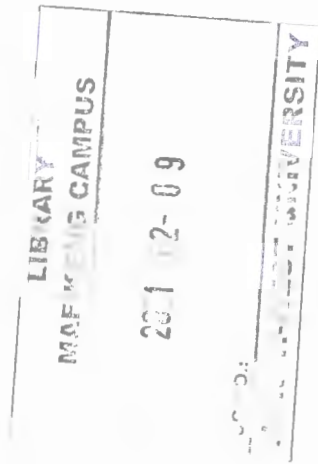


**A FRAMEWORK FOR IMPROVING THE ORGANISATIONAL
EFFECTIVENESS
OF FUNDING AGENCIES ON THE SCIENCE SECTOR**



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Supervisor: Professor PD Gerber

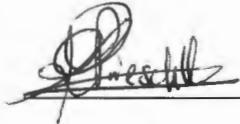
Co-supervisor: Professor S Swanepoel

October 2015

DECLARATION

I, Rakeshnie Ramoutar-Prieschl, declare that this dissertation, entitled: "**A framework for the organisational effectiveness of funding agencies in the science sector**", is hereby submitted to North West University in fulfilment of the degree, **Doctor Philosophiae**, in Business Management, and has not been submitted in any form for a degree at any other university. This is my own work in design and execution, and all materials and other sources of information have been duly acknowledged and cited.

Signature:



R Ramoutar-Prieschl

Date:

15 October 2015

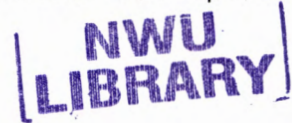
ABSTRACT

Research funding agencies are quasi-public organisations mandated by specific legislative acts or laws. Although they are independent entities, they are still dependent on government for financial resources. Through the resources they manage, funding agencies are able to facilitate and drive research and development. Although funding agencies exist in the midst of a system compounded by numerous external players, their responsibility is to optimally utilise limited resources. These resources are invested, through the use of grant awarding processes, to encourage research productivity from those scientists who are recipients of grants. However, funding agencies, like all other public organisations, face challenges such as the: poor allocation and utilisation of resources; weak management practices; weak research-performing institutions; unpredictable political, economic and ethical environments; and poor morale and motivation among public employees. Given this context, it is difficult yet critical to establish a useful, reliable and valid set of effective indicators for evaluating the organisational effectiveness of funding agencies. This study therefore endeavoured to address this very issue by firstly providing insights into the factors and subfactors associated with the balanced scorecard, with the aim of explaining, from a theoretical perspective, how each of these factors influence the organisational effectiveness of funding agencies. Secondly, this research sheds light on some of the key elements necessary for improving the organisational effectiveness of funding agencies in the science sector by presenting a conceptual framework that was based on the research findings from several countries internationally. The research questions that were addressed in this study, were as follows:

- 1) Do the factors and subfactors cluster according to the balanced scorecard that was proposed in this study?
- 2) What are the main factors influencing/impacting the organisational effectiveness of funding agencies?
- 3) Can a conceptual framework for improving the effectiveness of funding agencies be developed?

In addressing the research questions and objectives of this study, a sequential explanatory mixed methods approach was adopted. Initially, a theoretical model in the form of a five factor balanced scorecard was proposed, which was used to develop a survey, geared towards evaluating employee perceptions relating to the organisational effectiveness of funding agencies. From this phase of the study, a total of 188 responses were received, and these were subjected to descriptive statistics, t-tests, ANOVAs and factor analysis. The outcomes of

the factor analysis revealed that four interrelated and interdependent factors, play a contributing role in influencing the organisational effectiveness of funding agencies. These factors include: environmental and stakeholder management; financial management; organisational business processes; and organisational learning and growth. It was further found that each of these factors play an equally important role in influencing the organisational effectiveness of funding agencies. The outcomes from the first phase of the study, were subsequently verified and validated in the secondary qualitative phase comprising eight semi-structured interviews with the top management of funding agencies and representatives from other organisations closely associated with funding agencies. The interview transcripts were subjected to thematic analysis. The outcomes from this phase of the study, confirmed the quantitative research outcomes, and helped the researcher to gain a better understanding of the research subject, which guided and refined the development of both the conceptual model and implementation roadmap that are presented in this study.



Keywords: *Organisational effectiveness; balanced scorecard; funding agencies; mixed methods*

For my family...

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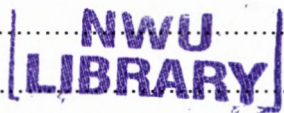


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ACRONYMS

ANOVA	Analysis of Variance
BMW	Bayerische Motoren Werke
CONICYT	Comisión Nacional de Investigación Científica y Tecnológica: Chile
DFG	Deutsche Forschungsgemeinschaft
e-mail	Electronic Mail
EPSRC	European Physical Sciences and Research Council
FDA	Food and Drug Administration
FNB	First National Bank
FT	Financial Times
GDP	Gross Domestic Product
GRC	Global Research Council
IBM	International Business Machines Corporation
IP	Internet Protocol
IT	Information Technology
KOSEF	Korean Science and Engineering Foundation
MOST	Korean Ministry of Science and Technology
NIH	National Institutes of Health
NRF	National Research Foundation
NSF	National Science Foundation
OECD	Organisation for Economic Cooperation and Development
PEST	Political, Economic, Socio-cultural and Technological
PhD	Philosophiae Doctor
R&D	Research and Development
RCN	Research Council of Norway
Roi	Return on Investment
UK	United Kingdom
UN	United Nations
USA	United States of America

CHAPTER 1: INTRODUCTION

1.1 Introduction

This thesis explores the factors linked to the organisational effectiveness of funding agencies across several countries and attempts to contribute towards a global discussion on funding agencies and the factors that influence their effectiveness. An in-depth exploration of the literature guided and shaped the research design and process of this study. This thesis begins by providing an introduction to the study, followed by an explanation of funding agencies and a definition of organisational effectiveness, prior to describing the research process, its outcomes and key findings and recommendations. The main objective of the study was to develop a framework that could be used to guide funding agencies in improving or enhancing their effectiveness in the science sector. Firstly, a theoretical model based on the balanced scorecard was proposed that stipulates established measures from the existing organisational effectiveness literature. This model was empirically tested as an initial step towards developing a conceptual framework geared towards improving the organisational effectiveness of funding agencies in the science sector. The conceptual framework was subsequently verified and validated through a secondary qualitative process comprising semi-structured interviews.

1.2 Background

Research and development (R&D) are considered driving forces towards establishing a knowledge economy aimed at contributing to a country's economic wealth. It is on this premise that many countries have raised R&D investments in order to boost scientific and technological advances over the years (Lee, Park & Choi 2009). Playing a central role in driving scientific and technological outputs are organisations such as funding agencies that direct national scientific research by investing in research projects that meet specific requirements and criteria (Braun 1998). Funding agencies can therefore be considered protagonists in the distribution of public resources and structure the way research is conducted by the stipulation of criteria and conditions linked to research grants (Braun 1998). Funding agencies also play a key leadership role in stimulating interest in young people to pursue careers in science and technology and developing a diverse labour force with the necessary skills to navigate in a knowledge economy (Lee, Park & Choi 2009). Given the magnitude of their mandates and the level of accountability, it is not surprising that the effectiveness of such organisations in addressing these objectives has been questioned (Lee, Park & Choi 2009).

The management of science by funding agencies, from the very outset, is influenced by and mediated in concert with the environment (Morgan 2006, Braun, 2003; Braun, 1998). In turn, these interactions are influenced by economic, political and global factors. In essence, these agencies receive inputs, primarily R&D funding from government, which, using grant awarding processes, are transformed into outputs, that are generated by those scientists who are recipients of research funding. Feedback loops are also used in such organisations and are employed to assess the impact of research funding on scientific productivity from those scientists who are recipients of grant awards (Leydesdorff, Wagner 2009, Lane 2009, Jacob, Lefgren 2007, Arora, Gambardella 2005). Unravelling the complexities associated with funding agencies, and their interactions with the environment, does not lend itself to a simple explanation.



In the past two decades, governments in developing countries have taken steps to improve the effectiveness of public sector organisations under the guidance of good governance and new public management, which were first introduced in the United States of America (USA) (Waheed, Mansor & Ismail 2011). New public management is an intervention by government that aims to formalise the interplay between government, the market and society. The philosophy of this tool is underpinned by a set of management techniques that is used to reform public sector organisations and their management (Waheed, Mansor & Ismail 2011). In addition, new public management has been informed by the literature on good governance, which calls for more accountability and better performance (Prybil 2006). The concept of organisational effectiveness in the public sector is therefore guided by the concepts of new public management and good governance. In addition, organisational effectiveness is geared towards organisations becoming more efficient, effective and relevant to the needs of customers and other stakeholders (Waheed, Mansor & Ismail 2011, Peterson et al. 2003, Lusthaus 2002). Finally, it has been proposed that the provision of public access to regular and reliable information not only increases transparency, but also improves public accountability (Waheed, Mansor & Ismail 2011, Peterson et al. 2003, Lusthaus 2002). For improvement to be the desired outcome, when measuring the effectiveness of public organisations, it is important for customer satisfaction to be a key performance measure (Waheed, Mansor & Ismail 2011).

1.3 Research rationale

Funding agencies must identify, link and align resources with external sectors to be better able to meet the needs of the science community. This includes brokering partnerships with industry, government, international bodies and research institutions (Tiu 2001). Advances in facilitating

such partnerships include the cross-fertilisation of ideas, access to expertise and technology, the improvement of services and the increased ability to acquire additional resources. Forging such partnerships also attempts to ensure the pursuit of academic excellence as well as the incorporation of the needs of all stakeholders into the organisation's strategic planning. Such interactions have the potential to reshape national science policy (Tiu 2001).

Organisational effectiveness has been widely studied in the private sector but to a lesser extent in the public sector. In the latter case, a lot of research undertakings have focused on the effectiveness of government departments, universities and non-governmental organisations. What is lacking in the literature is specific attention to the effectiveness of organisations such as funding agencies.

This doctoral study is therefore not only a unique undertaking but also aims to investigate the effectiveness of funding agencies in the science sector by assessing the perceptions of funding agency employees. Its findings will be used to develop a conceptual framework that hopes to contribute to a global discussion on the effectiveness of funding agencies and their role in influencing scientists to be more productive, while simultaneously addressing the demands of government. To address this research focus, the study was guided and shaped by the literature on organisational effectiveness.

1.4 Research problem statement

Few studies have attempted to measure the effectiveness of public organisations and these studies have focused on analysing the effectiveness of hospitals (Prybil 2006, Kershaw, Kershaw 2001), municipalities (Ngcelwane 2008), universities (Mukerjee 2014, Rasheed et al. 2011, Zangouinezhad, Moshabaki 2011, Owsley-Stevens 2010, Thiruchelvam 2004), non-governmental organisations (Fowler 2013, bin Haji Zain 2010) and government or government departments (Khan, Ukpere 2014, Meyer 2014, Stanton, Webster 2014, Hoque, Adams 2011).

Even fewer studies have attempted to investigate the effectiveness of public funding agencies, of which a number of these have either focused on the effectiveness of specific funding programmes or developed various methods to evaluate research productivity (Leydesdorff, Wagner 2009, Lane 2009, Jacob, Lefgren 2007, Arora, Gambardella 2005). This study is a unique undertaking in that there is limited, if any, reference in the literature, to understanding the organisational effectiveness of funding agencies, particularly in middle-income countries, by identifying a useful, reliable and valid set of factors for evaluating the organisational

effectiveness of funding agencies. This study also contributes towards the development of an conceptual framework geared towards both understanding and improving the effectiveness of these agencies.

1.5 Research objectives

The aim of this research study was to identify a useful, reliable and valid set of factors for evaluating the organisational effectiveness of funding agencies using the balanced scorecard and a mixed methods approach. The outcomes of the study aided in the development of an conceptual framework geared towards contributing to the global discussion on the effectiveness of funding agencies. It also makes strategic recommendations, in the form of an implementation map, to government and funding agencies on how best to address the factors that influence the effectiveness of funding agencies.

1.5.1 Investigative questions

- 1) Do the factors and subfactors cluster according to the balanced scorecard that has been proposed in this study?
- 2) What are the main factors influencing/impacting the organisational effectiveness of funding agencies?
- 3) Can a conceptual framework for improving the effectiveness of funding agencies be developed?

1.6 Scope of study

This study focused primarily on the perceptions of employees about the organisational effectiveness of funding agencies, across several countries using a mixed methods approach. Although the scope of this study originally extended itself to include the perceptions of funding agency employees, government officials and researchers, the leadership of the few funding agencies that were agreeable to participating in this study, indicated that the scope must be limited to the perceptions of funding agency employees only, and exclude those of government officials and researchers. The study therefore did not extend to evaluating the perceptions of other stakeholders, such as government officials and researchers who are recipients of grant awards from the funding agency.

1.7 Study outline

The outcomes of this doctoral thesis will be described in six distinct and demarcated chapters.

Chapter 1 introduced the study and provided the rationale for the proposed research undertaking. Further, it focused on the contextual background to the balanced scorecard, which framed the research approach in this study and briefly introduced funding agencies. The research problem statement and the investigative questions that this study endeavoured to answer were also discussed.

Chapter 2 contains the main literature review and provides a comprehensive overview of the theoretical concepts underpinning this study. In addition, it describes the theoretical factors and subfactors as well as their impact on the organisational effectiveness of funding agencies.

Chapter 3 describes the research methodology, approach and design of the study. It also describes the sample population and the sampling procedures followed. Finally, this chapter presents the method for data collection as well as the data analysis tools that were employed. The issues pertaining to reliability, validity and ethical considerations are discussed.

Chapter 4 expands on the research findings and provides the statistical data that resulted from undertaking this research study. The outcomes presented here determine whether the research questions were adequately answered.

Chapter 5 includes an interpretation of the research findings by integrating the literature review with the study outcomes. In addition a conceptual framework is presented, that highlights the key factors associated with the organisational effectiveness of funding agencies. The developed framework is discussed in detail in this chapter. It also includes recommendations to government and funding agencies, in the form of an implementation map, on how best to improve the organisational effectiveness of funding agencies. The limitations of the study are acknowledged and discussed in this chapter.

CHAPTER 2: LITERATURE STUDY

2.1 Introduction

This chapter focuses on three bodies of literature. Firstly, funding agencies and funding practices across several countries are discussed. Secondly, organisational theory is briefly discussed. As part of this discussion, reference is made to the relevant literature in describing the balanced scorecard, which forms the basis of the development of the survey instruments that were used in this research. Thirdly, the literature relating to organisational effectiveness is visited. As part of the conclusion to this chapter, the complexity associated with understanding the organisational effectiveness of research funding agencies is unravelled by identifying and describing the various factors and subfactors that were discussed and presented in the literature.

2.2 Research funding

A focal point of this research study is on research funding due to the considerable investments that are directed towards funding R&D activities across the R&D value chain with the view that the long-term direct and indirect benefits will accrue economic returns (Lane, 2009; Leydesdorff & Wagner, 2009; Goldfarb, 2008; Boardman & Ponomariov, 2007; Jacob & Lefgren, 2007; Arora & Gambardella, 2005; Ruegg & Feller, 2003). R&D activities are usually funded from two major sources, private enterprise and government (OECD, 2008). The funding of research by private enterprises is primarily motivated by profit, which incentivises researchers to concentrate their energies on projects that are perceived to be profitable. Hence private sector investments in R&D tend to be focused on development and commercialisation projects (OECD, 2008). Government-funded research, however, facilitates the generation of new knowledge and fosters collaborative networks (Defazio, Lockett & Wright, 2009). With minor exceptions, government tends to invest significantly in basic and applied scientific research (OECD, 2008). In many instances, government investments in R&D are managed by funding agencies which play a key role in the disbursement of these funds in the form of research grants (Goldfarb, 2008; Braun, 2003; Van der Meulen, 2003; Braun, 1998; Van der Meulen, 1998).

2.3 Funding agencies

Research funding agencies are quasi-public organisations mandated by specific legislation and are accountable to a board of directors (Braun, 1998). Although they are independent entities, they are still dependent on government for financial resources. Through the resources they manage, funding agencies are able to drive the somewhat complex and dynamic R&D process

(Hodgson & Calatrava, 2006). Although funding agencies exist in the midst of a system compounded by numerous external players, their responsibility is to optimally utilise limited national resources. The resources invested by funding agencies, using grant awarding processes, drive the research process and encourage research productivity by the scientists who are recipients of research grants (Defazio et al, 2009, Jacob & Lefgren, 2007; Rowlands & Olivieri, 2006; Arora & Gambardella, 2005).

The mechanism for funding research usually involves researchers applying for financial support in the form of research grants from funding agencies. This involves funding research projects through a competitive process, which involves the evaluation of projects against set criteria by a peer review committee of experts in a specific field of research (OECD, 2008). The awarding of these grants entails a lengthy process as the funding agency enquires about the researcher's background, the facilities used, the equipment needed, the time involved, and the overall potential and impact of the scientific outcome. Ultimately, only the most promising projects receive funding (OECD, 2008).

As a consequence, these public organisations possess the power to structure, constrain and enable specific behaviours that address national strategic priorities (Hodgson & Calatrava, 2006). This type of behaviour tends to be driven by government departments that form the primary sources of financial investment to funding agencies. The respective government departments allocate financial resources to the funding agency on the basis that specific strategic objectives must be met and key performance areas addressed (Braun, 1998). However, the level of government and political authority influencing the role and mandates of funding agencies differs because almost all funding agencies have a considerable amount of latitude in determining and implementing their strategies (Braun, 1998).

2.3.1 Types of funding agencies

In attempting to understand the various types of funding agencies that have been reported in the literature, two differing perspectives are presented. In 2007, Lepori and co-authors, proposed a classification system relating to the nature of funding agencies with their relationships to government. The authors proposed four major types of funding agencies (Lepori, Van den Besselaar, Dinges et al, 2007). These included national agencies that form a direct part of government administration, intermediary agencies that are independent in their management and decision-making processes, regional agencies that are part of the local state

administration and have regional relevance, and international agencies that form part of the European Union, such as intergovernment agencies.

An alternate categorisation system was suggested earlier by Braun (1998), which related the type of research that funding agencies aim to steer, with the level of influence of national government on their activities. In essence, Braun (1998) identified three types of funding agencies. Firstly, he proposed science-based funding agencies that support all disciplines of science as individual silos. This type of funding agency fosters mainstream research by selecting and funding reputed scientists in a disciplinary arena, thereby avoiding the rise of hybrid communities that could compromise the existing distribution of power in the scientific system (Braun, 1998). Examples include the German Research Community, the American National Science Foundation and the French Centre National de la Recherche Scientifique. The second proposed type of funding agency includes political funding agencies that are obliged to respond to the general and multifaceted problems raised in parliament or ministries. These are rare funding agencies and an example includes the German Ministry of Education and Research (Braun, 1998). Political agencies, according to Braun (1998) are forced to create hybrid communities because they need unconventional solutions to politically defined problems. Such agencies can very well lead to the differentiation of the science community (National Research Council, 2005; Braun, 1998). Thirdly, Braun (1998) proposed strategic funding agencies that promote research in a particular problem area such as health and environment. Such agencies also respond to particular problems raised by the scientific community, laypersons, industry or politicians. Strategic funding agencies not only promote disciplinary research, but also develop strategies to apply basic research in a wider context and, in most instances, support clinical research that is often neglected by science-based funding agencies (Braun, 1998). Examples of such agencies include the various research councils in the United Kingdom (UK), Grands Organismes de la Recherche in France and the National Institute of Health in the United States of America (USA).



Despite the differences between the various types of funding agencies as described in the literature, it can be deduced that the role of all funding agencies, regardless of their mandates and allegiance to national government, is essentially based on the same principles – that is, to ensure that the needs of the research community are addressed and that competitive evaluation practices are adopted to ensure that there is a return on investment in R&D that aligns with government objectives and targets.

2.3.2 Practices of funding agencies

In managing the public investment in R&D, several approaches have been utilised to evaluate scientific or research proposals that are submitted to funding agencies by research applicants. The main criterion, which forms the cornerstone for the evaluation of proposals, relates to scientific merit, which is measured by the research productivity of the applicant (Rowlands & Olivieri, 2006; Braun, 1998). Productivity can be defined as the measure of scientific activity that is able to generate various quality research outputs, particularly research publications (Rowlands & Olivieri, 2006). The productivity of applying researchers can be measured by using the quantitative method of bibliometrics. According to Ruegg and Feller (2003), bibliometrics is defined as the quantitative study of literature as reflected on bibliographies and utilises quantitative analysis and statistics to describe patterns of publication in a given field or body of literature (Weingart, 2005). The challenge funding agencies face in employing this method is that bibliometrics only addresses a single type of R&D output, namely publications (Lee et al, 2009). This method therefore poses a challenge to funding agencies, particularly in developing countries that are required by government to consider and report on other research outputs that form part of national performance indicators, including student training and innovative outputs that have the potential to draw economic benefits to the country.

A commonly employed method utilised by funding agencies to evaluate the merit of research proposals, is the peer review method, which is based on the perceptions of well-informed experts on various quality dimensions of R&D (Ruegg & Feller, 2003). Referees are co-opted by the funding agency and usually two referees present a research proposal to the rest of the participants of the peer review group (Braun, 1998). This opens the floor to dialogue and opposing views by the other panel participants. The research proposal is usually rated against set assessment criteria defined by the funding agency. Although peer reviewers can gain consensus on proposals that are either outstanding or poor, it is difficult to reach consensus on proposals that score in the middle range, which is a major limitation associated with the peer review system (Weingart, 2005). An additional limitation is that this method is both costly and an inherently subjective one that is likely to be biased, depending on the interests, experience, competence and knowledge of the evaluators (Lee et al, 2009).

Another method, employed by funding agencies, but to a lesser extent than the peer review process, is the anonymous mail review. Anonymous referees or reviewers are invited by funding agencies to decide on the credibility of the proposal and the research applicant in accordance with the same set of assessment criteria that are used in the peer review process. In the mail review system, the referee makes a decision by himself or herself without being exposed to the

opinion of other reviewers (Lee et al, 2009). Usually two or three mail reviews are requested on the same research proposal in order to compensate for opposing views. The final decision on the investment potential of a proposal is then made by funding-agency personnel.

Each of the above-mentioned practices form part of the core business of funding agencies and possess certain drawbacks that need to be weighed. As such, some funding agencies have developed alternate methods of measurement. These include computer-modelling programs such as data envelopment analysis (Lee et al, 2009), which allow funding administrators at funding agencies to assess all criteria involved in the decision-making process. Such techniques are widely utilised by the US and European funding agencies (Lee et al, 2009; Jacob & Lefgren, 2007; Jaffe, 2002). However, these too suffer from limitations in that all the historical data on the applicant needs to be electronically available and the software program itself is expensive to purchase (Jaffe, 2002). Further, these programmes need to be adapted to ensure alignment to each country's national funding priorities (Weingart, 2005).

The challenge with the use of any of the above-mentioned methods, is that each practice can be either time consuming or expensive, or both. Nevertheless, in the absence of generally accepted or agreed methodologies, funding agencies continue to base their grants awarding processes on peer review, despite this method being open to both questions and flaws (Leydesdorff & Wagner, 2009).

2.3.3 Challenges facing funding agencies

In addition to the criticisms from the research community, relating to the processes adopted by funding agencies to award research grants, these public organisations also face several other challenges.

Firstly, there is a worldwide drive across many countries to adopt new public management, which aims to make public agencies more transparent, especially with respect to their expenditure behaviours by applying a set of performance measurement indicators. Performance management tools attempt to make objectives, performance outputs and resource utilisation clear in public sector organisations, including agencies, by integrating financial and nonfinancial information (De Waal, 2010). The new public management tools however, have been received with mixed reviews. On the one hand, these tools have been shown to improve overall efficiency and effectiveness across public sector organisations, and on the other, they have failed to achieve their objectives in terms of discouraging corruption in public agencies (De Waal

2010). Furthermore, it appears that across public funding agencies, the use of these tools has not as yet been fully implemented and explored, especially with regard to their alignment with the nature and complexity associated with the mandates of funding agencies.

Secondly, a major contributor impacting on the effectiveness of funding agencies is the external environment and its management by agencies themselves. Funding agencies tend to exist in a dynamic environment driven by the need for resources and accountability (Braun, 1998; Abernethy & Brownell, 1997). The external environment that impacts on the effectiveness of funding agencies involves two major stakeholders, namely government, on the one hand, and the scientific community, on the other. Funding agencies by virtue of their processes and their mandates significantly influence the scientific community of a country by determining those who will be recipients of grant awards (Braun & Guston, 2003). However, in delivering on the demands of the scientific community, they themselves need to address the demands of the political environment that is accountable for the organisation's financial resources (Wagner, 2011). In essence, while dealing with educational and research management, funding agencies face the challenge of converging the interests of scientific and political stakeholders (Braun, 2003).

A third challenge is the need for funding agencies to remain autonomous. Although they act as intermediary organisations between government and universities, which include the scientific community, these agencies require a certain level of autonomy with respect to both sides. Part of the influence on funding agencies by the scientific community is explained by the peer review process, the primary instrument used to evaluate and select fundable projects. Despite the role of scientists in advising funding agencies, through the peer review process, of what projects are fundable, the positions of funding agencies and scientists in the quest for the distribution of funds are different (Braun, 2003). Furthermore, funding agencies represent independent organisations that are governed by specific mandates, and are not mere agencies that aspire to fulfil the demands of the scientific research community alone. The basic interest of funding agencies therefore is to maintain the organisational capacities for organisational survival, and this not only demands a close relationship with scientists and government, but also a certain degree of independence. Boundaries are therefore necessary and need to be maintained in order for these organisations to operate effectively and efficiently (Braun, 1998).

Compounding the above challenge is the fact that boundary lines are often blurred owing to the inextricably interdependent relationship that funding agencies share with the external environment. A case in point is the recent practice of funding agencies to replace personnel with

scientific staff (Braun, 2003; Braun & Guston, 2003; Braun, 1998). The reasons for this are twofold. Firstly, the matters of funding agencies are so specific that they require a reasonable knowledge of the scientific field; and secondly, in order to succeed, funding agencies require personnel with good contacts in the scientific community who are familiar with the values, norms and procedures of scientists (Braun, 2003; Braun, 1998). This institutional symbiosis means that no goal can be achieved without the active cooperation of both sides. However, these agencies are under growing pressure from government to demonstrate greater accountability and accomplish more with fewer resources, in order to improve their organisational productivity and enhance their impact on the research-productivity capacity of the country (National Research Council, 2005). This interplay has numerous implications for the role played by funding agencies and has raised many concerns about the efficiency and effectiveness of R&D spending by funding agencies. Compounding this issue is the absence of a universal indicator that measures the return on R&D investments.

Drawing on the above-mentioned list of challenges that face funding agencies, it is not surprising that South Africa faces similar constraints. The South African National Research Foundation is considered to be an intermediary agency between the policies and strategies of the South African government and research performing institutions or universities. The objective of the South African National Research Foundation is to "promote and support research through funding, human resource development and the provision of the necessary facilities in order to facilitate the creation of knowledge, innovation and the development of all fields of science and technology" (South Africa, 1998). In 2010, an institutional review of the National Research Foundation was conducted, which highlighted that the government agency's effectiveness was constrained by its decision-making structures and the allocation of its resources in balancing grants and overhead costs have impacted on both its efficiency and effectiveness in the science sector (Cruz, Duncan & Ward, 2011). Given that the review was a consultancy report, no proposed clear solution was recommended for the funding agency to enhance its effectiveness. Across other developing countries, the challenges associated with the effectiveness of public sector organisations include the following: poor allocation and utilisation of resources; weak management practices; weak research-performing institutions; unpredictable political, economic and ethical environments; and poor morale and motivation among public employees (Waheed et al, 2011).

Given this context, it is difficult yet critical to establish a useful, reliable and valid set of effective indicators for evaluating the organisational effectiveness of funding agencies. This study therefore endeavoured to address this issue by focusing on five major critical success factors

that emerge from the literature review, that have been pinpointed as playing a significant role in influencing the effectiveness of public sector organisations.

2.3.4 Research funding practices across several countries

This section describes research funding practices across several countries, which appear to be largely influenced by political demands and economic constraints. In addition, understanding the state of a country's funded research system, requires due acknowledgment of its goals, research choices, policies, outcomes and challenges. The direct involvement of government in research decision-making is growing, and this, in most instances, has led to the establishment of agencies that appear to closely link funding to specific goals (Niven, 2008).

The first example is the USA, which during World War II, enjoyed great success in harnessing its then, fairly small science and technology cohort, to develop new weapons and meet military needs (National Research Council, 1999). At the end of the Cold War, there was a shift in thinking towards pushing resources to support R&D activities. Over the years, the USA has significantly increased its investments in R&D and its subsequent scientific and technological advances have positioned it as a global leader.

However, in 2006, Bybee and Fuchs (2006) conducted an assessment that revealed that although the USA has led the world in scientific discovery and technological innovation for over a century, nations from Europe to East Asia were on a fast track to exceeding the USA's performance to date. The challenge the R&D sector in the USA faces is declining investments, as a percentage of Gross Domestic Profit (GDP), in the natural and physical sciences, as well as mathematics and engineering (Bybee & Fuchs, 2006). From 1994 to 1998, the number of Asian students who chose to pursue their doctoral studies at US universities, declined by 19%. At the same time, the number of students who chose to pursue doctoral studies at universities in their own countries nearly doubled. This, according to Bybee and Fuchs (2006), indicated that these countries, particularly, China, South Korea and Taiwan, were quickly growing their own higher educational capabilities that appeared to successfully retain their skilled youth. The USA share in research articles published worldwide declined from 38% in 1988 to 31% in 2001. Europe and Asia, however, were responsible for a major portion of the growth in scientific papers in this time period (National Research Council, 2005). Another finding was that, the world's fastest-growing economies were on track to achieving R&D investments on par with the USA. China, South Korea and Taiwan increased their gross R&D investments by about 140%, from 1989 to 2001, while the USA only increased its investment by 34% (Bybee & Fuchs, 2006).

The decline in R&D investment in the USA has impacted on the performance of funding agencies. The National Institute of Health (NIH) and the National Science Foundation (NSF) are the two agencies that allocate almost US\$30 billion annually to the basic and applied sciences (Jacob & Lefgren, 2007). Since 2000, there has been a decline in the annual budget allocation by government of these two funding agencies and the associated consequence was a decrease in the average grant award size, which was not large enough to support a large portion of promising research projects (Arora & Gambardella, 2005). Such cutbacks have played a significant role in contributing to the USA's performance during this period (Leydesdorff & Wagner, 2009).

A similar trend was observed in Australia. In a publication by the Organisation for Economic Co-operation and Development (OECD) in 2008, it was reported that Australia's performance in terms of scientific and technological activity in the higher education sector was declining because of a smaller budget for R&D (Quirk, 2004). This was substantiated with data from 2001 when Australia's investment in R&D was 1.53% (Quirk, 2004). At this stage, Sweden had the highest investment in R&D as a percentage of GDP, at 4.27%, followed by Finland (3.4%), Japan (3.09%) and the USA (2.82%) (Quirk, 2004). Subsequent to 2001, however, increases in business sector investment in R&D were noted, and this has managed to offset Australia's modest research performance in the public sector (Bybee & Fuchs, 2006). Hence Australia has continued to enjoy a considerable share of world publications, which increased steadily from 2.85% in 1999 to 3.18% in 2008 (OECD, 2008).

Finding innovative solutions to addressing declining national R&D budgets, however, is not necessarily a feat that has been successfully achieved in some middle-income countries. Although Argentina has highly-trained human resources, some of whom have received several Nobel science prize awards, its skilled research staff is aging and there is limited development in many of the scientific disciplines (Villegas, 2013). Argentina also faces the challenge of having few linkages between its academic and private sectors and a fairly limited number of research activities at universities are able to meet the needs of the production sectors. These are the consequences of a complex history associated with the political and economic landscape in Argentina (Ribeiro, Albuquerque, Franco & Moura, 2009). From 1991 to 1998, Argentina experienced high growth in GDP, which was briefly interrupted by the tequila crisis of 1995. In late 1998, the economy entered into a stagnation period, which was followed by a deep decline in GDP in 2001 and 2002, in the midst of a huge financial crisis (Chudnovsky, 1999). These economic challenges have had dire consequences for the nation's scientific productivity, which had been marked by an increase of approximately 654% in the number of

articles published from 1974 to 2008. During this time, other Latin American countries such as Brazil, Mexico and Costa Rica had an increment of 3 449%; 1 440% and 1 153% respectively (Ribeiro et al, 2009). However, patent production was described as a linear trajectory for Brazil, which experienced a rise of 171% in the number of patents granted by the USA Patent and Trademark Office (Ribeiro et al, 2009). Argentina experienced a decline in the number of patents granted, which dropped from 60 in 1974 to 51 in 1982. The country's expenditure on R&D as a percentage of GDP revealed that in 2006, it spent 0.46%, and this investment supported a headcount of 3.37 full-time equivalent scientists per thousand people.

In comparison, South Korea another middle-income country, experienced growth rates that were regarded as impressive in terms of publications and patents (Ribeiro et al, 2009). Whereas in 1974, South Korea was classified as a country in which the scientific infrastructure was too immature for minimum technological production, by 1998 this country was characterised by its consistent connections and interactions between science and technology. An analysis of the trends in Asian countries indicated that during this time period, there was a higher and regular increase in its scientific and technological production (Ribeiro et al, 2009). Although starting their trajectory at a higher level than South Korea, Latin American countries, however, were not capable of reaching the status that South Korea had achieved between 1998 and 2006.



The success associated with South Korea can be attributed to the establishment of the Ministry of Science and Technology (MOST), which in 1967 committed this country to the long-term development and funding of science and technology, including support for research (Hwang, 1990). The ministry is responsible for several funding agencies, including the Korean Science and Engineering Foundation (KOSEF), which focus on addressing the loss of skilled individuals to Western countries, particularly in the USA. KOSEF's effort to reverse the brain drain is highly concentrated on providing motivations and incentives for the recruitment of skilled scientists and engineers in public sector R&D institutes. With this intervention in place, there has been an influx of skilled workforce returning to South Korea. The intervention implemented in South Korea was characterised by dual approaches that focus on researcher motivation and reward systems. Firstly, it aimed to attract skilled Korean scientists and engineers back home, and secondly, to create a conducive environment to protect professionalism (Yoon, 1992), which included revising the salary scale for repatriates, to be on par with cabinet and National Assembly members. Interestingly enough, the private sector piggy-backed on the interventions initiated by government and offered incentives such as a "PhD allowance" on top of a basic salary for employees pursuing doctoral studies. Furthermore, laws were passed to encourage

engineering services and industry sector R&D as well as ensure that R&D in the public sector is protected (Yoon, 1992).

In each of the cases presented above, there appears to be an observed enforcement of measures to ensure the efficient use of public resources, which clearly articulates the demands from government for a higher level of accountability with regard to the use of public funds. In addition, there is a strong push towards ensuring that research funding is linked to research productivity; key performance indicators, that are defined upfront in contracts with government departments; and the introduction of research funding instruments that are aimed at addressing political priorities (Lepori et al, 2007; Lepori, 2006).

In summary, it appears that across various countries, the evaluation of the effectiveness of research funding either through private sector, government or agencies needs to be interpreted with respect to stakeholder mandates, their level of investments, national policies, political and socioeconomic priorities, institutional structures and stakeholder networks in specific countries (Lepori et al, 2007). These challenges are tabulated in Table 2.1 below.

Table 2.1: Summary of the key contributing factors that have been highlighted in the literature to influence the returns linked to R&D investments (own source)

Contributing factor	Associated criterion	Country
Financial investments	Government investments	USA South Korea Australia Brazil
	Private sector investments	Mexico European countries
Higher education capabilities	Calibre of staff and students	USA South Korea Australia Brazil
	Research productivity	Mexico European countries
Academic-private sector linkages	Feeding innovative R&D outputs to the private sector for development and commercialisation opportunities	South Korea Australia Brazil
	Developing skilled graduates that are absorbed by the private sector	European countries
Political and economic climate (fiscal policies and science policies)	Legislative environment that is supportive of R&D investments	USA South Korea Australia
	Long-term commitment from government, that articulates the strategic vision for R&D investments in areas of identified national priorities	Brazil Mexico European countries
Customer products and services	Products and services supporting the long-term vision ensures sustainability is addressed	South Korea Australia Brazil European countries
Organisational processes	The unifying link to other factors ensure effective delivery on R&D spending	South Korea Australia Brazil European countries

In each of the above case studies, there are linkages to the political and economic climate that appear to have a strong influence on the ability of a country to steer science forward.

Based on the summary provided in table 2.1, there is a reaffirmation that activities in the external environment, namely the national and global arenas, play a key role in influencing the effectiveness of R&D spending.



Figure 2.1: Summary of the major broad factors impacting on the effectiveness of funding agencies

Furthermore, emanating from the discussion thus far, there appears to be a lack of literature relating specifically to understanding the effectiveness of funding agencies in terms of delivering on their mandates, which in turn ties in with their delivery on performance indicators linked to R&D investments. This further substantiates the uniqueness of the current research studies.

Thus far in this chapter, there has been a strong focus on the role of funding agencies and the contextual environment relating to R&D investments across several countries. The remainder of this chapter therefore focuses on the factors that have been implicated in influencing the effectiveness of organisations in general. In summary, the rationale is to attempt to marry the literature on funding agencies with that of organisational effectiveness.

2.4 Funding agencies as organisations

In order to begin the process of identifying and understanding the factors that influence the effectiveness of funding agencies, it is imperative to understand two key elements, namely that (1) funding agencies are organisations; and (2) organisations do not exist in a vacuum. All organisations exist in a contextual setting that needs to be clearly understood, prior to proposing any framework for enhancing their effectiveness. It is therefore imperative that time is afforded to briefly describe the literature on organisations and organisational theory.

2.4.1 Introduction to organisations

An organisation, by virtue of its definition, is a structured social system, composed of individuals operating within an organised system of parts that are highly integrated in order to achieve an overall goal (Firth, 2013; Parsons, 2013; Greenberg, 2010). Studies in the field of organisational and management sciences, commonly involve the assessment of two fundamental concepts, namely organisational effectiveness and organisational development.

Organisational effectiveness is a measure of the extent to which an organisation is able to realise its goals using limited resources (Matzler & Abfalter 2013; Cameron, 1978). Organisational development, however, is commonly viewed in the literature as an improvement strategy that increases effectiveness at the individual and organisational levels, through applied behavioural science principles and practices (Cummings & Worley, 2014; French, Bell & Zawacki, 2000; Pasmore, 1988) In addition, this concept refers to the attempts made by organisations to be better able to attain their short- and long-term objectives (French et al, 2000).

When analysing organisations as integrated systems, with due consideration afforded to the concepts of organisational effectiveness and development, the fundamental approach to such analyses tends to be informed by expert social inputs that suggest that organisations are established in order to better serve human needs (Giddens, 2013; Berger & Luckmann, 1966). This view provides a description fitting of funding agencies that are mandated by government to serve the needs of scientists, the majority of which are based at universities in a country. It is perhaps relevant therefore to trace the evolution of the theories informing the analysis and understanding of complex organisations.

2.4.2 Evolution of organisational theories

Organisational theory is the study of organisations with the objective of identifying common themes for solving problems, maximising efficiency and productivity, and meeting the needs of stakeholders. Organisational theory can be broadly conceptualised as the study of the following units: the individual, the group, and the organisation itself (Manning, 2013). The study of organisational theory, according to Pfeffer (1997), provides an interdisciplinary focus on the following: the effect of social organisations on the behaviour and attitudes of individuals within them; the effects of individual characteristics and action on the organisation; the performance, success and survival of the organisation; the mutual effects of environments, including resources and tasks; and the political and cultural environments that impact on the organisation (Pfeffer & Salancik, 2003; Pfeffer, 1997). Given this rather multifaceted view of organisational theory, it is perhaps best to attempt to unravel this intricate picture by first reviewing the literature and discussing the schools of thought that inform the theories of organisations at both the inter- and intra-organisational levels.

Prior to embarking on this journey, it is perhaps fitting to indicate here, that organisational theories and their evolution have played a critical role in shaping organisations. In essence, systems theory, which can be traced back to 60 years ago, originally presented linear organisational systems and the key concepts were information and feedback, with the objective that the functions of the system were understandable to external agents (Rice, 2013; Uhlin, 2006). The systems theory soon evolved to include nonlinear and complex systems, and the key concepts include representation and self-organisation (Rice, 2013; Uhlin, 2006). While representation refers to the necessity for the system to store information for future use concerning the environment, self-organisation refers to the adaptability of an organisation to design, implement, manage, evaluate, change and develop innovative systems (Rice, 2013; Uhlin, 2006). A complex system therefore consists of a large number of elements that interact in a dynamic manner. Any element in the system influences and is influenced by many other elements, thereby contributing towards a state of nonequilibrium. There are positive as well as negative feedback loops in the interactions. Moreover, complex systems are usually open systems, that is, they interact with their environments (Rice, 2013; Uhlin, 2006).

2.4.2.1 Traditional organisational theories

Traditional organisational theories extend to include classical and neoclassical theories. When visiting classical organisational theory, which evolved during the first half of the last century, it is inclusive of the theory of scientific management, bureaucratic theory and administrative theory.

The scientific management approach to organisational theory is informed by the experience of Frederick Taylor's as an American engineer and is based on the concept of planning work to achieve efficiency, standardisation, specialisation and simplification (Taylor, 1914). Proponents of scientific management are of the opinion that the rationalisation of the organisation with precise sets of standard instructions and time-motion studies, would contribute to increased predictability, efficiency and productivity (Morgan, 2006). Prominent models of this approach are found in numerous manufacturing firms, retail organisations and offices. One of the major shortfalls associated with Taylor's approach is that it ignores the many differences between people and fully supports the proposition that the prescribed way is the "best way" and is able to suit everyone's needs (Morgan, 2006; Walonick, 1993).

Taylor's philosophy was expanded by Weber, who observed the parallels between the mechanisation of industry and the proliferation of bureaucratic forms of organisations (Morgan, 2006). The bureaucratic approach stressed the need to reduce diversity and ambiguity in the organisation by establishing clear lines of authority and control (Walonick, 1993). This approach was based on the principles of precision, speed, clarity, regularity, reliability and efficiency (Morgan, 2006). The challenge here is that of rigidity, impersonality and a displacement of objectives. The bureaucratic approach, according to Morgan (2006) had the potential to erode the human spirit and the capacity for spontaneous action.



Finally, there is Fayol's administrative theory, which focuses on establishing a universal set of practical management principles that could be applied to all organisations (Morgan, 2006). The objectives of these principles emphasise efficiency, order, stability and fairness (Fayol, 1937). However, the problem with Fayol's principles of management is the uncertainty associated with its application – that is, when can this theory be applied and how can it be adapted to new situations (Walonick, 1993)?

In summary, classical management theory suggests that organisations are rational systems that have the potential to operate in the most efficient manner possible. Such practices provide the recipe for success in organisations where precision, safety and clear accountability are

essential such as surgical wards and courier services (Morgan, 2006). However, the classical approach is also regarded as mechanistic in that these organisations have great difficulty in adapting to changing circumstances. In addition, such organisations have been viewed to encourage bureaucracy, ignore major aspects of human nature, and almost endorse the oppression of creativity, individual growth, and motivation (Morgan, 2006). In contrast, the birth of the neoclassical approach introduced an informal organisational structure, which addresses many of the problems inherent in classical theory (Walonick, 1993).

Neoclassical theory, unlike classical theory, displays a level of concern for human needs by focusing on individual or group behaviour and a participatory management style in improving productivity (Nouraei, 2013). It was argued that these considerations are more consequential in determining productivity than mere changes in working conditions. The fundamental principle associated with both classical and neoclassical theorists was that conflict needed to be avoided at all costs as it interfered with the organisation's state of equilibrium (Nouraei, 2013). Furthermore, both these schools of thought perceive organisations as existing in a vacuum and that efficiencies are related to processes and the internal environment only (Morgan, 2006). Hence these traditional approaches failed to take into account many environmental influences that impact on the efficiency of organisations (Pfeffer & Salancik, 2003).

2.4.2.2 Modern organisational theories

While classical management theories emphasise organisations as closed systems focusing primarily on internal processes, modern theories of organisations tend to steer towards a more dynamic perspective that stresses the interorganisational interactions of the organisation with the environment. Attention needs to be drawn to the principle, that, in order for organisations to survive and motivate staff, they require various kinds of resources from the external environment (Morgan, 2006). This stance, offers a somewhat lucid perspective towards unravelling the complexity associated with organisations such as funding agencies.

(a) The open systems approach

The open systems approach stresses that organisational systems are interrelated with the environment (Woodward, 1970; Terreberry, 1968; Burns & Stalker, 1961). Effectiveness is therefore a function of management's ability to adapt to environmental changes. This approach further suggests that different environments require different organisational relationships for optimum effectiveness, taking into consideration various social, legal, political, technical and

economic factors (Walonick, 1993; Hellriegel & Slocum 1974). The open systems approach also assumes that organisations can be regarded as systems that process inputs into outputs in order to achieve the goal desired by an organisation. Whereas inputs refer to resources such as materials, capital, technology and people, outputs refer to the products, services and other measures of performance or efficiency (Pfeffer, 1997). The processes driving the translation of inputs into outputs include carefully coordinated activities that are ultimately able to achieve the goals set for the organisation. Fundamental to the systems approach are feedback loops that are informed by both internal and external stakeholders. While internal factors refer to individuals, processes as well as the culture in the organisation, external factors relate to economic conditions, the legal/political environment as well as competing organisations (Pfeffer & Salancik, 2003).

The open systems approach focuses on a number of key issues. Firstly, there is the emphasis on the environment in which the organisation exists, which focuses on the organisation's interactions with customers, competitors, suppliers, labour unions, government as well as other players in the general environment (Morgan, 2006; Walonick, 1993). Secondly, the emphasis in the open systems approach defines organisations as interrelated systems. Organisations comprise individuals belonging to groups or departments, which in turn belong to larger organisational divisions (Morgan, 2006; Walonick, 1993). Each of these form subsystems of the ultimate system, that is, the organisation itself. This way of thinking is an expansion of the sociotechnical view of organisations and recognises that internal business processes and the management of relations between the subsystems and the environment must be satisfied in order for an organisation to survive (Morgan, 2006; Walonick, 1993). Thirdly, the open systems approach rests on the alignment between different subsystems, which refers to the nature of the relationships between inputs and transformations as well as transformations and outputs (Morgan, 2006; Walonick, 1993). To ensure the effective management of the complex interactions between subsystems and systems, control mechanisms and internal as well as external boundaries need to be defined and managed (Morgan, 2006; Walonick, 1993).

In summary, the open systems approach indicates that organisations influence and in turn, are influenced, by the environment in which they operate.

(b) The contingent theory

The contingent theory of organisations indicates that organisations are open systems that require careful management in order to reach a state of equilibrium between addressing the needs of internal business processes and adapting to the external environmental (Morgan, 2006; Walonick, 1993). In 1961, Burns and Stalker, presented the case for the integration of the traditional and modern approaches to organisational management. The fundamental principle presented in their study, was that changes in the environment require open and flexible styles of organisation and management, which range from mechanistic to organic, depending on the nature of the environmental stress.

Later, Lawrence and Lorsch (1967) conducted a study on contingent theory that focused on the following two principal ideas: (1) different kinds of organisations are needed to deal with different market and technological conditions; and (2) organisations that operate in uncertain and turbulent environments need to achieve a higher degree of internal differentiation than those in environments that are less complex and stable (Thompson, 2011; Lawrence & Lorsch, 1967). These ideas were tested on high- and low-performing e-organisations and showed that the degree of differentiation required in managerial and organisational styles between departments varied according to the nature of the industry and its environment. In addition, an appropriate degree of integration was needed to tie these differentiated parts together. The successful use of integrative devices was shown to be dependent on achieving an intermediate stance between the coordinated units; on the power, status and competence of those involved; and the presence of the reward structure favouring integration (Thompson, 2011; Lawrence & Lorsch, 1967). This work served to popularise the idea that when exposed to different environmental circumstances, organisations are likely to experience many problems both in terms of dealing with the environment and internal processes (Thompson, 2011; Lawrence & Lorsch, 1967).

In summary, the contingent theory approach advocates that those organisations that adopt internal processes that match the demands of the environment are best positioned for both organisational effectiveness and survival in that environment.

(c) The organisational ecology approach

While the contingent theory views organisations as self-sufficient entities that exist in a state of tension with their environments, the organisational ecology perspective presents the view that

organisations exist as elements of a complex system (Morgan, 2006). Embracing the concepts of biological organisms and environmental ecology, organisational ecology refers to the engagement of the organisation with the environment in a pattern of co-creation and influence. An awareness of the changing structure of critical resources and patterns of resource dependencies can make important contributions to understanding the success and power of different organisations (Morgan, 2006).



Organisations may therefore play an active role in shaping their futures, especially when interacting with the environment. As such, the external environment can to some extent be a negotiated influence rather than an independent external force (Morgan, 2006). From an ecological perspective, there is a tendency to stress the “survival of the fitting” with the environment in addition to the biological concept emphasising the survival of the fittest (Morgan, 2006). The concept of organisational ecology has as a consequence opened the door to a more creative way of thinking regarding the evolution and survival of organisations in the interorganisational context dealing with complex environments.

Changes in the environment are viewed as presenting challenges to which the organisation must respond in order to survive (Morgan, 2006). This idea was challenged by Maturana and Varela (1980), who argued that living systems are organisationally closed, autonomous systems of interaction that make reference only to themselves. Maturana and Varela (1980) presented the term “autopoiesis”, which refers to the capacity for self-reference through a closed system of relations. Maturana and Varela (1980) do not present systems as isolated entities, but instead as living systems that close themselves in order to maintain stable patterns of relations that separate the system from its environment. The theory of autopoiesis has vital implications for understanding organisations. Firstly, it helps clarify the attempt to achieve a form of self-referential closure between the organisation and its environment (Maturana & Varela, 1980). Secondly, the theory helps understand that the problems organisations encounter when interacting with the environment are informed by the type of identity that the organisation attempts to maintain. Thirdly, this perspective gives attention to the evolution, change and development of organisations by focusing on the factors that shape the patterns of interaction between them and their environments (Morgan, 2006).

2.5 The organisational ecology of funding agencies

On the basis of the preceding review of the literature on organisational theory, it is the viewpoint of the researcher, that the organisational ecology approach is most fitting for the exploration of the dynamics associated with funding agencies, their environment and the organisations that

impact on their effectiveness. The management of science by funding agencies, from the outset, is influenced by and mediated in concert with the environment (Braun & Guston, 2003; Braun, 2003; Van der Meulen, 2003; Braun, 1998; Van der Meulen 1998). In turn, these interactions are influenced by economic, political and global factors. In essence, these agencies receive inputs, primarily R&D funding from government, which using grant awarding processes are transformed into outputs that are generated by those scientists who are recipients of research funding. Feedback loops are also used in such organisations and are employed to assess the impact of research funding on scientific productivity from those scientists that are recipients of grant awards (Braun, 1998).

