation. The reasoning derived from this study has shown that sustainability, the triple bottom line (TBL), innovation, culture of innovation and structural stability can be linked. From the literature it was shown that sustainability can be represented by or quantified by the TBL. Sustainability was shown to coexist with enterprise excellence and enterprise resistance; this was evident in the SEER2 model for enterprise sustainability.

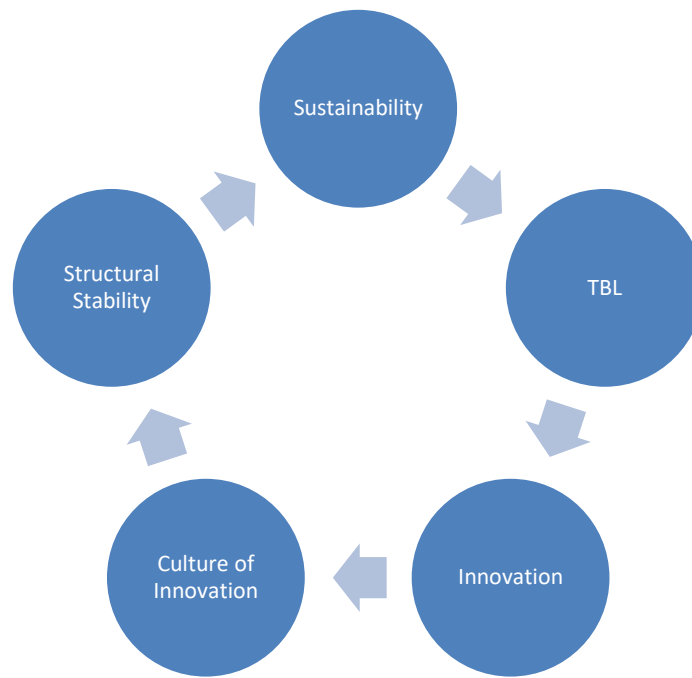


Figure 6.1: Achieving sustainability through a culture of innovation

As outlined in the SEER2 model the implementation of the triple bottom line of planet, people and profits (3P) can be achieved through ethical, efficient and effective (3E) strategy and governance. A common enabler in SEER2 for the 3P and 3E initiatives is innovation. Sustainability oriented innovation (SOI), as discussed in the literature review has shown that when an environment shifts towards sustainability then innovation shifts towards people and the organization. This shift towards people and the organization connotes the importance of a culture of innovation since it is culture that shapes people and the organization.

6.3 Implications of this Research

Sustainability is often tightly linked to reporting on triple bottom line. This study contributes an organizational element of a culture of innovation that can be crafted and executed to achieve a sustainability oriented organization. Smaller organizations or organizations with one business unit such as research may have more focus on a functional level with executing tasks in the short term and much lesser focus on the importance of implementing sound business practices. The benefits of sustainability such as growth and longevity are desirable to any organization. The study highlights the importance of considering sustainability from a business practice point of view and encourages organizations to explore further business practices that enhance effectiveness and efficiency.

6.4 Limitations of the study

The main limitations of this study were identified as:

- a) The sample size was small therefore it may not be applicable to a larger institute.
- b) The participants were required to answer questions based on their current work environment. There could have been a sample bias towards certain questions.
- c) The data was collected once and analysed using methods that was perceived to be most appropriate, collected data repeatedly and alternate data methods were not sought out. This may have resulted in shortcomings or an inadequacy in the data collection and analysis.

6.5 Recommendations to solve the Research Problem

The research problem was based upon the need for escalating research and development in the water sector for much needed attempts to avert the imminent water crisis facing South Africa. Although water research groups do currently contribute towards water research, a growing imperative has arisen within the country to find solutions towards water conservation and improved water technologies.

The nature of Research Groups with respect to financial and human resources are short term which would most likely create instability. As discussed in the literature review striving toward business sustainability can positively contribute skills retention and attraction; and the development of innovative ideas. Organizations should strive towards developing and maintaining a sustainable environment in order to achieve the aforementioned benefits.

There are two recommendations to solve the research problem. This was derived from figure which represents the core of the study. Sustainability can be represented by the triple bottom line (TBL). Organizations should move away from looking at profits in isolation and shift towards TBL reporting with an integrated focus on profits, people and the environment. A core enabler of sustainability, shown in the literature review, is innovation. Creating a culture of innovation not only aids in the development of new ideas but also creates structural stability of the organization. Therefore creating and sustaining a culture of innovation encourages new ideas and creates stability for the attraction and retention of human resources as well as more intellectual capital for future projects.

6.6 Recommendations for future studies

A culture of innovation has been receiving a lot of attention globally as it combines culture and innovation; two business trends that have proved to be an integral component in today's business success. Further studies on a culture of innovation are recommended with a focus on crafting, implementing and sustaining culture for it is people who ultimately are responsible for initiating and executing ideas and tasks. This research will contribute greatly towards strengthening developing organizations.