From an organisational ecology perspective, funding agencies tend to exist in a complex environment driven by the need for resources and accountability. Such agencies by virtue of their processes and their mandates significantly influence the scientific community of a country by determining those who will be recipients of grant awards (Braun, 1998). However in delivering on the demands of the scientific community, they themselves need to address the demands of the political environment that is accountable for the organisation's financial resources (Braun, 1998). The environment that impacts on the effectiveness of funding agencies involves two major stakeholders, namely government, on the one hand, and the scientific community on the other. While dealing with educational and research management, funding agencies face the challenge of converging the interests of scientific and political entrepreneurs (Braun, 1998). Scientists mostly assume the lead in defining their interests to funding agencies, but politicians, who are representatives of government, assume positions on the board and are therefore able to monitor the level of accountability and efficiency of funding agencies (Braun, 1998). Balancing these contradicting demands is not an easy feat, and has led to the question relating to the effectiveness of funding agencies in the science sector.

2.6 Organisational effectiveness

In this section of the literature review, the factors that have been highlighted in the literature as impacting on the effectiveness of organisations are reviewed. In addition, a definition of organisational effectiveness is offered, and the determinants of organisational effectiveness are then presented and described in detail. Where literature is lacking in terms of the level of influence of each of these factors and subfactors on public agencies, reference is made to public sector organisations in general.

2.6.1 Introduction

The understanding of organisational effectiveness is closely associated with the theoretical perspective of organisational theory (Makmee, Sujiva & Kanjanawasee, 2009), which was described in detail in the preceding section. The study of organisational effectiveness provides an interdisciplinary focus on the effect of modern organisations regarding the following (Morgan, 2006; Pfeffer & Salancik, 2003):

- The performance of the individual employee, the group or team and the organisation itself.
- The behaviour and attitudes of individuals in them.
- The effect of individual characteristics and actions on the organisation, with particular reference to leadership.
- The performance, success and survival of the organisation.
- The mutual effects of environments, including resources as well as the political and cultural environments that impact on the organisation.

2.6.2 Evaluating organisational effectiveness

In defining the concept of organisational effectiveness, many questions have been raised, especially with regard to developing applicable criteria and measures that are universally accepted (Waheed et al, 2011). In essence, the concept of organisational effectiveness is fairly abstract and difficult to measure. Hence instead of precisely measuring organisational effectiveness, many researchers determine proxy measures that aim to represent effectiveness (Malik, Ghafoor & Naseer, 2011). Some of these proxy measures include factors such as the efficiency of management, performance of employees, core competencies, number of customers served, types and sizes of population segments served and the acquisition of resources (Malik et al, 2011).

Numerous authors propose that any study aimed at evaluating the effectiveness of organisations must be closely linked to the definition of effectiveness for that specific organisation, which in turn relates to the organisation's objectives as well as the return on investment linked to the resources or inputs to the organisation (Haid, Schroeder-Salnier, Sima et al, 2012; Al-Ma'ani & Jaradat, 2010; Dorjgotov, 2010; Bartram, Robertson & Callinan, 2002; Atiyah, 1999). As such, the effectiveness of organisations, particularly in the public sector, can be defined as the extent to which inputs achieve outcomes and meet policy objectives (Lusthaus, 2002; Carer, 1991). This definition will be adopted throughout the current study.

Five major approaches have been reported in the literature to address the concept of organisational effectiveness. The first approach refers to the goal model, which focuses on outputs and goal accomplishments, which in turn form the measures for effectiveness in this model (DeLoach & Miller, 2010; Popova & Sharpanskykh, 2010; Cameron, 1978). This model is aligned to a closed systems perspective and focuses on the internal mechanisms and interactions that are implicated in the achievement of specific goals through rational and formal means. Performance is therefore linked to effectiveness, which is estimated by both qualitative and quantitative indicators (Popova & Sharpanskykh; 2010). The goal model continues to impact on modern organisations and as such, leadership in numerous companies consciously embarks on efforts to define organisation-specific goals, performance indicators and measures to evaluate them.

A second model that has traditionally been used to evaluate organisational effectiveness is that of the systems resource model, which was introduced by Yuchtman and Seashore in 1967 (Hoverstadt, 2009). This model analyses the organisation's leadership capacity in terms of efficiently distributing resources among various interrelated subsystems within it (Yuchtman & Seashore, 1967; Morgan, 2006; Hoverstadt; 2009). This may include various business units and departments in the organisation. In particular, there is a focus, in the systems resource model, on the interaction of the organisation with its environment. In this model, organisations are viewed as open systems, and effectiveness in this instance, is defined as the organisation's ability to exploit its environment in the acquisition of scarce and valued resources (Morgan, 2006; Abernethy & Brownell, 1997). The primary criterion therefore is that of the acquisition of resources. The limitation of this method is that, while there is much focus on inputs, there is a lack of attention on outputs (Cameron, 1978; Hoverstadt, 2009).

The alternate approach to the systems resource model, relies on the evaluation of internal organisational processes, as a measure of organisational effectiveness (Ashraf, 2012). The process model focuses on the manner in which organisations articulate preferences, perceive demands and make decisions, in the quest to acquire additional resources (Kumar & Subramanian, 2011). The process model focuses on adding value to the customer and increasing efficiency, which are difficult to monitor, measure and track (Kumar & Subramanian, 2011). However, if this model is adopted in a strategic manner and integrated within the organisation's operational plan, it can provide its leadership with a framework for assessing the major processes involved in effectiveness (Martz, 2008).

Apart from the above-mentioned models, the strategic constituencies model and the competing values model have also been employed to measure organisational effectiveness (Ashraf, 2012; Atiyah, 1999). In the strategic constituencies approach, an effective organisation is perceived as one that satisfies the demands of those constituencies in its environment from whom it requires support for its continued existence (Pfeffer & Salancik, 2003). In this approach, the organisation is assumed to belong to a network of organisations, wherein various parties compete for control over resources (Jun & Shiau, 2011). Hence it is assumed that the organisation has a number of constituencies, with different degrees of power, each trying to satisfy its demands. The approach seeks to satisfy only those in the environment who can threaten the organisation's survival (Morgan, 2006). Effectiveness is thus defined in terms of the degree to which the needs and expectations of the strategic constituencies are met by the organisation (Kaplan, 2008; Cameron, 1978). However, the task of separating those strategic constituencies from the environment in which they operate is a difficult and problematic task (Lejeune & Vas, 2009).

In the competing values model, the assumption is that there is "no best" criterion that is valued and universally used in assessing organisational effectiveness (Waheed et al, 2011). This approach assumes that people in the organisation have diverging goals and therefore cannot arrive at a consensus on which goals take precedence over others (Carer, 1991). The following two fundamental principles underpin this model (Cameron & Quinn, 2011) :

- 1) There are multiple and conflicting criteria associated with assessing organisational effectiveness.
- 2) Multiple constituencies will result in certain values being preferred, which may differ according to the specific perspective and interests adopted by an organisation.

In essence, three basic sets of competing values can be identified, namely flexibility versus control, people versus the organisation and the means versus the end. The sets associated with the competing values model are commonly applied when comparisons are made between for-profit and nonprofit organisations (Cameron & Quinn, 2011). In essence, this model summarises the concepts outlined in the goal-oriented, systems resource, processes and strategic constituencies models. The competing values model therefore provides an apt tool for the development of management programmes, in the diagnosis of existing and desired cultures and in the identification of gaps (Cameron & Quinn, 2011).

Each of the five models discussed here indicates that there is indeed no single or universal criterion that is best suited to evaluating organisational effectiveness. None of these models has been proven to be superior to the others, and subject leaders maintain that each of them has its strengths and weaknesses (Ashraf, 2012). These varying approaches and findings on organisational effectiveness are indicative of the rather elusive nature of this concept (Atiyyah, 1999).

In 1992, Kaplan and Norton proposed the balanced scorecard method to evaluate and measure the financial and nonfinancial perspectives linked to the effectiveness of organisations in terms of their investment in customers, internal business processes, learning and growth. A subsequent revision of the balanced scorecard proposed a link between the perspectives of the balanced scorecard and an organisational strategy map, with the objective of outlining how daily operations can contribute to the organisation's strategic objectives (Kaplan, 2008). The development of the balanced scorecard therefore claims to provide a holistic perspective of progress and performance towards achieving strategic goals that allow the organisation to function in a rapidly evolving environment (Hoque, 2014; Martz 2008). This multiperspective method articulates links between inputs, processes and outcomes as well as focuses on the importance of managing these components in order to achieve the organisation's strategic priorities and targets (Kaplan & Norton, 1992). According to Martz (2008), this approach is a strategic tool that allows for performance management, alignment between unit and organisational goals and the identification of strategic initiatives. In addition, the tool has been suggested to focus on long-term strategy, by facilitating both the design and communication of that strategy in the organisation (Bolívar, Hernández & Rodríguez, 2010). In essence, four perspectives are addressed, namely the financial, customer, internal business processes, and the learning and growth perspectives. The balanced scorecard has been adopted in the services, manufacturing, marketing and retailing, and public organisations (Hoque, 2014). Across public sector studies, there have been several claims relating to the effectiveness of the balanced scorecard in measuring organisational performance.

In a study of municipal government, it was found that the use of the balanced scorecard aided the organisation in enhancing accountability through the refinement of the performance measurement system (Hoque & Adams, 2011; Poister & Streib, 1999), but it had a rather limited focus in guiding decision-making processes (Chan, 2004). A similar trend was observed in studies on nonprofit organisations, which revealed the usefulness of the balanced scorecard in improving the organisation's sustainability (Aidemark, 2001; Kershaw & Kershaw, 2001; Brewer 2000). Potential limitations that have been reported in the literature on the use of the balanced

scorecard relate to the subjective measures of performance, that is: (1) random errors due to the incorrect reporting on performance which is largely attributable to the reliance on memory to substantiate figures; and (2) systematic bias due to the use of a single respondent as a data or information source (Hoque, 2014; Wall, Michie, Patterson et al, 2004; Podsakoff, MacKenzie, Lee et al, 2003; Podsakoff & Organ, 1986). One of the recommendations to minimise the effect of such limitations is to adopt a number of subjective and objective measures of performance. Qualitative studies therefore are encouraged when using the balanced scorecard, to offer a different perspective (Hoque, 2014). The use of mixed methods can therefore provide a richer and more accurate data set (Creswell, 2013). The balanced scorecard has been used to evaluate organisational effectiveness through the use of quantitative methods (Maiga & Jacobs, 2003; Speckbacher, Bischof & Pfeiffer, 2003; Ittner & Larcker, 1998; Hoque & James, 2000), qualitative methods (Akkermans & Van Oorschot, 2005; Kasurinen, 2002; Malina & Selto, 2001; Malmi, 2001) and to a lesser extent mixed methods (Milis & Mercken, 2004; Malina, Nørreklit & Selto, 2011).

The balanced scorecard, using a mixed methods approach was therefore adopted in the present study to address the demands associated with the evaluation of complex public sector organisations such as funding agencies.

2.6.3 Summary of organisational effectiveness

Over the past few decades, several models have been adopted to improve performance and effectiveness in the public sector, however, these improvement interventions have been met with mixed reviews (De Waal, 2010). One particular intervention that has become quite prominently used in the public sector across various countries is the use of accountability and transparency legislation such as new public finance. These tools are used to increase transparency on government spending as well as link performance measures to government expenditures (Dodor, Gupta & Daniels, 2009). Unfortunately, from an implementation point of view, these tools have not been adequately implemented in organisations to be able to effectively resolve efficiency, accountability and performance demands from government (De Waal, 2010).

Given this context, it appears that no one method is able to adequately address the demands associated with evaluating and measuring organisational effectiveness in complex public sector organisations. Furthermore, because the task of measuring organisational effectiveness is in itself a somewhat complex and difficult process, the current study proposes the use of the

balanced scorecard, which has been used across higher education and public health institutions as well as other government organisations, including municipalities (Ashraf, 2012; Cugini, Michelin & Pilonato, 2011; Koigi, 2011; Gonzalez-Padron, Chabowski, Hult and Ketchen, 2010; Weir, d'Entremont, Stalker, Kurji & Robinson, 2009; Niven, 2008; Poister & Streib; 1999). The rationale for adopting this method is that the balanced scorecard attempts to link organisational improvement with process improvement, by evaluating employee performance, customer satisfaction and the effectiveness of internal business processes. In addition, some of the offerings of the balanced scorecard resonate with some of the models proposed in the literature, particularly the principles associated with new public finance (De Waal 2010). As such, this model affords due attention to organisational goals as well as employee learning and growth, which also ties in with the propositions of the systems and goal models as well as the process model respectively (Martz, 2008).

2.7 Identifying the factors influencing organisational effectiveness

Identifying the factors influencing organisation's effectiveness is vital for the allocation of scarce resources and is essential for improving organisational performance and survival (Morgan, 2006), particularly in the public sector (Bryson, 2011; Lupi et al, 2011; Atiyah, 1999). Effective organisations are therefore able to survive and sustain themselves amid competitors and fluctuating internal and/or external environments.

This has become the subject of emerging research interest and has particularly raised interest in the management theory and organisational development fields. This is largely due to the increased need for accountability and the demonstration of effectiveness, particularly with respect to improving performance to multiple stakeholders (Lupi et al, 2011). While numerous factors have been highlighted in the literature to influence organisational effectiveness, most of the research focused either on performance measures at the employee or management level (Al-Ma'ani & Jaradat, 2010; Dorjgotov, 2010; Abernethy & Brownell, 1997), or on evaluating the effect of organisational culture on performance (Lupi et al, 2011; Malik, Ghafoor & Naseer, 2011; Haid et al, 2012; Joaquin & Park, 2009). In essence, the literature focuses on linking factors such as strategic management, financial management, human resource management, corporate leadership, organisational processes and organisational culture to organisational effectiveness (Barndt, McGee & Cataldo, 2011; Cugini et al, 2011; Gimzauskiene & Kloviene, 2011; Koigi, 2011).

In studies focusing on public sector organisations, factors such as the quality of management, the level of openness and action orientation, long-term commitment, continuous improvement

and the quality of workforce, emerge as contributors to high-performing organisations (De Waal, 2010). In a separate study by Joaquin and Park (2009) five measures of performance were evaluated, including human capital management, competitive sourcing of commercial services, financial management, government influences, budgets and performance integration (Joaquin & Park, 2009). The study provided evidence that performance measures must address the needs of political leaders and align with the measures of effectiveness of public agencies. Yet another study highlighted that measures need to be in place in order to identify areas of good performance and well as areas that require improvement in a particular business unit. Such measures are necessary to facilitate the prioritisation of strategic initiatives; assist decision-making on the allocation of resources; improve the value the organisation delivers to its primary stakeholders and customers; and strengthen an organisation's competitive position in the marketplace (Martz, 2008). The findings of this study also highlighted the need to use a collection of performance measures in order to assist agencies in evaluating effectiveness. Several other studies across different organisations have echoed similar sentiments (Lupi et al, 2011; Haid et al, 2012).

In the organisational development literature, there is a push for public sector organisations to seek congruency between the organisation and its strategic goals as well as the environment (Sminia & Van Nistelrooij, 2006). In public agencies in particular, the organisational development approach is usually adopted to strategically inspire quick and purposeful change in a top-down manner, from a system-wide perspective that eliminates bias. Theoretically, however, organisational development requires a bottom-up approach with the full commitment and involvement of all employees, as well as external stakeholders in order to achieve strategic re-orientation (Sminia & Van Nistelrooij, 2006).

It thus appears that organisational development is integrally linked to strategic management and the management of change (Sminia & Van Nistelrooij, 2006). The use of organisational development in organisations such as public agencies is usually perceived to clash with the prevailing organisational culture and work ethos because these organisations pursue centralised control as well bureaucratic and political working conditions (Sminia & Van Nistelrooij, 2006). In the Netherlands, it appears that top management play a pivotal role in the introduction of organisational development change practices in public agencies. In addition, the success of top management effectively implementing organisational development changes has been suggested to be dependent on employee participation, initiative and commitment (Sminia & Van Nistelrooij, 2006). In essence, these are either direct or indirect contributors to the development of organisational effectiveness in the public sector.

Given this context as well as the review of the literature thus far, the current study introduces a fifth perspective to the original balanced scorecard proposed by Kaplan and Norton in 1992. The adapted version introduces to the scorecard, what has traditionally appeared in the organisational theory literature relating to the impact of the external environment on the effectiveness of the open-system organisation (Rice, 2013; Susniene & Sargunas, 2009; Morgan, 2006; Hoque, 2005; Pfeffer & Salancik, 2003). Substantiating this proposition is the increasing number of environmental influences that impact on organisations. These include evolving technologies, customer preferences, market demands, political, social and economic pressures as well as global competition (Parsons, 2013; Moura et al, 2011; Pondent, 2011; Qian & Baek, 2011; Wetherley, 2011; Hoque, 2005; Cooper, 1995; D'Aveni, Gunther & Harrigan, 1995; Goldman, Nagel & Preiss, 1995; Hamel, 1996; Snow & Miles, 1992). The nonfinancial perspectives of the balanced scorecard may present the opportunity for an organisation to address environmental uncertainty by monitoring competencies and processes so that productivity and overall efficiency can be improved (Hoque, 2005; Kaplan & Norton, 2005). According to the literature review thus far, these five perspectives have been labelled as key contributors to the effectiveness of public organisations including agencies and have been implicated in the survival and sustainability of such organisations facing turbulent environments (Versailles, Mérindol & Letexier, 2011).

The rest of this chapter concentrates on the various subfactors that have been implicated in the literature to be associated with each of the five perspectives. In summary, these perspectives or factors, as they are referred to in this study, include organisational learning and growth, comprising human resource management, business processes, financial management, customer service and the external environment.

2.7.1 Organisational learning and growth

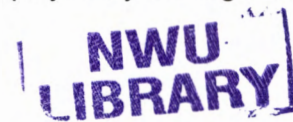
One of the perspectives associated with the balanced scorecard is that of learning and growth, which is closely linked to human resource management. In the literature, learning and growth are associated with high-performing organisations in which incentives are in place for employees seeking out learning and growth opportunities. Such organisations find it much easier to attract and retain high-level manpower (Gonzalez-Padron et al, 2010; Atiyah, 1999). This perspective includes employee training and corporate cultural attitudes relating to both individual and organisational improvement. Kaplan and Norton (1992) emphasised that "learning" encompasses a lot more than "training", because it also includes elements like mentors and tutors in the organisation, as well as the ease of communication between

employees that allows them to readily tackle problems and challenges as they arise (Hoque & Adams, 2011; Gonzalez-Padron et al, 2010; Kaplan & Norton, 1992).

The following key attributes, referred to as subfactors in this study, are closely linked to this perspective and have been suggested to underpin staff attraction and retention:

- 1) identifying and addressing critical organisational competencies and skills
- 2) talent and skills management
- 3) employee motivation
- 4) providing career or professional development opportunities to employees
- 5) performance management and assessment (Becker, Antuar & Everett, 2011; Castro & Martins, 2008).

The sub-factors identified above, aims to unpack the three categories that were presented by Kaplan and Norton in 1996, which related specifically to: employee capabilities; information system capabilities and motivation, empowerment and alignment. When assessing the learning and growth perspective of the balanced scorecard, there is an emphasis on the potential of human resources in achieving sustained competitive advantage within the organisation. Human resources, in this instance, refer to the pool of human capital employed by an organisation (Chien, 2011; Lado & Wilson, 1994).



2.7.1.1 Organisational competencies and skills

Competency as a subfactor of the organisational learning and growth perspective, forms a key component in the alignment of human capital with business strategy. This subfactor forms the backbone to creating value for organisations and driving their performance forward in a competitive talent market (Koigi, 2011). The concept of organisational competency is one of the most misunderstood or misapplied concepts in the organisational management literature and refers to more than knowledge and skills. Organisational learning and growth was introduced by Prahalad and Hamel in 1990 and refers to the set of skills, knowledge, attitudes, emotional intelligence and capabilities of the organisation's employees that create unique value in the market place (Koigi, 2011; Koulopoulos & Roloff, 2006; Prahalad & Harnel, 1990), and skilled staff in an organisation have thus become a prized asset. In addition, competency provides long-term differentiation for an organisation (Koulopoulos & Roloff, 2006). In modern organisations in particular, competences have become the subject of special attention (Wasiluk, 2010). High-performing organisations tend to improve the competencies of their employees through highly competent and skilled managers. Skills refer to what employees need to know

and understand to be able to perform their roles competently and effectively (Flynn, 2014; Willemse, 2011; Lawler, 2005).

Competency, however, refers to the set of behaviours that provide the organisation with a structured guide for the identification, evaluation and development of individual employees to perform a job properly (Srivastava, 2005; Greaver, 1999; Prahalad & Hamel, 1990). Essentially, there are two objectives associated with competency, namely to bring the greatest value to the end customer and to ensure the highest level of productivity for the company itself (Boguslauskas & Kvedaraviciene, 2009). Competency therefore not only relates to the knowledge and skills set but also to the ability to meet complex demands by drawing on and mobilising psychological resources which can be deemed as emotional intelligence (Rickard, 2006). Finally, in order for an organisation to be wholly competent, it also needs the technologies, information, unique operating methods and processes to complement skilled and competent employees. Such a combination has been suggested to facilitate the enhanced performance and competitive advantage of organisations in the market place (Rice, 2007).

Across public sector organisations, particularly government agencies, additional efforts have been made to ensure that over and above the management of skilled staff and the provision of an enabling environment, cultural diversity is a priority. In the USA, several steps have been taken to reduce language barriers by ensuring that agency staff are able to address queries from the community in several languages (Rice, 2007) and are adept in the use of technologically-appropriate tools (Versailles et al, 2011). Other criteria associated with competency include the quality of management; openness and action orientation, which includes conflict resolution; long-term commitment and continuous improvement; and the quality of workforce (De Waal 2010). Competency management therefore has become increasingly crucial not only in private sector organisations but also in public sector organisations.

According to the OECD (2008), competencies can be classified into three broad categories. Firstly, individuals need to be effective with interacting with the physical environment such as information technology (IT) and the use of language, both written and verbal. Secondly, individuals need to effectively engage in a diverse sociocultural environment with includes individuals from heterogeneous backgrounds, in order to compete in an increasingly interdependent world. Thirdly, individuals need to assume responsibility for acting autonomously including managing their own lives within the broader social context (Delobbe, Gilbert & Le Boudelaire, 2014; Bryson, 2011; OECD, 2008; Rychen & Salganik, 2000). The discussion below reflects on these three key principles that have been classified as contributors to

improving competency primarily in private sector organisations, and secondly in public sector organisations.

(a) Competency in the technological environment

The social and professional demands of the global economy, require a certain degree of mastery of technological tools in order to facilitate knowledge-empowered interactions, which includes the use of language, information, and physical technological tools such as computers (Haar & White, 2013). Using such tools interactively requires more than having access to the tools, but also involves the technical skills required to handle them. Individuals also need to create and adapt their knowledge and skills sets (Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000). This requires a familiarity with the technological tool itself as well as an understanding of how it changes the way individuals can interact with the organisation and the external environment as well as accomplish broader goals. In essence, this relates to how employees are able to utilise technological tools to address the requirements of the organisation's core business. In this sense, a tool is not merely a passive mediator, but an instrument in an active dialogue between the individual, the organisation and the external environment (Chao, Lai & Chou, 2014; Haar & White, 2013; Bybee & Fuchs, 2006). Using tools interactively opens up new possibilities in the way organisations perceive and relate to demands in the external environment and position themselves to better address the customer-needs environment (Chao et al, 2014; Haar & White, 2013; Bybee & Fuchs, 2006).

Associated with this competency category, which refers to the use of technological tools, the following key variables have been suggested:

- 1) *The ability to use language, symbols and texts interactively.* This refers to the effective use of the spoken and written language using technological tools such as the telephone and computer. In addition, it entails the use of computation and other mathematical skills in multiple situations. These are essential tools for functioning well in society and the workplace and participating in an effective dialogue with others (Chao et al, 2014; Haar & White, 2013; Wasiluk, 2010; Rychen & Salganik, 2000).
- 2) *The ability to use knowledge and information interactively.* This requires critical reflection on the nature of information itself. This involves the use of technical infrastructure in context with its social, cultural, and even ideological impact. Information competence is necessary as a basis for understanding options, forming opinions, making decisions, and carrying out

informed and responsible actions, both at the operational and strategic management levels (Chao et al, 2014; Haar & White, 2013; Wasiluk, 2010; Rychen & Salganik, 2000).

- 3) *The ability to use technology interactively.* This places increasing demands on individuals inside and outside the organisation. The interactive use of technology requires an awareness of new ways in which individuals can use technologies, information and communication technology to transform the way people work together. To harness such potential, individuals need to go beyond the basic technical skills needed to simply use the internet, send e-mails and use other technologies (Chao et al, 2014; Haar & White, 2013; Wasiluk, 2010; Rychen & Salganik, 2000).

(b) Competency in the sociocultural environment

The second category of competency lends itself to the concept of interacting in heterogeneous groups. With organisations becoming more diverse, it becomes important to effectively manage interpersonal relationships for the benefit of individuals building new forms of cooperation (Agha, Alrubaiee & Jamhour, 2012). The key principle for sociocultural competence underpins itself to emotional intelligence which includes the willingness of individuals to learn, live and work with others, which relate to terms such as “social competencies”, “social skills”, “intercultural competencies” or “soft skills” (Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000). Associated with the sociocultural aspect of competency, are the following key behaviours:

- 1) *The ability to relate well to others.* This involves the initiation, maintenance and management of personal relationships. Relating well to others is not only a requirement for social cohesion, but also organisational effectiveness by emphasising emotional intelligence in a highly competitive and economic climate (Rice, 2007). For organisations to be high performers, there is a strong need to understand and respect cultural diversity. In cross-cultural situations, such as the in South African context, competency refers to the learning of new patterns of behaviours that respond to the challenges and opportunities posed by the sociocultural environment, including the work environment (Rice, 2007). This ability rests on individuals being able to respect and appreciate the values, beliefs, cultures and histories of others in order to create an environment conducive for empowerment and success. In addition, the ability to relate to others, requires empathy and an effective management of emotions (Moran, Abramson & Moran, 2014; Wasiluk, 2010; Rychen & Salganik, 2000).

- 2) *The ability to cooperate and form work teams or groups.* This requires individuals to share the same interests. Cooperation requires each individual to possess a certain level of expertise. In addition, each individual needs to be able to balance his or her commitment to the group and/or organisation with his or her priorities as well as share leadership roles in an effort to support others within the team (Al-Ma'ani & Jaradat, 2010). The ability to cooperate specifically relates to the following:
- the ability to present ideas and listen to others
 - the ability to construct tactical or sustainable alliances
 - the ability to negotiate
 - the capacity to make decisions that allow for differing opinions
 - possessing an understanding of the dynamics of debate as well as following an agenda (Moran et al, 2014; Srivastava, 2005).
- 3) A key variable associated with competence in the sociocultural environment, is *conflict management and resolution*. This refers to the ability to manage and resolve conflicts at home, the work place or the larger social community. Conflict is an inherent part of human relationships and arises when two or more individuals or groups oppose one another because of divergent needs, interests, goals or values (Fard, Rajabzadeh & Hasiri, 2010). The key to dealing with conflict is to approach it in a constructive manner by recognising it as a process to be managed rather than avoided. This requires that consideration is afforded to the interests and needs of others and for finding solutions in which both sides gain and compromise equally. Some of the important points to consider when mediating conflicts, include an analysis of the issues and interests, identifying areas of agreement and disagreement, reframing the problem and prioritising needs and goals (Moran et al, 2014; Wasiluk, 2010; Rychen & Salganik, 2000).

(c) Competency in acting autonomously

The third and final category associated with competency relates to acting autonomously, by being aware of the organisational climate and the social dynamics prior to identifying the role one wishes to adopt in such an environment (Anderson, 2014; Lejeune & Vas, 2009). In simple terms, it refers to individuals being empowered to manage their lives in a meaningful and responsible manner by exercising control over their living and work environments (Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000). Acting autonomously is vital in modern organisations, particularly in public sector organisations in which each individual's position is not well defined. It also allows individuals to have freedom of

choice and empowers them to make choices and choose a course of action. Key variables associated with this category of competency include the following:

- 1) *The ability to act within the big picture.* This requires individuals to consider the wider context of their actions and decisions. This means that they need to understand patterns and possess an understanding of the system in which they exist, from social systems to the organisational culture and structure (Rice, 2007). In addition, there is a need to identify the direct and indirect consequences of their actions as well as choose between different courses of action by reflecting on the potential consequences associated with the misalignment of individual and organisational shared norms and goals (Anderson, 2014; Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000).
- 2) *The ability to form and conduct life plans and personal projects relating to the project management capabilities of the individual.* This means that individuals must be able to define a project and set goals as well as identify and evaluate accessible and needed resources (Rice, 2007). This ability further requires a prioritisation and refinement of goals; a balance of the resources needed versus resources available, to meet multiple goals; and the ability to learn from past actions. Furthermore, it requires the ability to monitor progress as well as making necessary adjustments based on customer needs and resource availability, as the project unfolds (Anderson, 2014; Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000).
- 3) *The ability of the individual to assert rights, interests, limits and needs in different contexts.* On the one hand, this ability relates to self-oriented rights and needs, and on the other, it relates to the rights and needs of the individual as an employee of the organisation (Rice, 2007). This also refers to the skill of the individual to understand his or her own interests; understand the written rules and principles on which to base a case; construct arguments in order to have needs and rights recognised; and suggest arrangements or alternative solutions (Anderson, 2014, Boguslauskas, Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000).

When reflecting on organisational competency, particularly in the South African context, not only does it appear that managers have to compete in a global business environment, but they also have to address challenges that are unique to the African and South African context (Smit, Cronje, Brevis and Vrba, 2011). Across South African organisations, competencies extend further to include the management of cultural diversity, employment equity and trade unions (Smit et al, 2011). These characteristics apply to individual employees as well.

Given the argument presented above, it is apt for Rychen and Salganik (2000) to infer that competencies develop and change throughout an individual's lifespan and that demands on individuals are expected to change throughout adult life (Rychen & Salganik 2000). Furthermore, it can be inferred from the review of the literature that individuals need to draw on key competencies to allow them to adapt to an environment characterised by change, complexity and interdependence. Competency, however, is multidimensional and embodies knowledge and skills beyond the technical aspects of the job requirements, and integrally links to the principles of emotional intelligence (Delobbe et al, 2014; Wasiluk, 2010; Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik, 2000).

2.7.1.2 Organisational talent and skills management

Talent and skills management as a subfactor of the organisational learning and growth perspective, forms a key component in today's global economy and prompts organisations to continually invest in human capital by attracting, hiring, developing and retaining talented individuals (Schiemann, 2014; Glenn, 2012). Although pay and benefits are fundamentally important in attracting and retaining talented employees, it has also been suggested that other incentives such as the development of employees provide organisations with a competitive edge (Rodgers, 2011). However, a major constraint to talent and skills management is the skills shortage, the aging workforce, increasing mobility, shifting demographics and global supply chains (Beausaert, Segers, Rijt &, Gijsselaers, 2011). Given these challenges, human resource practitioners globally deem talent management as a primary driver of organisational success (Collings & Mellahi, 2009). Furthermore, the face of highly skilled and talented employees may take the form of migrant workers, students, expatriates, refugees and business travellers (Glenn, 2012). As such, the high demand for talent has led to many countries developing strategies to attract and retain talent as well as reverse the "brain drain", which has affected many African and Asian countries because of the USA investing heavily in foreign talent (Lacey & Groves, 2014).

In 1998, a group of consultants at McKinsey coined the term "War of Talent" and since then, there has been growing interest from both the academic and practitioner sector on the subject of talent management (Johnson, 2014; Chambers, Foulon, Handfield-Jones, Hankin & Michaels, 2001). Despite the widespread popularity of this concept, talent management remains rather elusive. This is due to the lack of a universally accepted definition for the concept as well as conceptual boundaries (Collings & Mellahi, 2009). Nevertheless, across all types of organisations globally, there has been a shift towards the management of talent that specifically addresses the dynamic competitive environment that modern organisations face. As such,

Collings and Mellahi (2009) suggest a theoretical model for strategic talent management, which focuses on three pillars, namely the identification of pivotal talent positions, the development of a talent pool and the creation of a differentiated human resources architecture.

- 1) The systematic identification of key positions, across all levels within the organisation differentially contributes to the organisation's sustainable competitive advantage (Schiemann, 2014; Collings & Mellahi, 2009). These authors indicate that there should be a greater degree of differentiation and delineation of roles in an organisation, with the primary focus on strategic positions that promise significant impact and secondly on non-strategic jobs, which offer marginal impact.
- 2) The development of a talent pool of committed, high-potential and high-performing incumbents has been suggested by Collings and Mellahi (2009) to contribute to an organisation's sustainable competitive advantage. In public sector organisations in particular, the ability to find and retain highly competent and skilled individuals is critical to the success of the organisation itself and in the reform of any country (Glenn, 2012). In order for strategic jobs to have a differential impact on the organisation's performance, it is crucial that such positions are held by high performing or high potential employees so as to ensure a more deliberate and focused utilisation of the organisation's resources. However, it is not practical to fill an organisation with only high performers in non-strategic positions in an organisation as this would result in an over-investment with the consequence of wasteful expenditure (Glenn, 2012; Collings & Mellahi, 2009).
- 3) The development of a differentiated human resource architecture allows for positions to be filled with competent incumbents and ensures their commitment to the organisation (Glenn, 2012). The first step is to encourage the identification of high performers, and secondly, to employ human resource policies that optimally utilise such individuals within the organisation (Collings & Mellahi, 2009).



Influencing the above approach, are factors such as an increasingly global and virtual workforce, different generations working together, longer life expectancies as well as an empowered and autonomous workforce (Sparrow, Scullion & Tarique, 2014). Owing to demographic changes and targets set by government, the workplace is increasingly diverse in terms of age, gender, ethnicity and cultural norms. Talent management strategies at the organisational level need to provide a context that is conducive to both diversity and inclusion (Cheese, Thomas & Craig, 2007).

Another factor influencing the effectiveness of the model is the anticipation of the skills shortage in the short and medium term, given that numerous organisations globally are already competing for talent. While not all sectors will experience a lack of skills, some professions, such as public and government organisations including universities are more concerned with the loss of talent owing to an aging workforce or talented employees seeking more lucrative opportunities in the private sector (Glenn, 2012). In Canada, for example, senior officials in public sector organisations have identified the capacity to recruit and retain highly-trained, qualified staff as paramount to the organisation's survival (Glenn, 2012). In addition, the Canadian government has adopted talent management as an approach to sustainably managing its key human resources, particularly since most public sector organisations face the challenge of an aging workforce. This challenge is exacerbated by the rapid rate of retirements, an increasingly competitive marketplace for skilled employees, demands in terms of balancing work and personal lives, changing expectations from government, the instability of the global economy and the introduction of new technologies (Glenn, 2012).

In a developing country such as South Africa, there are challenges associated with social and economic development, and as such, general human resources management, including talent management practices, are inadequate especially when addressing the challenges of transformation and talent development (Kock & Burke, 2008). Compounding these stresses, is the challenge that most other countries face, namely the skills crisis due to the swell in numbers of talented employees retiring, which has been identified as a major hindrance to economic growth in South Africa (Kock & Burke, 2008). In addition, competitive compensation packages, emotional recognition, bonus structures, performance management systems, mentorship and career development opportunities for talented staff, especially in higher education institutions, are necessary to retain talented staff (Theron, Barkhuizen & Du Plessis, 2014). The management of talent needs dedicated attention, especially for the survival and success of organisations in South Africa, particularly organisations in the public sector. An additional priority in the South African context is the management of talent, particularly among black and female employees, which is fundamentally important in order to meet current and future social and economic demands of the country (Kock & Burke, 2008).

In summarising the literature on talent management in organisations, four major human resource-based activities need to be acknowledged, namely recruitment, performance and talent management, leadership development and organisational strategy. Basically, when focusing on strategic human resource management, particular attention should be paid to the management of key resources, including financial resources. Based on this premise, it has

been suggested that the capabilities that underpin an organisation's competitive advantage are directly linked to the capabilities of talented individuals (Schiemann 2014; Sparrow et al, 2014; Cheese et al, 2007; Becker & Huselid, 2006). Furthermore, numerous organisations are now including talent management in their dashboards or scorecards to measure the effectiveness of the organisation itself. Finally, recruiting, compensating, training and developing as well as succession planning that are linked to performance and endorsed by the organisation's leadership, provide the mechanism to attract, engage, reward and develop a high-performing and talented workforce (Theron et al, 2014; Glenn, 2012; Collings & Mellahi, 2009, Kock & Burke, 2008).

2.7.1.3 Employee motivation in organisations

Employee motivation as a subfactor of the organisational learning and growth perspective, focuses on the psychological and sociological aspects of human behaviour and human relations. Motivation is a technique that has been suggested to create satisfaction for employees in the job environment (Lazaridi, 2014; Becker et al, 2011; Gilbert, Halliday, Heavey & Murphy, 2011). It entails encouraging employees for better performance in order to achieve the goals of the organisation, which in turn contributes as well as impacts on the effectiveness of the organisation (Weisbord, 2011).

Early literature on organisational theory perceived employees as just another input into the production of goods and services (Becker et al, 2011; Freeman & Soete, 2009; Godin, 2007). However, this thinking has evolved over the years towards understanding what motivates employees and how they can be motivated to perform better (Carrigan, 2011). Furthermore, factors motivating employees cannot be standardised because they vary among individual employees in an organisation. The use of motivation is usually informed by the inextricable link between motivation and human productivity within an organisation (Balassanian, 2006). Motivation can therefore be defined as the initiation, direction, intensity and the maintenance of specific goal-oriented behaviours that steer towards improving the overall effectiveness of the organisation (Balassanian, 2006).

Incentive-based motivation has been reported to influence the behaviour of people for better and improved outcomes (Lazaridi, 2014; Gilbert et al, 2011; Pfeffer & Salancik, 2003). Incentives and incentive-based systems have proven to be an essential tool in developing capacities and enhancing performance. Incentive-based motivation is therefore able to persuade individuals and organisations to perform their functions effectively, efficiently and sustainably (Balassanian, 2006). The key to the success of implementing incentive measures is

to ensure that there is alignment between the employee's and the organisation's goals and objectives (Becker et al, 2011). An additional requirement is the motivation for employees to be proactive and coordinate their efforts and activities (Rickard, 2006). In essence, it is the employee's positive efforts and attitudes that will significantly contribute to the success of the organisation. In achieving this outcome, there is the need to design both monetary and non-monetary incentive-based systems geared towards addressing individual employee needs (Lazaridi, 2014). The skills, efforts and accumulated knowledge and commitment of employees that are complemented by strong organisational leadership, contribute significantly to an organisation's competitive advantage (Rickard, 2006). Systems that make employees feel that their efforts are appreciated, that their personal goals can be achieved and that there is the prospect of future promotions, have been demonstrated to collectively encourage effort amongst employees within an organisation (Gilbert et al, 2011; Rickard, 2006). Appropriate motivation systems are broader than financial incentives and rewards, although the level of pay is a primary motivator when it comes to employee performance.

Theories of motivation explain that the amount of effort and the direction of that effort exhibited by employees influence and impact on the level of motivation within an organisation. From the literature, it appears that performance is viewed as a function of motivation, ability, role perceptions and resources (Carrigan, 2011). In delving deeper into the literature, it appears that there are six major theories of motivation that attempt to understand the factors that influence motivation within teams and the work environment. These theories evolved from (1) Maslow's hierarchy of needs model in 1954, to (2) Frederick Herzberg's motivation-hygiene theory, which were followed by theories (3) X and (4) Y, and later the (5) expectancy theory of motivation and the (6) self-determination theory of motivation (Gagne, 2014; Ha & Sung, 2011). Although these theories have been tested on various private sector organisations, there is limited evidence to suggest the potential implications of these theories on public sector organisations such as funding agencies (Denhardt & Catlaw, 2014; Carrigan, 2011).

According to recent studies, it appears that the participative management style, which is associated with the expectancy theory, has been most effective in motivating employees. This theory advocates open communication, as well as full participation of employees in decision-making processes (Lazaridi, 2014; Ha & Sung, 2011; Nassar, Abdou & Mohmoud, 2011; Jimenez, Fasci & Valdez, 2010; Angermeier et al, 2009). This management style has been postulated to satisfy the whole range of human needs and hence has been suggested to motivate employees to achieve high targets and high productivity. In addition, there is a high level of participation in working groups and this leads to a high level of motivation. This theory

has experienced widespread success over the years across varying types of organisations (Nassar et al., 2011; Jimenez et al, 2010; Angermeier et al, 2009).

It has further been suggested in the literature, that despite the nature of the organisation, it appears that goal setting allows for employees to perform better by setting performance targets, facilitating management by objectives and setting work standards that are aligned to the organisation's goals (Carrigan, 2011). This is a particularly effective method for motivating staff in public organisations to perform better, when financial or monetary incentives are already established and maintained in them. These incentives may include benefits such as paid time off, pension funds and comprehensive medical coverage (Gagne, 2014). The full effect of the cost of such benefits, however, has long-term financial implications for the organisation (Denhardt & Catlaw, 2014; Carrigan, 2011). The challenge, however, that is associated with the effective design and implementation of this method in the public sector, is the vagueness and constantly evolving and conflicting nature of government goals (Becker et al, 2011). It is thus imperative that different motivational incentives are in place in order to consider the varying needs of different employees, which may range from gender, age, personality characteristics and personal needs (Carrigan 2011). Ultimately, it is essential that in the public sector, employees are motivated to achieve high levels of productivity to ensure that taxpayers' money is not fruitlessly spent (Denhardt & Catlaw, 2014; Carrigan, 2011).

In public agencies, higher levels of performance have been observed when there are incentives in place that ensure the commitment of employees to the organisation (Petrovsky & Ritz, 2014; Torca, 2011). Agency workers tend to perform better when the organisation recognises and respects their contribution as well as cares for their well-being. Improved commitment to the job, has been speculated to be linked to support, fairness, rewards, favourable job conditions and supervisor support (Torca, 2011). In addition, factors such as job security, pay benefits, job characteristics, development and promotion opportunities, general caring and open communication as well as participating in problem solving and decision-making processes have been reported to enhance employee performance (Becker et al, 2011). Finally, motivation offers several important benefits to the organisation and its employees. These include, high efficiency, reduced absenteeism, low staff turnover, good working relations, improved morale and improved corporate image, that collectively contribute towards an enabling environment for employees to be proactive and innovative (Petrovsky & Ritz, 2014; Becker et al, 2011; Carrigan, 2011; Balassanian, 2006).

In South Africa, not only does senior management have to focus on motivating staff, they also have to face challenges, such as a national unemployment rate of 40%, which is coupled to approximately 45% of skilled workers only, receiving any form of training (Theron et al, 2014; Du Toit, van Staden & Steyn, 2011). Given this context, management needs to commit to additional measures in order to satisfy the motivational needs of talented and high-performing employees. Some of these measures include the provision of employees with autonomy in projects or tasks, which allows for them to be both innovative and creative. In addition, South African organisations need to pay particular attention to putting into place lucrative salary structures, promotions and monetary rewards (Theron et al, 2014; Du Toit et al, 2011). Emerging as a factor in the South African context, is the need for both recognition and acknowledgement of employee performance by senior management. Employees feel that internal training does not enhance their skills set, and is a poor investment towards training and developing staff. Such interventions are perceived to lack focus and do not meet the needs of personal career development goals (Theron et al, 2014; Du Toit et al, 2011).

In summary, it appears that management across the various types of organisations needs to constantly create and maintain a motivational environment in which employees can perform at their optimal levels thereby contributing to the achievement of the organisation's goals (Petrovsky & Ritz, 2014; Becker et al, 2011; Carrigan, 2011; Balassanian, 2006). Both monetary and non-monetary incentive systems need to be in place in order to satisfy and address the diverse needs of the workforce. However, in order for organisations to stay abreast of their competitors and to ensure a highly motivated workforce, incentive systems need to be continuously evaluated and revised or changed. This allows for such systems to be effective in terms of achieving organisational effectiveness and survival (Gagne, 2014; Mafini & Dlodlo, 2014; Lazaridi, 2014; Jimenez et al, 2010).



2.7.1.4 Employee development in organisations

Employee or professional development as a sub-factor of the organisational learning and growth perspective, focuses on the skills and knowledge attained for personal development and career advancement (Cummings & Worley, 2014; Noe & Tews, 2014; Purwanti, Pasaribu & Lumbantobing, 2011; Lee & Bruvold, 2003; Tansky & Cohen, 2001). Professional development, also known as skills development, encompasses all types of facilitated learning opportunities ranging from university or college degrees to formal coursework, conferences and informal learning opportunities in situ (Noe & Tews, 2014; Jasper, 2007). In essence, the concept refers to the ongoing acquisition or refinement of skills and knowledge, which refers to job mastery (Willemse, 2011). Professional development therefore refers to the skills and knowledge that go

beyond the scope of the employee's job description, although they may indirectly improve job performance (Willemse, 2011). Hence this is an ongoing and dynamic process in which employees need to be encouraged and supported by management through a review and evaluation of goals and activities. The various approaches used to tackle professional development at the organisational level, include the use of the case study method, consultation, coaching, communities of practice, lesson study, mentoring, reflective supervision and technical assistance (Noe & Tews 2014; Jasper, 2007).

Organisations therefore face the need to continuously invest in the development of employees, which not only supports the attraction and retention of high quality staff, but also plays a key role in ensuring that they are both competitive and innovative especially in the delivery of quality services to customers (Cummings & Worley, 2014; Willemse, 2011). As such, there has been a push for the human resources departments at various organisations to develop and implement tools that allow for the continuous learning, training and development of employees (Cummings & Worley, 2014; Beusaert et al, 2011). The development of staff and their skills sets must be a daily occurrence and follow the skills development cycle, which involves the following key phases:

1) Strategic, business and operational planning, which includes the following:

- a clear understanding of the organisation's challenges – both within and outside the organisation
- possessing a clear vision, mission and objectives that direct the organisation's efforts in meeting its challenges and exploiting its benefits
- formally articulating in business plans the strategic focus and objectives on skills development
- developing operational plans that address the strategic focus set forth in the business plan (Noe & Tews, 2014; Willemse, 2011; Lee & Bruvold, 2003)

2) Capacity building and standard setting, which includes the following:

- assigning clear roles and responsibilities to individual employees, as indicated in the operational plan
- describing the type and level of competencies needed from employees and management in the organisation
- creating an enabling environment, which is supported by senior management, in which skills development is an ongoing priority
- describing expected employee performance standards

- assigning responsibilities and resources to effective and operational performance management systems (Noe & Tews, 2014; Willemse, 2011; Lee & Bruvold, 2003)
- 3) Evaluation and skills planning, which include the following:
- regularly conducting employee performance evaluations
 - identifying skills gaps from performance discrepancies
 - effecting skills development planning systems and official organisational skills development plans (Noe & Tews, 2014; Willemse, 2011; Lee & Bruvold, 2003)
- 4) Progress assessment and reporting, which include the following:
- regularly providing feedback on skills development progress and achievements
 - reviewing results and recommending improvements (Noe & Tews, 2014; Willemse, 2011; Lee & Bruvold, 2003).

The skills development cycle has been used as a framework for addressing the challenges experienced in the current labour market, which is characterised by a growing number of short-term employment contracts, a shortage of skilled workers, an ageing workforce and increasing employee mobility (Cummings & Worley, 2014; Beausaert et al, 2011). The skills development cycle therefore puts a lot of emphasis on talent management and the continuous development of the professional capacity or skills sets of junior staff (Beausaert et al, 2011). One tool that has been used to implement the skills development cycle is that of the performance appraisal and review process. Closely linked to this tool is the professional development plan. The use of the professional development plan as a tool has been widely adopted across organisations as an effective mechanism to address employee professional and personal development. However, there are mixed reviews associated with the implementation of the professional development plan in the workplace. While a small group of employees are motivated to use the tool, most employees and managers find it a burden and a tedious task (Beausaert et al, 2011). In such instances, the professional development plan has been perceived as an ineffective, frustrating and time-consuming activity and is solely used for the purpose of window dressing (Cummings & Worley, 2014; Beausaert et al, 2011). Despite these contradictory reviews, tools are continuously being developed and refined to address the development of skills amongst employees.

Hartley (2011) explored how development does not necessary apply to only employees in an organisation but also to managers and politicians. Hartley (2011) further proposed that managers, particularly in public sector organisations, as well as politicians require leadership development for the mere fact that they are accountable to a wide range of stakeholders. The author further suggested that there are two avenues of development, namely unplanned and

planned development. While unplanned development refers to on-the-job training, planned development refers to activities such as training courses and formal mentoring (Soldan & Nankervis, 2014; Hartley, 2011). Intimately associated with these development activities are key interventions relating to reflection and action, which allow the individual to think about or reflect on the outcomes of the development activity. Reflection also informs the individual on how best to act or proceed the next time he or she is involved in a similar task or situation (Soldan & Nankervis, 2014; Hartley, 2011).

In South Africa, there is a deliberate move by government to create an enabling environment, through various national strategies and interventions, in an effort to address skills development across all sectors of the South African economy (Theron et al, 2014; Willemse, 2011). This drive is motivated by the need to address the challenges the country faces, which include poverty, unemployment and low standards of living for a majority of South Africans (Jackson, 1999). Across both private and public sector organisations in South Africa, there is a concerted effort to address the dire shortage of appropriately skilled and qualified labour in the national workforce (Leibowitz, Bozalek, Van Schalkwyk & Winburg, 2015; Theron et al, 2014; Willemse, 2011). Hence the push towards skills development at the organisational level is to not only address the challenges facing the country, but also to drive increased productivity, quality and customer service at lower costs.

In summary, the literature on skills development shows that it benefits the employer to have staff, which possesses the relevant skills that support business priorities. This has been suggested to improve quality and enhance customer satisfaction, which then become entrenched in the organisation's culture. This in turn, improves interpersonal relationships and enhances business performance (Leibowitz et al, 2015; Theron et al, 2014; Willemse, 2011). For the employee, skills development has been implicated in contributing to employee morale, motivation and commitment, especially if the organisation's leadership not only invests in staff development but also celebrates the successes (Cummings & Worley, 2014; Beausaert et al, 2011). In addition, employees feel valued, take responsibility for their performance and strive for quality assurance and customer satisfaction. Skills development also contributes towards enhanced team dynamics and improved team spirit especially if incentives are linked to performance (Willemse, 2011).

2.7.1.5 Performance management and assessment

Performance management and assessment as a subfactor of the organisational learning and growth perspective, focuses on the relationship between performance management and human

resource productivity (Mone & London, 2014; Armstrong & Baron, 2000; Delaney & Huselid, 1996; Lebas, 1995). Closely associated with this subfactor is emotional intelligence, which can be defined as the ability to identify, assess, and control the emotions of oneself, of others, and of groups (Cole & Rozell, 2011). Research indicates that there is a strong correlation between emotional intelligence and individual job performance (Gooty, Gavin, Ashkanasy & Thomas, 2014). By emphasising emotional intelligence in the recruitment phase, as well as in team building and development interventions, organisations can improve their decision-making and problem-solving capabilities as well as their ability to deal with change management (Hong, Catano & Liao, 2011).

In today's pressurised environment, the competition between organisations is not only strong but also rather complicated. As such, managers face the challenge of managing the performance of their employees in order to stay ahead of the game (Slizyte & Bakanauskiene, 2007). The management and measurement of the performance of individuals or teams by managers need to be founded on accountability and appropriate measures for assessing performance (Becker et al, 2011). Although performance management and performance assessment are closely related concepts, both are linked to human resource management and draw attention to the provision of feedback to individual employees with the objective of building effective relationships and enhancing performance. In essence, these concepts are geared towards improving the efficiency and effectiveness of both the organisation and the individual (Mone & London, 2014; Ngcelwane, 2008; Delaney & Huselid, 1996). However, each concept, that is, performance management and performance assessment and/or measurement, relates to a specific body of literature and these will be explored in detail in this section.

Performance management is imperative to any organisation, particularly with regard to formal performance assessment or appraisal systems, that inform decisions about salary increases, promotions, demotions, transfers and terminations (Lazaridi, 2014; Rasheed et al, 2011; Delaney & Huselid, 1996). The primary focus, is to assess and suggest improvements in employee productivity, secondly to address areas of development and thirdly to assist managers in taking necessary action when faced with uncertain changes (Rasheed et al; 2011; Armstrong & Baron, 2000; Delaney & Huselid, 1996). Performance assessment, however, focuses on quantitative measures of performance at the organisational or departmental level with a strong emphasis on financial and other strategic organisational perspectives (Becker et al, 2011). Performance measurement tools play a key role in performance assessment. These tools allow for decision-making and the analysis of performance both at the strategic as well as operational levels. At any level, the performance measurement system must be aligned to the

specific strategic requirements and needs of the organisation especially with regard to performance standards and expectations (Carassus, Favoreu & Gardey, 2014; Mone & London, 2014; Slizyte & Bakanauskiene, 2007).

The performance assessment or appraisal process has been used in the literature to define the human resource practices that support employee professional growth and development (Noe & Tews, 2014; Beausaert et al, 2011). Almost all employees undergo an assessment cycle annually. This usually involves a performance interview, a development interview and an appraisal interview with the line manager. During this process, the manager and employee can make use of a personal development plan, which specifies employees' competencies as well as their areas for development (Noe & Tews, 2014; Beausaert et al, 2011). Over the past two decades, the number of performance measurement tools has increased considerably, each of which, is geared towards addressing challenges such as unclear differences or similarities, insufficient experience of managers and the lack of systematic thinking during the appraisal process. Some of the major performance measurement tools that are commonly used by organisations include the use of key performance indicators, the balanced scorecard, the European Foundation for Quality Management (EFQM) framework and the performance prism (Slizyte & Bakanauskiene, 2007).

Key performance indicators (KPIs) reflect the critical success factors of an organisation that are relevant to its goals. These indicators are usually long-term considerations and changes in such indicators are usually linked to the evolution of the goal of the organisation (Slizyte & Bakanauskiene, 2007). All activities in an organisation therefore need to focus on meeting or exceeding the KPIs. The tool measures the performance of individual employees against the organisation's KPIs. The weakness of this tool is that the use of KPIs does not show the overall relation and interaction between each of the KPIs, and this in turn, impacts on clearly defining similarities and differences in the performance of employees (Gimzauskiene & Kloviene, 2011).

The balanced scorecard as proposed by Kaplan and Norton in 1992, looks at a number of perspectives that are both financial and nonfinancial measures. While private sector companies focus on measuring success in terms of financial profits, nonprofit and public sector organisations focus more on cost savings. The balanced scorecard has evolved over the years from a performance measurement tool to a performance management tool that connects strategic goals to organisational performance (Barndt et al, 2011). The model ensures that each of the measures link to the organisation's strategy (Kaplan & Norton, 1992). Given this context, the balanced scorecard can be used both as a performance measurement and a performance

management tool. The four perspectives that are measured here aim to focus on long-term results, which ensure both organisational survival and sustainability. This technique is one of the most popular techniques that are used across organisations from consultancy firms to nonprofit, private and public sector organisations, including higher education institutions (Zangoueinezhad & Moshabaki, 2011; Bolívar et al, 2010).

The third model (commonly used in the European Union) is the EFQM, which is a framework utilised both as the organisation's management tool and a self-assessment guide (Slizyte & Bakanauskiene, 2007). As such, this model allows for a common way of thinking which assists in focusing the organisation itself on the important areas of performance, which comprises of nine key criteria. These include five "enablers" and four "results". While "enablers" refer to what the organisation does, "results" refer to what the organisation achieves. Results associated with the management of customers, people and society, are achieved through strong leadership that drives policy and strategy; people; partnership; resources and processes, which lead to performance excellence. This model is therefore geared towards helping organisations in their drive towards being more competitive by continuously refining and reviewing the model (Purwanti et al, 2011). Such a model is suitable for operational performance management as it lacks a strategic planning context. It is thus not surprising that the EFQM model is used more as a diagnostic tool and is applied to the management of quality. When this tool is employed, it is usually recommended that additional management tools also be employed (Slizyte & Bakanauskiene, 2007). The use of this model has been widely explored across multinational organisations such as Xerox, Nokia, Yellow Pages and Bridgestone. In addition, this model has enjoyed widespread success across Europe and the USA (Seath, 2009). In the UK, the EFQM model has also been used in the public sector, particularly ,by cabinet, as an improvement tool in local government and the criminal justice, healthcare and higher education sectors (Seath, 2009).



Finally, there is the performance prism model, which claims to be an innovative performance measurement and management tool. This model deals with stakeholder satisfaction, stakeholder contribution, strategies, processes and capabilities. The model primarily focuses on stakeholders and meeting customer needs. The rationale for the primary focus being on stakeholders is that strategy is only formulated once stakeholder needs have been identified. This model is therefore used in a strategic context to create value for stakeholders. Consequently, the performance prism model has been deemed as a conceptually sound model, although it has been criticised for lacking a clear implementation plan (Singh & Weligamage, 2010). Despite this misgiving, this performance measurement tool has been used across a

variety of organisations in various countries, from DHL, the international courier company in the UK (Chillida, 2009), to higher education institutions in India (Singh & Weligamage, 2010).

On the basis of the summary of the various performance management tools, one can infer that performance management is a cornerstone for organisations to ensure that they are continuously effective and are able to out-perform their competitors (Ngcelwane, 2008). Across various countries and organisations, there has been a push to sustain the belief that an organisation's competitive edge no longer lies in its products but in its people (Ngcelwane, 2008). As such, varying tools are adopted, as highlighted in this section, to ensure that this issue is both addressed and prioritised globally by organisations. In South Africa, across all government departments and public sector organisations, performance appraisals are held between line managers and employees annually (Khan & Ukpere, 2014; Theron et al, 2014; Ngcelwane, 2008). Historically, there were no clear goals or objectives set between the manager and employee and no timeframes stipulated to accomplish these goals, which in turn made the performance appraisal process a somewhat frustrating effort. At local government and municipal levels, it was found that training and developing interventions for under-performing employees were not identified, addressed or analysed (Khan & Ukpere, 2014; Theron et al, 2014; Ngcelwane, 2008). After 2000, legislation was passed that indicated that training interventions, performance objectives and targets for both the organisation and employees must be identified and timelines specified, which would then inform the performance appraisal process. In addition, there was a clear stipulation of the consequences for substandard performance (Ngcelwane, 2008). Since the promulgation of the legislation, across most public sector organisations in South Africa, there has been a drive to implement a version of the balanced scorecard to monitor and track organisational and employee performance. This implies that different organisations tend to amend the scorecard to best address their organisational focus and priorities (Ngcelwane, 2008).

Drawing from the literature thus far, it would appear that the selected performance measurement tool must be able to support strategic objectives, balance short and long-term results, include only essential, specific and comparable measures, be easily adapted into an implementation plan and be changeable or adaptable over the long-term (Upadhaya, Munir & Blount, 2014; Rasheed, et al, 2011; Neely, Gregory & Platts, 2005). In recent years, there has been a push to use a 360-degree appraisal system, in parallel with the appraisal tool adopted by the organisation. This system ensures that information is obtained from both internal and external stakeholders which includes several sources of information, the line manager, top management, assistants, co-workers, customers, dealers, advisors and community officials

(Upadhaya et al, 2014; Rasheed et al, 2011). Such a system has been proposed to encourage feedback, teamwork and improved working relationships between employees and managers. The implementation of the 360-degree appraisal system, however, has been met with some trepidation across the various types of organisations, due to the questions relating to the reliability and validity of the measuring instruments, as well as the manner in which reviewers are selected, which lends itself to bias (McCombs, 2014; Church & Bracken, 1997).

In summary, it is imperative for organisations to apply performance assessment and appraisal systems in the management of their human resources. Across all types of organisations, there is a measurement of performance among employees to ensure certain quality standards are adhered to (Rasheed et al, 2011). Performance appraisal is a continuous process through which the performance of employees is identified, measured and improved. This usually entails practices such as regular feedback, recognition of employees' achievements and professional development programmes being put in place (Upadhaya et al, 2014; Rasheed et al, 2011). The whole concept of performance management revolves around a set of processes that includes knowledge of the employees about the expectations from management, employee motivations to perform well, evaluating employee performance and identifying areas for improvements and growth. Performance management therefore requires the use of performance measurements in order to manage and improve performance and demonstrate what has been accomplished (Upadhaya et al, 2014; Rasheed et al, 2011).

2.7.1.6 Summary of the organisational learning and growth perspective

Learning and growth within an organisation, focuses on its intangible assets, mainly the skills set, competencies and talent of employees and how these capabilities can be nurtured through development and training interventions, motivation and performance management systems. Collectively, these human resource capabilities support the internal processes required to create value for the customer and the organisation's stakeholders. Organisational learning and growth are thus one of the five cornerstones needed to ensure organisational effectiveness, which in turns ensures the organisation's long-term survival and sustainability.

2.7.2 Organisational business processes

A second perspective of the balanced scorecard is that of business processes. This perspective focuses primarily on the core business processes that are deemed critical for an organisation to be able to satisfy the needs of both stakeholders and customers. Metrics based on this perspective allow managers to know how well the organisation is performing, and whether

products and services conform to customer requirements (Koigi, 2011). The following subfactors are associated with this perspective (Haid et al, 2012; Makmee et al, 2009):

- 1) leadership capability and capacity
- 2) organisational climate
- 3) processes and technology structures that support the organisation's core business
- 4) communication channels
- 5) organisational structure with clearly defined roles of accountabilities and responsibilities.

Each of the above-mentioned sub-factors either directly or indirectly addresses the three principle categories that were identified by Kaplan and Norton (1996), namely: (1) innovation; (2) operations; and (3) post sale service.

2.7.2.1 Organisational leadership

Organisational leadership as a subfactor of the organisational business processes perspective focuses on the demands faced by organisations in terms of both accountability and enhanced performance. Now, more than ever, organisations need leaders who can formulate and articulate a vision, are sensitive to the needs of all constituents, can build consensus, work with teams and above all, motivate employees (Bush, 2014; Chemers, 2014; Bass, Bass & Bass, 2008; Denton & Vloeberghs, 2003; Burns, 1978). Effective leadership is critical in creating the organisational culture that directs and motivates employees in the organisation (Tiu, 2001). A good leader's repertoire and actions need to be informed by a comprehensive understanding of the social identity principles associated with organisations and their employees. Effective leadership occurs as a result of knowing the effect individual differences have on leadership style, organisational culture, the identity of the organisation, and its effectiveness (Tibaingana, 2014; Woods, 2008). The fundamental role of a leader is to define the organisational goal or vision, formulate strategic plans and motivate, lead and organise people to achieve those goals through the execution of plans (Gupta, 2009).

Early literature on leadership theories focused on six categories of leadership traits that focused on personality, intelligence, background, physical attributes, social standing and the level of task orientedness (Dinh et al, 2014; Northouse, 2014; Stogdill, 1948). It was noted that these theories were neither able to substantiate that some leader traits are absolutely necessary nor explain leadership effectiveness (Yukl, 2008). The literature thus shifted towards describing leadership behaviours and proposed that effective leaders are employee centred and focused on the needs of their teams in addition to establishing high performance standards (Chemers,

2014; Dinh et al, 2014; Yukl, 2008). According to critics of this theory, behaviour cannot always account for leadership, particularly in different situations. Hence alternate leadership theories were developed. The contingency theory postulates that different situations create different leadership style requirements (Fiedler, 1978). According to the situational theory, leaders choose the best course of action based on situational variables and that different styles of leadership may be appropriate for different types of decision-making (Yukl, 2008). In management theory, there is a focus on the role of supervision, organisation and group performance. This theory emphasises leadership in terms of a system of rewards and punishments (Chemers 2014; Dinh et al, 2014; Yukl, 2008).

Among the suite of theories on leadership, there is no mention of the emotional intelligence, inspiration and innovation capabilities that leaders need in order to effectively function in today's rapidly changing environment. As a result there has been the argument that in both the business and academic worlds, there is a need for transformational leaders who are flexible, inspiring and empowering (Geer-Frazier, 2014; Tiu, 2001). Transformational leadership traces its roots to the theory of leadership relationship, where there is a tendency to focus on the dynamic connections between leaders and followers. Transformational leaders tend to motivate and inspire people to perform better in a group and fulfil their potential. Leaders with this style often have high ethical and moral standards (Burns, 1978). Since the publication of Burn's work, a number of meta-analysis studies have shown that transformational and transactional leadership can positively predict a wide variety of performance outcomes including improvement of individual, group and organisational level performance (Chemers, 2014; Bass et al, 2008). The following four elements of transformational leadership were proposed:

- 1) Individualised consideration refers to the degree to which the leader attends to the needs of his or her followers and also mentors them. In this element of transformational leadership, the leader is empathetic, keeps the channels of communication open and presents challenges to followers. This also encompasses the need for respect and celebrates the individual contribution that each follower can make to the team. The followers possess will and aspirations for self-development as well as intrinsic motivation for their tasks (Chemers, 2014; Northouse, 2014; Bass et al, 2008).
- 2) Intellectual stimulation speaks to the degree to which the leader challenges assumptions, takes risks and solicits followers' ideas. Leaders with this style stimulate and encourage creativity amongst their followers. They nurture and develop people who think independently. For such a leader, learning is a value and unexpected situations are seen as

opportunities to learn. The followers ask questions, think deeply about things and figure out better ways to execute their tasks (Chemers, 2014; Northouse, 2014; Bass et al, 2008).

- 3) Inspirational motivation refers to the degree to which the leader articulates a vision that is appealing and inspiring to followers. Leaders with inspirational motivation challenge followers with high standards, communicate optimism about future goals, and provide meaning for the task at hand. Followers need to have a strong sense of purpose if they are to be motivated to act. Purpose and meaning provide the energy that drives a group forward. The visionary aspects of leadership are supported by communication skills that make the vision understandable, precise, powerful and engaging. The followers are willing to invest more effort in their tasks, are encouraged and optimistic about the future and believe in their abilities (Chemers, 2014; Northouse, 2014; Bass et al, 2008).
- 4) Idealised influence provides a role model for high ethical behaviour, instils pride, and gains respect and trust (Chemers, 2014; Northouse, 2014; Bass et al, 2008).

In essence, transformational leadership is about managing change. Despite the ambiguity that continues to pique the curiosity of researchers, transformational leadership appears to form the cornerstone for organisational effectiveness and entails the articulation of a vision, empowerment, team building and the creation of an enabling environment for organisational performance (Chemers, 2014; Northouse, 2014; Bass et al, 2008).

Gauging from the literature thus far, it appears that there is a transient state associated with leadership roles and this is due to the evolutionary changes that organisations undergo on the basis of various external and internal factors (Dinh et al, 2014; Northouse, 2014; Gupta, 2009). In the case of organisations such as technology start-ups, there is a need for task-oriented leaders and the need to hire individuals with high experience to whom a number of tasks can be delegated. However, once the company evolves and increases in size, young graduates increasingly become employed and there is a need for leaders who focus on the needs of their employees and actively embrace the concept of coaching (Gupta, 2009).

In organisations of public administration, the concept of integrated leadership tends to emerge, which focuses on five roles and functions that are essential for leaders to be successful in the public sector (Bush, 2014; Hassan & Hatmaker, 2014; Fernandez, Cho & Perry, 2010). These factors focus on the following characteristics that an ideal leader in the public sector ought to possess: being task oriented, relations oriented; change oriented, diversion oriented and integrity oriented. Such characteristics have been linked to what is termed “integrated leadership”, which is deemed to relate not only to one level of leadership, but also across senior

management in government agencies. This includes team leaders, supervisors, managers and senior executives in such a manner that integrated leadership has a positive impact on organisational performance and effectiveness (Bush, 2014; Hassan & Hatmaker, 2014; Fernandez et al, 2010).

In the unique and multicultural demographic population of South Africa, leadership is deemed contextual – hence there are numerous challenges associated with defining a truly authentic South African leadership approach (Bush, 2014; Cotter, 2010; Denton & Vloeberghs, 2003). In the public sector in South Africa, there appears to be a lot of criticism associated with lack of service delivery across the spectrum, from the provision of healthcare and education to the provision of clean water and electricity to citizens (Bush, 2014; Cotter, 2010; Denton & Vloeberghs, 2003). However, since the roll-out of the Skills Development Act in 2001, there has been a national drive across all organisations for compliance with legislation and governance principles, and two major forces come into play here, namely knowledge and information. The learning organisation is often labelled as a highly productive, modern workplace, which advocates the concept of organisational intelligence and focuses on intellectual capital as well as strong leadership that generates value (Cotter, 2010). Innovative leadership linked to technologically “savvy” capabilities is therefore imperative. Given this context, current and future leaders in South Africa need to be results oriented as well as solutions and performance driven. The following five major attributes have been linked to effective leadership in the new South African economy:



- 1) Purpose-directed visionary leadership advocates creativity and innovation. In essence, leaders need to have execution skills, a focused vision and managerial competence that include the ability to solve tactical problems and anticipate strategic shortfalls (Bush, 2014; Hassan & Hatmaker, 2014; Cotter, 2010; Naidu, 2008).
- 2) Transformational missionary leadership continually tests, transcends and stretches known boundaries in the search for better and more effective solutions for both followers and the organisation. Modern leaders are independent thinkers who are able to reinvent themselves, advance with contemporary development and keep abreast of the changing needs of their organisations. In addition, such leaders are able to redeploy, position and mobilise their resources for optimal performance and utilisation (Bush, 2014; Hassan & Hatmaker, 2014; Cotter, 2010; Naidu, 2008).
- 3) A certain kind of leadership focuses on developing employees in line with national employment equity plans. Many public organisations address this priority area by using the balanced scorecard, which has been effectively used in the South African context to

translate strategy into action-driven measures (Cotter, 2010). Leaders therefore need to play a key role in the organisational learning and growth perspective of the balanced scorecard in order to sustain the ability of their employees to change, grow and improve (Bush, 2014; Hassan & Hatmaker, 2014; Cotter, 2010; Naidu, 2008).

- 4) Dynamic leadership is another attribute and refers to courageous leaders who do not succumb to the pressures imposed by the external environment. Such leadership ensures global competitiveness and demonstrates high levels of endurance and stamina in order to withstand the demanding challenges of the workplace (Bush, 2014; Hassan & Hatmaker, 2014; Cotter, 2010; Naidu, 2008).
- 5) Emotionally intelligent leaders are charming, charismatic, convincing, credible and capable of influencing others to follow them. Such leaders are people oriented and are able to nurture both trust and mutual respect. They have the ability to motivate and inspire employees to be confident, successful and goal oriented. Finally, emotionally intelligent leaders possess the ability to recognise, understand and manage their own emotions as well as those around them in order to ensure performance (Bush, 2014; Hassan & Hatmaker, 2014; Cotter, 2010; Naidu, 2008).

Based on the literature, the following key descriptors summarise the different leadership styles across the various sectors:

- 1) Transactional leadership refers to a leadership style where team members obey their leader during the execution of a task and the organisation in turn remunerates staff for their effort and compliance. As such, organisational leadership can impose rewards or punishment on those team members who either exceed or do not meet the predetermined standards. Transactional leadership has serious limitations for knowledge-based or creative work owing to its stringent requirements (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 2) Autocratic leadership is an extreme form of transactional leadership, where leaders exert high levels of power over their employees and team members. Employees in an organisation are afforded few opportunities, if any, to make suggestions, even if these would be to the organisation's benefit. As such, autocratic leadership usually leads to high levels of resentment among employees, absenteeism and staff turnover as well as poor productivity (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 3) Bureaucratic leaders ensure that staff, strictly follow procedures and historical approaches or methods of doing things. Such leaders add layers of control and push for a top-heavy structure in order to control the flow of information. Although this is an appropriate

leadership style for work involving serious safety risks such as working with heavy machinery and toxic substances, this leadership style can demoralise staff, and diminish the organisation's ability to react to changing external circumstances (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).

- 4) The charismatic leadership style injects huge doses of enthusiasm into the organisation and is extremely energetic in driving employees forward. Such leaders inspire their organisation and have the ability to extract high levels of performance from employees. This can create a risk that a project, or even the entire organisation, might collapse if the leader leaves, especially since followers strongly believe that success is tied up with the presence of the charismatic leader. As such, charismatic leadership carries great responsibility, and needs a leader's long-term commitment (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 5) Although a democratic leader will make the final decision, he or she invites other members of the team to contribute to the decision-making process. This facilitates increased levels of job satisfaction by involving employees in terms of what needs to be done and how it should be done, in order to increase organisational effectiveness. Employees feel in control and are motivated to work hard by more than just a financial reward. As participation takes time, this style can lead to things happening more slowly than an autocratic approach, but often the end result is better. It can be most suitable where team work is essential, such as matrix structures, and where quality is more important than speed to market or productivity (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 6) Delegative leadership refers to leaders who leave their staff to get on with their work and provide little guidance to their teams. Although organisational leadership provides all the necessary resources, all tasks and problems must be accomplished and resolved by staff, independent of any inputs or involvement from the organisation's leaders. This leadership style can be effective if leaders monitor what is being achieved and communicate this back to their teams regularly. Most often, delegative leadership works for teams in which individuals are highly experienced and skilled. Unfortunately, it has been found that this leadership style has negative implications for the level of productivity in the organisation (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 7) People- or relations-oriented leadership reflects on creating an emotionally supportive work environment that contributes to higher levels of employee job satisfaction and motivation. This style of leadership prioritises the welfare of subordinates and focuses on fostering good interpersonal relations between organisational members. There is also a focus on appreciating and recognising the work of employees and creating opportunities for growth and development (Northouse, 2014; Fernandez et al, 2010; Bass et al, 2008). Closely linked to this type of leadership style is the leader-member exchange theory, which

suggests that managers and subordinates go through the following three phases: (1) role-taking, where the manager assesses the skills and abilities of new employees; (2) role-making, where employees are expected to work hard, be loyal and trustworthy as they become accustomed to their role in the workplace; and (3) routinisation, where the manager and the employee establish set routines, as the new employee becomes settled in the workplace (Hassan & Hatmaker, 2014).

- 8) Task-oriented leadership focuses only on getting the job done, and can be quite autocratic. Such leaders focus on setting and communicating goals and performance standards as well as defining structures and roles for their employees and establishing well-defined processes and channels of communication to accomplish tasks effectively. However, because task-oriented leaders spare little thought for the well-being of their teams, this approach can suffer many of the flaws of autocratic leadership, with difficulties in motivating and retaining staff (Northouse, 2014; Fernandez et al, 2010; Bass et al, 2008).
- 9) Transformational leadership refers to leaders who inspire their teams with a shared vision of the future. Transformational leaders are highly visible, and spend a lot of time communicating. They do not necessarily lead from the front because they tend to delegate responsibility among their teams. Transformational leaders are generally energetic, enthusiastic and passionate. Not only are these leaders concerned and involved in the process, but they are focused on helping every member of the group to succeed as well. Such leaders tend to be supported by a strong management team that focuses on the details of tasks and other operational issues (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 10) Situational leadership refers to leaders switching instinctively between styles according to the people and work they are dealing with. According to this leadership style, effective leadership is task relevant, and the most successful leaders are those who adapt their leadership style to the maturity of employees in the organisation. Effective situational leadership varies according to the maturity and emotional intelligence of employees in the organisation as well as the task, job or function that needs to be accomplished (Chemers, 2014; Dinh et al, 2014; Bass et al, 2008; Blanchard, 1997).
- 11) Change-oriented leadership is strongly aligned to transformational leadership and primarily reflects on improving strategic decision, adapting to changes in the external environment, increasing flexibility and innovation, making major changes in processes, products and services, and gaining commitment from employees and stakeholders regarding these changes (Northouse, 2014; Fernandez et al, 2010; Bass et al, 2008).
- 12) Diversity-oriented leadership focuses on business settings and particularly on identifying and nurturing positive relations related to racial and demographic diversity. It has been suggested that leaders in public sector organisations who tend to understand and

appreciate diversity management are able to generate numerous performance benefits (Northouse, 2014; Fernandez et al, 2010; Bass et al, 2008). Leaders who focus on diversity are able to reap dividends in terms of the quality of ideas generated and decisions accepted. In addition, this style of leadership creates the potential for enhancing value for the organisation through the skills, experience and knowledge of diverse employees and stakeholders (Fernandez et al, 2010).

13) Integrity-oriented leadership styles have been linked to enhancing performance within organisations. In public-sector organisations there is a focus on integrity-oriented leadership that addresses the institutionalised and political environments in which agencies operate. These environments impose demands for legality, fairness and equitable treatment of employees and stakeholders, including customers. In the USA, integrity has been identified as a fundamentally key competency that is a prerequisite for the appointment of senior executives (Northouse, 2014; Fernandez et al, 2010; Bass et al, 2008).

In the public sector context, transactional, transformational and leader-member exchange or people-orientated leadership styles have been explored to some extent. In the Malaysian context, it was found that transformational leadership had a greater level of influence in terms of job satisfaction among public employees (Voon, Lo, Ngui & Ayob, 2011). A similar observation was made across public organisations in South Africa (Wright, Moynihan & Pandey, 2012). In a separate study, it was found that leader-member exchange or people-orientated leadership has the ability to improve the performance of employees across South African public sector entities (Hassan & Hatmaker, 2014). Across universities, it was found that there was a positive and significant relationship between transformational and transactional leadership styles and job satisfaction. This study further revealed that there was a preference for the transformational leadership style than the transactional leadership style amongst 60 instructors at three universities in Mogadishu, Somalia (Ali, Sidow & Guleid, 2013).

In summary, it appears that leaders who are able to withstand changes in the external environment, are people focused, innovative, push for employee development, continually motivate their staff, embrace technological trends with the objective of meeting or exceeding targets as well as focusing on stakeholder and customer satisfaction, possess the ability to bolster performance within the organisation.

2.7.2.2 Organisational climate

Organisational climate as a subfactor of the business processes perspective, focuses on understanding human behaviour in organisations. This concept has been closely linked to

measuring the effectiveness of organisations (Barbera, 2014; Ehrhart & Raver 2014; Castro & Martins, 2008). The climate of an organisation refers to the feel of its internal environment, as perceived by outsiders and employees alike (Choudhury, 2012). This climate has the ability to impact on the behaviour of employees and distinguish one organisation from the next, as well as influence the behaviour of people over a relatively enduring period of time (Vashdi, Vigoda-Gadot & Shlomi, 2012; Woods, 2008). The organisational climate comprises a system of shared action, policies, procedures, values and beliefs that develop in an organisation and guide the behaviour of employees (Choudhury, 2012). Studies have demonstrated that climate is often an intermediary between employee motivation and skills, on the one hand, and a number of performance-related variables, on the other, which include job satisfaction, commitment, creativity, supportive human resources structures and pro-social behaviours (Vashdi et al, 2012). Climate therefore was considered in the early literature to be differentiated into organisational and the psychological climates. While studies in organisational climate measured the average perceptions of organisational members, and referred to a collective description of the same environment, studies focusing on the psychological climate tended to concentrate on the individual's perceptions of the organisation's policies and procedures (Barbera, 2014; Ehrhart & Raver, 2014; Joyce & Slocum Jr, 1984).

In 1968, Tagiuri and Litwin (1968: p. 25) formulated the following definition of organisational climate:

Climate is a relatively enduring quality of the internal environment of the organisation that (1) is experienced by its members, (2) influences their behaviour, and (3) can be described in terms of the values of a particular set of characteristics (or attributes) of the organisation.

The concept of organisational climate has since gained popularity in the management, psychology and organisational theory literature, and various approaches have been proposed to influence the formation of organisational climate. More specifically, four approaches have commonly been identified in the literature, namely the structural, perceptual, interactive and cultural approaches (Barbera, 2014; Ehrhart & Raver, 2014). The structural approach tends to regard climate as an attribute that belongs to an organisation, which exists independently of the perceptions of individual members. Climate is therefore an objective manifestation of the organisation's structure (Eustace & Martins, 2014; Choudhury, 2012; Moran & Volkwein, 1992). Critics of the structural approach observe that this approach does not account for differences in climate within groups in a particular organisation. In addition, it has been observed that the

organisational structure characteristics are inconsistent with the climate, and this approach thus fails to consider the subjective responses to organisational climate (Moran & Volkwein, 1992).

In the perceptual approach, the formation of climates lies with the individual who responds to situational variables and that climate is a psychological description of organisational conditions (Van Houtte, 2005). This ties in with the psychological approach which perceives leadership as the driver for organisational conditions such as communication, work design, collaboration and organisational structure which influence the perception of the organisational climate by employees (McCauley, Drath, Palus, O'Connor & Baker, 2006). The challenge associated with the perceptual theory, is that there is the strong argument for the climate being entirely defined by the perception of the individual and it ignores the influence of the organisation itself as well as the interaction between individuals within it (Castro & Martins, 2008; Moran & Volkwein, 1992).



In the interactive approach, there is a tendency to focus on the interactions of individuals responding to situations, which brings forth a shared perception, which in itself creates the organisational climate (Barbera, 2014; Tiu, 2001). This approach provides a link between the structural and the perceptual approaches and it acknowledges the objectivity presented by the structural approach as well as the subjectivity offered by the perceptual approach (Castro & Martins, 2008). However although the interactive approach has its foundation in psychology, it is unable to explain how social interactions shape organisational culture and the fact that interactions are constrained by the organisation's values, norms and myths (Castro & Martins, 2008).

Finally, the cultural approach views the creation of the organisational climate as a result of a group of interacting individuals who share a common and abstract frame of reference as they deal with organisational demands (Moran & Volkwein, 1992). This approach, which is founded in sociology, iterates that both organisational conditions and individual personality play a part in the formation of the organisational climate (Tiu, 2001). As such, organisational culture, which is deeply rooted in the employee's beliefs, values and assumptions, forms an integral part of the organisational climate. The latter provides a snapshot of the organisational climate at a particular point in time and is measured by a range of quantifiable dimensions (Eustace & Martins, 2014, Choudhury, 2012; Moran & Volkwein, 1992).

For the purposes of this study, the definition of organisational climate was an adaptation of the one proposed by Moran and Volkwein (1992) in that this concept is viewed as the shared

perceptions, feelings and attitudes that organisational members have about the fundamental elements of the organisation (Moran & Volkwein, 1992). These, in turn, reflect the established norms, values and attitudes of the organisation's culture and influence the behaviour of individuals either positively or negatively. According to Watkins and Hubbard (2003), high-performing organisations have climates that make a difference to the performance of employees. Not only does organisational climate describe the experiences of employees and assist in understanding the psychological phenomena in organisations, but also provides explanations for how organisations influence behaviour, attitudes and the well-being of individuals (Eustace & Martins 2014; Watkin & Hubbard, 2003). In general, the organisational climate of the organisation refers to the combined support from the various levels of management, personnel policies and practices as well as the attitudes towards staff development in the organisation (Choudhury, 2012). In addition, organisational climate offers a justifiable case for why some organisations are more able to adapt to environmental changes and why some organisations are more successful than others (Castro & Martins, 2008).

It has been postulated in the literature that an organisational climate that encourages employee development and empowerment in decision-making can be used as a predictor of the organisation's financial success (Denison, 1990). In the manufacturing sector it has been found that a positive organisational climate that expresses concern for employee well-being, learning, performance and promotes flexibility, increases the productivity of an organisation (Patterson, Warr & West, 2004). Organisational climate can therefore be directly linked to employee satisfaction, which in turn enhances organisational performance in terms of efficiency, productivity, commitment and team cohesiveness (Lee, Ahmad, Ahmed & Musarrat, 2010). Overall, a positive organisational climate has the ability to impact on the effectiveness of an organisation (Choudhury, 2012). Recent studies have suggested that it plays a key role in the improvement of organisational performance (Vashdi et al, 2012). The following seven factors have been integrally linked to influencing organisational climate, particularly in public sector organisations:

- 1) Internal communication channels, which refer to both formal and informal interactions between people in the workplace. This type of communication enhances employee support structures, participation, openness and trust, while also reducing stress and frustration in the workplace (Ehrhart & Raver, 2014; Vashdi et al, 2012; Lee et al, 2010; Castro & Martins, 2008).
- 2) Organisational structure refers to the way in which the organisation arranges its employees and jobs to meet organisational goals and role clarification, and is fundamentally essential

for an organisation to be able to focus on its core business and address environmental circumstances (Lee et al, 2010). Hence it is not surprising that organisations in which roles are clarified and employees participate in decision-making, have been linked to enhanced job satisfaction (Ehrhart & Raver, 2014; Vashdi et al, 2012; Lee et al, 2010; Castro & Martins, 2008).

- 3) Political climate refers to the degree to which employees consider their work to be dominated by the political environment, which may result in job dissatisfaction as well as high turnover and job anxiety (Lee et al, 2010).
- 4) Professional development opportunities have been closely linked to increased motivation and enhanced job satisfaction, despite lower salaries (Ehrhart & Raver, 2014; Vashdi et al, 2012; Lee et al, 2010; Castro & Martins, 2008).
- 5) Performance evaluation needs to be fairly implemented and once desired standards of performance have been met, management need to demonstrate their appreciation of employees in order to motivate them and reinforce positive behaviour (Ehrhart & Raver, 2014; Vashdi et al, 2012; Lee et al, 2010; Castro & Martins, 2008).
- 6) Promotion or opportunities for job enhancement have been demonstrated to enhance satisfaction and performance in the work environment, and contribute significantly to a positive work environment (Ehrhart & Raver, 2014; Vashdi et al, 2012; Lee et al, 2010; Castro & Martins, 2008).
- 7) Regard for the employee's personal concerns and being supportive of problems relating to work-family imbalances have been shown to contribute to a positive work environment as well as enhancing motivation, job satisfaction and organisational performance (Lee et al, 2010). This includes having in place a staff wellness programme that ensures that staff welfare is a priority. Such a measure contributes to staff who are healthy, positive and stress-free (Choudhury, 2012).

Based on the alignment of the organisational climate with the above criteria, the following descriptors can be used to define the climate of an organisation:

- 1) Open: Employees are free to express their ideas. They are comfortable to talk to any employees and their employers about their views and problems. Management adopt an open-door policy to maintain openness in the internal environment (Barbera, 2014; Choudhury 2012).
- 2) Confrontational: Problems are brought to people rather than avoiding them. Employees face problems together and try to find a solution. The organisation encourages people to

recognise a problem and bring it to the people concerned to solve it (Barbera, 2014; Choudhury, 2012).

- 3) **Trust-oriented:** Trust includes maintaining the confidentiality of information shared by others, so that nobody can misuse it. Trust among employees for management and management's trust in employees result in high levels of empathy, coordination among employees, a friendly and disciplined atmosphere and higher productivity. An atmosphere of trust also reduces stress and politics among employees (Barbera, 2014; Choudhury, 2012).
- 4) **Authentic:** This refers to the willingness of a person to acknowledge the feelings of others and make the effort to coordinate what he or she says with what he or she does. This value is important for the development of an emotionally mature culture in the organisation (Barbera, 2014; Choudhury, 2012).
- 5) **Proactive:** Employees take the initiative and plan in advance and take preventive action. Proactivity also includes positive behaviour in which an individual, either the employer or employee, starts a new process or a new pattern of behaviour (Barbera, 2014; Choudhury, 2012).
- 6) **Autonomous:** This refers to giving freedom to the employee to enjoy power of a position but within certain limits set by the organisation. Management respect employees' feelings and encourage them to take responsibility (Barbera, 2014; Choudhury, 2012).
- 7) **Collaborative:** This refers to people working together and using one another's skills to achieve a common goal. It entails employers and employees supporting each other, planning and preparing strategies and implementing them together (Barbera, 2014; Choudhury, 2012).
- 8) **Experimental:** Employees also provide feedback to employers on improving processes, products and services. Employers, however, provide employees with the space to use innovative approaches to solving problems and improving the organisation's effectiveness (Barbera, 2014; Choudhury, 2012).
- 9) **Oppressive:** Management unilaterally make decisions and these are subsequently communicated to the rest of the organisation, which is responsible for implementing such decisions without clear guidance. Innovation and creativeness as well as change are not welcomed in such an environment (Barbera, 2014; Choudhury, 2012).

In the South African context, organisations tend to comprise extremely diverse people from different backgrounds, beliefs and religions (Eustace & Martins, 2014; Nieuwoudt, 2011). Because South Africa has eleven official languages and several identifiable race groups, a supportive and accommodating work environment where knowledge and information are shared, allows employees to relate and learn from each other. In addition, there is an overall improvement in diversity management, innovation and performance among South African

organisations (Eustace & Martins, 2014; Nieuwoudt, 2011). The results of studies on South African organisations suggest that supervisor support, employee understanding of the bigger picture and the link between own behaviour and outcomes result in a motivated and self-empowered effect (Nieuwoudt, 2011).

In summary, it appears that organisational climate is defined as the recurring patterns of behaviour, attitudes and feelings that characterise the working environment of a particular organisation. An organisation's climate is influenced significantly by leadership, communication, the achievement and acknowledgement of goals and objectives, motivation and decision-making processes. Motivation among employees to enhance their performance is reinforced when the organisational climate is supportive and encourages individuals to spend time, effort and resources in helping employees and the organisation grow and develop (Ehrhart & Raver, 2014; Vashdi et al, 2012).

2.7.2.3 Organisational technology usage and processes

Organisational technology usage and processes as a subfactor of the business processes perspective, focus on the value presented to customers and stakeholder (or shareholders) via effective and efficient business processes (Spanyi, 2015). The use of technology to support the core business processes of the organisation is aligned to the objective of improving organisational performance. Every institution across the science sector is touched by technology. Technology not only impacts on how people access information globally, but also on how teaching happens at the university level (Schram, 2014; Tiu, 2001). According to Tiu (2001), the availability of the appropriate technological tools to perform work not only contributes to organisational culture, but also to the effectiveness of the organisation. However, given the rapid pace of technological change, the expansion of knowledge and the increasing demand for a technologically-competent workforce, organisations must adapt to these changes efficiently (Tiu, 2001). This therefore warrants an alignment between the business of organisations and the technology adopted, and in order for this alignment to succeed it must be supported by appropriate organisational structures.

In order to maintain and sustain organisational performance, it is essential for the continuous evaluation or review of the efficacy of the organisation's business processes. This relates to the concept of business process management, which includes the methods, techniques and tools that support the design, implementation and analysis of the organisation's business processes (Jeston & Nelis 2014; Van Der Aalst, Ter Hofstede & Weske, 2003). Variations in business process management can relate to radical redesign of work flow, addressing broad, cross-

functional business processes, setting stretch goals for process improvement and the use of IT as an enabler of new ways of working (Burlton, 2015; Markus & Jacobson, 2015; Spanyi, 2015; Jeston & Nelis, 2014; Fripp, 2011). Fundamental to business process management and its implementation are people. Hence it is imperative that business process management is aligned to strategy, human resource management, financial management and other management disciplines (Spanyi, 2015; Jeston & Nelis, 2014). The changing economic environment has led many organisations, both in the public and private sectors, to re-engineer business processes in order to speed up and improve processes, reduce resource consumption, improve productivity and efficiency and improve competitiveness (Jurisch, Palka, Wolf & Krcmar, 2014; Kannengiesser, Totter & Bonaldi, 2014; Rosemann, Recker & Flender, 2008; Attaran, 2004).

Many organisations such as Cisco, Dell, Intel and Solectron have used IT to stimulate increasingly complex organisational change. The IT tool has been used since the 1990s to breakdown communication barriers, empower line workers and re-engineer core business processes (Attaran, 2004). Bill Gates (1999) advocates a complete digital infrastructure similar to the human nervous system that allows organisations to operate flexibly, smoothly and effectively; respond quickly to emergencies and opportunities; and provide a means for quickly transmitting information to those people in the organisation who need it (Gates, 1999). This, in turn, empowers employees to make decisions and interact with customers (Jeston & Nelis, 2014; Attaran, 2004).

The following three major phases are associated with process and technology realignment and re-engineering:



- 1) The enabling phase commences before processes are designed or reviewed. This is a strategic phase and requires a clear understanding of customers, markets, industry and competitive directions (Burlton, 2015; Markus & Jacobson, 2015; Jeston & Nelis, 2014; Dinwoodie, Quinn & McGuire, 2014; Attaran, 2004). Underpinning and guiding this phase is the organisation's business strategy and vision as well as a clear understanding of its strengths and weaknesses, market structure and opportunities (Attaran, 2004). For business processes to be designed and changed, there is a need for several key enablers, including an awareness of IT capabilities and solutions, commitment from the organisation's human resources and organisational change (Attaran, 2004).
- 2) The facilitating phase comprises technical and social redesign. In the technical phase, there is a consolidation of information; alternatives are proposed, discussed and interrogated; process linkages are re-examined; and controls are relocated prior to applying technologies

(Attaran, 2004). The social design focuses on human elements and involves defining jobs and teams; defining skills and staffing needs; and designing appropriate incentives (Burlton, 2015; Markus & Jacobson, 2015; Jeston & Nelis 2014; Dinwoodie et al, 2014; Attaran, 2004). In this phase, there is the development of test and roll-out plans in line with the objectives set forth for this phase. In parallel, existing processes are mapped, measured, analysed and benchmarked. The findings are then all combined and consolidated to develop new business processes (Attaran, 2004). It is critical that the development of people, processes and technology is integrated from the start.

- 3) The final phase focuses on implementation and includes planning and managing people, processes and technology while driving the organisation towards realising its vision (Attaran, 2004). The objectives of this phase are to pilot the new approach, monitor results and provide extensive training for employees. It is essential that during this phase there is continuous defining and redefining of performance goals and objectives, ensuring that there are minimal or no barriers between departments and being flexible as the business environment changes (Burlton, 2015; Markus & Jacobson, 2015; Jeston & Nelis, 2014; Dinwoodie et al, 2014; Attaran, 2004). Throughout this phase, there is a commitment towards the organisation's vision.

In principle, the success of these three phases is not only dependent on understanding the organisation's core processes and the full capabilities of IT, but also applying a clear strategy for valuing employees (Burlton, 2015; Markus & Jacobson, 2015; Jeston & Nelis, 2014; Dinwoodie et al, 2014; Attaran, 2004). In recent years, there has been a drive across organisations and various government departments, in particular, to implement flexible knowledge management processes and technologies in order to represent, create and distribute knowledge for use, awareness and learning (Rubanju, 2007). It has been postulated that in order to achieve organisational effectiveness and a sustainable competitive advantage, there must be established synergies among people, processes and technology (Rubanju, 2007). The whole concept of knowledge management has become embedded in the policy, strategy and processes of organisations, government and institutions worldwide, including organisations such as Dell, Wal-Mart, Cisco, Enron and General Electric (Rubanju, 2007). The success of the use of knowledge management technologies and processes has been linked, not to IT infrastructure, but to motivated and skilled people in the workforce being able to optimally use these computer technologies (Rubanju, 2007). Hence there is a push from a knowledge management perspective to ensure knowledge sharing among people in an organisation, as well as introducing new knowledge. Despite these successes, there have been numerous failures associated with the implementation of knowledge management systems, which have been linked to gaps between technology inputs, knowledge processes and business

performance (Rubanju, 2007). In essence, these failures are encountered because of the challenges associated with the integration of diverse technologies, computer programs and data sources to support the internal business processes. These challenges are exacerbated by the need for flexible processes that facilitate the easy adaptation of the organisation to changes in the external business environment (Markus & Jacobson, 2015; Rosemann et al, 2008). It is therefore imperative that leaders decide on the core business of their organisation and then invest accordingly in appropriate technologies that complement their core business function and offerings (Rubanju, 2007).

In South Africa, the method of alignment of business processes in favour of greater efficiency and organisational effectiveness has been affected by the introduction and replacement of new technologies in the market (Saetang & Haider, 2014; Fripp, 2011). In addition, South Africa, while being technologically at the forefront compared to other African countries, still lags behind its international counterparts, especially with regard to the use of new-age technologies in support of business processes. The international trend is to ensure that there is an integration of skills and processes with the needs of clients and customers in order to ensure more streamlined product flow. This also implies that there is a level of decision-making and accountability afforded to personnel at all levels in the organisation in accordance with their job descriptions (Fripp, 2011). Such measures pave the way for increased efficiency, especially with regard to the adoption of new technologies in support of business process management, which in turn streamlines processes. Unfortunately, despite this global trend, South Africa is approximately five years behind in embracing such a philosophy (Fripp, 2011). South African organisations therefore need to understand the changing needs of their customers, clients, stakeholders and workforce, prior to re-engineering business processes and implementing a mature and technologically streamlined business process management strategy (Saetang & Haider, 2014; Fripp, 2011). Such a strategy must ensure that all relevant information pertaining to the organisation's core business, including information relating to support, professional services, marketing, customers and stakeholders, is accessible from a central technological point of reference. Such a knowledge integration platform can pull together traditional support content as well as other content from around the organisation that allows employees to become empowered to better address any customer query, regardless of where the information is housed or managed within the organisation (Jeston & Nelis, 2014; Kay, 2003). Such technological tools, that facilitate easy, precise and integrated flow of information to the employee, empowers them to deliver better service quality to the customer faster (Kay, 2003).

In summary, one of the fundamental flaws associated with aligning business processes with technology is the failure to recognise the importance of people in the change process (Burton, 2015; Markus & Jacobson, 2015; Jeston & Nelis, 2014; Dinwoodie et al, 2014; Attaran, 2004). In order to secure a sustainable advantage, organisations need to establish structures and processes, which complement their organisational strategy (Kumar & Subramanian, 2011). Organisations that lack alignment between strategy and processes are therefore crippled in terms of enhancing their performance and becoming successful enterprises (Markus & Jacobson, 2015; Spanyol, 2015; Kumar & Subramanian, 2011). It is therefore imperative that there is an understanding that process management in an organisation needs to constantly be reviewed in order to improve organisational processes. Finally, the performance of an organisation in achieving its given mandate, ought to be the key driver in informing leaders of what relevant processes and technologies are adopted, modified, rejected, replaced and/or enhanced in support of enhancing organisational effectiveness and performance (Rubanju, 2007).

2.7.2.4 Organisational communication

Organisational communication as a subfactor of the business processes perspective focuses on the channels in an organisation that facilitate both information sharing and quality interactions between individuals (Heide, 2015; Tiu, 2001). Communication can be defined as the “process by which individuals stimulate meaning in the minds of other individuals by means of verbal or nonverbal messages in the context of a formal organisation” (Richmond, McCroskey & McCroskey, 2005: p. 30). Regardless of the type of organisation, intra-organisational communication forms the foundation for maintaining and sustaining relationships in the organisation. Communication between co-workers and with managers plays a significant role in employee motivation, job satisfaction and performance (Miller, 2014; Shockley-Zalabak, 2011; Richmond et al, 2005). Communication serves the function of informing, regulating, integrating, managing and persuading people in an organisation and serves as a means of socialising (Richmond et al, 2005).

The major components associated with communication include the following:

- 1) The communication source refers to the person or persons who created or initiated a specific message. In the organisational setting, the source determines the specific meaning to be communicated, translates ideas and information into messages and communicates or transmits the message. The manner in which the source communicates the message is

important for it will determine how the message is received (Heide, 2015; Miller, 2014; Richmond et al, 2005).

- 2) The message of the communication refers to any verbal (which includes words) or nonverbal stimulus (such as gestures, facial expressions and other forms of body language) and elicits meaning in the receiver of that information. It is important that managers are able to interpret the meaning behind the nonverbal messages of their employees (Richmond et al, 2005). The channel refers to the means by which messages are conveyed. During live interactions, our senses such as sight, hearing, touch, smell and taste become channels, while in other situations, mediated systems such as radio, television and the internet, among other things, form channels of communication. People therefore tend to form the informal communication network of an organisation (Richmond et al, 2005). The receiver refers to the person who acquires the message from the source translates it and then responds to it. Challenges in communication in an organisation tend to usually result from problems in the organisational climate and individuals not being able to understand one another because of poor communication channels as well as a lack of understanding of other people's attitudes and feelings or do not possessing a mature level of emotional intelligence (Heide, 2015; Miller, 2014; Richmond et al, 2005).
- 3) The feedback refers to the receiver's observable response to the source's message which can be verbal or nonverbal. Such feedback is essential not only between managers and employees, but also among fellow colleagues (Richmond et al, 2005).
- 4) The goals of communication in an organisation are to develop interpersonal relationships, obtain compliance or support among peers and gain understanding (Richmond et al, 2005). Challenges are encountered when the goal of communication is focused on slander, disrepute and gossip, instead of the objectives mentioned above.
- 5) The context of communication refers to the characteristics of the situation in which communication transpires. In addition, the rules for interacting with each other changes when communicating with different people in an organisation which may include colleagues and managers (Heide, 2015; Miller, 2014; Richmond et al, 2005).