6.6 Summary

This study concluded that sustainability is linked to organizational culture through innovation. Further conclusion is that the building blocks for a culture of innovation are related to the characteristics of culture and help attain structural stability. These conclusions satisfy the research objectives and questions of this study. This research will contribute towards encouraging organizations to take an active interest in implementing beneficial business practices. Although a noted limitation was a small sample size the conclusions of this study were shown to be highly probable through the literature review. The research problem can be solved by crafting and implementing a culture of innovation in order to reap benefits of sustainability. As culture is an increasingly popular business trend and has many benefits that organizations can benefit from, it is highly recommended that future studies incorporate research on crafting, implementing and sustaining a culture of innovation.

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Appendix A: Letter of informed consent



16 March 2017

Ms Kavisha Nandhlal (SN 200000296)
Graduate School of Business
College of Law and Management Studies
Westville Campus
UKZN
Email: kavisha296@gmail.com

Dear Ms Nandhlal

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), towards your postgraduate degree, provided Ethical clearance has been obtained. We note the title of your research project is:

"Reinventing an organization through its culture to drive business sustainability".

It is noted that you will be constituting your sample by handing out questionnaires to Senior Researchers, Post doctorate Researchers, technicians and Postgraduate students on the Howard College Campus.

Please ensure that the following appears on your notice/questionnaire:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely



MR SS MOKOENA
REGISTRAR

Appendix B: Research Questionnaire

VALUES	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
We have a burning desire to explore opportunities and to create new things.					
We have a healthy appetite and tolerance for ambiguity when pursuing new opportunities					
We avoid analysis paralysis when we identify new opportunities by exhibiting a bias towards action					
We encourage new ways of thinking and solutions from diverse perspectives.					
Our workplace provides us the freedom to pursue new opportunities.					
We take delight in being spontaneous and are not afraid to laugh at ourselves.					
We are good at asking questions in the pursuit of the unknown.					
We are constantly experimenting in our innovation efforts.					
We are not afraid to fail, and we treat failure as a learning opportunity					
Behaviours					
Our leaders inspire us with a vision for the future and articulation of opportunities for the organization					
Our leaders frequently challenge us to think and act entrepreneurially.					
Our leaders model the right innovation behaviors for others to follow.					
Our leaders devote time to coach and provide feedback in our innovation efforts.					
In our organization, people at all levels proactively take initiative to innovate.					
Our leaders provide support to project team members during both successes and failures					
Our leaders use appropriate influence strategies to help us navigate around organizational obstacles					
Our leaders are able to modify and change course of action when needed.					
Our leaders persist in following opportunities even in the face of adversity.					

Climate					
We have a community that speaks a common language about innovation.					
We appreciate, respect and leverage the differences that exist within our community.					
Teamwork We work well together in teams to capture opportunities.					
We are consistent in actually doing the things that we say we value.					
We question decisions and actions that are inconsistent with our values.					
We are able to freely voice our opinions, even about unconventional or controversial					
We minimize rules, policies, bureaucracy and rigidity to simplify our workplace.					
People take responsibility for their own actions and avoid blaming others.					
Our people know exactly how to get started and move initiatives through the organization.					
Resources					
We have committed leaders who are willing to be champions of innovation.					
We have access to innovation experts who can support our projects.					
We have the internal talent to succeed in our innovation projects.					
We have the right recruiting and hiring systems in place to support a culture of innovation.					
We have good collaboration tools to support our innovation efforts.					
We are good at leveraging our relationships with suppliers and vendors to					
We give people dedicated time to pursue new opportunities.					
We have dedicated finances to pursue new opportunities.					
We have dedicated physical and/or virtual space to pursue new opportunities.					

Processes					
We systematically generate ideas from a vast and diverse set of sources.					
We methodically filter and refine ideas to identify the most promising opportunities.					
We select opportunities based on a clearly articulated risk portfolio.					
We move promising opportunities quickly into prototyping.					
We have effective feedback loops between our organization and the voice of the customer					
Fail smart We quickly stop projects based on predefined failure criteria.					
Our processes are tailored to be flexible and context-based rather than control-and bureaucracy-based.					
We quickly go to market with the most promising opportunities.					
We rapidly allocate resources to scale initiatives that show market promise.					
Success					
Our customers think of us as an innovative organization.					
Our innovation performance is much better than other firms in our industry.					
Our innovation efforts have led us to better financial performance than others in our industry					
We treat innovation as a long-term strategy rather than a short-term fix.					
We have a deliberate, comprehensive and disciplined approach to innovation.					
Our innovation projects have helped our organization develop new capabilities that we did not have three years ago					
I am satisfied with my level of participation in our innovation initiatives.					
We deliberately stretch and build our people's competencies by their participation in new initiatives.					
We reward people for participating in potentially risky opportunities, irrespective of the outcome.					

Appendix C: Ethical clearance approval letter



03 May 2017

Ms Kavisha Nandhlal (200000296)
Graduate School of Business & Leadership
Westville Campus

Dear Ms Nandhlal,

Protocol reference number: HSS/0269/017M

Project title: Reinventing an organization through its culture to drive business sustainability

Full Approval – Expedited Application

In response to your application received on 29 March 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and FULL APPROVAL for the protocol has been granted.

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

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

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

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

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Muhammad Hoque
Cc Academic Leader Research: Dr Emmanuel Mutambara
Cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

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Appendix D: Turnitin report

Thesis

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