There are both formal and informal networks of communication that exist in the workplace (Heide, 2015; Miller, 2014; Richmond et al, 2005). In the formal communication network, there is a prescribed path of communication that follows the hierarchical structure in an organisation. This communication network explicitly indicates the level of accountability and indicates who in the organisation should be reporting to which line manager (Richmond et al, 2005). The informal communication network, however, does not follow the official hierarchical path of communication, but refers to the informal communication links and relationships that have grown among employees (Richmond et al, 2005). The informal network is quite strong in any

organisation and works much faster and more accurately than the formal communication network. New employees tend to tap into and access the informal network in order to become fully integrated in the organisational system (Richmond et al, 2005). While management control the formal network, the employees in an organisation control the informal network, which is in itself somewhat elusive. One should therefore note that the informal networks in an organisation are powerful avenues for the movement and flow of information and is highly susceptible to the influences of office gossip (Heide, 2015; Miller, 2014; Richmond et al, 2005).

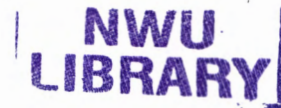
In both the formal and informal communication networks, there is also a focus on the flow of communication, which can either be vertical or horizontal (Richmond et al, 2005). Vertical communication refers to the flow of information, which focuses on both the downward and upward communication between managers and employees. Downward communication entails information being relayed from managers to employees and focuses on job instruction, rationale, ideology, information and feedback (Richmond et al, 2005). This type of communication is particularly effective when management are highly motivated to make this work. In addition, many employees are dependent in many ways on downward communication for their own success and growth in the organisation (Heide, 2015; Miller, 2014; Richmond et al, 2005). Employees at lower levels in an organisation, however, initiate upward communication, but its success is influenced by the level of buy-in and support from higher levels within the organisation. Upward communication should be focused on being positive and timely, support the organisation's current policy, be communicated directly to the person who can act on it and have intuitive appeal, especially with regard to improving the organisation's effectiveness (Richmond et al, 2005). Horizontal communication transpires more frequently than vertical communication and refers to flows of information across the organisation from peer to peer. The reason is that there are more employees in an organisation than managers and employees feel more comfortable about talking to their fellow colleagues than to people at different authority levels (Heide, 2015; Miller, 2014; Richmond et al, 2005). Horizontal communication forms the basis for social interaction in the organisation and also influences motivation, job satisfaction and employee morale.

Over and above the formal and informal as well as vertical and horizontal communication channels, there are internal organisational communication practices, including newsletters, presentations, performance reviews, meetings and externally directed communications, which refer to public, media and inter-organisational communication (Miller, 2014; Shockley-Zalabak, 2011; Baker, 2002). It has further been suggested that communication provides a broad and diverse perspective to parties both inside and outside the organisation (Grunig & Grunig, 2011).

Across organisations, there has been a tidal wave of changes in communication channels, which has resulted in a transformation of both work and organisational structures (Baker, 2002). Communication practices and technologies have therefore become more important across all organisations, and particularly significant in knowledge-intensive organisations such as science and public science management organisations (Miller, 2014; Shockley-Zalabak, 2011; Baker, 2002).

In South Africa, there is a need for the development of basic multicultural skills based on the values of nonracism, humanity, fairness and freedom (Holtzhausen, 2014; Hussain & Rawjee, 2014; Lesch, 1999). Inherent in this is the challenge of creating an environment that facilitates cultural diversity at all levels (Lesch, 1999). The introduction of new labour laws such as the Employment Equity Act has provided the impetus for ensuring culturally diverse and respectful organisations in South Africa as well as empowering those who were discriminated against during the apartheid regime (Lesch, 1999). The development of effective working relationships and the establishment of effective communication flows as well as networks are therefore highly complex in the South African context (Lesch, 1999). The use of verbal and nonverbal communication in multicultural interactions brings with it different contextual backgrounds and social meanings. This may result in miscommunication and interpretative difficulties in the workplace (Lesch, 1999). The success of multicultural communication is dependent on the level of employee emotional intelligence, positive attitudes and openness to embracing other races and cultures. In addition, individuals in the workplace should sharpen their communication competence, which includes dimensions of appropriateness and effectiveness (Holtzhausen, 2014; Hussain & Rawjee, 2014; Lesch, 1999). Underpinning the whole multicultural communication process is hearing and active listening as well as displaying empathy, which improves the quality of the relationships in the workplace. Finally, tolerance, especially with regard to ambiguity, is influenced by differing cultural and social perceptions as well as interpretation issues (Lesch, 1999). The link integrating the above dimensions associated with multicultural communication is founded on the shared contextual understanding of both the relationships and roles between those involved in multicultural interactions (Lesch, 1999). Given the complexity associated with communication in the workplace, innovation, knowledge management, organisational learning, conflict management, diversity management and communication technologies are imperative. In modern organisations, communication, regardless of its complexity, has become quintessentially vital to the overall effectiveness of the organisation, particularly in terms of both success and function (Heide, 2015; Grunig & Grunig, 2011).

Organisational communication has also become increasingly important in understanding how new communication technologies and capabilities can influence organisational types and structures, thereby impacting on organisational effectiveness (Heide, 2015; Grunig & Grunig, 2011). Communication has therefore been linked to the promotion of motivation in the workplace, as a source of information to the organisation's employees. In addition, communication plays a crucial role in altering attitudes and socialising. Furthermore effective and efficient communication systems require managerial proficiency in delivering and receiving messages, discovering barriers to communication, analysing the reasons for their occurrence and taking preventive measures to avoid these (Heide, 2015; Grunig & Grunig, 2011). Finally, integrated technological tools that support the core business of the organisation, empower staff to access any and all information for them to effectively support and deliver the right answers quickly to customer enquiries (Heide, 2015; Grunig & Grunig, 2011).



2.7.2.5 *Organisational structure*

Organisational structure as a subfactor of the business processes perspective focuses on the formal structure and design of the organisation, which in turn asserts appropriate job responsibilities and duties and acknowledges the contribution of these responsibilities towards the overall effectiveness of the organisation (Espinosa & Parada, 2014; Tiu, 2001; Dalton, Todor, Spendolini, Fielding & Porter, 1980; Child, 1972). Organisational structure can be defined as the set of rules and roles that shape the relationship between parts of an organisation (Ashworth, Boyne & Delbridge, 2009). Organisational structure determines the manner and extent to which roles, power and responsibilities are delegated, controlled and coordinated. It also influences how communication flows between levels of management (Guadalupe, Li & Wulf, 2012). The organisation's structure must be aligned to its objectives and strategy. In centralised organisational structures, decision-making power is concentrated in the upper levels of the organisation's management structure and tight control is effected over departments and divisions. In contrast, decentralised structures refer to a distributive decision-making structure in which departments and divisions have varying degrees of autonomy (Wilfred, Daniel, Nyandika & Yegon, 2014; Guadalupe et al, 2012).

Organisational structure impacts on operations by, firstly, setting the foundation for standard operating procedures, and secondly, by determining which individuals actively participate in the organisation's decision-making processes. The existence of organisational structures can be traced back to tribal leaders, royalty and clerical power structures (Aycan, et al, 2014; Jung & Kim, 2014; Lim, Griffiths & Sambrook, 2010). Organisational structures have evolved over the years. Initially, there was the flat structure, which has commonly been associated with small

organisations and university spin-offs. This structure is highly centralised and lacks standardisation of tasks (Lim et al, 2010). Leadership is therefore geared towards decision-making, implementing and communicating. Such a structure has been shown to work in small start-up companies where the leader plays a fundamental role in controlling growth and development (Cummings & Worley, 2014; Mohr, 1982). As organisations begin to grow, bureaucracy tends to influence organisational structures, which moves towards the endorsement of more standardised activities (Burns & Stalker, 1994). The bureaucratic structure tends to follow a hierarchical form in which there are clearly defined roles and responsibilities and respect for meritorious work. Such structures have been successfully implemented across larger-scale, complex organisations (Pinto, 2014; Mohr, 1982). The post-bureaucratic structures that subsequently followed included top quality management and culture management. Such ideal structures tend to support dialogue and consensus instead of authority and command, with the objective of encouraging participation and people empowerment (Lim et al, 2010). The post-bureaucratic structure has been widely used in nonprofit and community-based organisations. Another organisational structure is that of the functional structure, that tends to focus on performing a set of specialised tasks with the objective of enhancing operational efficiencies in the group (Pinto, 2014; Heckscher & Donnellon, 1994). The coordination and specialisation of tasks are centralised in the functional structures, but they face the challenge of facilitating communication barriers, which in turn can impact on the flexibility and response time for organisations to address demands from both external and internal environments (Heckscher & Donnellon, 1994). Such a structure, however, works well in the production and the services sectors in which large volumes of standardised goods and services are offered at reduced cost (Heckscher & Donnellon, 1994). In the divisional structure, organisational functions are organised into divisions, each of which can contain all the necessary resources and support structures in it. Divisions may result because of geographic locations or specialisation of the functional needs of each division, which may include manufacturing (Snow & Miles, 1992). The divisional structure influenced the development of the matrix structure, which groups employees by both function and product or service. Such a structure exploits its strengths in order to make up for its weaknesses and in so doing, the deployment of technical expertise and the necessary resources is used to the benefit of the organisation (Snow & Miles, 1992). A major hurdle to the success of the implementation of such a structure in an organisation is dependent on the delicate management of power sharing and ownership of tasks and responsibilities, which in turn is dependent on emotionally intelligent employees (Gooty et al, 2014; Snow & Miles, 1992). Other modern models that are being explored within organisations, include the team, network, virtual and the hierarchy-community phenotype models (Thareja, 2012). The team model refers to the synergy of individual competencies to achieve newer dimensions and has been adopted by companies such as

Xerox, Motorola and Daimler-Chrysler (Thareja, 2012). Conversely, the network model allows for managers to spend more time coordinating and controlling external relations usually through electronic means (Wellman, Dimitrova, Hayat, Mo & Smale, 2014; Amaral & Uzzi, 2007). This model has been used by H&M, which has outsourced its clothing network to over 700 suppliers in Asian countries. The virtual model allows for a small core company to operate yet has a global presence because of the usage of IT and web-based applications (Amaral & Uzzi, 2007). A shining example of the usage of this model is Amazon.com, which has tapped into a variety of markets globally via the web (Amaral & Uzzi, 2007). Finally, there is the hierarchy-community phenotype model, which confers on employees the sense of belonging and identity and hence the organisation itself becomes a form of community (Lim et al., 2010). Lim et al (2010) developed this model, which is based on the concept of phenotyping in biological terms. Due to this being a relatively new model, some organisations are testing it cautiously.

The above structures have impacted in some way or other on the success and failures associated with multinational companies and various governments. Bureaucracy structures have been and were widely utilised at the government level in the Soviet Republic, China and numerous other countries (Anderson, 2008). The Shell Group also used the bureaucratic structure for many years, and this structure impeded the company's ability to grow and develop any further, especially when there were changes in the market (Frynas, 2003). The inflexibility of the bureaucratic structure for the Shell Group led to the organisation adopting the matrix structure. The same structure has been successfully implemented by Starbucks, which holds the title for exceptional customer service (Thareja, 2012). The company encourages team spirit and empowers its employees to make their own decisions, as well as introducing training interventions to develop employees' hard and soft skills (Thareja, 2012). Other companies that have embraced the matrix structure and variations thereof include Procter and Gamble, Unilever and Toyota (Thareja, 2012). In essence, it has become increasingly popular over the past decade for companies to embrace a flatter, less hierarchical, more fluid and virtual structure that is able to address the demands of globalisation, competition and customers (Thareja, 2012).

A study by Guadalupe et al (2012) indicated that the greater the diversification in middle management and fewer such changes in senior managers can be linked to an organisation's effectiveness. In essence, a stronger and empowered middle management team and a smaller and less diverse upper management can be deemed as a success factor to organisational effectiveness (Guadalupe et al, 2012). A study conducted across the services and manufacturing sector, found that as organisations become more diverse, the opportunities for

synergies between business units diminish. This translates into activities being centralised under a single manager instead of being distributed across business units, which in turn limits divisional managers from undertaking synergistic work, which would otherwise require incentives (Guadalupe et al., 2012). In government departments, there has been a shift from rigid to more flexible structures that encourage less bureaucracy, a decentralisation of core activities and more integration in the relevant department in order to achieve targets and goals and facilitate a speedier responsiveness to new demands (Pinto, 2014; Ashworth et al, 2009). This implies increased autonomy among managers. To overcome this challenge, the South African government developed a toolkit for informing interventions focused on enhancing performance and addressing strategic objectives. The three-step guide suggests that there must first be a review of the strategy and an identification of the problem. Secondly, there must be a clear understanding of the organisation's core business and which businesses the organisation would need to improve (South Africa, 2006). Thirdly, options must be considered for a possible structure that addresses the strategic objectives and improves the core business processes of the organisation. At all times, there needs to be a defined and understandable process for organisational redesign, in which all managers must have a clear understanding of the process to be followed, the various stages to be performed and the review processes required. In addition, the organisational design must be executed in a standardised, structured, disciplined and informed manner (Holtzhausen, 2014; South Africa, 2006).

From the review in this section, it appears that organisational structures play a key role in enhancing organisational performance especially in light of globalisation and economic crises (Corkindale, 2011; Pinto, 2014). The challenge organisations face is the slow movement away from the hierarchical structure, which appears to more frequently broaden out into a matrix structure, instead of flattening out. In essence, the hierarchical structure remains embedded in the newly adopted one (Corkindale, 2011). In addition, few efforts are made to ensure that people understand the new structures and show employees how to operate within them. This in itself can lead to over-regulation, cultural clashes, conflicts and slow decision-making turnaround times (Aycan et al, 2014; Corkindale, 2011).

In essence, an effective organisational structure must be able to facilitate

- 1) a flow of information
- 2) growth and expansion of the organisation
- 3) a mix of talent and appropriately-skilled and experienced managers

- 4) timeous and successfully completed tasks, without an infringement on roles and responsibilities
- 5) employees clearly understanding their roles and reporting relationships (Espinosa & Parada, 2014; Pinto, 2014; Hill, 2012).

2.7.2.6 Summary of organisational business processes

Business processes in an organisation, focus on the set of related and structured activities that provide an organisation with its competitive edge. Closely linked to this, are the support structures in place that provide for an efficient and effective organisation. In essence, there is a focus in this perspective, on the leaders in an organisation, who are ultimately accountable for establishing a functional organisational structure, nurturing the organisational climate, ensuring effective communication channels are in place, and that the organisation is equipped with the appropriate technological tools to advance its core business and strategic objectives. The business process perspective can therefore be perceived as a key contributor towards the organisation's long-term survival and sustainability.

2.7.3 Organisational customer focus

A third perspective of the balanced scorecard is that of customer focus. Recent management philosophy has shown an increasing realisation of the importance of customer focus and customer satisfaction in any business. Customers are a key contributor towards an organisation's effectiveness and the development and maintenance of customer relations is critical for an organisation being competitive (Odhiambo, Ooko & Okibo, 2014). If customers are not satisfied, they will eventually find other suppliers that will meet their needs and this could lead to the demise of an organisation. Poor performance from this perspective is thus a leading indicator of future decline, even though the current financial picture may appear positive (Odhiambo et al, 2014). In developing countries where public organisations are often blamed for development failures, public managers have a strong interest in maintaining good relations with their clients by providing them with better services (Barndt et al, 2011). When developing metrics for satisfaction, customers should be analysed in terms of the various types of customers and processes for which a service or product is offered (Atiyyah, 1999). In summary, the following subfactors have been reported to influence customer service (Haid et al, 2012):

- 1) customer support
- 2) communication strategy to customers
- 3) customer service and satisfaction

- 4) customer attraction and retention
- 5) organisational reputation and image

The above-mentioned sub-factors relate either directly or indirectly to the core measurement group, that have been described by Norton and Kaplan (1996) to include: (1) market share; (2) customer retention; (3) customer acquisition; (4) customer satisfaction; and (4) customer profitability.



2.7.3.1 *Customer support*

A lack of understanding of customer needs provides competitors with a greater advantage. In order to achieve long-term strategic objectives, organisations need to understand customer requirements, needs, values and lifestyles in order to provide them with a suitable product and/or service (Wilder, Collier & Barnes, 2014). In addition, there is a need for appropriate investments in the correct tools that support customer needs. These include quicker incident handling, more effective customer websites and better feedback for improving products and/or services. In essence, improving problem resolution makes one's customers genuinely happy. The technology that is therefore adopted to support customer needs must provide comprehensive integrated solutions to the employee in such a manner that all information is precisely and easily accessible when dealing with a customer query (Shih, Lei, Klein & Yiang, 2014; Kay, 2003). One of the main drivers of organisational success is customer loyalty, which is usually linked to customer satisfaction. However, customer satisfaction is by no means a substitute for customer loyalty, which translates into repeat business and secured income. The use of automated problem resolution applications that can understand, classify, aggregate and report on interactions can eliminate human error and exploit website traffic (Kay, 2003). In addition to having appropriate technological tools that allow for easy access to precise and integrated information for both the employee dealing with customers as well as customers themselves, there is also the need to have the right experts, such as technical managers and engineers, at hand to tackle difficult queries (Shih et al, 2014; Kay, 2003). Such experts are better able to clarify doubts and satisfy the concerns of the customer (Jain, Sethi & Mukherji, 2009). This also involves a less bureaucratic approval process for information to be communicated to customers, either via electronic mail, telephone or the web. A study by Kay (2003) suggested that through the use of analytical tools, information can be obtained from web-based tools, that can be transformed into knowledge, which in turn can be used to further develop and/or enhance products and services, which has a powerful advantageous effect on the organisation, particularly in responding to customer-based opportunities.

Owing to constraints posed by the current economic climate, most organisations have to rely on technology in order to allow customers to access relevant content through a click of a button using a computer. An important tool for customers is an interactive website that empowers them with information and enables them to easily access assistance either from the organisation's support staff or each other (Shih et al, 2014; Kay, 2003). Given the fact that customers do not necessarily fully understand the organisation or its core business, the tools available to customers for accessing information must be effective in order to guide them through the process of acquiring the information they are looking for. This includes the provision of suggested terms, concepts and related subjects to explore (Kay, 2003). Hence the use of information and communication technologies has become increasingly popular (Kato & Schoenberg, 2014; Modiba & Koyze, 2012). Organisations such as Nokia and Siemens have advocated the use of information and communications technology to support economic and development growth (Modiba & Koyze, 2012). The use of such technology in South Africa has been geared towards assessing whether such technology can help alleviate some of the socioeconomic challenges the country faces.

In recent literature, the term "customer agility" has become increasingly prevalent, and alludes to the organisation's capabilities to sense and respond quickly to customer-based opportunities that allow for innovation and competitive advantage (Lee & Yang, 2014; Roberts & Grover, 2012). Information technology-based tools have been implicated in the development of novel products and services as well as the provision of end-user support in the online environment, thereby contributing to service enhancement. Such tools have also been able to enhance the organisation's ability to respond to market opportunities, which in turn can be linked to an organisation's competitive advantage (Roberts & Grover, 2012). Such IT infrastructure, which combines technical components and IT services, such as platforms, networks, telecommunications and software applications, can boost an organisation's ability to adeptly respond to environmental changes, which include customer demands and social relations. Organisations can use web-based tools to allow customers to generate, propose and refine ideas associated with new products and/or services. In addition, such tools (including analytical tools) can play a critical role in customer-based knowledge creation thereby improving the organisation's customer needs-sensing capability (Roberts & Grover, 2012). However, IT-based tools can only facilitate the relationship between the customer and the organisation, the onus is on employees to initiate a response to customer-based queries and opportunities. Effective customer service is therefore dependent on coordinated functions and processes in the organisation itself such that IT-based tools can effectively and timeously deliver concise and precise information to the employee addressing customer queries either telephonically or face to face (Lee & Yang, 2014; Roberts & Grover, 2012).

Such IT tools have been effectively utilised to exploit the potential of knowledge management, which has not only been implicated in increasing organisational agility, but has also played a fundamental role in the development of the customer-centric focused e-business wave of technology (Sinkovics & Kim, 2014; Du Plessis & Boon, 2004). By definition, e-business refers to using the web and other IT-based tools that allow for a single platform on which customers, vendors, suppliers, employees and other stakeholders can share information and knowledge (Du Plessis & Boon, 2004). The e-business sector commands a sound knowledge of its markets, customers, products and services, methods and processes, competitors, employee skills and competencies as well as the regulatory environment (Du Plessis & Boon, 2004). Hence the use of e-business, which is underpinned by knowledge management systems, has become essential to the survival of organisations. In addition, organisations that embrace e-business tools are able to do business seamlessly across the globe, which has led to an explosion of information and knowledge that can be easily accessed using the internet (Du Plessis & Boon, 2004). Customer relationship management in the global and digital economy has forced organisations to rethink the ways in which they build relationships with a broadened customer base. Knowledge management therefore plays a key role in building long-term and sustainable relations with such a customer base, particularly with regard to effectively and efficiently delivering products and services that support customer needs (Sinkovics & Kim, 2014; Sharma et al, 2014; Du Plessis & Boon, 2004).

In the South African context, market conditions differ from other countries particularly given its political and socioeconomic history. Few public sector organisations, if any, have therefore been able to adequately embrace technological tools that support customer needs. This includes South Africa's booming private sector that has optimally used such tools in the financial services, IT, professional services and telecoms sectors (Craffert, Ungerer, Visser, Morrison & Claassen, 2014; Du Plessis & Boon, 2004). The Airports Company South Africa (ACSA) and First National Bank (FNB) are two examples of companies that have been able to exploit the potential of e-business. By using IT-based tools linked to telephonic interactions, these companies have been able to fully provide customers with the support structures that are able to satisfy their customer needs effectively and efficiently, both in terms of cost and time (Storbacka & Pennanen, 2014). In the case of FNB, the introduction of constant innovative solutions has led to the title of "social banker" (Jordon, 2012). The organisation uses IT-based tools to build and reinforce ongoing relationships with both existing and potential customers, by keeping abreast of the constant evolution of technology platforms (Wilder et al, 2014). This philosophy has enabled FNB to provide the necessary structures required to meet customer needs with relevant and valuable information. The use of such tools, allows the organisation not only to address customer needs, but also to collect rich data about its customers and other

potential new markets, which in turn informs its marketing and communication strategies as well as the development of new products and/or services (Jordon, 2012).

In summary, the agility of an organisation helps with the continual reconfiguration of its ability to sense and shape opportunities and threats; respond to market opportunities; and maintain competitiveness through the enhancement, alignment and reconfiguration of its intangible and tangible resources (Lee & Yang, 2014; Roberts & Grover, 2012). In addition, the availability and accessibility of knowledge and the development of new technologies have been able to provide organisations with the added advantage of addressing as well as supporting the needs of the new genre of customers. Such customers are not only knowledgeable about their needs, but are also aware of what products and services can satisfy those needs (Du Plessis & Boon, 2004).



2.7.3.2 Organisational communication strategy to customers

Informing customers of what is going on inside an organisation is the key to building customer relationships, which essentially paves the way for financial revenue. Communication is usually deemed as the process of sending and receiving information or as a means of human socialisation (bin Haji, 2010). On a daily basis, communication, which entails knowledge transfer, occurs between employees and between employees and customers (Kay, 2003). Communication encounters therefore explain how and why relationships are constituted, developed and sustained over time (Hoang, 2011). In the organisational theory literature, organisational communication has been suggested to involve individuals both inside and outside the organisation with the objective of dealing with and solving problems (Miller, 2011). In addition, communication takes the form of not only interacting with customers using technological tools, but also using telephonic means and face-to-face interactions. Communication therefore is an integral part of customer relations management, which in turn links itself to customer loyalty, which supports organisational sustainability (Odhiambo et al, 2014). Communication has been shown to aid in increasing customer numbers, enhancing the level of customer satisfaction and supporting the process of value creation for both the customer and the organisation (Odhiambo et al, 2014).

Communication is therefore a connection between service employees and customers that helps to establish relationships as well as cement interactions and understanding between the two parties (Hoang, 2011). Organisations must therefore be able to communicate in a compelling manner in order to encourage loyalty and build long-term relationships (Godfrey, Seiders & Voss, 2011). One of the mechanisms supporting this objective is multichannel relational

communication, which can be defined as personalised communication with existing customers to remind them of needed services, announce new products and/or services, convey targeted promotional offers and assess customer satisfaction (Godfrey et al, 2011). One of the major drawbacks that has been encountered in the use of multichannel communication is the lack of understanding of the effects associated with implementing it, especially with regard to either positively or negatively influencing customer behaviour (Siegman & Feldstein, 2014). Communication is therefore important to an organisation's growth and it is essential that improvements and changes be made to the way communication and interactions with customers are done in order to better serve them (Hoang, 2011). Communication competence is a requirement for employees that interface with customers, and this interaction process may require employees to cope with problems, discourteous behaviour and negative service performance (Chen & Jaramillo, 2014; Hoang, 2011). Consequently, it can be assumed that the role of communication behaviours as exhibited by employees can affect the image and reputation of the organisation itself (Poovalingam & Veerasamy, 2007).

Communication, however, is not dependent on information that is presented to the customer via web and other IT-based tools, it also involves telephonic or face-to-face interactions. It has recently been found that the short messaging system (SMS) tends to be the favoured method of communication by organisations to customers, as well as electronic mail. Both these tools can deliver personalised information, communicate invoices, drive transactions, build relationship with customers and complement and support other channels of communication (Poovalingam & Veerasamy, 2007). Face-to-face communication, however, creates the opportunity for customers and service providers to establish a relationship and for customers to assess the quality of the service provided or product received (Hoang, 2011). It is therefore vital for organisations to set up an organisational programme of social norms, which prescribes the framework for employees to display their emotions in an appropriate manner when engaging with customers (Hoang, 2011).

Fundamental to the communication process is relationship marketing (Cornelisen, 2014; Poovalingam & Veerasamy, 2007). Relationship marketing can be defined as the process of establishing and maintaining mutually beneficial long-term relationships between organisations, employees, customers and stakeholders in a highly competitive environment (Poovalingam & Veerasamy, 2007). No organisation can function properly without an effective system of communication, not only with employees, customers and stakeholders, but also with the media and members of the public in general. Effective communication with the aforementioned groups has been implicated in building better relationships, saving time and money, more effective

decision-making and successful problem solving (Poovalingam & Veerasamy, 2007). Moreover, since employees create the first impression of the organisation, it is essential to have well-trained staff with the necessary communication skills to deal with customers effectively and efficiently (Cornelisen, 2014; Poovalingam & Veerasamy, 2007).

Closely linked to organisational communication is marketing, which is much more than merely developing, pricing and selling a good product. Marketing creates the platform for organisations to communicate with current and potential customers. Using the media as a marketing communication channel has the strength to attract both existing and new customers by providing either print or pictorial information. In addition, customers receive immediate information about product and service offerings, prices, the geographic location of stores and contact numbers (Rust & Huang, 2014; Poovalingam & Veerasamy, 2007). The interaction between customers and the organisation's relevant employees indicates that communication is a crucial part of the marketing and relationship-building process (Poovalingam & Veerasamy, 2007). For this reason organisations have to establish, maintain and manage complex marketing communication systems with customers and other stakeholders. It is imperative therefore for them to know what, to whom, how, when and where to communicate specific messages. Marketing communication is a process for managing customer relationships and building the organisation's image and reputation as well as creating and nurturing profitable relationships with customers and other stakeholders (Rust & Huang, 2014; Poovalingam & Veerasamy, 2007).

Because marketing communication is difficult to implement, it is essential that the organisational values and employee performance agreements focus on building relations with customers, regardless of the channel of communication. The primary focus is to satisfy customer needs in a manner that does not impact negatively on their feelings and emotions (Hoang, 2011). In the whole communication process, feedback plays a critical role as it represents a channel for customers to express their needs, perspectives or judgements of the organisation's activities and performance (Jannach, Zanker & Fuchs, 2014). Feedback allows organisations to learn how best to improve their services and products, which allows for an overall improvement in their effectiveness (Hoang, 2011). Positive engagement with organisations is deemed to influence customers to act as the organisation's brand ambassador by being proactive in word-of-mouth marketing. In such instances, satisfied customers tend to recommend the products and services of the organisation to their friends and relatives (Poovalingam & Veerasamy, 2007).

In developing countries, such as Vietnam, service quality and awareness of customer service are vital for both private and public sector organisations. However, while public sector organisations are slow in their progress towards improving customer communication, there have been big changes in terms of customer communication behaviours in the private sector (Hoang, 2011). In public sector organisations, there is a tendency to focus on satisfying the social and financial needs of citizens of a country (Denhardt & Catlaw, 2014). Hence public organisations function in a monopolistic system, which is fundamentally dependent on government and should therefore focus on using communication channels including technology more effectively in responding to service delivery and quality of services to its people (Loretan, 2011).

In the South African context, it has been found that an effective communication strategy is necessary to promote relationship marketing. This communication strategy must take into consideration the socioeconomic challenges the country faces – hence racial, gender and language sensitivity is imperative (Hamann & Papadopoulos, 2014). Given this context, South African organisations tend to adopt a wide range of communication methods, which include personal communication, such as direct sales (face-to-face contact), SMSes, post, personalised electronic mail and word-of-mouth behaviours (Hamann & Papadopoulos, 2014). Large-scale mass communication involves advertising using media channels such as billboards, print material, electronic marketing material and television and is usually utilised by large companies (Poovalingam & Veerasamy, 2007). However, marketing by South African organisations faces the challenge of addressing a wide divide between the socioeconomic groups. With the recent growth in the middle-income group, most organisations tend to provide customers with too much information via SMSs and electronic mail, which can be both a frustrating and challenging experience for the customer, such that organisations face the prospect of losing a loyal customer base (Hamann & Papadopoulos, 2014). In a study by Poovalingam and Veerasamy (2007), it has been suggested that South African customers favour friendly, efficient, effective and well-trained staff who can deal with their challenges, technical and emergency problems while still ensuring that the customer's privacy is protected. Trust therefore plays a key role in ensuring customer loyalty in the South African context. This trust is built on the basis of an effective communication strategy in which organisations inform customers of short-, medium- and long-term plans, new developments and any fundamental changes.

In summary, communication is believed to directly affect the building of long-term relationships with both internal and external stakeholders (Poovalingam & Veerasamy, 2007). It has the capacity to build long-term and sustainable relationships between an organisation and its customers. Communication is therefore the core of an organisation's success and its

effectiveness, if it is implemented and managed effectively and within the framework of a set of values or norms that embrace the organisation's set of values and philosophy (Hamann & Papadopoulos, 2014).

2.7.3.3 Customer service and satisfaction

Delivering value to customers has become the priority goal for most organisations. Service, for any organisation, underpins customer satisfaction, which in turn impacts on the organisation's goals and profit margins (Ford, Paparoidamis & Chumpitaz, 2015; Ming-Chieh, Lee & Shun-Yu, 2012). Customer service is thus a communication process, in which an employee presents a service or product in exchange for revenue to the organisation (Hoang, 2011). The communication that transpires between the employee and the customer plays a critical role in fostering relationships and customer retention. Customer service is closely linked to the concepts of marketing, economics, management, psychology and communication-based research (Akin & Demirel, 2011).

It has also been suggested that customers will procure services and products from a company that is perceived to offer the highest customer-delivered value. Customer satisfaction can be defined as the overall feelings or attitudes that customers have after products have been purchased and tested in their daily lives (Picón, Castro & Roldán, 2014; Akin & Demirel, 2011). In addition, it has been suggested that underpinning any sense of loyalty to the organisation are factors such as trust and communication (Akin & Demirel, 2011). A satisfied customer base is the cornerstone for building the organisation's image and reputation as well as customer attraction, retention and loyalty (Picón et al, 2014; Akin & Demirel, 2011).

Understanding the perception of customers involves interacting and communicating with them to enquire whether they are satisfied or have unspoken complaints (Jannach et al, 2014; Poovalingam & Veerasamy, 2007). Such feedback affords the organisation an opportunity to better its services and enhance its product offerings at the next opportunity. If, on the second interaction with the organisation, the customer has a better service experience than at the initial interaction, and this service experience continues at the same level, then this creates a learning platform from which the opportunity for customer loyalty increases (Poovalingam & Veerasamy, 2007). Some of the key requirements associated with improved customer service include a welcoming greeting and friendly interaction with customers, protecting their privacy, inviting dialogue by making contact numbers and electronic mail addresses available and being sensitive to their time (Poovalingam & Veerasamy, 2007). In respecting the customer's time, the use of technological tools allows the organisation to interact with a wide range of customers

electronically and streamline as well as automate its manual processes for ensuring speedy interactions with customers (Poovalingam & Veerasamy, 2007). Another factor influencing customer service is the response time by organisational employees to technical queries and challenges faced by customers. Having a quick turnaround time for assisting customers, particularly in cases of emergency and/or technical challenges with products and/or services, contributes to both the perceived image and reputation of the organisation as well as loyalty (Azad, Roshan & Hozouri, 2014; Lin et al, 2014; Poovalingam & Veerasamy, 2007).

In such instances, the use of word-of-mouth marketing becomes a powerful tool. However, the challenge that organisations face is to ensure that there is a positive impact on the end result – that is, influencing customer buying behaviour to the advantage of the organisation (Groeger & Buttle, 2014; Akin & Demirel, 2011). Using marketing tools, which were discussed in the section above, consumes a large portion of the organisation's budget and has often been implicated as an ingredient in the success of its product and/or service offerings (Akin & Demirel, 2011). The use of such marketing tools in today's environment, which is inundated with commercial marketing messages, can contribute towards consumers building a resistance to the company's brand as well as its product and/or service offerings (Akin & Demirel, 2011). It is therefore essential to adhere to understanding, respecting and addressing the needs of one's customer base by communicating, interacting and engaging with customers. Furthermore, organisations need to be able to determine the factors that influence and satisfy the attitudes of their customer base. According to the literature, such factors include the following:

- 1) *Commitment and communication.* Both the organisation and the customer should be dedicated to the relationship, which in turn may involve uncovering and solving key points of dissatisfaction. This makes for a more durable relationship in the long-term (De Beer, 2014; Human & Naudé, 2014; Akin & Demirel, 2011).
- 2) *Analysing inter-relationships.* This is necessary to determine and solve the communication and other trust problems that may exist in the organisation-customer relationship (Akin & Demirel, 2011; Azad et al, 2014).
- 3) *Value and image.* The relationship is based on values, ethics, mutual trust and coherence. Value is also related to the image and reputation of the organisation, which is important for both building and sustaining the relationship (Akin & Demirel, 2011; Azad et al, 2014).
- 4) *People and processes.* These play a key role in relationship management. While people form the social construction of a relationship, processes form the basis for the interaction between the organisation's employees and the customer. People drive the supply and

demand processes of an organisation, which includes processes, service, value and products (Akin & Demirel, 2011; Azad et al, 2014).

- 5) *Networks*. Networks must be carefully planned, and the combination of such networks improves the relationship between organisations and customers (Akin & Demirel, 2011; Azad et al, 2014).
- 6) *Quality*. This is the basis for the interaction between the customer and the organisation with particular emphasis on product and service inequality (Human & Naudé, 2014; Akin & Demirel, 2011).

From the discussion of the above-mentioned factors, one can deduce that customer satisfaction and loyalty are essential to the survival and success of organisations in the public sector. It is only recently that public sector organisations have come on board in the realisation that customers play a vital role in delivering services that are both effective and efficient (Denhardt & Catlaw, 2014; Beevers, 2006). Some of the challenges facing the public sector include service delivery at local and national government levels, dialogue with citizens and strong political and managerial leadership (Beevers, 2006). In addition, there must be a blend of competent people, processes and technology that are geared towards developing a citizen or customer-centric organisation. In a study by Poovalingam and Veerasamy (2007), it appears that in multicultural and diverse countries such as South Africa, customers appreciate well-trained and knowledgeable staff who ensure that relationships are maintained and that privacy is ensured. In addition, organisations such as cell phone companies should institutionalise privacy policy services to reassure customers of the company's intentions (Azad et al, 2014; Lin et al, 2014; Poovalingam & Veerasamy, 2007). A recent consumer satisfaction survey indicated that Vodacom, First National Bank and Sanlam were voted the top customer support and service companies by the South African consumer market (SouthAfrica.info reporter, 2011). This survey was conducted by the South African Satisfaction Index, in partnership with the Department of Trade and Industry, in 2012. Amongst the 27 critical drivers that formed the basis of the measurable consumer satisfaction index, were criteria such as the quality and efficiency of staff, the general attitude of staff and whether or not customers were kept informed of the latest trends and news updates (SouthAfrica.info reporter, 2011).

In summary, customer satisfaction is primarily based on the establishment of sustainable, satisfied relationships with customers, in which the organisation is aware of the evolving expectations of its customers. Underpinning customer satisfaction is the quality of the communication of the organisation's employees as well as the delivery of appropriately priced

quality products and services, which are dependent on the use of up-to-date-technology in driving organisational processes such as payment options.

2.7.3.4 Customer attraction and retention

One of the key drivers for influencing market activity and sparking an explosion of unlimited opportunities for attracting and retaining customers is e-business (Lin et al, 2014; Du Plessis & Boon, 2004). Marketing campaigns focus resources on customer attraction and retention, both of which are geared towards the organisation's long-term profitability (Godfrey et al, 2011). Such campaigns have exploited the internet and other IT-based tools to tap into world markets. The behaviour and interaction of employees with customers should elicit positive emotions and feelings in customers, which are essential to building customer loyalty and ensuring the survival of profitable organisations (Hoang, 2011). Customers satisfied with the service obtained from the organisation, lead to a durability of the relationship between the organisation and the customer (De Beer, 2014; Jannach et al, 2014).

In attracting customers, organisations tend to showcase and demonstrate high-quality products and an offering of excellent service support (Brandt, 2014). However, if customers are unaware of product and service offerings, they will not be able to react accordingly (Akin & Demirel, 2011). Communication is therefore imperative in order to inform and persuade potential customers of the benefits of entering into a transactional relationship with the organisation (Cornelisen, 2014a). The use of mass communication is able to reach a big audience fast and is therefore cost effective. In addition, mass communication aims to improve the organisation's image as well as persuade customers and potential customers that the organisation is both trustworthy and benevolent (Portman, Yosef, Moretzky & Frenkel, 2014; Akin & Demirel, 2011). However, feedback time is low, and measuring its effectiveness is difficult. In addition, customers may become resistant to such efforts owing to over-exposure to mass propaganda (Akin & Demirel, 2011). In addition, the challenge the organisation faces in terms of attracting new customers is that modern customers are better informed and are more sceptical of marketing information. Modern customers are also more inclined to seek out information from sources they trust, from online resources to people they know. Hence there is a need to ensure that customers are exposed to more accurate, personal and reliable information and communication (Akin & Demirel, 2011). Playing a key role here, are the employees in an organisation who are ultimately responsible for ensuring that customers are satisfied and comfortable during the transactional process (Ming-Chieh et al, 2012). The quality of services rendered by these employees is linked to customer satisfaction levels, which in turn increase

the emotional connection of the customer to the organisation and influence their willingness to return to the organisation (Human & Naudé, 2014; Ming-Chieh et al, 2012).

Quality of service is a subjective feeling for customers that have had a specific service experience or purchased a specific product, which can be attributed largely to an emotion-based experience or encounter (Ming-Chieh et al, 2012). Understanding emotions and emotional management have therefore become focal points for recent research projects, and research has indicated that they play a vital role in the life of the organisation, especially with regard to organisational employees engaging with one another and with customers (Poovalingam & Veerasamy, 2007). It has been suggested in the literature that employees need to be trained in dealing with difficult situations and customers in particular, and trained in the rules regarding what emotions are suitable to display when interacting with customers, all of which aligns to the organisation's vision and philosophy (Hoang, 2011). Such service and communication has been implicated in the enhancement of service quality, customer satisfaction and the development of sustainable customer-employee relationships (Chen & Jaramillo, 2014). In addition, positive emotions are contagious, and if employees display these positive emotions, the mood of customers improves, which in turn leads to customer service improvement and customer satisfaction, which have the ability to ensure customer loyalty (Chen & Jaramillo, 2014; Poovalingam & Veerasamy, 2007).



Forming the basis for customer satisfaction are employees, who need to be trained and developed in order to deliver quality services to the customer (Ming-Chieh et al, 2012). This translates into customer retention and profits for the organisation. The research findings of Ming-Chieh et al (2011) have indicated that there is a positive correlation between service quality and repeat business. Organisations therefore need to invest appropriately in training their employees, particularly service personnel. Incorporated in the training programmes for employees should be modules for better communication and improved conversation skills especially when dealing with customer complaints. In addition, there must be customer opinions in terms of evaluating the efficacy of the training programme and steps for improving techniques and processes during the translational interaction (Chen & Jaramillo, 2014; Jannach et al, 2014; Ming-Chieh et al, 2012).

Organisations can maintain and enhance relationships by treating customers fairly and offering quality products and services, which in turn influence customer loyalty. Loyalty is often seen as a biased, repeat-purchase behaviour by the customer. The attitudinal definition of loyalty implies that such behaviour is actually a reference to a state of mind (Human & Naudé, 2014;

Poovalingam & Veerasamy, 2007). Customers tend to be loyal if they have a positive preferential attitude towards their own behaviour. Any organisation wanting to increase loyalty, particularly in attitudinal terms, must focus efforts and investments towards improving products, services, its image and the overall customer experience (Hoang, 2011). The challenge organisations face, is that they tend to focus on attracting new customers after securing a customer's order and fail to understand the importance of maintaining and enhancing their relationships with current customers and securing repeat business (Poovalingam & Veerasamy, 2007). Developing customer loyalty requires organisations to provide customers with a reason to remain loyal, especially since some customers are fully loyal while others are less so (Poovalingam & Veerasamy, 2007). Underpinning this relationship is trust – in order for customers to trust in a specific organisation, there must be confidence in the organisation's ability and willingness to keep its promises (Ford et al, 2015). Similar to trust is customer commitment, which relates to the belief that the customer-organisation relationship is significant enough to warrant maximum effort in ensuring that the relationship is sustainably maintained (Poovalingam & Veerasamy, 2007). Commitment and trust have been suggested to influence positive cooperative behaviours that are conducive to the formation and sustainability of long-term customer relationships (Ford et al, 2015).

In the South African context, organisations in the cellular industry have been able to manage this challenge well (Ezeuduji, Lete, Correia, et al, 2014; Poovalingam & Veerasamy, 2007). The cell phone industry has managed to bridge the socioeconomic divide in the country and has successfully managed to sell products in high-end stores and address the demands of employees at mega corporations, while simultaneously being able to sell the same products in township bazaars and address the needs of grandmothers in rural communities. In the banking sector, for example, attracting and retaining customers depend largely on the use of technology to enhance their experiences (Anani, 2010). This includes the use of relationship management and electronic tools for enhancing the customer banking experience. In essence, South African organisations need to continually embrace international trends, customer relationship principles and technological advancements in order to attract and retain a loyal customer base (Odhiambo et al, 2014; Anani, 2010).

Finally, in summarising this subfactor, companies seeking to grow their business focus on broadening their customer bases (De Beer 2014). In addition, retaining customers is driven by the organisation's ability to meet and satisfy customer needs. Modern organisations need to effectively communicate with their customers, embrace feedback, technology, investments in developing and training employees to deliver better quality services and also work towards

enhancing trust with their customers. The use of relationship marketing is therefore critical in not only attracting customers, but also retaining them, which is more economically feasible than attracting new customers (De Beer, 2014; Jain et al, 2009). The retention of customers is part of the new wave of thinking in that a loyal customer base has been recognised as enhancing the sustainability of the organisation as well as securing future revenues and growth. However, this is dependent on service encounters being consistently delivered at the same level of quality (Human & Naudé, 2014; Jain et al, 2009).

2.7.3.5 Organisational image and reputation

A solid reputation increases the chances of acquiring new customers and retaining existing ones. The following three concepts play a key role in an organisation's image: corporate identity, organisational reputation and organisational image, all of which focus on the organisation's intangible assets (Balmer, 2014). Corporate identity refers to the words and symbols an organisation uses to set itself apart from other organisations. Identity is considered to be shaped by the organisation's vision, mission, structures, processes, climate, credibility and behaviours (Akin & Demirel, 2011). However, organisational image is determined not by the organisation, but by the perceptions as well as impressions of multiple audiences of the human and physical resources of the organisation, including employees' behaviours and attitudes, communication styles, the organisation's value system, its environmental policy and the quality of products and services (Balmer, 2014; Akin & Demirel, 2011). Finally, the organisation's reputation is deemed to have greater stability in the eyes of customers as well as other stakeholders, and this reputation is developed as more information is obtained over a longer period of time about the organisation (Akin & Demirel, 2011). The perceptions of those external to the organisation can be surmised as the sum of a number of characteristics, which include credibility, reliability and trustworthiness, to name a few that are associated with the organisation itself. Such perceptions are based on three dimensions, namely beliefs, emotions and behaviour. However, not all stakeholders and customers have the same set of beliefs, emotions and behavioural responses to a single organisation (Akin & Demirel, 2011; Bahrami, Samadi & Sohrabi, 2014). Usually there are six descriptors for articulating the image of an organisation, and these include the following:

- 1) Dynamic, which refers to an organisation being a pioneer, goal-oriented, proactive and attention getting.
- 2) Cooperative, which involves an organisation being friendly, well liked and recognised for being eager to please.

- 3) Business-focused, which means that the organisation is perceived to be wise, shrewd, persuasive and well organised.
- 4) Character-oriented, which means that the organisation reflects and lives ethical, reputable and respectable characteristics.
- 5) Successful, which means that the organisation demonstrates both financial performance and self-confidence to its stakeholders.
- 6) Withdrawn, which is used to describe an organisation that is perceived to be aloof, secretive and cautious (Balmer, 2014; Bahrami et al, 2014; Akin & Demirel, 2011).

Regardless of an organisation wanting to proactively pursue a specific image with its stakeholders and customers, all behaviours associated with it, impact on its communication and its image (Foroudi, Melewar & Gupta, 2014). The image of the organisation is therefore a public reality and may not necessarily reflect its profile. The factors influencing the organisation's image thus include its corporate image, marketing and communication activities, shared values, internal and interpersonal communications, employees' image, and the customer's previous experiences (Akin & Demirel, 2011).

However, there are instances when an organisation may suffer from the following (Argenti, 2014; Balmer, 2014; Hristache, Paicu & Ismail, 2014; Akin & Demirel, 2011):

- 1) poor labour relations
- 2) under-capitalisation of public relations
- 3) failures associated with research and development programmes
- 4) product and/or service flaws that have resulted in hazardous outcomes
- 5) financial controls that have been breached
- 6) pricing structures that have proven inadequate in the market

In any of the above-mentioned instances, any marketing campaign thereafter, that does not directly address the exact cause of the problem, may impact negatively on the virtues, reputation and image of the organisation as a whole (Akin & Demirel, 2011). Of the various entities of the organisation that may suffer negatively from such tactical challenges, the impact on reputation can be deemed the most detrimental. This is because of the organisation's reputation being associated with a set of values that are evoked by the customer or stakeholder when considering the image and identity of the organisation itself (Argenti, 2014; Akin & Demirel, 2011). Hence communication tends to play a key role in bridging the gap between

stakeholders' and customers' perception of the organisation with the image and reputation that the organisation wants to project (Akin & Demirel, 2011).

Again, as seen across the other subfactors in the customer perspective, there is a tendency to move towards communication, which has been linked to strongly influencing the customer's perceptions of the organisation (Jain et al, 2009). In public sector organisations, there is a drive to enforce national regulations, policies and strategies (McDonnell, King & Soule, 2014; Luoma-Aho, 2008). The reputation of public sector organisations is not formed by avid market campaigns, but on the basis of stakeholder assessment and opinions of the competence and trustworthiness of such organisations (Luoma-Aho, 2008). However, the image and reputation of such organisations impacts on the organisation's stability, profit, performance and employee loyalty, which all, in turn, impact on the organisation being able to effectively address financial and other external pressures (McDonnell et al, 2014; Luoma-Aho, 2008).

In the case of Toyota, a number of challenges were encountered that impacted on the organisation's risk exposure (Kello, 2010). The turbulent times commenced with the driver's floor mat that interfered with the function of the accelerator. This was compounded by the problem with the accelerator, which could not be over-ridden with the vehicle's braking system. These challenges, which were encountered across several vehicle models, inadvertently led to the death of several customers around the world (Kello, 2010). Consequently, Toyota recalled millions of vehicles and shut down sales in the affected vehicle models for an unspecified period of time. Toyota management were slow to respond to the pressures of the press and media and the statement that was released indicated that as a company, Toyota had grown too rapidly in its pursuit of market dominance and as a consequence there was a cost to both quality and safety (Kello, 2010). The key lessons learnt from this case, were as follows:

- 1) The environment in which organisations compete is fraught with turbulence, and this includes a rapidly evolving external environment in which there are, inter alia, changes to customer's expectations, relationships with suppliers, competitors' products and services, government regulations and labour agreements. In such instances, complacency cannot dominate, as it will merely invite the extinction of the organisation (Mason, 2014; Kello, 2010).
- 2) Image and reputation in the marketplace are central to the organisation's success and must be protected at all costs. Any organisation that is known for its quality, its culture for continuous improvement and the durability and safety of its products must be quick and

efficient when acting against anything that tarnishes its image and reputation (Human & Naudé, 2014; Kello, 2010).

- 3) Organisations need to include risk management plans and ensure that crisis management is adequately addressed. This entails adopting measures quickly that focus on fixing the problem while simultaneously addressing public relations issues in a manner that is neither haphazardous nor slow (Balmer, 2014; Kello, 2010).
- 4) Organisations need to have active and accurate mechanisms of risk management, including early warning systems to be able to capture and isolate errors that could lead to catastrophic consequences. In addition, they must be cautious when presenting an image of concern, regret and hope following a major crisis, as this is when public relations must form part of a crisis management protocol (Lizarzaburu, 2014; Kello, 2010).

Drawing from the literature, it appears that regardless of the nature of the organisation, image and reputation are fundamentally important in terms of safeguarding the organisation. A solid reputation is linked to effective organisations, but this does not mean that they can then become complacent in terms of continually enhancing their effectiveness by ensuring that quality standards are afforded across their business units from product to service offerings.

2.7.3.6 Summary of customer perspective

In summary, the customer perspective is fundamentally important for the survival and prosperity of any organisation, and communication plays a key role in addressing each of the subfactors associated with this perspective. It is therefore imperative for an organisation to embrace customer intelligence technologies such as e-business tools and other IT-related knowledge management systems that impact on the economy, social structures and culture of society today (Ford et al, 2015; Lin et al, 2014; Du Plessis & Boon, 2004). Such tools drive the establishment of strong relationships with customers to ensure both organisational effectiveness and sustainability in the long-term. In essence, engaging with the customer, from developing effective communication channels, including marketing techniques and establishing customer-service and satisfaction strategies and building a strong brand through the organisation's image and reputation collectively impact on both attracting and retaining customers and satisfying their needs. The customer perspective therefore forms a vital pillar in driving organisational effectiveness.

2.7.4 Organisational financial perspective

The fourth perspective of the balanced scorecard focuses on the financial health of the organisation. The financial perspective serves as a focal point for all the other perspectives in the balanced scorecard (Norton & Kaplan, 2000). As such, the timely and accurate reporting of financial data has always been and will always be a priority for any organisation measuring its effectiveness. With the implementation of organisational databases, there is a move towards processing financial data from an automated and centralised point of reference. In this perspective, there is perhaps a need to include additional financial-related data, such as risk assessment and cost-benefit data (Jeston & Nelis, 2014; Dodor et al, 2009). The following subfactors are closely associated with the financial perspective (Waheed et al, 2011):

- 1) good governance
- 2) ability to acquire resources
- 3) organisational productivity
- 4) return on investment
- 5) risk management

The above-mentioned sub-factors relate either directly or indirectly to Norton and Kaplan's themes of: (1) increasing revenue; (2) improving cost and productivity; (3) enhancing asset utilisation; and (4) reducing risk (Norton & Kaplan, 1996). When looking at the financial perspective, the following three growth phases of an organisation will be referred to: (1) the growth phase, which involves the early stages of the organisation's life; (2) the sustained phase, where organisations attract and reinvest capital in order to obtain higher returns; and (3) the harvesting phase, which refers to the mature stage of the organisation's life cycle in which it reaps the returns from the previous two phases (Norton & Kaplan, 1996).

2.7.4.1 Good governance

The concept of governance refers to the process of decision-making and the process by which decisions are implemented (United Nations Economic and Social Commission for Asia and the Pacific, 2012). Transparency, accountability, disclosure, capacity, economy, effectiveness and efficiency are all linked to the concept of governance (Bhimani, 2009). Government is one of the actors in the management of good governance practices, and other actors include bodies such as the World Bank and the OECD (Best, 2014; Clark & Pal, 2014). Good governance has been described as having the following eight characteristics: participatory, transparent, accountable, responsive, consensus-oriented, effective, efficient, law-abiding, equitable and

inclusive (United Nations Economic and Social Commission for Asia and the Pacific, 2012). In public sector organisations and entities, good governance ensures that corruption is minimised; the views of minorities are taken into account; the voices of the most vulnerable in society are heard in decision-making processes; and the present and future needs of society are considered and addressed (Best, 2014; Clark & Pal, 2014; United Nations Economic and Social Commission for Asia and the Pacific, 2012).



Of the characteristics that refer to good governance, participation involves freedom of association and expression, on the one hand, and an organised system, on the other (Auger, 2014). Transparency is associated with the enforcement of rules and regulations in the decision-making process as well as the provision of information to the general public. The characteristic of accountability ensures that organisations are accountable to both public and institutional stakeholders and this characteristic cannot be enforced without transparency and abiding by the rule of the law (Auger, 2014; Zyl, 2014; United Nations Economic and Social Commission for Asia and the Pacific, 2012). Responsiveness refers to organisations adopting processes that serve all stakeholders within a reasonable timeframe. In addition, there is a need to focus on reaching consensus in pursuing the best interests of customers and stakeholders (Wellens & Jegers, 2014). In doing so, organisations must be able to produce results that effectively and efficiently meet the needs of customers and stakeholders while making the best use of resources at their disposal (Wellens & Jegers, 2014). While undertaking such efforts, organisations must operate within a fair and legal framework that is full enforced to protect human rights and those of minorities. Finally, good governance displays the characteristic of equity and inclusiveness in which individuals do not feel excluded and even the most vulnerable have the opportunity to voice their opinions (United Nations Economic and Social Commission for Asia and the Pacific, 2012).

One of the driving forces in shaping the financial processes and internal audits in an organisation are principles and codes of good governance that are monitored and evaluated by a board comprised of investors and key stakeholders (Aguilera & Cuervo-Cazurra, 2009). Such practices are warranted in order to address the pressing issues of corporate accountability and disclosure. Codes of governance refer to the set of best practices regarding the behaviour and structure of the organisation, as monitored and approved by a board of directors (Ayuso, Rodríguez, García-Castro & Ariño, 2014). These boards of directors are bound by fiduciary duty to legally and ethically act in the best interests of the organisation and its resources (Aguilera & Cuervo-Cazurra, 2009). This fiduciary relationship is based on faith, trust and confidence. Since 1978, when the USA issued the first set of governance codes, they have become rapidly

adopted across numerous countries and have been marked by paralleled increases in academic journals (Filatotchev & Nakajima, 2014). The spread of the codes around the world, has been encouraged by entities such as the World Bank and the OECD with the objective of ensuring nations adopt good governance practices (Aguilera & Cuervo-Cazurra, 2009). The World Bank has specifically taken an active role in promoting good governance around the world, especially in terms of assisting developing countries evaluate their current governance practices and upgrade them to international standards. By collaborating with partners such as the International Monetary Fund, the World Bank has issued an evaluation mechanism in the form of the "Report on the Observance of Standards and Codes" to evaluate the corporate governance practices prevalent in specific countries against the OECD Principles for Corporate Governance (Best, 2014; Clark & Pal, 2014; Aguilera, Cuervo-Cazurra, 2009). The best practices proposed by organisations such as the World Bank, appear to facilitate the increasing confluence of governance systems towards the shareholder value model, which is geared towards regulating markets and protecting investors. This is due to increasing external forces such as globalisation, market liberalisation and the emergence of powerful foreign investors (Aguilera & Cuervo-Cazurra, 2009). However, not all countries strictly adhere to the best practices proposed by the World Bank. Japan as an example, has customised its governance practices in order to address its specific circumstances especially because of pressures from foreign capital and product markets (Milly, 2014). As a consequence, as much as Japan moves away from the shareholder's value model, it also adheres to most of its core principles (Aguilera & Cuervo-Cazurra, 2009). This can be seen in the governance codes adopted by Toyota, Honda and Canon that not only adhere to the core principles of good governance, but also afford due respect and recognition to the environment in which they operate as well as the stock markets (Aguilera & Cuervo-Cazurra, 2009).

Organisations therefore tend to adopt codes of good governance at varying degrees. However, the decision to adopt codes of conduct does not automatically guarantee effective compliance with good governance (Lawton & Macaulay, 2014; Aguilera & Cuervo-Cazurra, 2009). In such instances, an organisation's investors tend to rely on financial performance, that is, investors tend to be more tolerant of noncompliance with codes of good governance if there is a greater degree of enhanced financial return (Aguilera & Cuervo-Cazurra, 2009). In Germany, for example, organisational size is positively correlated with a higher level of compliance with good governance (Laes, Gorissen & Nevens, 2014). The challenge, however, is that the German code of governance includes to some degree controversial and debatable recommendations that are not always adhered to by the majority of German organisations (Milly, 2014; Aguilera & Cuervo-Cazurra, 2009). In developing countries, however, there is negligible or hardly any

compliance with codes of governance. In a country such as Cyprus, which is plagued by weak capital markets, legal support and a low degree of free-market control, there are additional hurdles such as highly concentrated ownership and unreliable information flows (Aguilera & Cuervo-Cazurra, 2009). In other countries such as the USA, UK and Australia, research has indicated that independent, knowledgeable directors on an organisation's governance board play a critical role in monitoring performance, the organisation's market value, earnings, management and compliance with governance codes. It is therefore proposed that compliance with codes of good governance generally appears to have a positive association with measures of organisational effectiveness and performance (Aguilera & Cuervo-Cazurra, 2009). In South Africa, the King Report on Corporate Governance was issued by the King Committee on Corporate Governance in 1994 (Marx & Mohammadali-Haji, 2014). Since its launch, three reports have been issued: King I in 1994, King II in 2002, and King III in 2009 (McGee, 2010). Compliance with the King Report is a requirement for organisations listed on the Johannesburg Stock Exchange (Andreasson, 2011). In the governance literature, the King Report has been reviewed as one of the most effective summaries of best international practices in corporate governance. Although it is a nonlegislative code, the King Report advocates leadership, sustainability and good corporate citizenship (Marx & Mohammadali-Haji, 2014; Andreasson, 2011). The report essentially perceives good governance as effective, ethical leadership that steers an organisation towards sustainable, economic, social and environmental performance (McGee, 2010).

Codes of good governance have therefore become a central issue in policy as well as public institutions, including academia (Akintobi, Dawood & Blumenthal, 2014). However, the codes issued in different countries, propose different recommendations and the comparison and effectiveness of these codes therefore face numerous challenges (Aguilera & Cuervo-Cazurra, 2009). This challenge is compounded by the codes of governance issued by different national entities, which may include government departments, investors, the national stock exchange or professional associations such as those affiliated with directors or employees (Aguilera & Cuervo-Cazurra, 2009). Governments and national stock exchanges have the power to impose practices and penalties on companies as well as public trading organisations, respectively (Akintobi et al, 2014). What is lacking in the literature is the effect of codes being passed by the different issuing bodies on content and enforceability.

2.7.4.2 Ability to acquire resources

The ability of an organisation to acquire resources refers in particular to sales growth rates and market share for targeted regions, markets and customers (Norton & Kaplan, 2000). During the

growth stage of organisations, there is a tendency for them to expand existing product offerings and introduce new products and services. The efficacy of new product and service offerings can be linked to the percentage revenue that is acquired from them over a specific period of time (Norton & Kaplan 2000). The challenge organisations face is that the new product and service offerings must reflect an improvement from the previous offerings, such that the organisation can tap into new customers and markets, in addition to securing its current customer base (Norton & Kaplan, 2000). Integrally linked to the management of resources is the concept of supply chain management, which includes all the activities that facilitate obtaining the right product or service on time, within budget and scope and with the correct quality standards in place (Heizer & Render, 2014; Meindl & Chopra, 2006). This concept is discussed in detail in the literature (see Heizer & Render, 2014; Meindl & Chopra, 2006).

In the sustained phase, organisations need to find easier ways to grow revenues out of existing products, and one of the most cost-effective solutions stems from expanding the applications that benefit from specific product and service offerings (Dager, 2014). This applies specifically to the pharmaceutical and agricultural chemicals sectors, where there is a lengthy government regulatory approval process and a long development time (Norton & Kaplan, 2000). The benefits of expanding the application base for existing products and services implies that there are no additional costs associated with the research and development, safety, manufacturing and piloting phases (Norton & Kaplan, 2000). An alternative route for revenue growth is that of taking existing product and service offerings to new customers and markets. The metrics to assess the impact of such initiatives include the percentage of sales in new applications, new customers, market segments and geographic locations (Norton & Kaplan, 2000). Some organisations even attempt to build synergies between their different business units, such that they are better able to develop new products or sell products and services to customers (Dager, 2014). This type of synergy is able to not only increase technology transfer between business units, but also to increase sales to customers from multiple business units in the same organisation, and can be measured as the amount of revenue generated from cooperative relationships across multiple business units (Norton & Kaplan, 2000). In the sustained phase, some organisations choose to increase revenue by shifting the products and services mix, in order to push for lower prices and lure customers away from competitors. However, an organisation may choose to be more differentiated in its strategy and move towards premium-priced products and services (Norton & Kaplan, 2000). Such interventions would need to be measured according to growth in sales or percentage of total sales in the premium segment respectively.

In the harvesting phase, revenue growth can transpire by raising the prices of existing products and services (Bowman, 2014; Froelich, 1999). The profitability of products and services can be measured by how much revenue is accrued from each of the offerings, and unprofitable products and services mark the signal for repricing or removing such offerings to the customer (Norton & Kaplan, 2000). Some organisations have found that specialised, niche products or particularly demanding customers can be charged at an increased rate per unit without losing market share to cover the costs of unprofitable products and services (Norton & Kaplan, 2000).

Given this context, it appears that revenue diversification is a key element of success for organisational effectiveness. This applies not only to private organisations, but also to public sector entities (Bowman, 2014; Carroll & Stater, 2009). Public organisations in particular need to focus on reducing revenue volatility through diversification by equalising their reliance on earned income, investments and contributions (Wang, 2014). Organisations that have multiple revenue streams in the form of grants, government subsidies and donations, tend to have increased financial stability (Carroll & Stater, 2009). This ability of organisations to acquire and maintain resources is linked to the resource dependency theory. This, particularly applies to organisations in the public sector, who are dependent on resources from their environments, specifically government (Carroll & Stater, 2009). The challenge faced by such organisations is that if there are various streams of income, then there are higher administrative costs. This in turn may be compounded by the implementation of several similar mechanisms of support to the general public, each of which would require meeting specific objectives and goals as defined by the donor (Wang, 2014).

In a country like South Africa, which is plagued by economic and social disparities, organisations are able to tap into a wide variety of markets (Mokoto, 2009). The majority of the South African population are considered to be from a low-income background, which has historically been underserved (Deegan, 2014). This has led to numerous service delivery protests aimed at government departments. However, it appears that South African organisations themselves have had limited success in addressing the demands of low-income groups in the country (Mokoto, 2009). One organisation has been able to span the living standard measure groups and adequately address each group's demands. Shoprite Holdings Ltd is the largest food retailer in the country and on the African continent, with a turnover in 2011 of R83 billion by operating 1 303 corporate and 427 franchise outlets in 16 countries whilst employing 95 000 people (Basson, 2012). The success of this organisation can be linked to a diverse portfolio of products and services to a number of different socioeconomic groups. These product offerings include the money market concept, which allows for a number of services to

be supported, from payments for utility bills, bus and airline tickets to insurance policies, tickets for major events through Computicket as well as money transfers, phone cards, postage stamps and lottery tickets (Basson, 2012). These product offerings are over and above Shoprite Holdings offering a pharmacy, fresh produce and other food-related products, liquor, clothing and footwear services, electronics and home improvement centres, including furniture and gardening solutions to the community at low prices (Basson, 2012). Underpinning the success of Shoprite Holdings is the strong focus on corporate social responsibility activities, which ranges from building schools and planting trees to hosting awards ceremonies that pay tributes to amazing women in various socioeconomic categories (Morris, Miyasaki, Watters & Coombs, 2006). This demonstrates that the ability to acquire resources does not necessarily mean limiting product offerings to specific target markets, but broadening the organisation's product portfolio to a wider target audience in order to ensure organisational effectiveness, success and sustainability (Wang, 2014).

In conclusion, the ability to acquire resources underpins the performance of any organisation, either private or public. Strong leadership and financial controls are essential for the acquisition and management of resources in an organisation. Playing a key role in the acquisition process is a sound business strategy on how additional resources will be used to enhance the performance of the organisation as well as contribute to improving social responsibility within organisations.



2.7.4.3 Organisational productivity

Organisational productivity refers to the ability of an organisation to allocate, manage and utilise resources effectively with the objective of improving its financial performance (Norton & Kaplan, 2000). Underpinning productivity is the effective and efficient management of overhead and human resource costs (Ahmed, Leggett & Rahman, 2014; Karimi, Chaghoeue & Hamidpour, 2014; Manchanda, 2014). In the growth phase of any organisation little attention is focused on cost reduction. Efforts to automate and standardise processes in this phase of the organisation's life cycle, may conflict with the flexibility required to customise new products and services for new markets (Norton & Kaplan, 2000). The growth phase therefore focuses on revenue enhancement through its physical and personnel resources, which in turn facilitates the shift to higher valued-added products and services.

In the sustained phase of the organisation's life cycle the focus should be on improving operating margins and monitoring indirect and support expense levels, such that there is a move towards higher profitability and return on investment ratios (Norton & Kaplan, 2000). The

simplest form of cost reduction is reducing the unit cost of performing work or producing output. Measuring output production may involve an activity-based process-oriented costing system, which tracks the resources used and activities completed across the different business units in the organisation (Norton & Kaplan, 2000). In addition, organisations must focus on the availability of multiple channels through which customers, suppliers and manufacturers can transact with them (Sharma, Pathak, Kumar, Chowhan & Singh, 2014; Sinkovics & Kim, 2014; Wilder et al, 2014). However, there are cost implications for the relevant banks associated with the processing of such transactions (Norton & Kaplan, 2000), although the cost of transacting electronically is much lower than the use of manual channels. Thus the use of more efficient transaction processing channels can significantly increase productivity and lower the cost of doing business (Norton & Kaplan, 2000). This includes lowering the cost of selling, administrative and other general expenses. However, at no stage should cost-cutting initiatives interfere with achieving important customer and internal process objectives (Norton & Kaplan, 2000). This can be achieved using the metric that measures the outputs generated from indirect and support resources, which in turn is a reflection of effectiveness (Norton & Kaplan, 2000). Norton and Kaplan (2000) thus suggest that activity-based cost analyses provide the linkage between spending on indirect, support and administrative resources, and the activities and business processes performed by these resources that produce a specific output or service (Sharma et al, 2014; Sinkovics & Kim, 2014; Wilder et al, 2014). In another study, there was demonstrated evidence to support both cost savings and organisational savings (Heffes, 2007). These interventions include the following: increased accountability for successfully achieving anticipated targets; improved programme management capabilities; targeted efforts to achieve short-term goals; incorporated structural improvements into the organisation's broader strategy; and the adoption of improved talent management, retention and review processes (Heffes, 2007). This correlates with the performance and effectiveness of the organisation (Karimi et al, 2014; Manchanda, 2014).

For government organisations, productivity measures do not always appear to align with the mission of the organisation to effectively render services to a country's citizens (Pearce, 2011). Recent research has indicated that government organisations have the potential to realise enhanced productivity through the adoption of the latest information and communication technologies (Manchanda, 2014). It has been found that only 14% of government agencies were able to meet productivity performance targets (Pearce, 2011). Furthermore, this study revealed that 68% of organisations that made investments in high-speed internet protocol (IP) networks achieved measurable productivity gains. It was deduced that managing risk is the top priority of government organisations, followed by creating a workforce, improving productivity and enhancing customer experience (Pearce, 2011). In the USA, the federal government has

identified specific actions required to enhance performance in the short- and long-term (Wakham, 1985). The performance of public sector organisations receives a lot of public scrutiny (Manchanda, 2014). Negative performance in particular, obtains a lot of media attention, but such organisations are unable to create a positive image of their good performance because of budgetary constraints (Wakham, 1985). Another limitation faced by government organisations, is that of employing outstandingly qualified managers, who fall short on delivering on expectations, which is the case in the USA. The challenge here is that there is a lack of understanding of how to be effective managers and cope with the managerial as opposed to technical aspects of the job (Denhardt & Catlaw, 2014; Wakham 1985). The final constraint faced by public sector organisations is that of improving the overall environment for productivity enhancement in the public sector (Manchanda, 2014). This includes the division of the organisation's activities into the following three core functions that are not necessarily mutually exclusive: (1) the political science, (2) public administration and (3) management development, functions (Wakham, 1985). In the political science function there is a thrust towards accountability when money is spent and projects undertaken. In this function, management need to find innovative ways in order to simultaneously face the challenge of uncertain goals with few or no criteria for success (Denhardt & Catlaw, 2014; Wakham, 1985). In the public administration function, there is a tendency to focus on centralised and formal control systems for approval of processes and decision-making activities. This function also needs to manage the challenge of increased bureaucracy, when addressing efficient administrative activities (Wakham, 1985). Finally, there is the management development function, which in itself is a difficult challenge to address. The basic focus of this function is to have management staff more involved in the act of managing employees, through effective communication and service delivery, in support of productivity improvement in public organisations (Denhardt & Catlaw, 2014; Wakham, 1985).

In summary, the productivity of organisations can be closely linked to the environment in which an organisation operates. Better management skills have been proposed to enhance productivity, regardless of the organisational structure or the system in which they operate. However, competent managers can easily be constrained by politics as well as centralised bureaucratic systems of administration that stifle innovation (Geer-Frazier, 2014; Wakham, 1985).

In the South African context, there is a need to focus on ways to improve productivity performance and the Productivity SA initiative focuses on productivity being closely linked to general management, production, finance, administration, human resources and marketing

activities in any organisation in the country (Productivity SA, 2010). While South Africa faces a 25% unemployment rate, the economy is dominated by the production of agricultural, mining and manufacturing products, which is plagued by labour disputes and unions (Bernstein, 2014). Despite such challenges in the primary and secondary sector, the country is also growing in the tertiary sector. This can be seen in international companies as well as national government departments, outsourcing their business to companies in the telecommunications, recruitment, banking and investment sectors (Bernstein, 2014). Such companies include Accenture, FNB, Industrial Development Corporation, Telkom, Kelly and Deloitte (Productivity SA, 2010).

Given this context, it can be inferred that organisational productivity can be influenced by a broad range of factors – from management and leadership styles to adopting streamlined processes using modern and relevant technologies; employing competent staff; establishing clear and transparent communication channels; and developing an open culture which allows for a nurturing environment wherein productivity can be enhanced. This invariably impacts on cost-saving activities across all divisions in the organisation itself. The challenge here is that organisations must operate efficiently in order to survive and optimise the use of limited resources (Tiu, 2001). This in itself also puts a huge burden on the organisation's leadership and effectiveness.

2.7.4.4 Return on investment

One of the measures to assess the effectiveness of organisations, is to measure the return on investment (ROI), which also provides an overall indicator of the success of the organisation's financial strategies to reduce costs and increase revenues as well as asset utilisation (Norton & Kaplan, 2000). Modern organisations tend to focus more on measuring performance primarily through accounting-based measures such as measuring the returns on assets, equity or invested capital (Waz, 2014; Brigham & Houston, 2011). Recent trends associated with the measurement of the ROI across organisations describe three major constituents. One includes the certification of financial statements by the chief executive officer and chief financial officer to ensure fraudulent activities linked to the reporting on financial performance are minimised (Brigham & Houston, 2011). A second trend is that of managing the demands of business globalisation. Developments in communication technology have made it possible for organisations such as Amazon, Coco-Cola, Walmart and IBM to name a few, to be able to obtain real-time data on sales from stores located on different continents around the world, which in turn allows such organisations to be able to calculate ROI. Organisations failing to address this technological demand will have difficulty becoming sustainable in the 21st century (Sharma et al, 2014; Sinkovics & Kim, 2014; Wilder et al, 2014; Brigham & Houston, 2011). The

third and final trend associated with maximising ROI is that of the ever-evolving state of IT structures that have supported the growth of business globalisation. If organisations are able to tap into IT structures, they can increase their return on investment potential. This includes the selection of locations for opening new stores and assessing competitor behaviours as well as market developments (Sharma et al, 2014; Sinkovics & Kim, 2014; Wilder et al, 2014; Brigham & Houston, 2011).

Traditional measures for ROI include evaluating the health of working capital, asset utilisation and risk management (Ukaegbu, 2014; Norton & Kaplan, 2000). In organisations in the manufacturing, retail, wholesale and distribution sectors, working capital relates to accounts receivable, inventory and accounts payable. Associated with working capital management is the cash-to-cash cycle, which represents the time to convert cash payments to suppliers to cash receipts from customers (Ukaegbu, 2014; Norton & Kaplan, 2000). Closely linked to working capital management is measuring asset utilisation which focuses on improving capital investment procedures, both to improve the productivity from capital investments projects, and accelerate the capital investment process itself in order to realise the return on investment sooner (Ukaegbu, 2014; Norton & Kaplan, 2000). The investments in assets include investments in physical capital such as information systems, specialised equipment and physical buildings, as well as investments in intellectual and human capital (Norton & Kaplan, 2000). Most organisations tend to increase the leverage from these investments in assets by sharing them across business units such that there is also a sharing of potential revenue benefits as well as knowledge and customers, which collectively impacts on cost reductions (Ahmed et al, 2014; Dager, 2014; Norton & Kaplan, 2000). The third and final measure associated with the ROI is risk management, which relates to the variability linked to the ROI. It is therefore necessary for organisations to be able to incorporate risk management into the financial perspective of the balanced scorecard in order to reduce their dependence on unexpected loans. Such realities face organisations when they set stretch targets for revenue growth. However, these challenges can be offset by growth and profitability objectives (Norton & Kaplan, 2000).

These measures appear to somewhat dilute efficacy in public sector organisations. As such, there has been a push by government to strengthen its financial position by adopting strict monetary policies in order to contain excessive demands and moderate price pressures in the economy (Denhardt & Catlaw, 2014; Manchanda, 2014; International Federation of Accountants, 2012). The universal financial management strategy by most government bodies is geared towards strengthening the revenue base and promoting savings to sustain future

levels of investment and growth, which in turn relates to ROI (International Federation of Accountants, 2012). All in all, there is a need for public sector organisations to be able to be more accountable and transparent in their financial management practices in order to address the demands of the people they serve in an increasingly complex organisational environment, especially one that is compounded by the accountability for the use of taxpayers money (Auger, 2014; Steiss & OC Nwagwu 1998). The challenges public organisations face include both the identification and measurement of public value or public returns, which appears to be a topic that is not well understood (Moore, 2006). More often than not, there is a view that links public value to the effect government behaviours and response time have on public stakeholders (Arrow & Lind, 2014). These include measuring the efficiency and effectiveness of processes, technology and other systems on service delivery and cost savings (Moore, 2006). Finally, a factor impacting on the perceived value created by government and public sector organisations reflects on the ability to share as well as have information easily accessible to the public (Akintobi et al, 2014). In essence, there is a need for public sector organisations to pursue the public value agenda in delivering service excellence to the public (Moore, 2006). The ROI in public organisations can therefore be summarised as a measure of improvements in productivity, quality, time saving, outputs and direct cost reductions (Ford et al, 2015; Philips & Philips, 2009). Hence efforts have been made to focus more on responsible financial management and measurement in public sector. These include the chief financial officer ensuring that the generation of financial information, including annual financial reports, is both complete and reliable (Philips & Philips, 2009). In addition, there is a drive through government legislation whereby public organisations set strategic goals and targets, and measure performance against set goals and targets.

In the South African context, despite a number of challenges associated with a diverse population, labour unions and strikes, global organisations cite numerous advantages in setting up facilities in the country. These include the low cost of labour, availability of infrastructure and a base from which to easily export products internationally (Marx & Mohammadali-Haji, 2014; Bernstein, 2014; SouthAfrica.info reporter, 2012). Such benefits have a positive effect on the potential returns for multinational companies. These lucrative returns have attracted companies such as Volkswagen, BMW, Alcatel, Vodafone, Levi Strauss, Singapore Airlines and Hertz International, to name but a few, to set up entities in South Africa (Marx & Mohammadali-Haji, 2014; Bernstein, 2014; SouthAfrica.info reporter, 2012). According to a recent UN report, consumer spending in Africa is set to double by 2020 – this growth mirrors the performance of India 10 to 15 years ago (Bhattacharya, 2011). While there is little doubt that multinationals around the world recognise the potential of Africa as a market for its high return on investment,

what remains to be seen is whether Africa delivers on this potential, given its political and socioeconomic challenges (Bhattacharya, 2011).

In conclusion, ROI is a performance measure used to evaluate the efficiency of an investment from several sources. This approach has been linked to the improvement of the effectiveness and efficiency of essential services and product offerings. The ROI approach has been used both in private and public sector organisations to streamline processes, design, development and implementation (Ford et al, 2015; Philips & Philips, 2009).

2.7.4.5 Risk management

Risks can be broadly defined as the effect of uncertainty on achieving set objectives, and they can either be positive or negative (ISO/DIS 31000, 2009). Risks can arise from uncertainty in the external environment such as financial markets, failures at any stage in a project life cycle, legal liabilities, credit risk, accidents, natural disasters and challenges posed by competitors (Lizarzaburu, 2014; Hubbard, 2009). Risk management, however, refers to the identification, assessment and prioritisation of risks (Stanton & Webster, 2014; Hubbard, 2009). Closely linked to this concept is environmental scanning, which relates to the identification, assessment and prioritisation of risk factors in both the internal and external environments, which in turn inform strategic business decisions (Lesca & Lesca, 2014). This is followed by the coordinated and economical allocation of resources to either minimise and control the probability and impact of an unfavourable event transpiring, or maximise the realisation of potentially beneficial opportunities (Stanton & Webster, 2014; Hubbard, 2009). Common strategies employed to manage risks include transference of the risk to another body, avoidance, reduction of the probability and impact of the risk occurring and accepting the consequences of the risk (Hubbard, 2009). There is usually a tendency for organisations to prioritise risks from those that have the greatest probability of occurrence and impact/loss to those that have a low probability of occurrence and impact/loss. There are several types of risks that can occur such as knowledge risks, which relate to insufficient or deficit knowledge being applied to the situation at hand; relationship risks emanating from ineffective communication and collaboration; and process engagement risks which materialise because of ineffective operational procedures being applied (Stanton & Webster, 2014; Hubbard, 2009). The occurrence of these risks directly impacts on the reduction of organisational reputation, brand value, productivity, cost effectiveness, profitability, service quality and earnings (Hubbard, 2009).

Risk management has been perceived over the years to influence cost control mechanisms in an organisation, which extensively influences policy and regulatory frameworks (Rampini, Sufi &

Viswanathan, 2014; Bhimani, 2009). The lack of a precise definition for risk in the organisational management literature, permits organisations to alter, define and reshape management activities in different ways. However given the need for organisations to increasingly be more transparent about their strategic management actions and cost containment efforts, risk management and governance have become closely intertwined and interrelated concepts (Bhimani, 2009). Given this rather vague context, it is posited that organisational control is exercised only when there is a balance between taking and managing risks across the various components of an organisation, from HR, stakeholder and financial management to business processes. However, there is a need to ensure transparency of risk management practices with specified measures for risk control (Rampini et al, 2014; Bhimani, 2009). The communication of such information will not only enhance the quality of management controls but also convey organisational legitimacy.

Stemming from the recommendations proposed in the section above, there is one risk that stands out: How much information should one disclose to the public? One of the major risks faced by modern organisations is that associated with knowledge sharing (Cummings, Holtz, Riddle & Ullman, 2014; Trkman & Desouza, 2012). Risks can be associated with loss of knowledge that is linked to the identification or storage and protection of knowledge that can benefit the organisation either operationally or strategically. In an ever-competing environment, organisations tend to form networks in order to improve operational efficiency and be innovative (Trkman & Desouza, 2012). Most of the literature encourages the act of knowledge sharing, but little reference is made to the risks associated with a breach in the sharing process. Organisations therefore need to develop knowledge transfer and risk management strategies that establish clear expectations of how the organisation transacts with business partners (Cummings et al, 2014; Trkman & Desouza, 2012). The objective of these strategies is to maintain, advance and protect their long-term competitive position.

In public sector organisations, the risk exposure and the consequences relating to risk impacts are a function of the cultural and environmental framework in which they operate (Bromiley, McShane, Nair & Rustambekov, 2014; Baldry, 1998). One of the major activities associated with risk management in the public sector is the requirement for undertaking compulsory competitive tender processes as well as exposing organisations to detailed audits. This includes public organisations clearly articulating to the public value for money and certainty of performance along with financial probity, accountability and conformance with the organisation's strategic objectives (Baldry, 1998). With regard to risk management, there is a tendency to respond to the risk which usually constitutes project failure or non-conformance to policies, in such a

manner than the focus is on mitigating the damaging effect on the organisation's financial situation. Owing to the budgeting processes in public organisation, risk losses manifest over varying periods of time, which in turn has a time effect on financial losses (Bromiley et al, 2014; Baldry, 1998). However, the risk impacts are usually of a nonfinancial nature in public organisations, and may cause disturbances at operational level, which consequently impact on service delivery and quality, customer dissatisfaction and strategic planning processes. In addition, in such circumstances, public organisations need to account to a rich mix of stakeholders from funders, government, employees and the greater community at large (Bromiley et al, 2014; Baldry, 1998).

In South Africa, there has been growing interest in risk management practices since the period of an economic downturn following the recession of 2007 (Antony & de Klerk, 2014; Magede, 2011). During this time, some organisations, abandoned governance and risk management principles in an effort to survive the recession. South African organisations therefore tend to not match the standards of the risk management and governance principles that are applied by their international counterparts, particularly in European, North American and other developed economies (Magede, 2011). Research has indicated that the level of compliance with international standards is a reflection of the state of political governance and corruption in South Africa, which is a notable trend across the African continent (Magede, 2011). Government therefore has a critical role to play in guiding organisations to comply with advanced risk management systems that align to regulatory objectives (Antony & De Klerk, 2014). Internationally, individual companies and specialist institutions shape and improve organisations and individual attitudes towards risk management. In addition, codes such as the Combined Code in the UK and Sarbanes Oxley in the USA ensure transparency (Magede, 2011). In South Africa, a number of private sector organisations and consultancies as well as codes and guidelines have been established such as the King Code, Institute of Internal Auditors, Public Finance Management Act and the Institute of Risk Management and have provided a frameworks for risk management (Marx & Mohammadali-Haji, 2014; Magede 2011).

In conclusion, risk and its management need to be driven by government and other specialist regulatory bodies to ensure organisational compliance and transparency to risk management principles (Magede, 2011). Effective financial management therefore evaluates both risk and return. Consequently, risk management focuses a great deal of attention on issues such as performance expectations, stakeholder management and perceptions, and the impact of the political and socioeconomic climate that impact on the strategic direction of an organisation (Baldry, 1998).

2.7.4.6 Summary of the organisational financial perspective

In summary, the financial perspective is linked to each of the other perspectives in the balanced scorecard. In addition, each of the four other perspectives in some form of the other focuses on improving financial performance, which in turn reflects on the organisation's effectiveness (Norton & Kaplan, 2000). The financial perspective therefore forms an integral part of the organisation's ability to be sustainable in the long-term and build a strong brand value for the external environment. This perspective involves organisations embracing international best practices when applying the principles of good governance and risk management. In addition, organisations need to focus on good business ethics when reporting on the return on investment to stakeholders as well as ensuring that the organisation is poised to attract additional resources, which in turn are managed and utilised productively in order to reap beneficial results for the organisation itself. In essence, the financial perspective forms the backbone of the balanced scorecard and performance in this perspective impacts on the ability of organisations to appropriately address the nonfinancial indicators of the scorecard, namely business processes, customer needs, human resource requirements and the demands of the external environment.

2.7.5 The external environment of organisations

Given the context of funding agencies, an additional perspective, which is a fifth perspective, is offered in this section and refers to the external environment, which is influenced by the political and economic climate both nationally and internationally as well as the globally competitive, social and technological environments (Parsons, 2013; Moura et al, 2011; Pondent, 2011; Qian & Baek, 2011; Wetherley, 2011; Hoque, 2005; Cooper, 1995; D'Aveni et al, 1995; Goldman et al, 1995; Hamel, 1996; Snow & Miles, 1992). This additional perspective, namely the external environment, significantly impacts on the availability of the necessary resources that are required for R&D investments and as such influences the effectiveness of funding agencies (Waheed, Mansor & Ismail, 2011). The external environment perspective also underpins itself to the PEST analytical framework, which relates to the political, economic, sociological and technological (PEST) environment, in which organisations operate. The use of PEST facilitates an understanding of the environmental influences that impact on the organisation, such that the organisation becomes better positioned to respond to changes (Tovstiga 2013). In his study, Woods (2008) indicated that government agencies need to work inter-dependently with the external environment in order to create new capacity. Woods (2008) also highlighted the fact that such organisations must be able to conceive policy and strategy solutions by spanning organisational and institutional boundaries to resource and implement programmes that achieve

desired policy outcomes (Woods, 2008). Closely linked to this perspective are the following subfactors:

- 1) the competitive environment
- 2) the political environment
- 3) the economic environment
- 4) the sociocultural environment
- 5) the technological environment

Associated with the external environment, is the concept of organisational development, which has become increasingly employed in public sector organisations, and is usually the approach chosen to address organisational challenges such as changing policies or legislation, technological change, top management changes as well as organisational restructuring (Cummings & Worley, 2014; Sminia & Van Nistelrooij, 2006).



2.7.5.1 The competitive environment

Organisations are increasingly operating on a global scale in response to opportunities abroad or threats in the home environment (Tokosi, 2011). In seeking opportunities abroad, organisations endeavour to tap into increased sales and profits by absorbing extra capacity thereby reducing unit costs and spreading economic risks over a wide number of markets (Cerna & Chou, 2014). Such opportunities are even more lucrative if they include setting up low-cost production and manufacturing sites offshore (Tokosi, 2011). However, in order to develop a globally competitive organisation, a substantial local market is a necessity (Du Plessis, 2012). Hence the challenges associated with increasing internationalisation include standardising operations and corporate ethics; addressing the aims and objectives among the various subsidiaries across the globe; managing the growth and power of multinational entities; and ensuring interdependence of the world economy (Nelson, Can & Bayraktar, 2014). All of these are in pursuit of minimising global competition and building global brand and distribution positions (Tokosi, 2011).

Organisations in developed nations are also extending their commitment to emerging markets and high-growth economies such as India, Asia, Eastern Europe, Latin America and Africa (Ma, Yiu & Zhou, 2014; Wagstyl, 2011). Companies such as Avon, Tupperware and Philip Morris have been able to increase sales in emerging economies to a minimum percentage of 50%. Unfortunately, remaining in their developed home countries would mean that there is slow growth as well as the risk of new sovereign debt crises (Wagstyl, 2011). An additional challenge

is: while foreign markets open the door for new opportunities for sales growth, they also open the door to international competition, not only domestic rivals.

The recovery from the 2007/2008 financial crisis was much stronger in emerging economies than in developed countries, which has led organisations based in emerging countries to push into global markets at an unprecedented pace (Gummesson, 2014; Nelson et al, 2014; Wagstyl, 2011). Prior to the crisis, China and Hong Kong had 17 companies listed on the Financial Times FT 500 list of top groups based on market capitalisation. By mid-2011, there were 45 companies on the list, putting them in second place behind the USA (Wagstyl, 2011). Such instances indicate that global competition is rapidly changing the way business is being managed in organisations. With the internationalisation of operations, there is also a tendency to employ international staff at operational level and recruit international executives, particularly from emerging economies, as board members. The ultimate goal is to compete more effectively, especially in emerging markets, which is a source of both new market opportunities as well as threats (Wagstyl, 2011). By operating on a global scale, organisations are forced to be innovative in their approaches to addressing the demands of the local customer market, through its processes, services and products. Coca-Cola, for example, realised that its competitors are stronger in the Asian markets and hence launched a juice-based drink in China in 2005 called Pulpy, which is now being rolled out globally. Within a five-year timeframe, this product was able to exceed \$1 billion in global retail sales (Wagstyl, 2011). This bears testament to the rivalry between organisations in developed and emerging economies, which is fraught with numerous claims. While organisations in developing countries claim that their counterparts in emerging economies have unfair competition with regard to the allocation of government contracts, organisations in emerging economies claim that their counterparts are protected by costly regulations and other market entry-related barriers (Wagstyl, 2011). No matter what the claims are, there appears to be the continued process of cooperation and competition between organisations in both economies, which are likely to continue into the future (Cerna & Chou, 2014; Wagstyl, 2011).

In a study by Matthews and Shulman (2005), it was explained that public sector organisations, particularly R&D organisations, not only conduct research and development activities, but also compete for funding from government, ministerial cabinets and other international funding bodies. The organisation is therefore dependent on understanding and recognising the relationships, constraints and impacts linked to the political and economic dependencies in order for them to achieve a sustainable competitive advantage (Matthews, Shulman 2005).

In a middle-income country such as South Africa, organisations across various industry sectors face numerous battles in order to be deemed globally competitive (Ezeuduji et al, 2014; Sewdass & Toit, 2014; Du Plessis, 2012). One of the major challenges is posed by imports, primarily from the Far East and in particular, China, which are subsidised and supported by the government. Another hurdle is that of the narrow focus of South African organisations, which tend to look to Africa as a primary market. This approach is fundamentally flawed because most African markets are already flooded with Asian products imported at globally competitive prices (Ezeuduji et al, 2014; Sewdass & Toit, 2014; Du Plessis, 2012). Given this context, obtaining market penetration in Africa by South African organisations is more difficult than originally assumed. In addition, South African organisations in general tend not to be competitive even in fair trade environments (Du Plessis, 2012). This challenge is exacerbated by the lack of critical skills and increasingly high electricity costs, which have led to secondary hurdles such as a volatile currency as well as poaching of skills globally (Du Plessis, 2012). The one industry that has been able to establish itself in the global arena is that of the automobile sector, which is substantially supported by the South African government and a continuous flow of foreign direct investments. It is therefore imperative that government and industry mirror what has been achieved in the automotive sector for other key industry sectors, with a particular focus on the development of SMMEs (Du Plessis, 2012).

Gauging from the literature, it appears that in today's global markets, every organisation is faced with worldwide competitors who are consistently improving productivity, performance and pricing (Pinto, 2014; Pinto, 2010). This is spurred on by the consumer market, which is increasingly more demanding and fickle in terms of having little or no brand loyalty, all of which is in pursuit of the best product at the cheapest cost (Pinto, 2010). It therefore appears that in the new global society, nations and regions are in a battle of ideas and innovations, of agility and tenacity. Organisations need to be innovative in their thinking, corporate strategies, customer service and support as well as leadership styles in order to stay ahead of the competition (Pinto, 2010). Long-term challenges that organisations face in a globally competitive environment include the outsourcing of segments of core business processes and operations. While outsourcing may provide short-term cost benefits, it also entails sharing priced intellectual property and the investment in human capital development, which may not necessarily accrue positive returns for the organisation in the long-term (Pinto, 2014; Pinto, 2010). It therefore can be assumed that knowledge and skilled workers, technologically adept processes and operations, innovative thinking and leadership as well as quick and agile responses to market demands are fundamental requirements for competing in a global economy (Worley, Williams & Lawler III, 2014).

2.7.5.2 *The political environment*

The political environment relates to the government and the collective decisions and rules that focus on the welfare of its citizens (Wetherley, 2011). Owing to numerous challenges and problems encountered by today's organisations, public legislation and regulations have gained a more prominent place (Berliner, 2014; Anonymous, 2012). The political environment of a country can have a profound impact on organisations by introducing a risk factor that could cause significant losses (Pondent, 2011). The political environment is also highly volatile and could change as a result of the actions and policies of governments at all levels, from local to national (Adomako & Danso, 2014; Kim, 2014). The political environment, nevertheless, reflects the attitudes of government especially in terms how best to promote national interest in the light of the country's resources as well as its economic and political standing. Public organisations strongly align themselves to the philosophy of an open-systems approach, in that they operate in close interaction with the external environment. In such instances, it is quite fitting to treat political and legal environments as synonymous (Ansoff 1980). Leadership in management must be able to understand and respond to the regulatory system in order to function effectively. When a country faces political instability, public organisations tend to face the brunt of these challenges (Enock 2014). Organisations thus need to be prepared in their corporate planning strategies to deal with fallouts of government politics as well as changes in national policies and legislations (Pondent, 2011). An example of the latter was the introduction of the Sarbanes-Oxley compliance regulations of 2002 by the USA Securities and Exchange Commission, which called for increased accountability of public organisations (Pondent, 2011). One can therefore infer that the government sector and international governing bodies largely drive the legislative and regulatory environment. As an example, in the pharmaceutical industry, the Food and Drug Administration (FDA), continually introduces more stringent regulations to ensure the safety of new medical products and devices for human subjects (Food and Drug Administration, 2003).

Government legislation and regulations can be influenced by political activity. Policymakers, managers, workers, social activists, government bodies and other stakeholders in both the developed and developing economies, need to have an in-depth understanding of how the global economy works and evolves in order to improve their position and protect themselves against any impending decline (Gereffi, 2005). For multi-national organisations in particular, a lack of political stability in any specific country in which an office is based can affect the organisation's operations (Kim, 2014; Morisset, 2000). This includes disruptions in the environment such as rioting, looting, strike action and general disorder in the environment, which have affected organisations with offices based in countries such as Sri Lanka, Egypt and Syria (Pondent, 2011). One way in which organisations can mitigate such political risks is to

purchase political risk insurance (Howell, 2014). In addition, organisations can use indices to calculate their risk exposure in certain countries. An index that is commonly used is that of economic freedom, which ranks countries on how political interference impacts on business decisions in each country (Howell, 2014; Pondent, 2011).

Investments by multinational organisations in a specific country therefore entail complex systems analysis, which is largely affected by the political risk in the country (Qian & Baek, 2011). Political risk is usually seen as the risk associated with government interference in business operations (Qian & Baek, 2011). Examples of political risk include acts of war, terrorism, military rebellion and expropriation of assets by government (Qian & Baek, 2011). The stability and instability of government policies therefore play a significant role in the decision-making of multinational organisations to deploy large-scale investments, which in turn affects the economic climate of a specific country and/or region (Qian & Baek, 2011). In addition, when engaging in business activities across national borders, the size of companies is often affected by international political and legal barriers which are largely dictated by government policies and laws (Kim, 2014; Morisset, 2000).

In a country like South Africa, which is deemed a middle-income developing country, there has been significant political transformation from the divide and rule apartheid system to a system of democratic governance in 1994, which 18 years later, remains politically stable (Adomako & Danso, 2014; Antony & de Klerk, 2014; Vergara, 2005). In this time, the government has pursued market-oriented economic policies, a renewal of infrastructure and the introduction of competitive public-private cooperation schemes for state-owned enterprises (Deegan, 2014). South Africa is also a signatory of numerous international agreements and conventions, one of which relates to the protection of intellectual property, which includes patents, trademarks, designs and copyrights (Antony & De Klerk, 2014). While discussions are ongoing to ensure competitive trade policies, the country is still plagued by political issues such as the rising cost of food, which has impacted on the majority low-income population, and criminal violence (Deegan, 2014). The country is plagued with crimes such as murders, attacks on armoured vehicles, business and mall robberies, home break-ins and sexual assaults. Such prevailing conditions pose potential barriers to entry for multinational organisations. One such challenge has been the instability of mining sector at Lonmin's Marikana mine in August 2012. The instability of the illegal strike tarnished investor confidence in South Africa (Isa, 2012). South Africa was thus labelled a high-risk destination (Isa, 2012).

In conclusion, the political environment in which organisations operate has a significant impact on the effectiveness of organisations especially when there is a great level of involvement in foreign markets. For multinational organisations to venture into new territories, there is a need for governments in both the destination and home countries to become full partners and develop international trade agreements in support of both the organisation as well as other potential trade ventures (Qian & Baek, 2011). Political risk and its measurement act as a barometer for organisations to measure their business risk in a specific political environment (Howell, 2014). This measurement is largely influenced by the sovereignty of nations, the legal systems, government policies, philosophies, interest groups and political parties amongst others (Qian & Baek, 2011). For organisations to be deemed effective there is a need for a strong organisational focus on monitoring the political climate in the countries in which business is conducted.



2.7.5.3 *The economic environment*

The economic environment can be defined as the sum of the efforts by all economic agents operating in a specific economic system in which there is a conversion of resources such as labour, capital and natural resources into outputs such as goods and services that are needed by the community (Wetherly & Otter, 2014; Vergara, 2005). The global economy has changed over the past several decades and has impacted on the flow of goods and services across national borders and it prescribes the manner in which organisations interact in the international system (Anh, 2014; Gereffi, 2005).

There are several levels of analysis associated with the study of the global economy, namely the macro, meso and micro levels (Gallouj, 2014). At macro level, there are international organisations that define the rules, resources and norms that form a broad set of parameters in which the global economy operates (Gereffi, 2005). Such entities include the World Bank, International Monetary Fund, the World Trade Organisation and the International Labour Organisation, to name but a few (Mankiw, 2014; Gereffi, 2005). At the meso level, countries and organisations form the building blocks of the economy. At this level there is a tendency to focus on a top-down approach to countries and organisation that are leaders in terms of market share and driving change (Terna, Margarita, Cecchini & Autunnale, 2014; Gereffi, 2005). At the micro level, resides the consumer market, activists and social movements that often tend to resist the effects of globalisation owing to labour issues and environmental abuses. Despite each of the levels being characterised by different players, all in all, each of these levels is influenced by international trade, investment and finance (Alessandria, Choi, Kaboski & Midrigan, 2014; Gereffi, 2005).

Globally, foreign direct investments have increased since the 1980s, which has resulted in global inter-connectedness, particularly in the finance and technology arenas (Booth, 2014; Gereffi, 2005). Global finance flows accelerated in considerable measure following the introduction of new financial instruments, such as international bonds, international equities, derivatives trading and international money markets (Gereffi, 2005). The growth of world trade has had a direct bearing on employment, wages and the rising number of free trade agreements around the world. This growth can be attributed to the lifting of technological and political barriers and controls that restricted trade pre-World War II (Booth, 2014; Gereffi, 2005). Post-World War II there has been transportation and communication, information as well as other technological improvements, and the removal of political barriers such as tariffs, import quotas, and exchange controls, which have collectively contributed to the rising number of free trade agreements around the world (Booth, 2014; Gereffi, 2005).

There is little consensus, however, on the kind of framework that can be used to analyse the contemporary global economy. This can be attributed to the breadth and rapidity of change as well as the fact that countries, organisations, workers and other stakeholders in the global economy are being affected by the shifts in the economy (Booth, 2014; Gereffi, 2005). One such shift is that of the emergence of a global manufacturing system that facilitates the production and export capabilities being outsourced to a number of developing as well as industrialised countries (Gereffi, 2005). Given the recent economic turmoil, outsourcing of production and manufacturing divisions of multinational companies to low-wage locations such as Asia and South America has become a common practice (Yeung, 2014; Jones, 2012; Gereffi, 2005). Countries on these continents are capable of better customer experiences as well as producing large volumes of low-cost, high-quality commodities that impact on the competitiveness of many organisations and markets globally (Yeung, 2014; Jones, 2012; Gereffi, 2005). Organisations adopting an aggressive approach to outsourcing endeavour to create radical business models that allow for outdated operations to be outsourced so that the organisation itself can position itself for new competitive strategies and free up the time of high-earning analysts and engineers to tackle issues relating to customer queries and innovative new products (Engardio, Arndt & Foust, 2006). In recent years, organisations such as IBM, Accenture, Genpact, DuPont and Unilever, to name a few, have outsourced certain aspects of their business processes to global networks of staff in countries from the USA to Asian and Eastern European countries (Engardio et al, 2006).

In the South African context, there is a different trend associated with the impact of the global economy on the country itself (Deegan, 2014). This is attributable to the complex political state

in which the apartheid rule in South Africa resulted in the country being expelled from the international sphere, which subsequently hampered a number of economic activities. Productivity performance and economic development were substantially improved by the transformation in 1994, which led to the adoption of policies of trade liberalisation (Deegan, 2014; Vergara, 2005). This led to South Africa becoming integrated into the world economy through openness in foreign trade and increases in import penetration in domestic markets, which have led to increasing price competitiveness among domestic producers (Vergara, 2005). Economic activity in the formal sector, particularly in the mining and manufacturing sector, was also boosted – this is because South Africa has a mineral-rich economy and a strong export sector in terms of supplying telecommunications and energy to the rest of Africa (Steinberg, 2014; US Foreign Commercial Service and US Department of State, 2010). Productivity activity, which improved rapidly in the mid-1990s, declined again in the mid-2000s because employment growth did not keep pace with capital formation (Baker, Newell & Phillips, 2014; Vergara, 2005). However, South African was not the only country to face these challenges.

Unfortunately, since the previous global economic crisis of 2007/2008, there have been disruptions and extreme volatility in global financial markets and increased rates of default and bankruptcy, which have impacted on consumer spending (Ma et al, 2014; Guina, 2009). This crisis started off as a mortgage crisis that primarily affected the USA, but it soon evolved into a global financial crisis that left a number of financial institutions across the world at the edge of bankruptcy, which in turn impacted on the performance of organisations in other nonfinancial sectors as well (Gummesson, 2014; Tong & Wei, 2009). South Africa also felt the impact of the global financial crisis and as a consequence had to put into place measures that would be able to protect low-income earners, the unemployed and vulnerable, strengthen the capacity of the economy to grow and create decent jobs, maintain high levels of public sector infrastructure investments and establish economic and social stimulus package (Cornelissen, 2014; SAICA, 2010). Although South Africa was not hit hard by the economic crisis because of significant infrastructure investments in preparation for the FIFA World Cup in 2010, the country did face a decline in the demand for export products, a fall in commodity prices and the loss of 900 000 jobs (Cornelissen, 2014; SAICA, 2010).

In conclusion, the leading organisations going forward in the global economy will be those that are adept at leveraging global talent to transform themselves and their industries. Unfortunately, the global economy is also a volatile environment and has the ability to impact on the sustainability, effectiveness and profitability of organisations. The state of the economy of a country has the ability to affect the sustainability of public organisations. Economic recessions

in particular affect the availability of public funds which usually takes the form of cut-backs by government (Sanz-Menéndez, Cruz-Castro 2003). Public organisations are dependent on the external economic environment, represented by government for its resources, in order to function. In such instances, public organisations tend to diversify their income streams by complementing their government income with private sector investments (Sanz-Menéndez, Cruz-Castro 2003). It is therefore imperative for organisations to have a framework in place that addresses the organisation's response to international economic threats and opportunities, which are endorsed by both the organisational leadership as well as the board.

2.7.5.4 The sociocultural environment

The sociocultural environment comprises a range of behaviours and relationships in which individuals engage in their personal and private lives (Wetherly & Otter, 2014). Such behaviours and relationships are influenced by the characteristics of the population such as gender, age, race or ethnicity, values and attitudes, and lifestyles and relationships (Wetherley, 2011). The relationship between an organisation, society and culture involves a two-way interaction – that is, the profitability of any organisation is dependent on the sociocultural setting in which the organisation is embedded; and the organisation itself has the ability to impact the wider sociocultural environment. In the latter case, reference can be made to the music, film, literature and magazine sectors (Wetherley, 2011). How society accepts the influences proposed by such organisations, can either be positive or negative, which could in turn either hinder or promote organisational performance. Hence the government fulfils a role in terms of both promoting sociocultural change and regulating organisational behaviour, as circumstances prescribe (Wetherley, 2011). This is no easy feat.

Further analysis of the literature revealed that a strong influencing force on the sociocultural environment is that of religion (Wetherly & Otter, 2014). Although historically, religion played a fundamental role in prescribing the sociocultural norms of society as well as the rules and regulations of government, in today's society, the influence of religion has dwindled (Wetherley, 2011). An ever-increasing global economy creates a multifaith and multicultural society and organisations need to ensure that religious and cultural conflicts are kept out of workplace and during interactions with customers (Coccia, 2014; Wetherley, 2011). This is a fundamental requirement for organisations to be able to tap into new market segments globally and to ensure customer satisfaction. Organisations also face the challenge of embracing a rapidly evolving demographic population which impacts on their ability to be effective, especially with regard to evolving needs and interests (Coccia, 2014; Wetherley, 2011). The baby-boom generation is aging and is increasingly losing interest in expensive brand-name goods such as Levi Strauss

and Nike. These organisations are struggling to build brand loyalty with the Y-generation, which rivals the baby-boom generation in size (Benson & Connell, 2014; Jeston & Nelis, 2014).

Organisations also need to heed the rapid changes in the sociocultural environment, which are strongly influenced by rapid developments in information and computer technologies (Ertl & Helling, 2014). Such developments have transformed the way in which society communicates, consumes products and gains access to information (Wetherley, 2011). This affords organisations the opportunity to compete freely in the marketplace with the objective of pursuing profits through product innovations, which in turn affects sociocultural trends and their purchasing behaviours (Benson & Connell, 2014; Ertl & Helling, 2014; Jeston & Nelis, 2014). However, this is not necessarily a positive attribute, given that consumerism has been linked to purchasing on credit, which in turn impacts on the state of the economy and stringent measures being imposed for debt recovery (Wetherley, 2011). This is because modern society is consumed by a continued desire to purchase the latest products and services in pursuit of some level of inherent satisfaction.

Other challenges that face organisations include inequalities associated with the sociocultural environment, which span income disparities between the rich and poor, poverty-related challenges, racial and cultural groupings and gender bias in terms of women employment (Wetherley, 2011). The last challenge referred to here, specifically focuses on the narrowing gap between the genders in terms of economic activity and employment rates (Spears & Amos, 2014). However, there is a marked and persistent difference associated with male and female experiences in terms of paid work, especially at the management level, which includes occupational segregation, the distinction between traditional and flexible working patterns and the amount paid on average to men and women employees (Wetherley, 2011). Such prejudicial attitudes towards women in organisations are usually a reflection of the prevalence of attitudes in wider society and can be traced back to the socialisation of boys and girls in both the family unit and the education system (Spears & Amos, 2014; Wetherley, 2011). Despite nations becoming increasingly cosmopolitan, there are still socioeconomic challenges such as poverty, inequalities, racism and varying consumer behaviours based on household income disparities. Addressing the challenges of the sociocultural environment, tends to form the focal point of a lot of public sector organisations. In essence, government and its agencies are accountable for providing for the poorest and most vulnerable groups of society (Spears, Amos 2014).

When looking at a country such as South Africa, which is characterised by a multicultural and diverse society, the term “rainbow nation” is often adopted (Deegan, 2014). South Africa is

characterised by a racially diverse society in terms of cultures, languages and beliefs - from black indigenous tribes to people from Europe, India, Malaysia, China and other African countries (Machanick, 1998). Although South Africa is regarded as a middle-income country, it is an interesting case of a mixture of both third and first world traits (Bernstein, 2014). The country is plagued by poverty, unemployment, informal settlements, poor service delivery to rural communities, a huge divide between the wealthy and the poor, and the impact of crime and HIV/Aids-related deaths (Steinberg, 2014; Machanick, 1998). Despite these challenges, South Africa's economy is not stagnant, but on the rise (Irwin, 2012). Organisations such as Coca-Cola have been able to successfully address the demands of the diverse population in the country. This beverage can be found at locations such as five star hotels and restaurants to malls and "spaza shops" in rural poverty-stricken communities (Irwin, 2012). Coca-Cola has been able to tap into the diverse markets and earn brand loyalty across the spectrum of South Africa multicultural and multiracial communities through clever advertising and involvement in local community life (Steinberg, 2014). To this end, the organisation has been able to initiate sport scholarships, sports development, entrepreneurial as well as community development and educational projects (Irwin, 2012). Other companies that have managed to use the diverse sociocultural setting in South Africa to boost their market opportunities include cellular companies such as MTN and Vodafone as well as the national state-run phone company, Telkom (Irwin, 2012).

In summary, the sociocultural environment comprises a range of behaviours, attitudes and values that are shaped by a wide sociocultural group of people. Despite nations becoming increasingly cosmopolitan, there are still socioeconomic challenges such as poverty, inequalities, racism and varying consumer behaviours based on household income disparities. Organisations that are poised to address the current and emerging sociocultural trends as well as the economic and cultural backgrounds of the society they aim to target, are best positioned to enhance their organisational effectiveness and performance.

2.7.5.5 *The technological environment*

Adapting to major environmental changes is a key challenge organisations face (Benner, 2009). The more rapidly changing the environment, the more dynamic and flexible the organisation needs to be (Burlton, 2015). One of the major forces for change in today's environment is the rapid development, dissemination and adoption of new technology when interfacing with the customer (Krell, 2000). When speaking of technological change, and its impact on the sustainability of organisations, the common perception is that of process automation and other capital-intensive production devices (Burlton, 2015). The less common perception is that of the



transformation of markets owing to the super-abundance of newly designed technology-based products (Krell, 2000). Either way, technological change has been able to transform the nature of the marketplace by changing the cost, features and availability of products. Rapid technological change has led to rapid product introduction as well as rapid product obsolescence (Krell, 2000). A technologically charged environment demands a highly skilled, competent and flexible workforce. Simultaneously, there is a need for flexible management thinking which relies significantly on educational training instead of on-the-job experience (Jeston & Nelis, 2014). The objective of recruiting such leaders in organisations is to ensure that they address the demands of the marketplace rather than those of the organisational culture. Such behaviours have been implicated in the establishment and maintenance of a more responsive organisational culture that is able to ensure its longevity in the marketplace (Krell, 2000).

The adoption of radical technological change usually entails an entire shift to a unique new technological trajectory in an effort to enhance the performance of the organisation in a specific industry (Cantwell, 2014; Benner, 2009). Examples of such cases involve the shift in technology from a mechanical escape device to quartz in the watch industry; from steam to diesel-electric locomotives; and from ice harvesting to mechanical refrigeration (Benner, 2009). Stemming from the cases presented here, it has further been postulated that one of the greatest challenges facing modern organisations has been the rapid expansion of e-commerce (Lin et al, 2014). Organisations across a multitude of sectors from the online book sales sector, to the manufacturing and telecommunication sectors, have been affected by the advances in the external technological environment (Lin et al, 2014). A case in point is Barnes and Noble, a company that ignored the technological evolution that was fundamental to the book selling business. Its competitor, Amazon, however, fully exploited the new wave of e-commerce technology, which allowed it to gain a major market share and competitive advantage (Ritala, Golnam & Wegmann, 2014). E-commerce is one of the information technologies that is constantly evolving and emerging (Lin et al, 2014). Unfortunately, with such information technologies, organisational leadership faces the challenge of adopting technologies that will either become widely institutionalised or abandoned in a short period of time (Wang, 2010). The adoption of the latest developments in sustainable technologies has been linked to the social approval of organisations as well as their legitimacy in the external environment (Wang, 2010). This may also entail organisations aligning their internal systems and processes with the external technological environment to gain further legitimacy in the marketplace, which impacts on the organisation's performance and success. This in turn places a lot of trust both internally and externally on the capability of the organisation's leadership and culture (Mirchandani & Lederer, 2014; Wang, 2010). In public organisations, the use of e-technologies can aid in the

understanding and addressing of public needs. The modernisation of administration by public organisations, in turn can contribute towards improving service effectiveness and quality whilst simultaneously reducing bureaucracy and increasing transparency (Matei 2009).

It is therefore necessary for organisations to embrace strategic technology planning interventions in order to exploit the latest trends in technological activities in the external environment, particular around social media which includes, but is not limited to Facebook, Twitter and Instagram (Lichtenthaler, 2008). The adoption of new technological knowledge that complements internal technological processes contributes not only to the organisation's effectiveness, but also its innovative capacity, which is linked to improving business processes (Lichtenthaler, 2008). Unfortunately, many organisations still pursue an ad hoc approach to the exploitation of new emerging technologies in the external environment, which is particularly true in the public sector. Some organisations tend to establish extensive technology-intensive processes in order to identify opportunities and threats in an organisation's environment (Lichtenthaler, 2008). In such instances, the organisation needs to have sufficient knowledge about the technology, its applications and the possibility of exploiting this technology for the purpose of tapping into new markets prior to considering its widespread adoption in the organisation (Jeston & Nelis, 2014). The challenge faced by organisations when considering technology acquisitions includes the general resistance to change, fear of poor market uptake and most of all, the failure to integrate the new technology in the existing core internal systems and processes of the organisation (Lichtenthaler, 2008). As such, scanning the environment for technological developments and trends has a key role to play in the organisation's corporate strategy, which may include the establishment of appropriate technology intelligence processes for either acquiring or ignoring such developments in the environment (Lichtenthaler, 2008).

In the global context, South Africa is ranked 20th in terms of acquiring IT and electronics-related products and services. South Africa's IT industry is characterised by technology leadership, especially in the field of electronic banking (Burlton, 2015; Wetherly & Otter, 2014; SouthAfrica.info reporter, 2008). Not only is South Africa a consumer of technological products, but it is also responsible for the development of technological products that are exported internationally, which include pre-payment, revenue management and fraud prevention systems (SouthAfrica.info reporter, 2008). Such capabilities have attracted many multinational companies to set up subsidiary offices in the country that are able to set up suitable pilot facilities in the country, given the diverse population in terms of race, culture and socioeconomic standing (Burlton, 2015; Wetherly & Otter 2014; SouthAfrica.info reporter, 2008). Despite such disparities in the population in South Africa, mobile technologies are rapidly growing with almost

50% of all Africans having mobile phones, and its penetration is increasing rapidly. South African organisations, however, tend to approach other technologies such as social business with caution, and the adoption of such technologies has the ability and potential to address the demands of the emerging Y-generation. In addition, the challenge South Africa faces in terms of adopting newer technologies from the external environment is influenced by two major stumbling blocks, namely bandwidth capabilities and security (Ramsingh, 2012).

In conclusion, organisations seeking legitimacy and increased chances of survival and growth need to embrace systems and processes, including new technologies that are widely accepted socioculturally (Wang, 2010). When interacting with the customer, the adoption of relevant technological tools should not be a static, but rather a fluid process, which is constantly reviewed and changed on the basis of the availability of new technologies, societal trends in technology usage, business values and the impact of the external environment (Fripp, 2011). This section focused primarily on the absorption of technologies from the external environment and did not pay much attention to the outward transfer of technologies from an organisation into the environment. The rationale for this focus is that most funding agencies offer a service to the research community through the provision of grants using core processes such as peer review. Public organisations therefore tend to focus primarily on the use of technologies for enhancing their core business processes, but the adoption of technological innovations from the external environment does not necessarily transpire in a strategically planned manner (Burlton, 2015; Wetherly & Otter, 2014; SouthAfrica.info reporter, 2008).

2.7.5.6 Summary of the external environment perspective

Today's organisational environment is characterised by increasing political and legislative regulations, global competition, technologies, diverse social behaviours, and an economic environment in a constant state of flux. The external environment is rather complex in nature and has the potential to impact on the entire organisation or aspects of the organisation (Lin et al, 2014). The external environment therefore is a major source of both opportunities and threats to any organisation and imposes constraints to the decisions made by organisational leaders (Lin et al, 2014). A major factor in the external environment that was discussed here is the competitive environment, which is the main threat to any organisation. However, whilst there is a lack of focus on the competitive environment, there is a focus on the factors that have the ability, as proposed in the literature, to ensure that organisations are best equipped to deal with opportunities and threats to preserve its effectiveness.

2.8 Summary of the literature review

In considering the theoretical propositions relating to the three bodies of literature incorporating funding agencies, organisational theory and the factors linked to the balanced scorecard that impact on organisational effectiveness, this research study focused on determining the organisational effectiveness of funding agencies from a multidimensional perspective. The theoretical propositions presented in this chapter helped to guide the development of the methodological approach, which was geared towards evaluating the organisational effectiveness of funding agencies. The balanced scorecard was used in this study because it presents a consolidated approach that tells the story of how an organisation endeavours to improve its business processes, human resource management principles and financial measures towards enhancing customer satisfaction and overall performance and effectiveness, amid growing pressures from the external environment (Norton & Kaplan, 2000). Based on the propositions offered in the management literature, it would appear that, given the complex and fairly dynamic interplay associated with measuring organisational effectiveness, it was deemed appropriate in this study to adopt a multidimensional measurement tool, namely the balanced scorecard, to evaluate the effectiveness of funding agencies. The balanced scorecard was applied in the present study, by means of a mixed methods approach, with the objective of addressing the multiple goals and constituencies associated with funding agencies that are constrained by scarce resources and have to account for the effective and efficient expenditure of these resources.



Table 2.2: A summary of the factors and subfactors that were reviewed and used to inform the development of the measuring instrument

FACTOR	Subfactor 1	Subfactor 2	Subfactor 3	Subfactor 4	Subfactor 5
HR MANAGEMENT/ LEARNING & GROWTH	Skills and competencies	Talent management	Employee motivation	Employee development opportunities	Performance management & assessment
BUSINESS PROCESSES	Leadership	Climate	Technology	Communication	Organisational structure
CUSTOMER SERVICE	Customer support	Communication strategy	Customer service and satisfaction	Customer attraction and retention	Organisational image and reputation
FINANCES	Governance	Ability to acquire resources	Productivity	Return on investment	Risk management
EXTERNAL ENVIRONMENT	Global competition	Political	Economic	Sociocultural	Technological

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This study employed a sequential explanatory mixed methods approach, as described in this section, to answer the following research questions:

- 1) Do the factors and subfactors cluster according to the balanced scorecard that has been proposed in this study?
- 2) What are the main factors influencing/impacting the organisational effectiveness of funding agencies?
- 3) Can a conceptual framework for improving the effectiveness of funding agencies be developed?

The primary objective of this study was to investigate the effectiveness of funding agencies in the science sector by applying the balanced scorecard to several funding agencies globally. The main aim of this study was to develop a conceptual framework geared towards both understanding and improving the effectiveness of funding agencies by identifying a useful, reliable and valid set of factors.

3.2 Research approach

The multilevel and complex nature of this study warranted the use of a mixed methods research approach, which is widely accepted as a balanced and useful methodological approach. Mixed methods embrace the philosophy of the pragmatism research paradigm that focuses on action and change relating to a specific problem (Johnson, Onwuegbuzie 2004, Johnson, Onwuegbuzie & Turner 2007, Denscombe 2008, Tashakkori, Teddlie 2010, Creswell 2013). Mixed methods focus on the collection, analysis and combined usage of both quantitative and qualitative data in a single study (Creswell 2013). The mixed methods approach is based on the premise that a combination of both quantitative and qualitative approaches promotes a better understanding of research problems that either approach can offer independently (Creswell 2013).

A sequential explanatory mixed methods approach was used in order to explain and interpret the findings from the quantitative study (Biddix 2009). The quantitative approach facilitated the systematic empirical investigation of the social phenomenon (Kotler, Armstrong 2011). The use of statistical tools assisted with identifying patterns and understanding and determining the relationship between the variables that impact on the organisational effectiveness of funding agencies. The qualitative approach, however, facilitated the examination, analysis and interpretation of the quantitative observations (Kotler, Armstrong 2011). The semi-structured interview discussions enabled the researcher to discover underlying meanings and patterns of relationships in a manner that contributed to the validity and trustworthiness of the outcomes of the quantitative study. The rationale for the use of the sequential explanatory mixed methods approach was that it allowed for a general understanding of the research problem through the use of the quantitative data. The qualitative data and its analysis then allowed for the refinement and explanation of the statistical results by exploring in details the views of key participants (Creswell 2008, Neuman 2010, Creswell 2013). The strengths and weaknesses linked to the use of this method are discussed at length in the literature (see Creswell et al. 2003, Teddlie, Tashakkori 2003, Ivankova, Creswell & Stick 2006, Tashakkori, Teddlie 2010).

In the present study, the limitations experienced included the availability of resources, the ability of the researcher to analyse both sets of data in detail, and the lengthy timeframe for data collection and analysis. Such challenges have been described in detail in the literature (Ivankova, Creswell & Stick 2006). The advantage of using the sequential explanatory mixed methods approach in the current study facilitated a richer understanding of the unexpected results that arose from the quantitative study, namely a surprising non-significant quantitative outcome. In addition, this research design was more quantitatively oriented, and this phase guided the sampling for the qualitative phase of the study (Creswell & Clark 2007). Using this premise, the researcher identified the key quantitative findings that needed additional exploration, which then guided the design of the qualitative phase of the study.

The mixed methods approach employed in this study comprised three phases. Phase 1 entailed the use of quantitative data that was collected using a large-scale online survey (SurveyMonkey), which was circulated to 22 funding agencies, across 16 countries. The data from 188 respondents was analysed, prior to embarking on the second phase of the data collection process. Phase 2 focused on qualitative methods, which involved the development of an interview protocol, which was piloted prior to being used as a guide for conducting eight interviews. The data was subsequently analysed before moving to the next phase. Phase 3

allowed the researcher to pool the research findings from phases 1 and 2, in order to propose a conceptual framework for improving the organisational effectiveness of funding agencies.

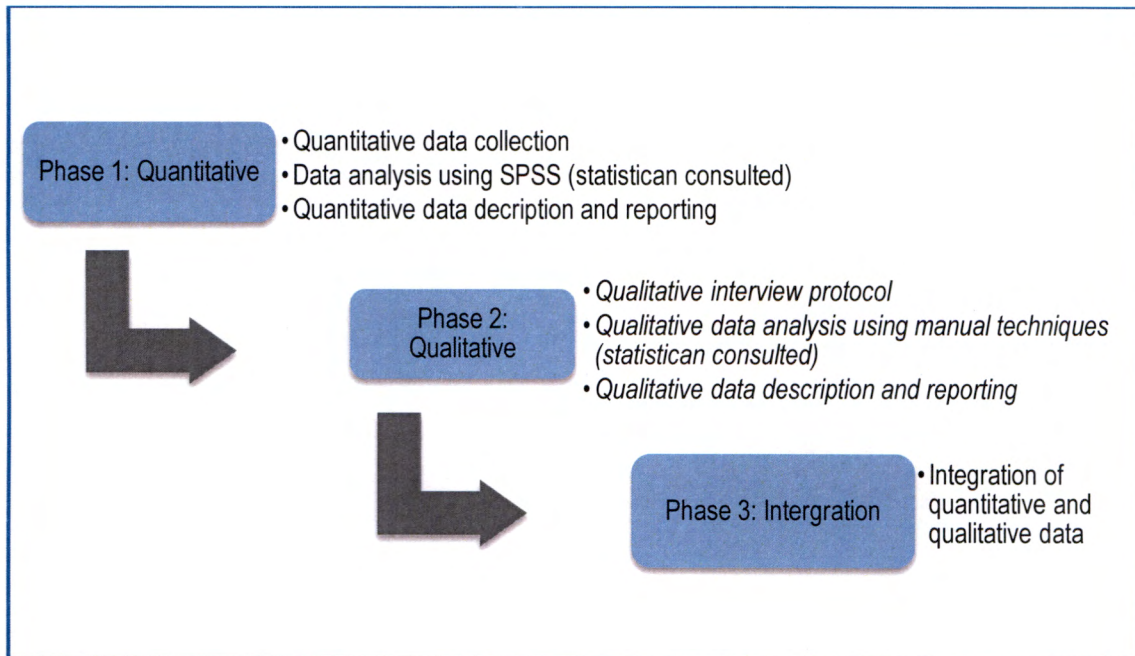


Figure 3.1: Summary of the sequential explanatory method used in the current study (Creswell & Clark 2007)

3.3 Research design

As mentioned previously, a mixed methods approach was adopted for the purposes of this research study. This organised approach allowed for deductive logic to be used in order to discover and confirm a set of probabilistic causal laws that could be used to predict general patterns of human activity (Neuman 2010).

3.3.1 Quantitative research design

3.3.1.1 Target group

The target groups for the online web-based survey initially extended to evaluating the perceptions of the various stakeholders associated with funding agencies, including the general science sector comprising researchers, employees in the funding agency itself as well as government and private sector representatives. Unfortunately, none of the funding agencies were willing to participate in the survey, and this target audience could not be accessed. This

subject is discussed in more detail in Chapter 4. As such, the survey was sent out to employees of the respective funding agencies only, which was met with approval by the leadership of participating funding agencies. The outcomes of this sampling process allowed for a comparative analysis of the findings across this target audience and across the different funding agencies. The following demographic variables were used to identify respondents:

- the employment status of respondents at the selected funding agency
- the number of years of employment at the selected funding agency
- the highest academic qualification obtained by the respondent

3.3.1.2 Data sources

The data sources for the quantitative phase, relied heavily on existing published texts and online surveys. The latter was completed by funding agency staff. The data collection strategy for this study involved an extensive literature review, which facilitated the identification of the factors and associated subfactors that influence the effectiveness of funding agencies. This process informed the questions that were posed in the web-based survey. In addition, reference was made to the NRF databases for sourcing potential participants for the survey. Furthermore, the websites of the various funding agencies were visited to obtain the contact details of the organisation's leaders and employees. A total number of 540 people were invited to participate in the web-based survey.

3.3.1.3 Sampling

The research participants were selected on a nonrandom basis using convenience sampling, in order to locate a highly specific population that was difficult to reach. As with other nonprobable sampling methods, convenience sampling does not produce a sample that is representative of a larger population, but is useful in accessing the clearly defined group that this study wished to target (Creswell 2013, Creswell & Clark 2007, Creswell et al. 2003).

The Global Research Council (GRC), which is divided into the German office, based at the Deutsche Forschungsgemeinschaft in Bonn, and the American office, which is based at the National Science Foundation in Washington, was contacted. The GRC representative provided the researcher with a list of 59 funding agencies. Using convenience sampling, a total of 22 funding agencies across 16 countries were selected to participate in the survey, which was

representative of funding agencies across the continents of Africa, Europe, the USA, South America, Australia, Canada and Asia. A wide net was cast with the objective of obtaining generalisable findings relating the effectiveness of funding agencies.

Invitations were sent to the leaders of the respective funding agencies and a response was required within a period of 14 working days. However, some agencies took more than four months to respond to the invitation. During this lengthy decision-making process, some of the employees employed by the respective funding agencies who had access to the online survey completed the questionnaire, despite the decision to participate in the survey not being finalised by the agency management. After a five-month period, from May to September 2013, only 13 agencies across 12 countries completed the online questionnaire, which constituted 59% and 75% of the total number of invited funding agencies and countries, respectively. From a total population of 540 employees from the 13 funding agencies that were invited to participate in the survey, only 188 agency staff or employees responded to the web-based survey, which reflected a response rate of 35%.

3.3.1.4 Data collection



A cross-sectional, large-scale online survey was used to collect quantitative information on the factors and subfactors associated with the organisational effectiveness of funding agencies in different contexts at the same time. The data was collected once and over a specified period of time, from May to September 2013. Fixed-response questions were posed to the respondents to gain a better understanding of the factors associated with the organisational effectiveness of funding agencies. The respondents, however, were afforded the opportunity to substantiate their responses. The survey comprised 55 fixed-response questions, but provision was made for each respondent to substantiate his or her response. During the piloting phase of this web-based survey, which was done in March 2013 with a group of ten representatives, comprising employees from the National Research Foundation of South Africa, and researchers from the University of North West, some questions had to be modified and refined so that a respondent could complete the survey within 15 minutes. A total of two questions per subfactor were posed in the final web-based survey, in order to ensure reliability. Annexure A, illustrates the link between the survey questions and the factors and subfactors, which was informed through the literature review. For the purposes of the online survey, the questions were scrambled (Annexure B).

A five-point Likert scale was used to evaluate the respondents' perceptions of organisational effectiveness, namely 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree; and 5 = unable to provide a response. The possible responses to any of the fixed-response questions, are listed below:

Strongly agree	Agree	Disagree	Strongly disagree	Unable to provide a response
Comment:				

The web-based survey was accessible online via SurveyMonkey and was available in both English and Spanish. The reason for having the survey translated into Spanish was to cater for the respondents from the Comisión Nacional de Investigación Científica y Tecnológica in Chile. Three reminder emails and invitations were sent out at three different time intervals to potential respondents of the quantitative data collection phase. The researcher was responsible for data collection during this phase.

3.3.1.5 Data analysis

The data obtained from the web-based survey was captured, processed and analysed by the researcher using the software package, SPSS. Analyses were limited to the sample available and were processed with the assistance of a statistician in order to minimise bias, given the researcher's experience in the funding agency environment.

(a) Descriptive statistics

Descriptive statistics were employed to describe the numerical data obtained from the online survey. Using frequency tables, the distribution of scores within the dataset was described. The data was further analysed and described by computing the mean, median and mode of the responses. In addition, the standard deviation, skewness, kurtosis and standard error were described (Neuman 2010).

Graphs were used to graphically depict the numerical data obtained from the web-based survey. This allowed for the identification of patterns in the data set and also indicated which data points were considered as outliers.

(b) Comparison of means

The comparison of group means was undertaken using statistical methods, including the t-test, analysis of variance (ANOVA). Both of these tests are parametric statistical techniques that involve an independent categorical variable and a number of assumptions, which are described in the section below.

T-test

The t-test is normally used when the dependent variable is a continuous interval/ratio scale variable and the independent variable is a second-level categorical variable. The t-test was used to test differences in the means between two groups and determine the p-value, which indicated the likelihood that the results were obtained by chance (Neuman 2010). The t-test is based on the following assumptions:

- The variables within each group are normally distributed.
- The variation of scores within the two groups is equal.

ANOVA

ANOVA is a statistical procedure used to compare the means between three or more groups by analysing variances. The ANOVA allows for only one independent categorical variable that has two or more different levels. The ANOVA is based on the following assumptions (Neuman 2010):

- The populations from which the samples are obtained are normally distributed.
- Samples are independent.
- Variances of the population are equal.

The ANOVA technique allows for a comparison of the ratio of between-group variance to within-group variance. In order to determine whether the variability of two samples differs significantly, an F-test was conducted, which measured the ratio of two independent chi-square variables divided by the respective degrees of freedom (Hair et al. 2010).

In the current study, ANOVA was employed to determine whether samples from two or more groups came from populations with equal means (Creswell 2008). Where the analysis indicated that the observed value was less than the test level of significance, then a significant difference was reported. However, the ANOVA test also indicated that the means were not equal, and a Scheffe test was thus conducted to find where the differences between the means lay.

(c) Factor analysis

Factor analysis was used to study the patterns of relationships between the factors and subfactors. Factor analysis was used to reduce the number of factors and classify them according to their relationship with subfactors. Once the common underlying dimensions had been verified, a summated scale was calculated for each, which was then used in secondary analysis (Hair et al. 2010).

Factor analysis was used to suggest answers to four major questions:

- Do the factors and subfactors cluster according to the balanced scorecard?
- If not, how many different factors are needed to explain the pattern of relationship between the subfactors?
- What is the nature of those factors?
- How well do the factors explain the observed data?

3.3.1.6 Reliability and validity of the quantitative research design

Reliability refers to the consistency of the measurement or the degree to which an instrument measures the same way each time it is used under the same conditions with the same subjects (Hair et al. 2010). Validity, however, refers to the technical soundness of a study (Creswell 2008). To ensure that the results were reliable and valid for both the qualitative and quantitative phases, statisticians from the respective fields were consulted.

In addressing these two concepts, the researcher encouraged employees across the different funding agencies to complete the web-based survey. In addition, senior management and advisors to the respective funding agencies were invited to participate in the interviews. This allowed for generalisable findings, which are reported in chapter 4.

To ensure the reliability of the quantitative findings of this study, the researcher used the internal consistency method, which is used to assess the consistency of results across items within the specified test, namely the Cronbach alpha (Hair et al. 2010). The Cronbach alpha, however, is not a statistical test but a coefficient of reliability of consistency. A high alpha value, that is, a value greater than 0.7, was used as evidence that the items measured an underlying or latent construct (Nunnally, Bernstein 1978). In addition, a minimum of two questions were

used in the survey to test for consistency in the participant's response to questions relating to the effectiveness of funding agencies. In essence, this process ensured a comparison of test items that measured the same construct.

3.3.2 Qualitative research design

3.3.2.1 Target group

Interviews were conducted with senior management of funding agencies that agreed to participate in the survey, namely the South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica in Chile and the Research Council of Norway. In addition, the head of the Global Research Council was also interviewed. Finally, interviews were conducted with those agencies that were willing to participate in a qualitative study only, such as the Deutsche Akademische Austauschdienst. The eight interviews were conducted either face to face in the office of the interviewee or via a telephonic discussion using Skype. The following demographic variables were used to identify respondents:

- the employment status of respondents at the selected funding agency
- the number of years of employment at the selected funding agency
- the highest academic qualification obtained by the respondent

3.3.2.2 Data sources

The data source for the qualitative phase comprised interviews. These interviews were conducted with funding agency staff, as well as a consultant and a university professor. Three reminder emails and invitations were sent out at three different time intervals to potential respondents of the qualitative data collection phase. The researcher was responsible for data collection in the qualitative phase.

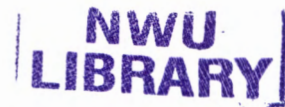
3.3.2.3 Sampling

Using convenience sampling, representatives from the senior management of the funding agencies that participated in the survey were invited to participate in the interviews. A total of 11 individuals were approached and eight individuals were interviewed at the end of the qualitative phase of the study, which was an approximate response rate of 72%. The interview participants

discussed issues pertaining to the organisational effectiveness of the following funding agencies:

- the South African National Research Foundation
- the Deutsche Akademische Austauschdienst
- the Comisión Nacional de Investigación Científica y Tecnológica
- the Research Council of Norway
- the European Physical Sciences and Research Council

3.3.2.4 Data collection



The objective of the qualitative phase was to determine the opinions, desires and attitudes of the interview participants in order to gain a better understanding of the factors impacting on the organisational effectiveness of funding agencies. In addition, corroborative interviews were conducted to assess the reliability and validity of the findings from the quantitative analysis. Participants for this phase of the research project were purposefully selected from the first phase of this study. The interview protocol was piloted using three participants, in order to refine the tool. Eight interviews were subsequently conducted with the senior management of those funding agencies participating in the quantitative study, namely the South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica in Chile, the Research Council of Norway, the Engineering and Physical Sciences Research Council and the Deutsche Akademische Austauschdienst. In addition, a consultant to one of the funding agencies and a professor, who is an advisor to several funding agencies as well as a recipient of grant funding from a separate funding agency, were interviewed. Semi-structured questions were posed to solicit as much information as possible relating to the validity of the quantitative findings. All the interviews were audio-taped, and then transcribed. The interview transcripts were sent to the various interview participants, to ensure the accuracy of the information that was captured in the transcripts.

3.3.2.5 Data analysis

The data obtained from the one-on-one interviews were tape recorded, transcribed by an independent transcriber and then analysed manually by the researcher. Analyses were limited

to the sample available and were processed with the assistance of a qualitative statistician in order to minimise bias, given the researcher's experience in the funding agency environment.

An interview guide or protocol was developed. The interviews followed a semi-structured interview guide and included some open-ended questions. The objective of this component of the assessment was to clarify and disentangle trends that had emerged from the web-based survey (Creswell 2013). For the purpose of analysing the interview data, thick description and thematic analysis was used. Audio-tapes of the interviews were transcribed verbatim to ensure that the analyses were consistent. The transcripts were verified by the researcher, who in this instance, was also the interviewer as well as the interviewee, prior to the commencement of analysis, in order to minimise description bias (Auerbach, Silverstein 2003).

Data analysis was conducted simultaneously with data collection, interpretation and transcription. Memos were also written immediately after data collection in order to document the impressions, and other detailed occurrences that transpired (Berg, Lune 2004). Open coding was used to analyse the transcript line by line, which led to the development of key concepts that represent the emerging phenomenon. The constant comparative method was applied to explore differences and similarities across incidents in the data to identify emerging concepts (Auerbach, Silverstein 2003). At this stage, thematic analysis was employed (Merriam 1998, Pope, Mays & Popay 2007).

The research design used for the analysis of the gathered interviews was qualitative thematic analysis. According to (Pope, Mays & Popay 2007: p. 96), thematic analysis is the "identification of the main, recurrent, or most important issues or themes arising in a body of evidence". Thematic analysis can be described as a process that "produces knowledge that takes the form of themes, built up from descriptive codes, which capture and make sense of the meanings which characterise the phenomenon under investigation" (Willig 2013: p. 65). After a thorough investigation of the most valid and reliable method to be used, the researcher decided to utilise thematic analysis as the main research design to extensively collect information and reveal the most vital perceptions relating to the organisational effectiveness of funding agencies. The purpose of this analysis was to determine the interviewees' knowledge and perceptions with regard to the organisational effectiveness of funding agencies in general. In addition, the researcher formed the structure of this particular study in three steps in completing the qualitative thematic analysis method (Attride-Stirling 2001). These three steps were as follows: (1) "the reduction or breakdown of the body text from the interviews; (2) the examination or

exploration of the text; and (3) the integration or grouping of the exploration” (Attride-Stirling 2001: p. 390).

3.3.2.6 Reliability and validity of the qualitative research design

In terms of the qualitative approach, validity and reliability remain rather hazy and there are different suggestions on how a researcher can address these concepts in the analysis of qualitative data (Brink 1993, Merriam 1998, Healy, Perry 2000). In the current study, contextual validity was ensured by referring to the original quoted texts of the interviewee, so as to present an authentic encounter (Ihantola, Kihn 2011). In addition, because the researcher used a mixed methods approach, the concerns relating to validity and reliability were minimised (Yin 2006). Triangulation or the mixing of quantitative and qualitative methods have been reported to improve validity by providing a more holistic picture of the concepts under investigation (Jick 1979, Ihantola, Kihn 2011), in this instance, the factors influencing the organisational effectiveness of funding agencies.

3.3.3 Ethics

The consideration of ethical issues relating to research in general is not a new phenomenon (Merriam 2009). For the purposes of this study, the following ethical issues were considered and implemented to ensure that the potential research participant was protected from harm.

3.3.3.1 Consent

All potential participants in this study were fully informed of the study, including their role and the impact of their participation. The potential participants were informed of the nature and consequences of giving their consent and were further informed that participation was voluntary. In essence, measures were adopted to ensure that the potential participants fully understood the research study and the questions posed. This was clearly defined and described in the protocol. Furthermore, no one under the age of 18 was approached to participate in the study. Informed consent from the potential research participants was a prerequisite for further participation in the study.

3.3.3.2 Harm

Measures were taken to ensure participant anonymity and treating confidential information with sensitivity and respect so that no harm would come to respondents as a consequence of their participation in the research study.

3.3.3.3 Privacy

Total privacy does not exist. However, for the purposes of this study, the researcher ensured that sensitive information was handled with care and respect for ensuring privacy. Furthermore, interviews were conducted in an enclosed office space to avoid undue invasion of privacy.

The participants were informed that on completion of this study, they would receive feedback.

3.4 Summary of the research methodology



As mentioned in chapter 2, the balanced scorecard was adopted for the purposes of this study. It was used to inform the study design and the development of data collection tools. As stated in chapter 2, five factors were identified through a rigorous literature review process, and each of these factors in turn had five associated subfactors. These 25 subfactors were then integrated into the sequential explanatory mixed methods research design, as described in the table below.

Table 3.1: Summary of the data collection sources and strategies

Data required	Source	Strategy	Primary/secondary data
Identification of factors and subfactors that need to be investigated in this research study	Literature	Extensive literature review	Secondary
<i>Quantitative phase: perceptions of the effectiveness of funding agencies</i>	<i>Employees of the respective funding agencies</i>	<i>Web-based survey</i>	<i>Primary</i>
Qualitative phase: perceptions of the effectiveness of funding agencies	Senior management of the respective funding agencies + consultant + university professor	Semi-structured interviews	Primary

The researcher had personal experience working in the funding agency environment. Therefore, during the quantitative and qualitative data analysis phases, statisticians in their respective fields of expertise were consulted to ensure that personal the biases, viewpoints and assumptions of the researcher were minimised, as recommended by Merriam (2009). The findings of the quantitative and qualitative phases were subsequently analysed and integrated in the final section of this dissertation.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

As discussed in the previous chapters, the broad aim of this study was to evaluate the effectiveness of funding agencies in the science sector by identifying the key factors that are closely linked to the organisational effectiveness of funding agencies. The research also aimed to contribute to a global discussion on funding agencies and their effectiveness in the science sector. This research employed a mixed methods approach to achieve these objectives.

This chapter is divided into four sections. The first section describes the data collection phase and some of the key learnings associated with the poor response rate from the various agencies that were invited to participate in the study. The second section describes the data that was collected from the participating countries and presents the quantitative results of survey responses. The third section deals with the qualitative results of the interviews, while the fourth section integrates and summarises the key findings of the study.

4.2 Quantitative data collection

The survey was accessible to all potential respondents from May to September 2013. In most instances, no response was received to the invitation to participate in the survey, despite several reminder emails and telephone calls to the respective agencies. A total of 540 potential respondents were invited to participate in the survey, but only 188 respondents completed the online survey. The poor response rate of 35% can partly be attributed to the following:

- 1) A number of leaders across the various funding agencies, were reluctant to participate in the survey, or have their employees participate in the survey, as the outcomes could impact on the image and reputation of either the country's or agencies' leadership.
- 2) This uncertainly cascaded down to employees across the various funding agencies' who were reluctant to participate in the survey.
- 3) Some of the potential respondents indicated that they worked for a national or federal agency and hence they could not participate in the survey, without consent from their senior leadership, as per the terms of their employment.
- 4) A number of potential respondents were concerned about confidentiality issues, given the relatively easy access to information by government bodies.
- 5) Some potential respondents were also scared about going against the organisation's leadership.
- 6) Other potential respondents were concerned about job security.

7) Finally, a number of the potential respondents had busy schedules and this may have resulted in them not completing the survey timeously.

In other instances, the following responses were received from the employees at the various agencies:

- *“We would like to decline the invitation to participate in the survey.”*
- *“We would be happy to provide a single agency response to your survey.”*
- *“We are not able to answer the survey, especially since your concept and terminology do not really cover the profile of our organization.”*
- *“It would be preferable for us not to be part of such a survey at this time. As you might not be aware, our former President left the organisation earlier this year and the uncertainty created by her departure could cause some variations in the results that would reduce its significance and, could present some interpretation and communication issues for the organization.”*
- *“It is very hard to put your questions into the proper context, and I hesitate to try. I regret we cannot contribute to your dissertation.”*
- *“I would gladly participate if a qualitative approach was adopted instead.”*
- *“I regret that we did not have the opportunity to participate with the requested amount of people from our organisation within the timeframe.”*
- *“I wanted to discuss your request with others before responding as there are considerable changes occurring in the organisation at the moment as well as quite a high workload because of the timing of government budget setting.”*
- *“I’ve had a look through the set of questions that you wish to pose and note that they are very similar to the annual survey that government funded institutions take part in.”*
- *“Though your study sounds interesting, we have some limitations on the manner in which we engage staff in survey undertakings.”*

Given the above-mentioned context, the leadership of those funding agencies that were agreeable to participating in the survey, indicated that the scope must be limited to the perceptions of funding agency employees only, and exclude those of government officials and researchers.

Table 4.1: Summary of quantitative data collection

DATA COLLECTION SUMMARY		
Country	Funding agency	Number of respondents
Australia	Australian Research Council	1
Austria	Austrian Science Foundation FWF	5
Brazil	Fundação de Amparo à Pesquisa do Estado de São Paulo	1
Canada	Natural Sciences and Engineering Research Council of Canada	5
Chile	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	43
Germany	Alexander von Humboldt Foundation	1
Indonesia	Indonesian Institute of Sciences	1
Norway	Research Council of Norway	21
South Africa	National Research Foundation	92
Sweden	The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning –FORMAS	8
UK	Engineering and Physical Sciences Research Council	2
USA	National Institutes of Health	7
	National Science Foundation	1
TOTAL		188



4.3 Quantitative data analysis

4.3.1 General findings for all respondents

4.3.1.1 Composition of the sample

The highest number of responses was received from the National Research Foundation, South Africa (48.7%), followed by the Comisión Nacional de Investigación Científica y Tecnológica, Chile (22.8%) and the Research Council of Norway (11.1%). The least number of responses

were received from the Alexander von Humboldt Foundation, Australian Research Council, Fundação de Amparo à Pesquisa do Estado de São Paulo, Indonesian Institute of Sciences and the National Science Foundation who each submitted one response (0.5%). The responses that were received were therefore erratic in terms of the number of employees from the various funding agencies' completing the survey (table 4.2).

The survey was translated into Spanish for the respondents from Chile (appendix B). Although a translator was used to translate the survey from English to Spanish, the translated survey was also edited by the Co-ordinator of Studies at the Comisión Nacional de Investigación Científica y Tecnológica: Chile (CONICYT), to ensure that the terminology used was relevant to its national context.

Table 4.2: Composition of the sample across the different funding agencies

		Frequency	Percent	Valid percent	Cumulative percent
Valid	National Research Foundation: South Africa	92	48.7	48.9	48.9
	Comisión Nacional de Investigación Científica y Tecnológica: Chile	43	22.8	22.9	71.8
	Research Council of Norway	21	11.1	11.2	83.0
	The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning – FORMAS	8	4.2	4.3	87.2
	National Institutes of Health: USA	7	3.7	3.7	91.0
	Austrian Science Foundation FWF	5	2.6	2.7	93.6
	Natural Sciences and Engineering Research Council of Canada	5	2.6	2.7	96.3
	Engineering and Physical Sciences Research Council: UK	2	1.1	1.1	97.3
	Alexander von Humboldt Foundation	1	.5	.5	97.9
	Australian Research Council	1	.5	.5	98.4
	Fundação de Amparo à Pesquisa do Estado de São Paulo	1	.5	.5	98.9
	Indonesian Institute of Sciences	1	.5	.5	99.5
	National Science Foundation: USA	1	.5	.5	100
	Total	188	99.5	100.0	
Missing	1	1	.5	100.0	
Total		189	100.0		

The largest number of respondents comprised employees that had worked for a period spanning one to five years (38.6%), which was followed by those who had been employed for a period of six to ten years (20.1%). The third highest number of respondents comprised those employees who had worked for the funding agency for a period less than a year (13.8%), and those who had worked for the agency for a period of 11 to 15 years (13.8%) as reflected in table 4.3 below.

Table 4.3: Duration of employment of respondents

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1-5 years	73	38.6	39.0	39.0
	6-10years	38	20.1	20.3	59.4
	<1 year	26	13.8	13.9	73.3
	11-15 years	26	13.8	13.9	87.2
	16-20 years	9	4.8	4.8	92.0
	21-25 years	9	4.8	4.8	96.8
	>30 years	4	2.1	2.1	98.9
	26-30 years	2	1.1	1.1	100.0
Total	187	98.9	100.0		
Missing	System	2	1.1		
Total		189	100.0		

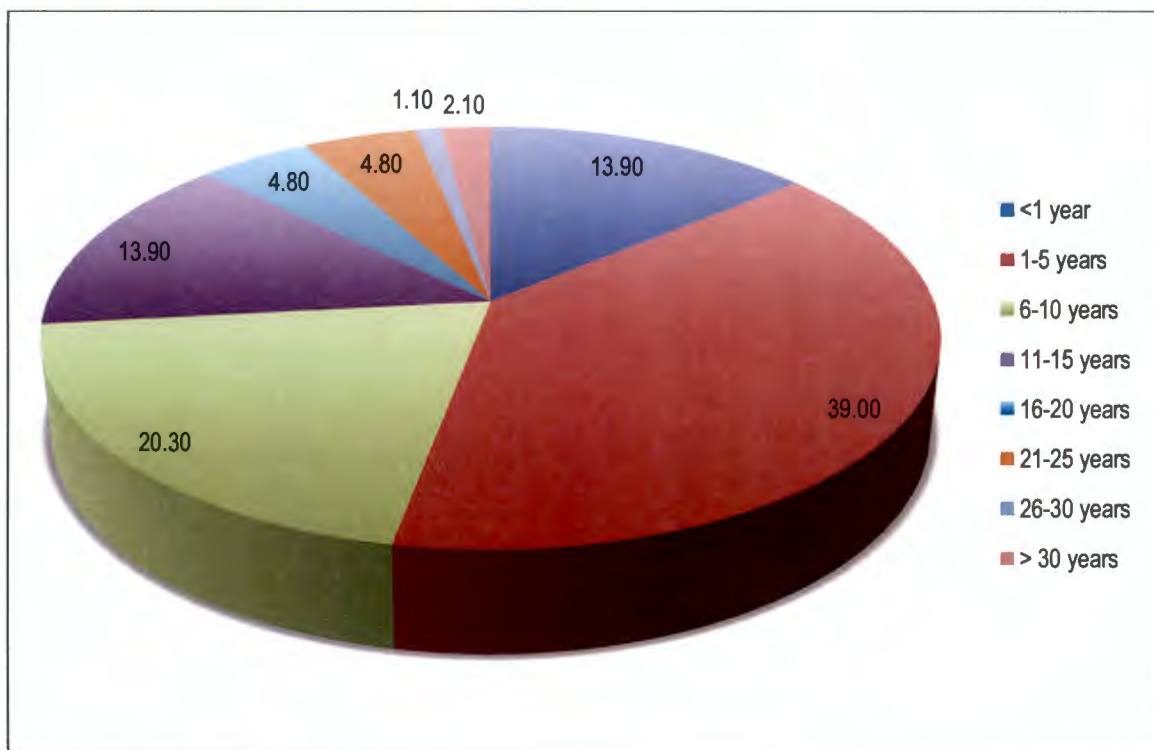


Figure 4.1: Demographic profile of respondents based on years of employment at the funding agency

The highest number of respondents had a master's qualification (30.7%), followed by respondents in possession of a doctoral qualification (27.5%), and lastly, a degree (22.2%), respectively. Nine percent of respondents were in possession of a diploma. Only 6% and 12% of the respondents had, as their highest qualification, a high school graduation and other training (table 4.4).

Table 4.4: Qualification level of respondents

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Masters	58	30.7	31.0	31.0
	Doctoral	52	27.5	27.8	58.8
	Degree	42	22.2	22.5	81.3
	Diploma	17	9.0	9.1	90.4
	Other	12	6.3	6.4	96.8
	Graduated from high school	6	3.2	3.2	100.0
	Total	187	98.9	100.0	
Missing	System	2	1.1		
Total		189	100.0		

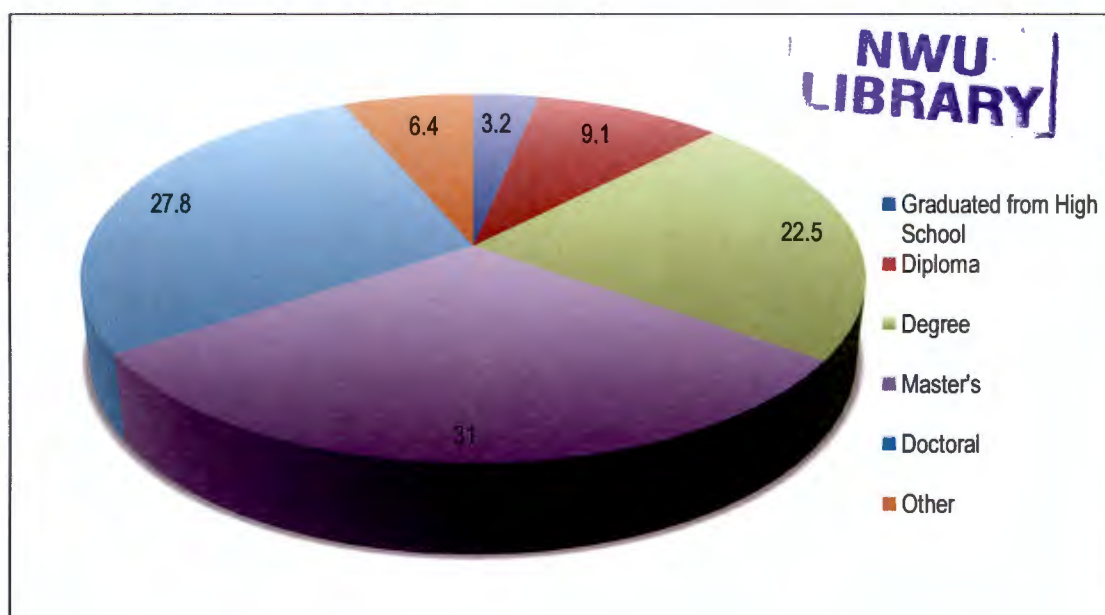


Figure 4.2: Demographic profile of respondents based on highest level of qualification

This reflects that the survey was completed by a group of highly qualified individuals. It is also a reflection of the calibre of employees engaged to manage and administer research grants at the various funding agencies.

4.3.1.2 Survey responses

From the sample size, missing values averaged at 13.6%. Almost 7.5% of respondents indicated that they were unable to provide a response. In addition, 49.3% of respondents provided a positive response – that is, they chose the strongly agree and agree options to the

questions posed in the survey. Finally, 29.5% of respondents provided a negative response – that is, chose the strongly disagree and disagree options to the questions posed in the survey (see Annexure B for the complete questionnaire).

Table 4.5: Summary of the responses received from the survey

Number of questions					50
Percentage	Positive (strongly agree + agree)	Unable to respond	Negative (strongly disagree + disagree)	Missing	TOTAL
Average	49.3	7.5	29.5	13.6	100
Highest	76.7	28.6	43.4	15.3	
Lowest	25.4	0.0	9.0	12.7	

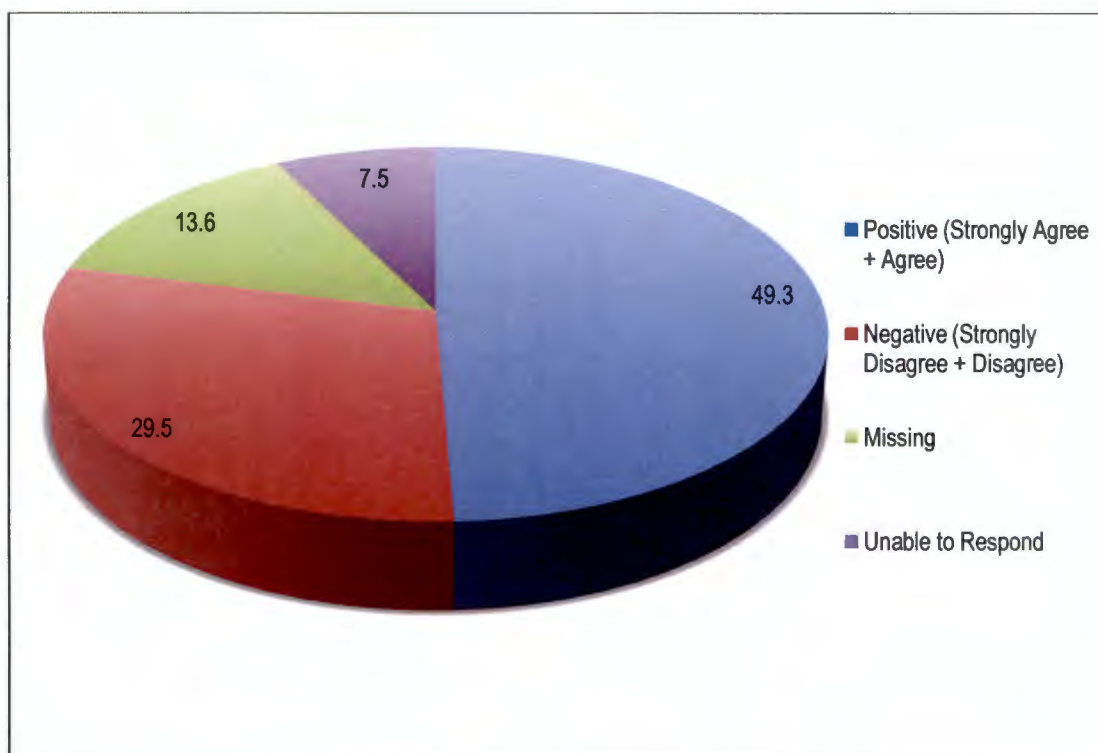


Figure 4.3: Summary of the responses received from the survey

From the above, one can deduce that employees seemed to agree with most of the statements made in the survey. In addition, it appears that they tended to adopt a positive attitude towards the elements linked to the organisational effectiveness of the funding agency at which they were employed.

Table 4.6: Summary of responses per statement in the web-based survey

No.	Question	Positive (strongly agree + agree)	Unable to respond	% Negative (strongly disagree + disagree)	Missing	TOTAL
1	The organisation has competent staff	76.7	0.0	9.0	14.3	100
2	The CEO/President/Director embraces the organisation's corporate values by "walking the talk"	58.2	6.9	21.2	13.8	100
3	Customer suggestions are dealt with utmost care	52.9	2.1	31.7	13.2	100
4	The organisation's financial management practices are effective	67.2	3.7	16.4	12.7	100
5	The organisation is often first to market new offerings	33.9	12.2	40.2	13.8	100
6	The organisation is able to mobilise resources to minimise the impact of risk events	50.2	9.0	27.0	13.8	100
7	The organisational image is positive	66.6	1.1	18.5	13.8	100
8	The organisational structure supports efficient decision-making processes	47.1	3.7	36.0	13.2	100
9	Roles of individual employees are clearly defined	53.4	3.2	29.1	14.3	100
10	The organisation re-engineers its information technology systems in accordance with environmental demands	49.7	7.4	30.2	12.7	100
11	The skills set of employees in the organisation is highly specialised	53.5	2.1	30.2	14.3	100
12	Trust in the leadership of the organisation is high	48.6	4.2	33.3	13.8	100
13	The current customer support structures at the organisation are effective	54.5	2.6	28.6	14.3	100
14	Financial controls are in place to ensure that funds are spent in a transparent manner	71.4	5.8	9.5	13.2	100
15	The organisation is able to counteract the effect of threats posed by competitors	39.7	24.3	23.3	12.7	100
16	Performance (including under-performance) is effectively managed	38.1	5.8	43.4	12.7	100
17	Employees understand their contribution to the organisation's strategy	51.8	2.6	31.7	13.8	100
18	The organisation has a reputation for quality assurance	59.8	5.3	22.2	12.7	100
19	Corrective measures are undertaken to manage identified risk factors	51.9	5.8	29.1	13.2	100
20	The organisation manages its information technology systems in accordance with international industry standards	41.8	13.2	31.7	13.2	100
21	The organisation's offerings meet the evolving demands of customers	49.2	6.3	31.2	13.2	100
22	Rewards are given to staff who go the extra mile	40.2	4.2	41.3	14.3	100

23	Adequate resources are allocated to improving business processes	41.3	7.9	37.6	13.2	100
24	The organisation is able to manage resources effectively	55.6	4.8	25.9	13.8	100
25	In the case of an economic crisis, the organisation is able to honour the payment of all committed grants	54.0	13.8	19.0	13.2	100
26	An informative website is used to share information with stakeholders	60.8	0.5	25.4	13.2	100
27	The board uses appropriate key performance indicators to measure the organisation's effectiveness	44.4	13.8	28.0	13.8	100
28	The organisation's business strategy articulates effective measures to deal with political volatility	32.8	20.1	32.8	14.3	100
29	Trust is the basis for interactions between employees	54.5	3.7	27.5	14.3	100
30	The organisation is able to adapt to sociocultural changes in the external environment	53.4	6.9	25.9	13.8	100
31	Support is provided for staff to pursue formal qualifications	66.7	1.1	18.5	13.8	100
32	Communication is clear	43.9	2.1	40.2	13.8	100
33	Quality customer service underpins customer loyalty	48.7	6.3	31.7	13.2	100
34	Employees know how to increase the return on investment for the organisation	32.8	14.8	39.2	13.2	100
35	In the case of an economic crisis, the organisation is able to secure additional resources to ensure operations are minimally affected	33.3	18.0	34.9	13.8	100
36	Employees in the organisation are productive	58.7	6.9	21.2	13.2	100
37	Levels of customer satisfaction are regularly assessed	44.4	7.4	34.9	13.2	100
38	Technological systems effectively support the organisation's core business	57.6	3.2	25.9	13.2	100
39	A staff wellness programme motivates staff to better manage work-life pressures	43.4	8.5	34.4	13.8	100
40	Employees feel valued for their contribution in the organisation	45.5	4.2	37.0	13.2	100
41	Communication with external stakeholders is managed in an effective manner	44.9	6.9	34.9	13.2	100
42	Identified talent is developed for promotion	40.7	6.3	38.1	14.8	100
43	The organisation is able to adapt to political changes	49.8	12.2	22.8	15.3	100
44	The organisation's portfolio of offerings attracts new customers	49.2	10.1	25.9	14.8	100
45	Oversight by the president's office of the country enhances organisational performance	25.4	28.6	32.8	13.2	100
46	Effective on-the-job skills training programmes are in place	46.6	4.8	35.4	13.2	100

47	The communication style in the organisation allows for the sharing of information	48,2	3,2	35,4	13,2	100
48	The best talent is sourced to fill internal positions	39,7	9,0	38,1	13,2	100
49	Return on investment is clearly defined in the organisation	33,3	14,3	38,6	13,8	100
50	All socioeconomic groups are able to access funding	61,4	5,3	20,1	13,2	100
AVERAGE %		49,3	7,5	29,5	13,6	
HIGHEST %		76,7	28,6	43,4	15,3	
LOWEST %		25,4	0,0	9,0	12,7	

From the table above, it can be seen that the top five elements that respondents were positive about included the following: that is, a total of 76.7% of the respondents strongly agreed that the funding agency at which they were employed, had competent staff. The respondents also agreed that financial controls were in place to ensure that funds were spent in a transparent manner (71.4%). Financial management practices were also deemed effective by the respondents (67.2%). In addition, the respondents were positive about the support structures in place for staff to pursue formal qualifications (66.7%) and about the image of the organisation (66.6%).

The top five elements that respondents were negative about are described here. This included performance (including underperformance) being ineffectively managed (43.4%). A total of 41.3% of the respondents were disillusioned by the reward system that was in place for staff who go the extra mile. The respondents were negative about communication being clear at the funding agency at which they were employed (40.2%), as well as the agency being first to market new offerings (40.2%). Finally, respondents disagreed with the agency's ability to clearly define a return on investment for the organisation (38.6%).

At the end of the questionnaire, each respondent was required to rank each of the five factors, in terms of their perceived impact on the organisational effectiveness of funding agencies. The respondents considered organisational learning and growth as the most important factor, with a mean score of 3.56; which was closely followed by the external environment, which had a mean score of 3.53. Customer service was ranked third, in terms influencing the effectiveness of funding agencies, and had a mean score of 2.87. The factors that were considered to be least important in terms of affecting organisational effectiveness, were financial management and business processes, which had a mean value of 2.71 and 2.33, respectively. Overall it would

appear that given that the mean scores ranged in value from 2.33 to 3.56, each of these factors was considered important by the respondents and need to be considered when developing a framework for the organisational effectiveness of funding agencies.

Table 4.7: Descriptive statistics for the five factors: all respondents

	N	Minimum	Maximum	Mean	Std deviation
Organisational learning and growth	163	1	5	3.56	1.375
External environment	163	1	5	3.53	1.411
Organisational customer Service	163	1	5	2.87	1.325
Organisational financial management	163	1	5	2.71	1.276
Organisational business processes	163	1	5	2.33	1.282
Valid N (listwise)	163				

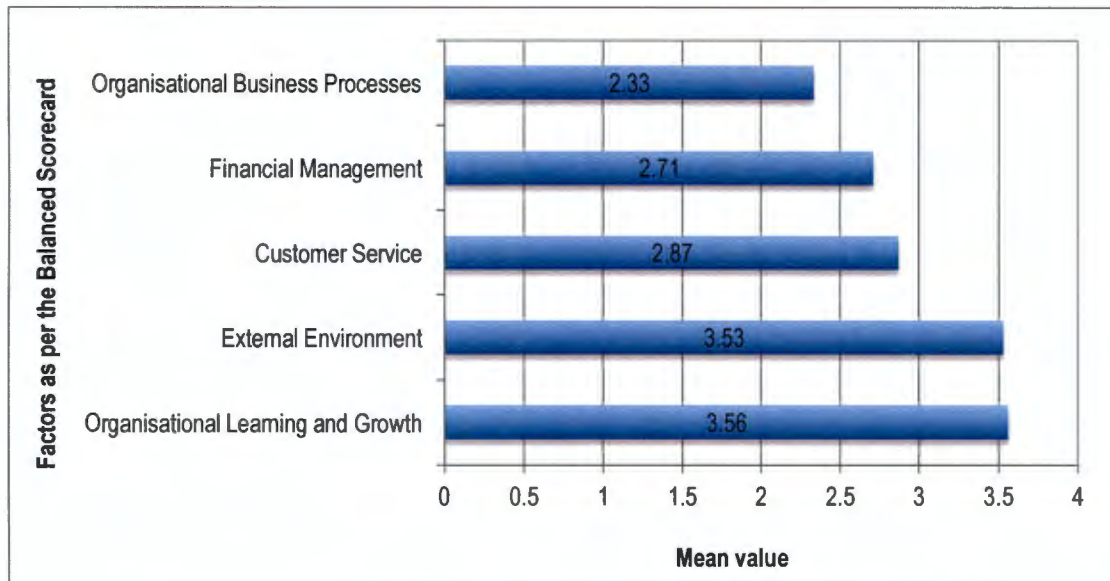


Figure 4.4: Factor means for the five factors linked to the balanced scorecard

4.3.1.3 Factor analysis

A principal axis factor analysis with a direct oblimin rotation was conducted to primarily determine whether or not the 25 subfactors clustered according to the five factors that were part of the theoretical balanced scorecard used in this study and presented in chapter 2. The secondary objective for using factor analysis was to determine the nature and number of factors that could adequately explain the organisational effectiveness of funding agencies.

The recommended sample size for conducting factor analysis varies, according to the literature. Some suggest that a sample size of 300 is required, while others suggest that 100 or 150 is more than adequate (Mundfrom, Shaw & Ke, 2005; Tabachnick & Fidell, 2007; MacCallum, Widaman, Zhang, & Hong, 1999). The items subjected to the factor analysis must be interval data, and for the purposes of the current study, this was achieved by means of a Likert scale. Owing to the sample size ($n = 188$) relative to the number of subfactors (25), it was decided that pairs of two questions would be entered into the factor analysis. This was based on five subfactors being linked to each of the five factors and each of the 25 subfactors in turn, had two questions formulated in the survey, in order to ensure reliability. This elevated the subfactor to sample ratio to 1:7.56, which is more than the acceptable ratio of 1:5 for factor analysis (Hatcher & O'Rourke, 2014; Hair et al, 2010; Gorsuch, 1997) and this was also confirmed by the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests for homogeneity of variances.

The KMO measure of sampling adequacy was 0.899. According to Kaiser (1970), the KMO value should be equal to or greater than 0.6 for the researcher to be able to proceed with factor analysis. In this study, it was recommended that a value of 0.5 could be considered as a cut-off point, and any value equal to or greater than 0.8 could be deemed a desirable value (Kaiser, 1970). The Bartlett's test of sphericity reflected a value of 0.000, which was significant ($p < 0.05$) and indicated a high level of sampling adequacy.



Table 4.8: KMO and Bartlett's test

KMO and Bartlett's test		
Kaiser-Meyer-Olkin measure of sampling adequacy		.899
Bartlett's test of sphericity	Approx chi-square	1587.764
	df	300
	Sig	.000

Before the factor analysis was performed, five factors were identified from the literature review, and each factor had five subfactors associated with it. A total of two questions per subfactor were posed in the final web-based survey, in order to ensure reliability. Hence a total of 50 questions were included in the survey relating to the organisational effectiveness of funding agencies. These factors and subfactors are described below.

Table 4.9: The factors and subfactors theoretically linked to the adapted balanced scorecard

FACTOR	Subfactor 1	Subfactor 2	Subfactor 3	Subfactor 4	Subfactor 5
HR MANAGEMENT/ LEARNING & GROWTH	Skills and competencies	Talent management	Employee motivation	Employee development opportunities	Performance management & assessment
BUSINESS PROCESSES	Leadership	Climate	Technology	Communication	Organisational structure
CUSTOMER SERVICE	Customer support	Communication strategy	Customer service and satisfaction	Customer attraction and retention	Organisational image and reputation
FINANCES	Governance	Ability to acquire resources	Productivity	Return on investment	Risk management
EXTERNAL ENVIRONMENT	Global competition	Political	Economic	Sociocultural	Technological

All 50 items, as presented in the questionnaire, could not be entered into the factor analysis, as the ratio of items to respondents was small. However, given that each subfactor had two items linked to it, for the purposes of reliability, the ratio pairs were then considered for further analysis. The 25 subfactors were then subjected to a principal component analysis to determine how many factors could be identified from the sample. Based on the eigenvalues, a scree plot was generated graphically depicting the number of factors on the X-axis and the eigenvalues on the Y-axis. The point at which the slope of the curve levels off and forms the typical elbow, also depicts the number of factors that ought to be generated by the analysis (Hair et al, 2010). In the current study, the scree plot confirmed that four factors had a value greater than one, which was also seen in the traditional elbow-shaped curve on the scree plot.

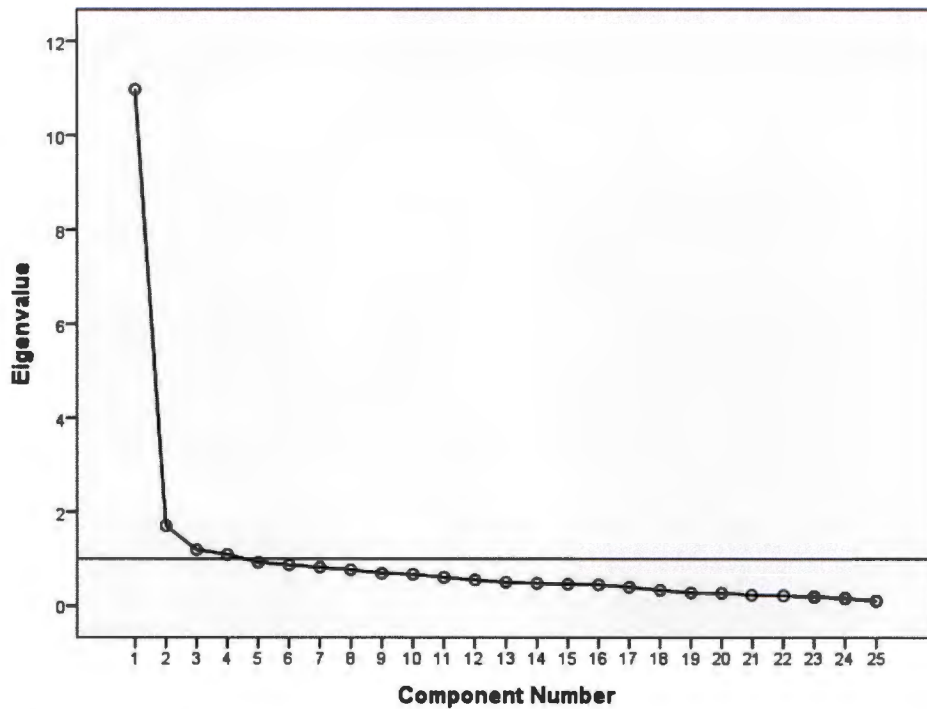


Figure 4.5: Scree plot of eigenvalues

Using principal component analysis, the Kaiser criterion also suggested that four factors could be extracted and that these would explain a total of 59.888% of variance in the data. A principal axis factor analysis with a direct oblimin rotation was subsequently performed (Kaiser, 1970).

Table 4.10: Principal component analysis reporting eigenvalues

Component	Total variance explained					
	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	10.980	43.920	43.920	10.980	43.920	43.920
2	1.705	6.821	50.741	1.705	6.821	50.741
3	1.194	4.778	55.519	1.194	4.778	55.519
4	1.092	4.369	59.888	1.092	4.369	59.888
5	.925	3.699	63.587			
6	.870	3.480	67.067			
7	.821	3.285	70.352			
8	.768	3.071	73.424			
9	.691	2.764	76.188			
10	.672	2.689	78.877			
11	.607	2.428	81.305			
12	.550	2.201	83.507			
13	.502	2.008	85.514			
14	.480	1.918	87.432			
15	.462	1.848	89.281			
16	.451	1.804	91.084			
17	.400	1.601	92.685			
18	.334	1.336	94.021			
19	.281	1.123	95.144			
20	.274	1.097	96.241			
21	.235	.940	97.182			
22	.226	.903	98.085			
23	.200	.798	98.883			
24	.167	.669	99.552			
25	.112	.448	100.000			

Extraction method: Principal component analysis

The factor loadings, original factors and subfactors as well as the newly identified four-factor names are reported below. The table indicates that the four new factors and the associated subfactors were reliable, as indicated by the alpha values. Loadings indicate the degree to which each of the subfactors contributes to the meaning of each factor (Hair et al, 2010). In the current study it was found that a value of 0.40 and higher was considered substantial and that the subfactors related positively to each of the factors. Although the initial five factors appear to be noticeably different from the newly identified four factors, the subfactors from the theoretical study, which was informed by a literature review, all clustered around the newly identified factors.

A few of the subfactors loaded against more than one factor: customer attraction and retention loaded against factor 1 (0.323) and factor 3 (0.424). Organisational communication loaded against factor 2 (0.393) and factor 4 (0.419). Financial management loaded against factor 1 (0.367) and factor 4 (0.416). Leadership loaded against factor 2 (0.301) and factor 4 (0.347). It

is a generally accepted practice to ignore those subfactors that load against a factor with a value lower than 0.3, because these subfactors have a less than 10% correlation with the factor (Hair et al, 2010). In this study, those subfactors that loaded against two factors were assessed and the lower loadings against a factor, which ranged in value from 0.393 to 0.301, were ignored.

This implied that customer attraction and retention was considered under factor 3 with a factor loading of 0.424; organisational communication was considered under factor 4 (0.419), financial management under factor 4 (0.416), and leadership under factor 4 (0.347).

Table 4.11: Factor analysis outcomes using principal axis factoring

Subfactor linked to the balanced scorecard	Original factor linked to the balanced scorecard	Factor loading				New factor	Alpha	Average inter-item r
		1	2	3	4			
Organisational image and reputation	Customer service	.754				Environmental and stakeholder management	.856	.497
Political environment	External environment	.617						
Communication strategy to customers	Customer service	.601						
Sociocultural environment	External environment	.594						
Customer service and satisfaction	Customer service	.477						
Skills and competencies	HR management	.472						
Talent management	HR management		.861					
Employee motivation	HR management		.599					
Employee development	HR management		.569					
Organisational climate	Business process		.341			Organisational learning and growth	.734	.406
Return on investment	Financial management			.828		Financial management	.844	.525
Organisational productivity	Financial management			.767				
Economic environment	External environment			.558				
Customer attraction and retention	Customer service	.323		.424				
Governance	Financial management			.394				
Technological environment	External environment				.677			
Customer support	Customer service				.625			
Global competition	External environment				.594			
Organisational processes and technology usage	Business process				.440			
Organisational communication	Business process		.393		.419			
Financial management	Financial management	.367			.416			
Risk management	Financial management				.399			
Organisational structure	Business process				.370			
Leadership	Business process		.301		.347			
Performance measurement and assessment	HR management				.316			
						Organisational business processes	.894	.434

Extraction method: principal axis factoring
 Rotation method: Oblimin with Kaiser normalisation^a
 Rotation converged in 18 iterations



4.3.1.4 Reliability

To ensure that the measuring instrument employed was both reliable and valid, the Cronbach alpha was determined. The Cronbach alpha is a measure of the internal consistency of a measuring instrument, that is, how closely related a set of subfactors is as a group (Hair et al, 2010). The Cronbach alpha coefficient should be more than 0.70 in order to be acceptable (Anastasi & Urbina, 1997). The four newly identified factors had alpha values ranging from 0.735 to 0.894, which indicated that all of the factors had a moderate to high level of internal consistency.

A further indication of the internal consistency of an instrument is the average inter-item correlation (Clark & Watson, 1995). These researchers (1995) suggested that the average inter-item correlation of items in a scale should be between 0.1 and 0.5. All the values for the instrument fell within this range, except for financial management, which had a value of 0.525.

The reliability and validity of the measure were therefore satisfactorily established and henceforth the following four newly identified factors from above, will be used in the subsequently analysis:

- Factor 1: Environmental and stakeholder management
- Factor 2: Organisational learning and growth
- Factor 3: Financial management
- Factor 4: Organisational business processes

4.3.1.5 Descriptive statistics of the four factors

Using factor loadings, factor scores were computed, which allocate appropriate weightings to each item or subfactor.

Table 4.12: Descriptive statistics of the four factors

	N	Minimum	Maximum	Mean	Std deviation
Environmental and stakeholder management	165	2.00	3.92	2.8582	.42036
Organisational learning and growth	164	2.00	4.00	2.7952	.47017
Organisational business processes	165	2.00	3.82	2.7950	.40085
Financial management	163	2.00	4.00	2.7385	.47325
Valid N (listwise)	163				

From the above table it would appear that the factor with the highest mean was environmental and stakeholder management, which had a mean value of 2.8582 on the five-point scale. This factor combined the subfactors linked to the external environment and customer service factors that were proposed in the balanced scorecard. Organisational learning and growth and organisational business processes had a mean value of 2.7952 and 2.7950 respectively. The factor that scored the lowest mean was financial management at 2.7385. Each of the extracted factors had mean scores that were closely associated and lay above the midpoint of 2.5 on the five-point scale.

Table 4.13: Overall mean of the four factors

	N	Minimum	Maximum	Mean	Std deviation
Overall mean	165	2.00	3.82	2.7981	.36559
Valid N (listwise)	165				

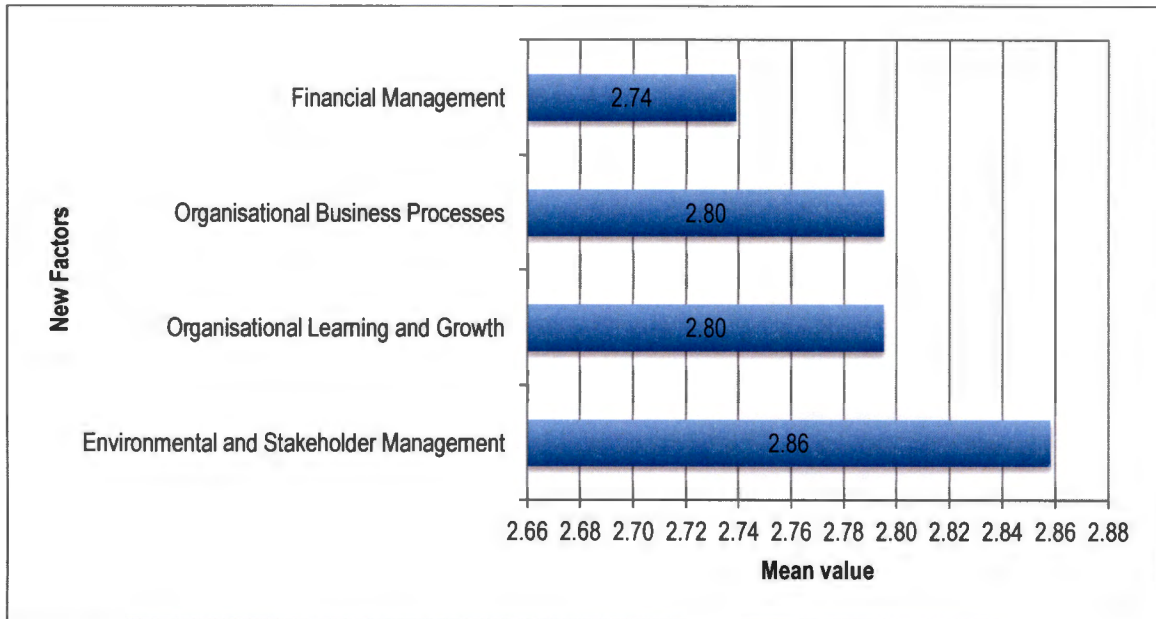


Figure 4.6: Factor means for the four factors

The overall mean was subsequently computed across all factors and the resultant mean was 2.7981, which was also above the midpoint of the five-point scale.

Table 4.14: Standard deviation and standard error for the four factors

	N	Mean	Std. deviation	Std. error mean
Environmental and stakeholder management	165	2.8582	.42036	.03272
Organisational learning and growth	164	2.7952	.47017	.03671
Organisational business Processes	165	2.7950	.40085	.03121
Financial management	163	2.7385	.47325	.03707

The independent one sample t-test was performed to analyse whether there were any factor scores that differed significantly from the overall mean.

Table 4.15: Independent one-sample t-test

	Test value = 2.7981					
	t	df	Sig (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Environmental and stakeholder management	1.836	164	.068	.06008	-.0045	.1247
Organisational learning and growth	-.078	163	.938	-.00288	-.0754	.0696
Organisational business processes	-.100	164	.920	-.00312	-.0647	.0585
Financial management	-1.608	162	.110	-.05960	-.1328	.0136

From the independent one sample t-test, it would appear that there were no significant differences observed when the factor means were compared to the overall mean ($p > 0.05$). This means that each of the factors had a similar perceived impact on organisational effectiveness.

4.3.1.6 The four factors across participating funding agencies

A separate data set was created with each agency aggregated to one mean score on the various factors. For agencies with more than one respondent, the mean of these respondents was represented. For agencies where one response was received on behalf of the agency, this value was simply used. Descriptive statistics in this regard are reported below, both in terms of numeric values and graphic representations (table 4.16 and figure 4.7).

As indicated in table 4.16, the Austrian Science Foundation, Indonesian Institute of Sciences, South African National Research Foundation and National Science Foundation, had the highest mean value for organisational learning and growth, which meant that these agencies perceived this factor to most influence the organisational effectiveness of funding agencies.

However, the Comisión Nacional de Investigación Científica y Tecnológica, Chile; Engineering and Physical Sciences Research Council, UK; Fundação de Amparo à Pesquisa do Estado de São Paulo, Brazil; National Institute of Health, USA; Natural

Sciences and Engineering Research Council of Canada; Research Council of Norway and the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning all had the highest mean value linked to the environmental and stakeholder management factor. This implies that 58.33% of the funding agencies, that is, seven out of the 12 funding agencies, perceived this factor to be most influential in terms of impacting on the organisational effectiveness of funding agencies.



The Australian Research Council was the only funding agency that had the highest mean value linked to the financial management factor. None of the funding agencies perceived the organisational business processes factor to be the most important in terms of impacting on the organisational effectiveness of funding agencies.

Table 4.16: Factor means across the participating funding agencies using the average response mean values

Which organisation would you be evaluating?	Environmental and stakeholder management					Learning and growth	Business processes	Financial management
	1	N	3.42	3.50	3.61			
Australian Research Council	1	N	1	1	1	1	1	1
Total	1	N	2.90	3.13	2.84	2.85	2.85	2.85
Austrian Science Foundation	1	N	1	1	1	1	1	1
Total	1	N	2.70	2.67	2.66	2.67	2.67	2.67
Comisión Nacional de Investigación Científica y Tecnológica	1	N	1	1	1	1	1	1
Engineering and Physical Sciences Research Council UK	1	N	3.29	2.69	3.20	3.20	3.20	3.20
Fundação de Amparo à Pesquisa do Estado de São Paulo Brazil	1	N	3.42	3.00	3.36	3.10	3.10	3.10
Indonesian Institute of Sciences	1	N	2.25	3.00	2.64	2.50	2.50	2.50
National Institutes of Health USA	1	N	2.93	2.52	2.88	2.61	2.61	2.61
National Research Foundation South Africa	1	N	2.81	2.86	2.76	2.77	2.77	2.77
National Science Foundation USA	1	N	2.83	3.38	3.09	2.80	2.80	2.80
Natural Sciences and Engineering Research Council of Canada	1	N	3.14	2.88	3.03	3.00	3.00	3.00
Research Council of Norway	1	N	3.06	2.72	2.91	2.61	2.61	2.61
The Swedish Research Council for Environment, Agricultural sciences and Spatial Planning – FORMAS	1	N	3.20	2.89	2.97	2.84	2.84	2.84
Total	1	N	12	12	12	12	12	12

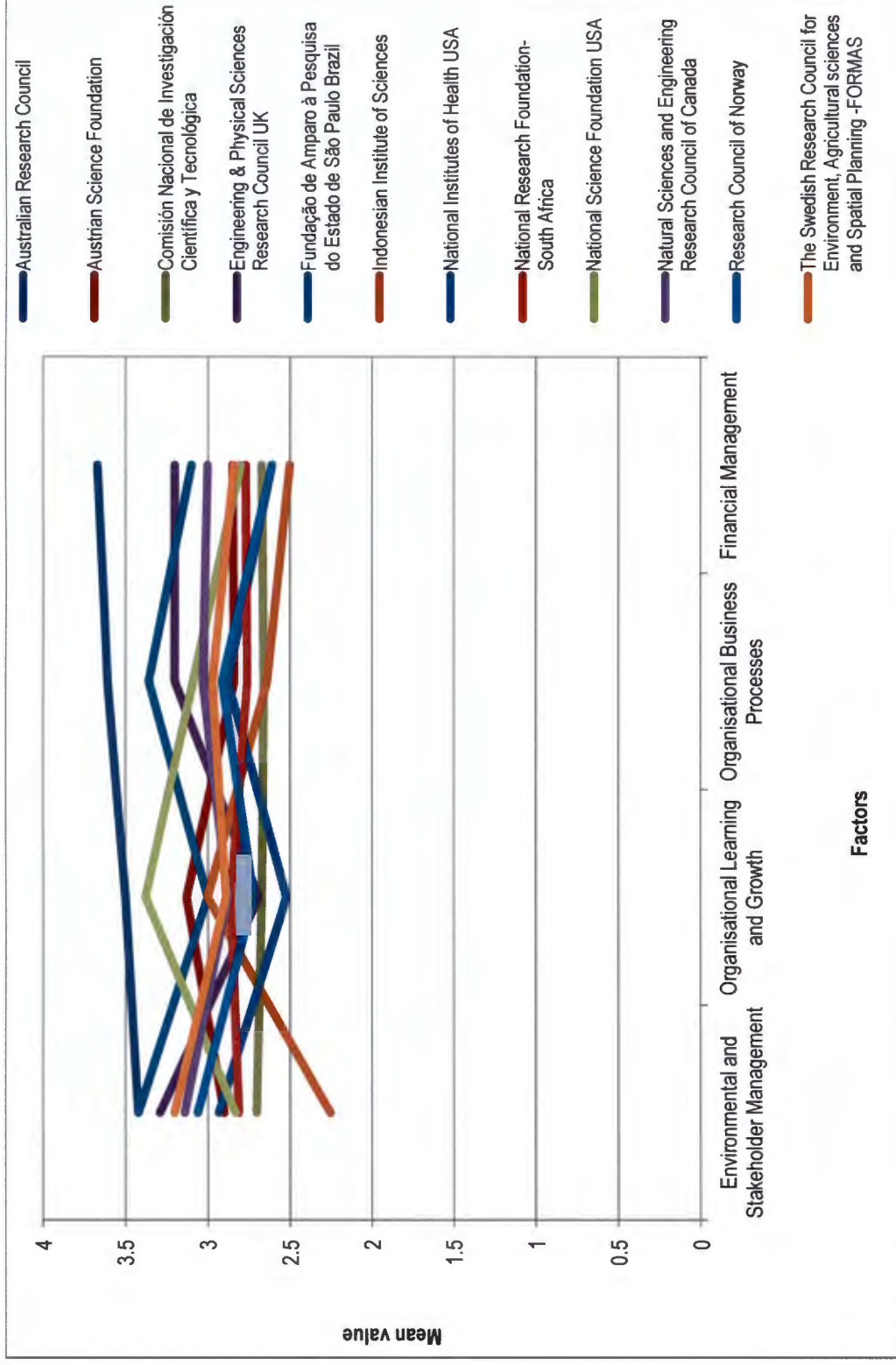


Figure 4.7: Factor means across the participating funding agencies using the average response

4.3.1.7 Analysis of subgroups using analysis of variance (ANOVA)

Following the calculation of factor scores, the various demographic groupings in the sample as a whole were measured against these factors by means of a one-way ANOVA. This is the appropriate technique to use when one independent categorical variable is related to one scale-dependent variable (Hair et al, 2010). The summary of results is reported in this section.

Years of service: all respondents

The first of the demographic groups that was analysed was that relating to the years of service of the respondents, or the years of employment of the respondent at the specific funding agency.



Table 4.17: ANOVA results based on years of service

		Sum of squares	df	Mean square	F	Sig
Environmental and stakeholder management	Between groups	.427	4	.107	.631	.641
	Within groups	21.965	130	.169		
	Total	22.392	134			
Organisational learning and growth	Between groups	.794	4	.198	.873	.482
	Within groups	29.550	130	.227		
	Total	30.344	134			
Organisational business processes	Between groups	.141	4	.035	.232	.920
	Within groups	19.834	130	.153		
	Total	19.976	134			
Financial management	Between groups	.874	4	.219	1.013	.403
	Within groups	27.842	129	.216		
	Total	28.716	133			

As indicated in table 4.17 above, none of the factors differed from one another, when related to the years of service ($p > 0.05$ in all cases).

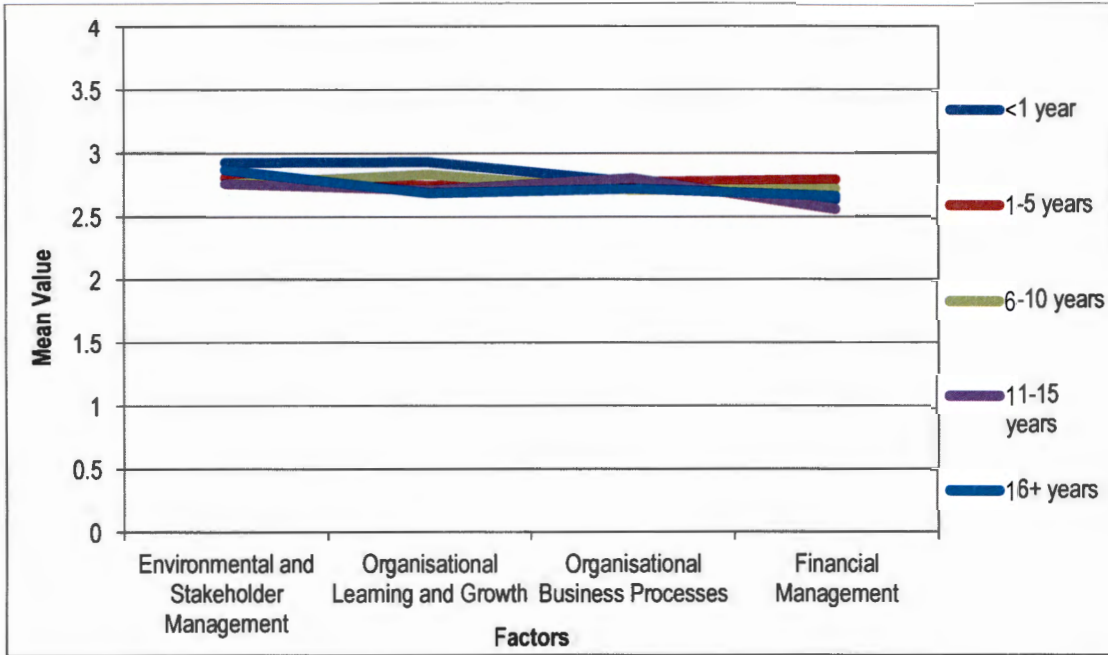


Figure 4.8: ANOVA results based on years of service across all respondents

Qualification: all respondents

The second demographic group that was analysed related to the respondents' qualifications. The qualification of respondents appeared to play a role in only one factor, namely environmental and stakeholder management ($p < 0.05$).

Table 4.18: ANOVA results based on the qualifications of all respondents

		Sum of squares	df	Mean square	F	Sig
Environmental and stakeholder management	Between groups	1.621	3	.540	3.362	.021
	Within groups	19.131	119	.161		
	Total	20.752	122			
Organisational learning and growth	Between groups	.535	3	.178	.802	.495
	Within groups	26.476	119	.222		
	Total	27.011	122			
Organisational business processes	Between groups	.465	3	.155	1.002	.394
	Within groups	18.402	119	.155		
	Total	18.867	122			
Financial management	Between groups	.139	3	.046	.211	.888
	Within groups	25.900	118	.219		
	Total	26.039	121			

Inspection of mean scores indicated that there was no consistent pattern regarding the qualification groups, but it would appear that respondents with master's and doctoral qualifications tended to rate the environmental and stakeholder management factor, slightly higher than those respondents with other qualifications.

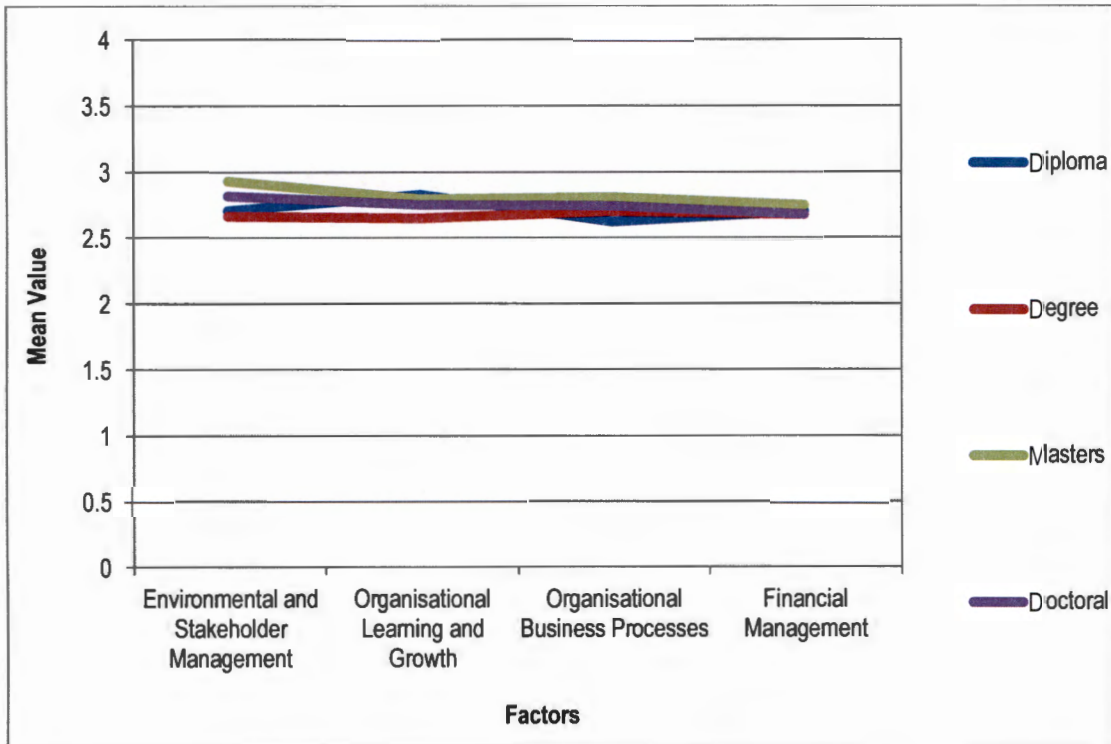


Figure 4.9: ANOVA results based on qualifications of all respondents

Given this finding from the ANOVA, post-hoc analyses were then considered to assess where the differences in means were observed and if they were significant. A post hoc test comprising pair-wise comparisons was conducted in order to compare all different combinations relating to the different qualification groups. Scheffe's test was used in this study as a single-step multiple comparison procedure, which applies to the set of estimates of all possible contrasts among the factor-level means (Hair et al, 2010).

The results from a Scheffe's test, which are highlighted in table 4.19 below, indicate that the only marginally significant ($p = 0.032$) differences between subgroups were between those respondents who had a degree (mean = 2.66) and a master's degree (mean = 2.93). The latter group thus had a slightly more positive perception of environmental and stakeholder management than the former. However, the differences were very small in real terms.

Table 4.19: Scheffe's test of multiple comparisons

Dependent variable	(I) What is your highest qualification?	(J) What is your highest qualification?	Mean difference (I-J)	Std error	sig.	95% confidence interval	
						Lower bound	Upper bound
Environmental and stakeholder management	Diploma	Degree	.04084	.13023	.992	-.3285	.4102
		Master's	-.22718	.12509	.352	-.5819	.1276
		Doctoral	-.11474	.13620	.871	-.5010	.2715
	Degree	Diploma	-.04084	.13023	.992	-.4102	.3285
		Master's	-.26803*	.08874	.032	-.5197	-.0164
		Doctoral	-.15559	.10381	.525	-.4500	.1388
	Masters	Diploma	.22718	.12509	.352	-.1276	.5819
		Degree	.26803*	.08874	.032	.0164	.5197
		Doctoral	.11244	.09728	.721	-.1634	.3883
	Doctoral	Diploma	.11474	.13620	.871	-.2715	.5010
		Degree	.15559	.10381	.525	-.1388	.4500
		Master's	-.11244	.09728	.721	-.3883	.1634
Organisational learning and growth	Diploma	Degree	.17930	.15320	.713	-.2552	.6138
		Master's	.03356	.14716	.997	-.3838	.4509
		Doctoral	.07372	.16022	.976	-.3807	.5281
	Degree	Diploma	-.17930	.15320	.713	-.6138	.2552
		Master's	-.14575	.10439	.585	-.4418	.1503
		Doctoral	-.10559	.12212	.862	-.4519	.2407
	Masters	Diploma	-.03356	.14716	.997	-.4509	.3838
		Degree	.14575	.10439	.585	-.1503	.4418
		Doctoral	.04016	.11445	.989	-.2844	.3647
	Doctoral	Diploma	-.07372	.16022	.976	-.5281	.3807
		Degree	.10559	.12212	.862	-.2407	.4519
		Master's	-.04016	.11445	.989	-.3647	.2844
Organisational business processes	Diploma	Degree	-.08074	.12772	.940	-.4430	.2815
		Master's	-.18783	.12268	.507	-.5357	.1601
		Doctoral	-.12351	.13358	.836	-.5023	.2553
	Degree	Diploma	.08074	.12772	.940	-.2815	.4430
		Master's	-.10709	.08703	.680	-.3539	.1397
		Doctoral	-.04277	.10181	.981	-.3315	.2460
	Masters	Diploma	.18783	.12268	.507	-.1601	.5357
		Degree	.10709	.08703	.680	-.1397	.3539
		Doctoral	.06431	.09541	.929	-.2063	.3349
	Doctoral	Diploma	.12351	.13358	.836	-.2553	.5023
		Degree	.04277	.10181	.981	-.2460	.3315
		Master's	-.06431	.09541	.929	-.3349	.2063
Financial management	Diploma	Degree	.02366	.15217	.999	-.4079	.4553
		Master's	-.04872	.14648	.990	-.4642	.3667
		Doctoral	.02212	.15914	.999	-.4293	.4735
	Degree	Diploma	-.02366	.15217	.999	-.4553	.4079
		Master's	-.07238	.10413	.922	-.3677	.2230
		Doctoral	-.00155	.12130	1.000	-.3456	.3425

Master's	Diploma	.04872	.14648	.990	-.3667	.4042
	Degree	.07238	.10413	.922	-.2230	.3677
	Doctoral	.07083	.11408	.943	-.2527	.3944
Doctoral	Diploma	-.02212	.15914	.999	-.4735	.4293
	Degree	.00155	.12130	1.000	-.3425	.3456
	Master's	-.07083	.11408	.943	-.3944	.2527

* The mean difference was significant at the 0.05 level.

4.3.1.8 Summary of findings

The theoretical balanced scorecard that was presented in chapter 2 suggested that 25 subfactors were equally clustered into five factors. This was not supported by the quantitative outcomes of this study. What did emerge from the factor analysis, was that the subfactors rearranged themselves and clustered into four factors, namely environmental and stakeholder management, organisational learning and growth, organisational business processes and financial management. Further statistical analyses indicated that the differences in means of the identified factors were not significant, which implied that each of the factors had a similar effect on the organisational effectiveness of funding agencies.

4.3.2 South African findings



4.3.2.1 Demographic profile of South African respondents

The respondents from the National Research Foundation in South Africa comprised mostly employees who had worked at the funding agency for a period of one to five years (37%), followed by those who had worked at the agency for a period of six to ten years (19.6%). The same number of respondents was noted for those who had worked at the National Research Foundation for less than a year as well as a period of 11 and 15 years (14.1%). A similar response rate was noted for employees who had worked at the National Research Foundation for a period of 16 to 20 years as well as 21 to 25 years (5.4%). Only 3.3% of South African respondents had worked at the National Research Foundation for more than 30 years.

Table 4.20: Duration of service: South African respondents at the National Research Foundation

		Frequency	Percent	Valid percent	Cumulative percent
Valid	< 1 year	13	14.1	14.3	14.3
	1–5 years	34	37.0	37.4	51.6
	6–10years	19	20.7	20.9	72.5
	11–15 years	13	14.1	14.3	86.8
	16–20 years	5	5.4	5.5	92.3
	21–25 years	4	4.3	4.4	96.7
	26- 30 years	3	3.3	3.3	100.0
	Total	91	98.9	100.0	
Missing	System	1	1.1		
Total		92	100.0		

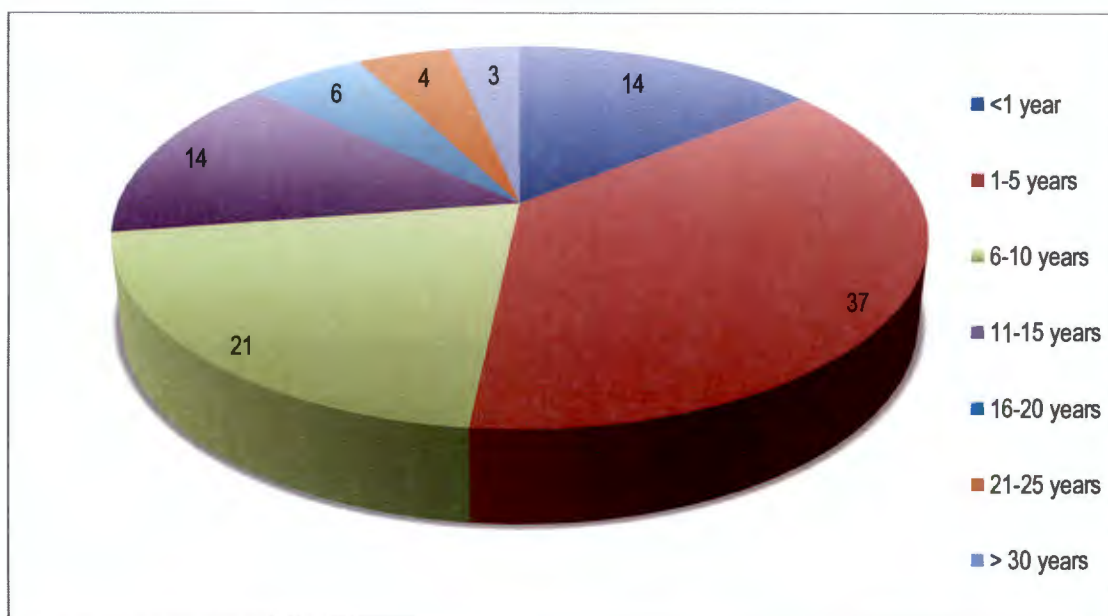


Figure 4.10: Demographic of South African respondents based on years of employment

The highest response was received from staff at the National Research Foundation in South Africa, in possession of a master’s qualification (27.2%). This was followed by staff in possession of a doctoral qualification (25%), and staff in possession of a degree (18.5%). This was closely followed by staff in possession of a diploma (12%) and staff in possession of a high school qualification (5.4%). Finally, a total of 10.9% of the South African

respondents were in possession of an alternate qualification, which was reflected in the category: other..

Table 4.21: Qualification level: South African respondents at the National Research Foundation

	Frequency	Percent	Valid percent	Cumulative percent
Valid	1	1.1	1.1	1.1
Degree	17	18.5	18.5	19.6
Diploma	11	12.0	12.0	31.5
Doctoral	23	25.0	25.0	56.5
Graduated from high school	5	5.4	5.4	62.0
Master's	25	27.2	27.2	89.1
Other (please specify)	10	10.9	10.9	100.0
Total	92	100.0	100.0	

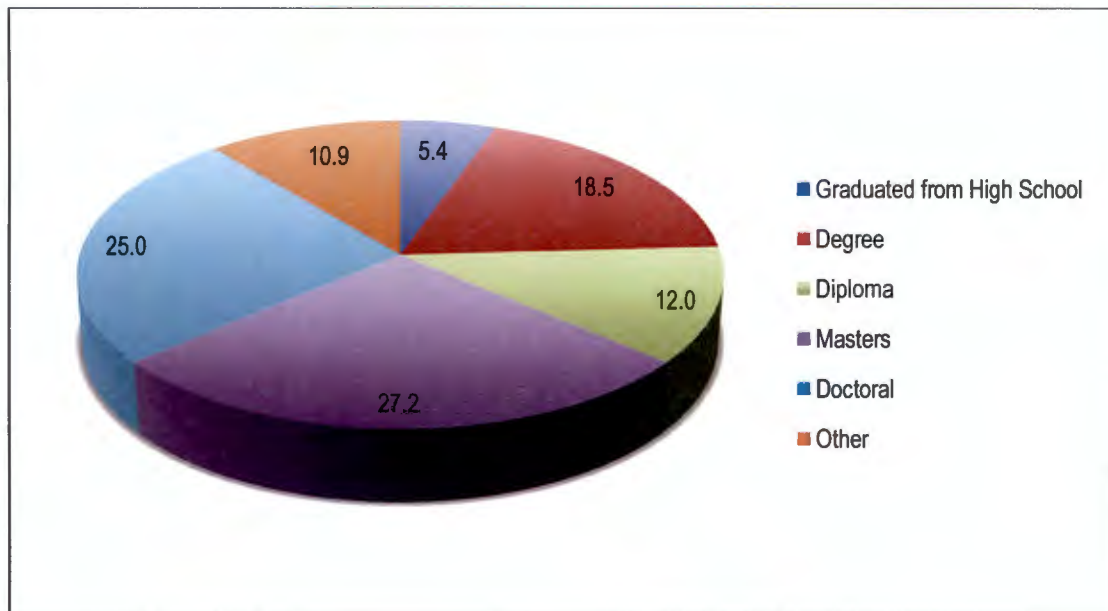


Figure 4.11: Demographic of South African respondents based on qualification

4.3.2.2 Descriptive statistics: South African respondents

Descriptive statistics are used in this section to describe the responses of the South African respondents relating to the four factors. This section of the study reflects a sample size of

73, rather than 92, as reflected in Table 4.2. The reason is that, although a total of 92 South African National Research Foundation employees responded to the survey, only 73 respondents answered all the questions posed in the online survey relating to the four factors.

Table 4.22: Descriptive statistics for the four factors for the South African respondents

	N	Minimum	Maximum	Mean	Std deviation
Environmental and stakeholder management	73	2.17	3.67	2.8137	.31095
Organisational learning and growth	73	2.00	3.75	2.8607	.41085
Organisational business processes	73	2.14	3.50	2.7645	.30354
Financial management	73	2.00	3.90	2.7726	.39621
Overall mean	73	2.23	3.47	2.8043	.26210
Valid N (listwise)	73				

According to the South African respondents, the factor that was considered most important was organisational learning and growth, which had a mean value of 2.8607. This was followed by the environmental and stakeholder management factor, which had a score of 2.8137. Ranking third, with a mean of 2.7726 was the organisational financial management factor. Organisational business processes had a mean of 2.7645. Each of the factors had mean scores that were closely related and lay above the midpoint of 2.5, on the five-point scale. In addition, the overall mean of 2.8043, was also above the midpoint of the five-point scale.

Table 4.23: Standard deviation and standard error for the four factors for the South African respondents

	N	Mean	Std deviation	Std error mean
Environmental and stakeholder management	72	2.8169	.31192	.03676
Organisational learning and growth	72	2.8681	.40891	.04819
Organisational business processes	72	2.7675	.30459	.03590
Financial management	71	2.7764	.39768	.04720

The standard deviation reported in table 4.23 indicates that none of the factors were significant. This was confirmed by means of the test of homogeneity of variances, which is depicted in table 4.24 below.

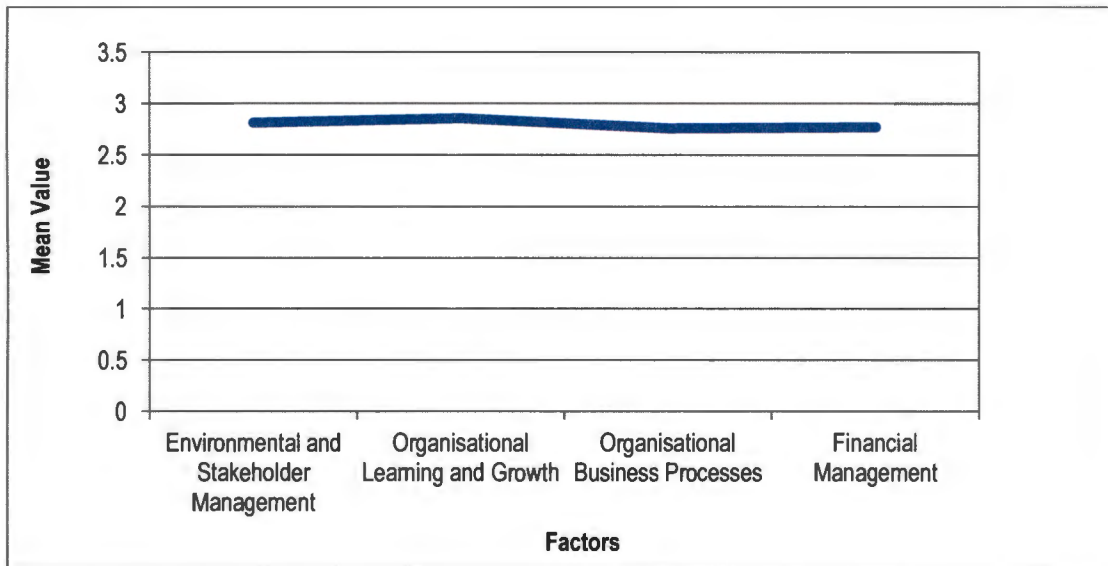


Figure 4.12: Factor means: South African respondents

Levene's test, which is an inferential statistic, was used to assess variance homogeneity. This test is usually conducted as a precondition for parametric tests such as the t-test and ANOVA (Hair et al, 2010). As indicated earlier, the outcomes of this test revealed that none of the factors were significant ($p > 0.05$).

Table 4.24: Levene's test for testing the homogeneity of variances for South African respondents

	Levene's statistic	df1	df2	Sig
Environmental and stakeholder management	1.018	4	67	.405
Organisational learning and growth	.667	4	67	.617
Organisational business processes	1.119	4	67	.355
Financial management	.216	4	66	.929

4.3.2.3 Analysis of subgroups for the South African respondents using ANOVA

The demographic groupings in the South African sample were measured against the four factors by means of one-way ANOVAs. The summary of results is reported in this section.

Years of service for South African respondents

The first of the demographic groups that was analysed was that relating to the years of service of the South African respondents or the years of employment of the respondent at the National Research Foundation.

Table 4.25: ANOVA results for South African respondents by years of service

		Sum of squares	df	Mean square	F	Sig
Environmental and stakeholder management	Between groups	.427	4	.107	1.104	.362
	Within groups	6.481	67	.097		
	Total	6.908	71			
Organisational learning and growth	Between groups	.908	4	.227	1.387	.248
	Within groups	10.964	67	.164		
	Total	11.872	71			
Organisational Business Processes	Between groups	.223	4	.056	.587	.673
	Within groups	6.364	67	.095		
	Total	6.587	71			
Financial management	Between groups	1.335	4	.334	2.263	.072
	Within groups	9.735	66	.148		
	Total	11.070	70			

As indicated above, none of the factors related to the years of service with respondents from the National Research Foundation ($p > 0.05$ in all cases).

Qualifications of South African respondents

The second demographic group that was analysed related to the South African respondents' qualifications.

Table 4.26: ANOVA results for South African respondents by qualification

		Sum of squares	df	Mean square	F	Sig
Environmental and stakeholder management	Between groups	.625	3	.208	2.561	.064
	Within groups	4.633	57	.081		
	Total	5.258	60			
Organisational learning and growth	Between groups	.559	3	.186	1.146	.338
	Within groups	9.265	57	.163		
	Total	9.823	60			
Organisational business processes	Between groups	.242	3	.081	.838	.479
	Within groups	5.479	57	.096		
	Total	5.721	60			
Financial management	Between groups	.334	3	.111	.759	.522
	Within groups	8.216	56	.147		
	Total	8.550	59			

As indicated in the table above, none of the factors were related to the qualification of the South African respondents ($p > 0.05$ in all cases).

4.3.2.4 Summary of findings: South African study

The four factors, namely environmental and stakeholder management, organisational learning and growth, organisational business processes and financial management were analysed for the South African respondents. Statistical analyses indicated that none of the identified factors were significant, which implied that each factor had an equal level of influence on the organisational effectiveness of the National Research Foundation in South Africa.

4.3.3 Comparative studies

A comparative analysis was subsequently conducted to investigate the effectiveness of funding agencies across three major continents, namely Africa, South America and Europe. The results from the comparative study are reported in this section.

4.3.3.1 Composition of the sample for the comparative study

Owing to the response rate of the various funding agencies, only three were selected for further analysis. These agencies included the National Research Foundation in South Africa, the Comisión Nacional de Investigación Científica y Tecnológica in Chile and the Research Council of Norway. The identified agencies had 73, 42 and 21 respondents who completed

the web-based survey, respectively. This section of the study reflects a sample size different to that, which is reflected in Table 4.2. The reason is that, although a total of 92, 43 and 21 employees from the South African National Research Foundation, Comisión Nacional de Investigación Científica y Tecnológica in Chile and the Research Council of Norway responded to the survey respectively, only 73, 42 and 21 respondents answered all the questions posed in the online survey relating to the four factors across the respective funding agencies.



Table 4.27: Composition of the sample across the respondents from South Africa, Norway and Chile

Which organisation would you be evaluating?		N	Minimum	Maximum	Mean	Std deviation
Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	Overall mean	42	2.00	3.61	2.6772	.42209
	Valid N (listwise)	42				
National Research Foundation: South Africa: South African respondents	Overall mean	73	2.23	3.47	2.8043	.26210
	Valid N (listwise)	73				
Research Council of Norway	Overall mean	21	2.16	3.70	2.8240	.43816
	Valid N (listwise)	21				

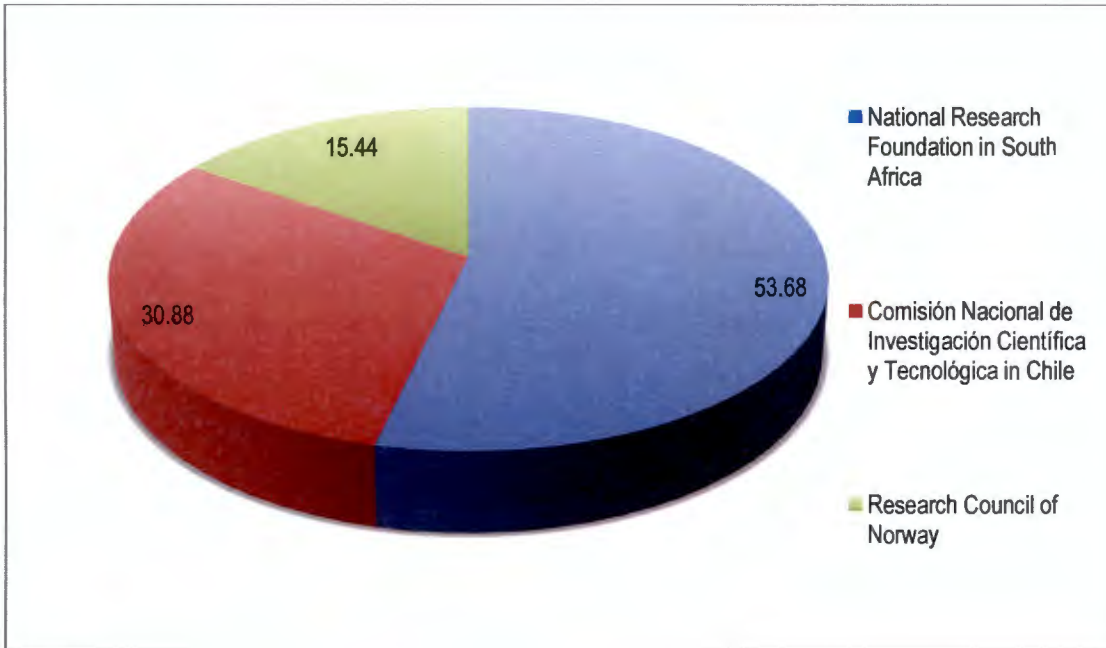


Figure 4.13: Respondents across the three funding agencies

4.3.3.2 Descriptive statistics: comparative study

According to the respondents from the National Research Foundation in South Africa, the Comisión Nacional de Investigación Científica y Tecnológica in Chile and the Research Council of Norway, the factor that was considered most important was environmental and stakeholder management, which had a total mean value of 2.8169. This was followed by organisational learning and growth, which had a total mean value of 2.7797. The organisational business processes factor, had a total mean score of 2.7566. Ranking fourth, with a mean of 2.7156, was the financial management factor. Each of the factors had mean scores that were closely associated and lay above the midpoint of 2.5, on the five-point scale. In addition, the overall mean for each of the funding agencies was also above the midpoint of the five-point scale (table 4.28).

Table 4.28: Descriptive statistics for the respondents from South Africa, Norway and Chile

	N	Minimum	Maximum	Mean	Std deviation
Environmental and stakeholder management	136	2.00	3.83	2.8169	.40776
Organisational learning and growth	136	2.00	3.75	2.7797	.47567
Organisational business processes	136	2.00	3.68	2.7566	.38508
Financial management	135	2.00	3.90	2.7156	.46330
Valid N (listwise)	135				

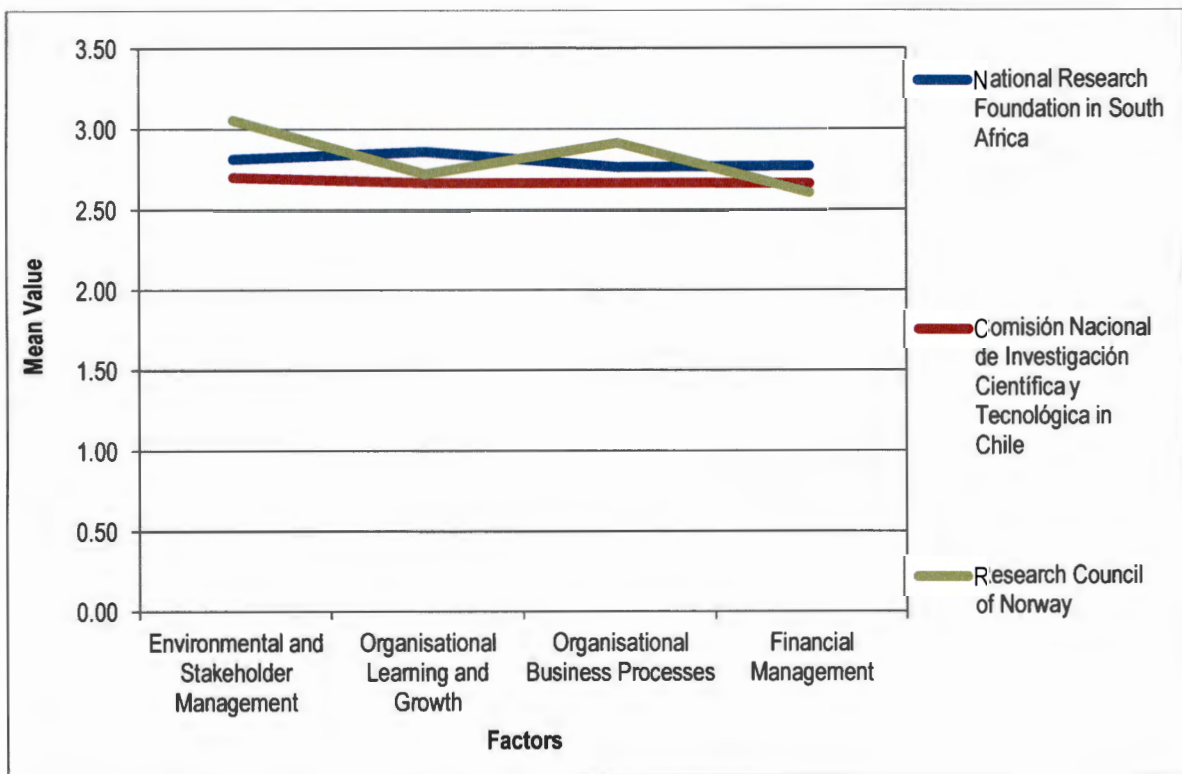


Figure 4.14: Factor means across the three funding agencies

Across the three funding agencies, the following were observed:

- The Research Council of Norway: The highest mean was observed for the environmental and stakeholder management factor (3.0556). The lowest mean was observed for the financial management factor (2.6067). The organisational business

processes factor had the second highest mean value (2.9134) and organisational learning and growth had the third highest mean value (2.7202).

- The South African National Research Foundation: Organisational learning and growth, environmental and stakeholder management, financial management and organisational business processes had mean values of 2.8607, 2.8137, 2.7726, and 2.7645 respectively.
- The Comisión Nacional de Investigación Científica y Tecnológica in Chile, had the highest mean score for the environmental and stakeholder management factor (2.7032). This was followed by the financial management factor (2.6724) and the organisational learning and growth factor (2.6687). Organisational business processes had the lowest mean value (2.6645).

Table 4.29: Descriptive statistics depicting the factor and country means for South Africa, Norway and Chile

		N	Mean	Std deviation	Std error	95% confidence interval for mean		Min	Max
						Lower bound	Upper bound		
Environmental and stakeholder management	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	42	2.7032	.48041	.07413	2.5535	2.8529	2.00	3.83
	National Research Foundation, South Africa: South African respondents	73	2.8137	.31095	.03639	2.7411	2.8862	2.17	3.67
	Research Council of Norway	21	3.0556	.46273	.10098	2.8449	3.2662	2.25	3.83
	Total	136	2.8169	.40776	.03497	2.7478	2.8861	2.00	3.83
Organisational learning and growth	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	42	2.6687	.54823	.08459	2.4978	2.8395	2.00	3.75
	National Research Foundation, South Africa: South African respondents	73	2.8607	.41085	.04809	2.7649	2.9566	2.00	3.75
	Research Council of Norway	21	2.7202	.49985	.10908	2.4927	2.9478	2.00	3.75
	Total	136	2.7797	.47567	.04079	2.6991	2.8604	2.00	3.75
Organisational business processes	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	42	2.6645	.47333	.07304	2.5170	2.8120	2.00	3.59
	National Research Foundation, South Africa: South African respondents	73	2.7645	.30354	.03553	2.6937	2.8354	2.14	3.50
	Research Council of Norway	21	2.9134	.40755	.08893	2.7279	3.0989	2.36	3.68
	Total	136	2.7566	.38508	.03302	2.6913	2.8219	2.00	3.68
Financial management	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	42	2.6724	.53218	.08212	2.5066	2.8383	2.00	3.90

National Research Foundation, South Africa: South African respondents	72	2.7726	.39621	.04669	2.6795	2.8657	2.00	3.90
Research Council of Norway	21	2.6067	.52173	.11385	2.3693	2.8442	2.00	3.90
Total	135	2.7156	.46330	.03987	2.6368	2.7945	2.00	3.90

It is evident from the above table that both the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica had the highest mean values of 3.0556 and 2.7032 respectively, for the environmental and stakeholder management factor. Both the Comisión Nacional de Investigación Científica y Tecnológica and the South African National Research Foundation had the lowest mean values of 2.6645 and 2.7645, respectively, for the organisational business processes factor.



4.3.3.3 Analysis of subgroups for the comparative study using ANOVA

The responses from the respondents from South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica and the Research Council of Norway were compared using a one-way ANOVA. The results are reported in this section.

Table 4.30: ANOVA results for respondents from South Africa, Norway and Chile

		Sum of squares	Df	Mean square	F	Sig
Environmental and stakeholder management	Between groups	1.740	2	.870	5.588	.005
	Within groups	20.707	133	.156		
	Total	22.447	135			
Organisational learning and growth	Between groups	1.072	2	.536	2.418	.093
	Within groups	29.473	133	.222		
	Total	30.545	135			
Organisational business processes	Between groups	.877	2	.439	3.049	.051
	Within groups	19.141	133	.144		
	Total	20.019	135			
Financial management	Between groups	.561	2	.280	1.312	.273
	Within groups	28.202	132	.214		
	Total	28.763	134			

The table above illustrates that the only difference between the three agencies investigated was found for the environmental and stakeholder management factor ($p = 0.005$). Inspection of mean scores showed that while the South African National Research Foundation and the Comisión Nacional de Investigación Científica y Tecnológica de Chile had quite similar scores of 2.81 and 2.70, respectively, the Research Council of Norway had a slightly higher score of 3.06.

A post hoc test comprising pair-wise comparisons was conducted in order to compare all different combinations relating to the different qualification groups. Using Scheffe's test, differences were observed in the environmental and stakeholder management factor.

Table 4.31: Scheffe's test of multiple comparisons for respondents from South Africa, Norway and Chile

Dependent variable	(I) Organisation	(J) Organisation	Mean difference (I-J)	Std error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Environmental and stakeholder management	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	National Research Foundation, South Africa: South African respondents	-.11052	.07642	.354	-.2997	.0787
		Research Council of Norway	-.35238	.10545	■	-.6134	-.0913
	National Research Foundation, South Africa: South African respondents	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	.11052	.07642	.354	-.0787	.2997
		Research Council of Norway	-.24186	.09771	■	-.4837	.0000
	Research Council of Norway	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	.35238	.10545	■	.0913	.6134
		National Research Foundation, South Africa: South African respondents	.24186	.09771	.050	.0000	.4837
Organisational learning and growth	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	National Research Foundation, South Africa: South African respondents	-.19208	.09117	.113	-.4178	.0336
		Research Council of Norway	-.05159	.12581	.919	-.3630	.2599
	National Research Foundation, South Africa: South African respondents	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	.19208	.09117	.113	-.0336	.4178
		Research Council of Norway	.14049	.11657	.486	-.1481	.4291
	Research Council of Norway	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	.05159	.12581	.919	-.2599	.3630

		National Research Foundation, South Africa: South African respondents	-.14049	.11657	.486	-.4291	.1481
Organisational business processes	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	National Research Foundation, South Africa: South African respondents	-.10006	.07347	.398	-.2819	.0818
		Research Council of Norway	-.24894	.10139	.052	-.4999	.0021
		National Research Foundation, South Africa: South African respondents	.10006	.07347	.398	-.0818	.2819
		Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	-.14888	.09394	.288	-.3814	.0837
		Research Council of Norway	.24894	.10139	.052	-.0021	.4999
		National Research Foundation, South Africa: South African respondents	.14888	.09394	.288	-.0837	.3814
Financial management	Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos	National Research Foundation, South Africa: South African respondents	-.10015	.08975	.538	-.3223	.1220
		Research Council of Norway	.06567	.12353	.868	-.2402	.3715
		National Research Foundation, South Africa: South African respondents	.10015	.08975	.538	-.1220	.3223
		Research Council of Norway	.16582	.11464	.354	-.1180	.4496
		Research Council of Norway	-.06567	.12353	.868	-.3715	.2402
		National Research Foundation, South Africa: South African respondents	-.16582	.11464	.354	-.4496	.1180

Post hoc results confirmed that there were differences between the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica de Chile, and the Research Council of Norway and the South African National Research Foundation. There was a statistically significant difference between the Comisión Nacional de Investigación Científica y Tecnológica de Chile and the Research Council of Norway ($p = 0.005$) and a marginally significant difference between the South African National Research Foundation and the Research Council of Norway ($p = 0.05$).

This finding was significant because both South Africa and Chile are considered as middle-income countries and hence there were no observed significant differences between the countries, whereas Norway is a high-income country (Cervantes-Godoy & Brooks, 2011). Given this context, similarities between the emerging-economy countries were expected.

In addition, because of the small range of the scale, the inter-relationship between the factors was investigated by means of Spearman's rho. Spearman's rho is used to identify and test the strength of a relationship between two variables (Hair et al, 2010; Tian & Wilding, 2008; Tabachnick & Fidell, 2007). Correlation values between 0.10 and 0.30 are referred to as small or weak positive relationships; between 0.40 and 0.60 as moderately positive relationships; and 0.70 and above as highly or strongly positive relationships (Tian & Wilding, 2008). Table 4.32 below shows the correlations of the four factors, namely environmental and stakeholder management, organisational learning and growth, organisational business processes and financial management.

Table 4.32: Spearman's rho correlations for respondents from South Africa, Norway and Chile

		Environmental and stakeholder management	Organisational learning and growth	Organisational business processes	Financial management	
Spearman's rho	Environmental and stakeholder management	Correlation coefficient	1.000	.430**	.624**	.595**
		Sig (2-tailed)	.	.000	.000	.000
		N	136	136	136	135
	Organisational learning and growth	Correlation coefficient	.430**	1.000	.446**	.427**
		Sig (2-tailed)	.000	.	.000	.000
		N	136	136	136	135
	Organisational business processes	Correlation coefficient	.624**	.446**	1.000	.530**
		Sig (2-tailed)	.000	.000	.	.000
		N	136	136	136	135
	Financial management	Correlation coefficient	.595**	.427**	.530**	1.000
		Sig (2-tailed)	.000	.000	.000	.
		N	135	135	135	135

** Correlation was significant at the 0.01 level (2-tailed).

Correlations ranging from 0.427 to 0.624 were observed, indicating that positive and moderately strong relationships existed. In addition, statistically significant correlations were found between the factors at the 0.01 level (2-tailed).



4.3.4 Summary of findings: quantitative study

Respondents to the web-based survey were fairly positive towards the organisational effectiveness of the funding agencies at which they were employed. The top five criteria that respondents were positive about are discussed here. A total of 76.7% of the respondents strongly agreed that the funding agency at which they were employed had competent staff. The respondents also agreed that financial controls were in place to ensure that funds were spent in a transparent manner (71.4%). Financial management practices were also deemed effective by the respondents (67.2%). In addition, the respondents were generally positive about the support structures in place for staff to pursue formal qualifications (66.7%) and the image of the organisation (66.6%).

The top five elements that respondents were negative about included the following: performance (including under performance) being ineffectively managed (43.4%). A total of 41.3% of the respondents were disillusioned about the reward system that was in place for staff who go the extra mile. The respondents were negative about communication being clear at the funding agency at which they were employed (40.2%), as well as the agency being first to market new offerings (40.2%). Finally, the respondents felt that the agency was unable to clearly define a return on investment for the organisation (38.6%).

Initially, a five-factor balanced scorecard was adopted to evaluate the organisational effectiveness of funding agencies, comprising the following factors: external environment, customer service, organisational learning and growth, organisational business processes and financial management. However, it was found through a factor analysis that a four-factor scorecard appeared to be more suited to this purpose, comprising the: environmental and stakeholder management, organisational learning and growth, organisational business processes and financial management factors.

The above-mentioned four factors were analysed across the total sample population and it was found that there were no statistically significant observations between the four factors. However, when the four factors were analysed across the South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica de Chile and the Research Council of Norway, some differences were observed. It was found that positive and moderately strong correlations existed between the four factors. In addition, statistical analyses indicated that differences were noted in the environmental and stakeholder management factor, and that there were observed differences between the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica de Chile; and the Research Council of Norway and the South African National Research Foundation. While significant differences were observed between the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica de Chile, marginally significant differences were observed between the Research Council of Norway and the South African National Research Foundation.

4.3 Qualitative analysis

4.4.1 Interviews

The qualitative phase of this research study comprised eight semi-structured interviews with senior management representatives, a professor and a consultant to the different funding agencies and organisations. The following funding agencies were ultimately discussed: the South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica in Chile, the Deutsche Forschungsgemeinschaft, the European Physical Sciences Research Council and the Research Council of Norway. The objective of this phase of the study was to build on the findings from the quantitative phase, which provided a general understanding of the research problem. The qualitative phase also facilitated the refinement and explanation of the quantitative results by exploring the viewpoints of key participants (Creswell, 2013; Tashakkori & Teddlie; 2010; Ivankova, Creswell & Stick, 2006). In addition, the findings from this phase were used to identify and capture any additional information or insights that could be used to substantiate the proposed framework in this study (Stainback & Stainback, 1988).

In particular, questions were posed that directly sought to:

- 1) Assess the suitability of the definitions and indicators used in the present study to describe effectiveness across funding agencies.
- 2) Understand the poor response rate in the quantitative study.
- 3) Identify the factors that impact on the effectiveness of funding agencies, which may or may not relate to the factors that have been identified in this study.
- 4) Assess the reliability of the four factors, that were identified in a factor analysis namely: (i) environmental and stakeholder management; (ii) financial management; (iii) business processes; and (iv) organisational learning and growth; in terms of influencing the organisational effectiveness of funding agencies.
- 5) Identify a ranking order for the factors, listed above. This question was specifically posed with the objective of understanding the quantitative outcomes that indicated that all four factors were considered to have an equal level of influence on the organisational effectiveness of funding agencies.

Interviews were conducted either face to face in the office of the interviewee or via an online voice and video program popularly known as Skype, which allowed instant and convenient

access to the members of different funding agencies and other organisations that were geographically spread across the globe. Skype allowed the researcher to record the interviews in real time and clarify responses and statements that were not clear during the interview. This was a frequent occurrence where English was used as a second or third language by the interviewees. However, a number of limitations were experienced with the use of Skype as a method to conduct interviews. This method did not allow the researcher and interviewees to communicate face to face or in person, which depending on the speed of the internet connection, did compromise the line of communication between the two parties as well as interrupt the train of thought and answers of the interviewees.

Participants were purposefully selected from those funding agencies that either participated in the web-based survey or were willing to participate in an interview only. The interviews were audiotaped and transcribed verbatim, as recommended by Creswell (2003). A thematic analysis was subsequently conducted on the transcripts, both within each case, and across the eight cases. This was achieved manually by the researcher and corroborated by an independent qualitative statistician.

The researcher used the frequency of the responses and occurrences of the participants to determine the point of data saturation. As indicated in this section, five major themes and several minor themes were identified, according to the methods discussed in chapter 3. The researcher employed the term “major theme” for the themes that received the greatest number of occurrences. Meanwhile, those that received fewer responses were called the “minor themes”, which were deemed important perceptions and experiences and were presented throughout the study. An observed frequency of 37.5% and higher was used for inclusion in the discussion – however, frequency was not used as an indicator of how important a theme is relative to another.

Table 4.33: Summary of major and minor themes

Major themes	Minor themes
1. An effective funding agency must adopt transparent and fair processes in the allocation of grants	1.1 Scientific excellence and quality must inform the awarding of research grants. 1.2 Grants must be awarded to projects that demonstrate innovative and/or economic potential. 1.3 Grants must be awarded within budget and on time. 1.4 Robust, effective and transparent peer review systems and supporting processes need to be in place for the effective allocation of grants.
2. The factors play a key role in influencing the organisational effectiveness of funding agencies	2.1 The factors are interdependent and have an equal level of significance in influencing the organisational effectiveness of funding agencies. 2.2 Environmental and stakeholder management is the only factor that is external to the funding agency. All other factors can be internally managed by the agency. 2.3 The funding agency must be responsive to changes in the external environment in order to be effective.
3. Remaining independent while developing and nurturing relationships with the external environment is imperative for the funding agency to be effective	3.1 The funding agency must develop and nurture good relations with government and the research community. 3.2 Clear and regular communication is important for the funding agency to be effective.
4. Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies	4.1 Appropriate levels of investment must be directed towards human capital development. 4.2 The funding available to the funding agency must be used to support as many research projects as possible.
5. Strong, effective and efficient leadership is important for a funding agency to be effective	5.1 Leadership is important in responding to changes in the external environment: government, researchers or other external demands. 5.2 Leadership is important in ensuring that staff are incentivised and exposed to international best practices. 5.3 Strong leadership as well as skilled and competent staff are key constituents for the effective allocation of grants.

4.4.2 Analysis

4.4.2.1 Description of sample

The participants in the interviews comprised eight senior management representatives, a professor and a consultant to the different funding agencies and organisations. The participants' positions were as follows: (1) coordinator of studies; (2) programme director (3) director; (4) executive director; (5) deputy chief executive officer; (6) chief executive officer; (7) professor (who was also a recipient of research grants from the funding agency as well as an advisor to another funding agency); and (8) consultant. In addition, five organisations

discussed where the participants were currently employed. Lastly, the participants' number of years in their current organisation ranged from two to 25 years.

Table 4.34: Breakdown of the sample of participants in the interviews

	Position	Organisation discussed	Years of service at current organisation
Participant 01	Coordinator of studies	CONICYT (Chile)	2 years
Participant 02	Director	Deutsche Forschungsgemeinschaft (DFG)	35 years
Participant 03	Programme director	Deutsche Forschungsgemeinschaft (DFG)	2 years
Participant 04	Deputy chief executive officer	National Research Foundation, South Africa	5 years
Participant 05	Executive director	National Research Foundation, South Africa	12 years
Participant 06	Chief executive officer	National Research Foundation, South Africa	7 years
Participant 07	Professor: Oxford University (also a recipient of research grants from the funding agency as well as an advisor to another funding agency)	European Physical Sciences Research Council (EPSRC)	7 years
Participant 08	University professor and consultant to a funding agency	Research Council Norway	N/A

4.4.2.2 Findings

Major theme 1: *An effective funding agency must adopt transparent and fair processes in the allocation of grants*

The first major theme that emerged related to the following: An effective funding agency must adopt transparent and fair processes in the allocation of grants. Four minor themes were linked to this major theme and are discussed in detail in this section. The first major theme received a total of eight responses, which was 100% of the total sample population. The implication here was that 100% of the interview participants perceived that transparent and fair processes used in the allocation of grants contributed to the organisational effectiveness of funding agencies. The perceptions of the interviewees are highlighted below.

Interview participant 1: *"It is imperative to ensure that monies are spent transparently, that is why we employ the international benchmarking process, peer review."*

Interview participant 2: *"The DFG, as with other funding agencies use[s] peer review to achieve this objective. The challenge is that the applicant to a specific funding instrument, can also be a reviewer on another funding instrument, and this is the challenge that the peer review system faces. The DFG tries to ensure that such conflicts are minimised, so as to ensure that a transparent and fair process transpires. So with the peer review process, the DFG, makes sure that the best experts are invited to evaluate research proposals."*

"... as a funding agency you would probably need to put in place business processes, such as the peer review processes so that there is transparency and fairness in the system, which links to the level of trust that the research community has in the funding agency."

Interview participant 3: *"The funding agency needs to be autonomous and independent of these demands in order to be able to fund research in a transparent and fair manner, that is, on the basis of scientific excellence. The DFG is an agency that is publicly funded, even though we are a private organisation. Despite this arrangement we are mandated to award grants on the basis of scientific merit."*



Interview participant 4: *"Secondly it's the quality of the systems that are in place that contributes to transparency, fairness and trustworthiness: so systems ought to demonstrate rigour and robustness. The quality of the systems that are at place is fundamental in terms of making an impact. If you have an NRF online submission system that's troublesome, then researchers are going to be frustrated and not apply during the call for submissions process – this can severely impact on the agency's ability to execute what you're supposed to do."*

Interview participant 5: *"Although we have two income streams to fund research, money is never enough to fund everyone that applies. So it is important to make sure that when we award grants to researchers, we ensure that best practices (in our case, peer review processes) are followed and the processes employed are fair and transparent as well as address the investment principles defined by the organisation."*

“Another important factor relates to the systems and business processes in use. That’s critical. The effectiveness and nimbleness of the system and its processes, which include both the manual and electronic submission of research proposals is key to a funding agency being transparent and trustworthy. Stemming from this point, is the issue relating to ensuring that rules and regulations are understood.”

Interview participant 6: “Secondly, make sure that you establish a funding agency that has credibility in the system. The agency must have a reputation for being transparent and trustworthy, and is able to award grants through best practices in a timeous manner – in our case, a competitive process that uses peer review. This must all be achieved without undue stakeholder or government interference.”

Interview participant 7: “I would say that the most significant factor is processes, because if the process is not validated and believed in (or trusted) by the research community, then the relationship between the end stakeholders or research community and funding agency breaks down fairly rapidly. The process has to be transparent and it has to be appropriate for the level of funding that is being requested.”

Interview participant 8: “Two is effectiveness and rigour of the business processes, especially the peer review processes for funding agencies such as the Research Council of Norway. Peer review is one of the implementation tools. That’s one way of achieving transparency, but it’s not the only, of course – peer review is the gold standard of reviewing applications, so I don’t see any other standards coming up and replacing that, so yeah, the effectiveness and the peer review as well. It’s important because you’re actually using the resources of the research community in your peer review, so – so it’s important to use the peer reviews in an open and transparent way.”

Table 4.35: Summary of theme 1

Major theme	Number of occurrences	% occurrences
1. An effective funding agency must adopt transparent and fair processes in the allocation of grants	8	100
Minor themes	Number of occurrences	% occurrences
1.1 Scientific excellence and quality must inform the awarding of research grants	7	88
1.2 Grants must be awarded to projects that demonstrate innovative and/or economic potential	3	37.5
1.3 Grants must be awarded within budget and on time	4	50
1.4 Robust, effective and transparent peer review systems and supporting processes need to be in place for the effective allocation of grants	8	100

Minor theme 1.1: Scientific excellence and quality must inform the awarding of research grants

The first minor theme that was linked to the first major theme related to the following: Scientific excellence and quality must inform the awarding of research grants. This minor theme occurred seven out of eight times, which comprised 88% of the total sample population. The perceptions of the seven interview participants are shared below.

Interview participant 1: *“Monies are very important and funding agencies are dependent on government. Funding is important in the following areas:*

- 1) *Receiving funds from government.*
- 2) *Awarding of research grants to the researchers.*
- 3) *Supporting quality research (excellence) and human capital development.”*

Interview participant 2: *“In awarding grants, on a competitive basis, funding agencies, must set criteria that put scientific merit at the forefront, not any political agenda. Politics must not influence scientific research, which has the potential to benefit the country. An independent funding agency ensures credibility and ensures that scientific merit or excellence is most valued or prized at universities and also non-university research institutions.”*

“The message for the funding agency at the end of the day is: top science is what gets funded – so the principle of awarding grants hinges on scientific merit.”

“The funding budget is important and must be used to fund science, excellent science.”

Interview participant 3: *“The funding agency needs to be autonomous and independent of these demands in order to be able to fund research in a transparent and fair manner, that is, on the basis of scientific excellence. The DFG is an agency that is publicly funded, even though we are a private organisation. Despite this arrangement we are mandated to award grants on the basis of scientific merit.”*

Interview participant 4: *“Excellence is the cornerstone of decision-making. Excellence is not negotiable, especially in the peer review process and awarding of grants.”*

Interview participant 5: *“And the other part, we as NRF decide what it is that we will invest in. The funds for this are from the NRF parliamentary grant. We then have to decide on defining investment principles, which at this stage becomes very important. So clear understanding of those investment principles help immensely in terms of being effective, because if people understand that as an agency we have an obligation to balance the act in terms of: i) maintaining to fund excellent research, but at the same time; ii) making sure that young researchers are trained, particularly from designated groups, that relates to race to gender.”*

Interview participant 7: *“I think it’s important to ensure that given that the application process is always onerous, that the awarding of grants is on the basis of scientific merit or excellence.”*

Interview participant 8: *“Excellence: All funded projects and the management of projects must be awarded on the basis of either research or innovation excellence. I think excellence always has been the guiding star at the Research Council.”*

Minor theme 1.2: Grants must be awarded to projects that demonstrate innovative and/or economic potential

The second minor theme that was linked to the first major theme related to the following: Grants must be awarded to projects that demonstrate innovative and/or economic potential. This minor theme occurred three out of eight times, which comprised 37.5% of the total sample population. The perceptions of the three interview participants are shared below.

Interview participant 3: *“But I do think that the innovation potential of funded research projects need to come up as an indicator in a few years to come, so that we can link what we fund to how it can accrue economic benefit for the country.”*

Interview participant 7: *“... how can the funded research benefit wealth creation or the general public, whose tax money has been used to fund such research?”*

“EU based funding agencies are slightly different. Indicators look at how investments in research contributes to the overall financial health of the EU and also in the provision of services, training and networks.”

Interview participant 8: *“All funded projects and the management of projects must be awarded on the basis of either research or innovation excellence.”*

Minor theme 1.3: Grants must be awarded within budget and on time

The third minor theme that was linked to the first major theme related to the following: Grants must be awarded within budget and on time. This minor theme occurred four out of eight times, which is 50% of the total sample population. The perceptions of the seven interview participants are shared below.

Interview participant 4: *“An effective funding agency is:*

- 1) On budget and on time;*
- 2) Transparent;*
- 3) Customer-centric;*
- 4) Efficient;*

- 5) *World-class governance systems; and*
- 6) *Robust in its core processes that is, peer review.*

These are the things that the NRF stands for."

Interview participant 5: *"I think effectiveness, has to be primarily based on what we have, as a funding agency, promised to do. And how well do we do it. With a basic definition of what effectiveness is in terms of making sure that we deliver on what we are mandated to do in a timeous fashion."*

Interview participant 6: *"The second thing is that the funding agency must be able to effectively ensure that all the money it has available for disbursement lands in the pockets of the research community, as quickly as possible, but at the same time having followed international best practices in terms of following a competitive peer review process."*

Interview participant 7: *"So I think processes must be tailored to the science or research community they serve in terms of matching the level of funding applied for, with the level of rigour employed in the processes employed. This must be balanced off, with the funding agency achieving this in a timely manner."*

Minor theme 1.4: Robust, effective and transparent peer review systems and supporting processes need to be in place for the effective allocation of grants

The fourth minor theme that was linked to the first major theme related to the following: Robust, effective and transparent peer review systems and supporting processes need to be in place for the effective allocation of grants. This minor theme occurred eight times, which comprised 100% of the total sample population. The perceptions of the seven interview participants are shared below.

Interview participant 1: *"Funding of competitive research is very important but so too is measuring the funding and the associated outputs. It is imperative to ensure that monies are spent transparently, that is why we employ the international benchmarking process, peer review."*

“Business processes must be transparent and rigorous as it allows for CONICYT to control the research undertakings of researchers such that there is a benefit to society that comes from the funded research. This is done by transparent and effective peer review and evaluation processes.”

Interview participant 2: *“Given the limitations of the budget available to the DFG, peer review is imperative in ensuring that these limited funds are awarded in a transparent and competitive manner.”*

“What I am trying to state here, is that international best practices must form the basis for the awarding of grants, across all funding agencies.”

Interview participant 3: *“... as a funding agency you would probably need to put in place business processes, such as the peer review processes so that there is transparency and fairness in the system, which links to the level of trust that the research community has in the funding agency”.*

Interview participant 4: *“An effective funding agency is:*

- 1) On budget and on time;*
- 2) Transparent;*
- 3) Customer-centric;*
- 4) Efficient;*
- 5) World-class governance systems; and*
- 6) Robust in its core processes that is, peer review.*

These are the things that the NRF stands for. Excellence is the cornerstone of decision-making. Excellence, is not negotiable, especially in the peer review process and awarding of grants.”

Interview participant 5: *“So it is important to make sure that when we award grants to researchers, we ensure that best practices (in our case, peer review processes) are followed and the processes employed are fair and transparent as well as address the investment principles defined by the organisation.”*

“Another important factor relates to the systems and business processes in use. That’s critical. The effectiveness and nimbleness of the system and its processes, which include

both the manual and electronic submission of research proposals is key to a funding agency being transparent and trustworthy. Stemming from this point, is the issue relating to ensuring that rules and regulations are understood."

Interview participant 6: "And ensuring that we have effective institutional infrastructure in place to deal with systems and processes that are core to the business of funding agencies. When I talk about infrastructure, I'm talking about IT systems and processes; procurement processes; records and document management; and governance. In other words, internal systems and processes that will ensure that we function effectively as a funding agency."

"If suitable indicators had to be identified, then I think:

- The effective disbursement of funds.*
- The credibility of the processes used to disburse those funds".*

Interview participant 7: "I would say that the most significant factor is processes, because if the process is not validated and believed in (or trusted) by the research community, then the relationship between the end stakeholders or research community and funding agency breaks down fairly rapidly. The process has to be transparent and it has to be appropriate for the level of funding that is being requested."

Interview participant 8: "Two is effectiveness and rigour of the business processes, especially the peer review processes for funding agencies such as the Research Council of Norway. Peer review is one of the implementation tools. That's one way of achieving transparency, but it's not the only, of course – peer review is the gold standard of reviewing applications, so I don't see any other standards coming up and replacing that, so yeah, the effectiveness and the peer review as well. It's important because you're actually using the resources of the research community in your peer review, so – so it's important to use the peer reviews in an open and transparent way."

Major theme 2: *The factors play a key role in influencing the organisational effectiveness of funding agencies*

The second major theme that emerged related to the following: The factors play a key role in influencing the organisational effectiveness of funding agencies. Three minor themes were linked to this major theme and are discussed in detail in this section. The second major theme received a total of eight responses, which comprised 100% of the total sample population. The implication was that 100% of the interview participants perceived that the factors, environmental and stakeholder management, financial management, organisational processes and organisational learning and growth, play a key role in influencing the organisational effectiveness of funding agencies. The perceptions of the interviewees are highlighted below:

Interview participant 1: *“If I had to make a last comment: All these factors are equally important – it is difficult to rank one over the other in terms of importance, as they are inter-dependent and a funding agency cannot be effective without paying equal attention on each of the factors you mentioned.”*

Interview participant 2: *“Yes.”*

Interview participant 3: *“Yes.”*

Interview participant 4: *“Yes. They are all inter-dependent. They all define the system that relates to funding agencies. As an example: There’s no point in having financial management if there [are] no funds to manage. So you need resources. There’s no point in having business processes if there [are] no stakeholders to serve. So the interdependency is very important. Of course the organisational learning growth, you can supplement that by the quality of staff you have. So in essence, you cannot rank these factors - all of the factors are equally important, whether they reside as a factor external to the organisation or factors that reside within the organisation.”*

Interview participant 5: *“I would fully agree and I’ve already explained this to you.”*

Interview participant 6: *“Yes, absolutely.”*

Interview participant 7: *"I would agree. I think all of those four are actually encapsulated in my two points."*

Interview participant 8: *"I do. All of them are equally important."*

Table 4.36: Summary of theme 2

Major theme		Number of occurrences	% occurrences
2.	The factors play a key role in influencing the organisational effectiveness of funding agencies	8	100
Minor themes		Number of occurrences	% occurrences
2.1	The factors are inter-dependent and have an equal level of significance in influencing the organisational effectiveness of funding agencies	6	75
2.2	Environmental and stakeholder management is the only factor that is external to the funding agency. All other factors can be internally managed by the agency.	5	62.5
2.3	The funding agency must be responsive to changes in the external environment in order to be effective	6	75

Minor theme 2.1: The factors are interdependent and have an equal level of significance in influencing the organisational effectiveness of funding agencies

The first minor theme that was linked to the second major theme related to the following: The factors are interdependent and have an equal level of significance in influencing the organisational effectiveness of funding agencies. This minor theme occurred six out of eight times, which was indicative of 75% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: *"If I had to make a last comment: all these factors are equally important – it is difficult to rank one over the other in terms of importance, as they are inter-dependent and a funding agency cannot be effective without paying equal attention on each of the factors you mentioned."*

Interview participant 2: *"In terms of ranking these factors, I would say that they are all complementary to one another and hence they are of equal importance to any funding agency."*

Interview participant 4: *"In my view all of them are equally significant. It's not one or the other. It's the totality that defines the effectiveness of the funding agency as an organisation."*

"They are all inter-dependent. They all define the system that relates to funding agencies. As an example: there's no point in having financial management if there [are] no funds to manage. So you need resources. There's no point in having business processes if there [are] no stakeholders to serve. So the interdependency is very important. Of course the organisational learning growth, you can supplement that by the quality of staff you have. So in essence, you cannot rank these factors - all of the factors are equally important, whether they reside as a factor external to the organisation or factors that reside within the organisation."

Interview participant 5: *"Just as a final point here: All these factors cannot be ranked or measured one against the other – all of them play an equal role in influencing the effectiveness of funding agencies, be it a factor that influences from the outside in, or factors within the organisation."*



Interview participant 7: *"In terms of ranking the factors, well, that's quite tricky. I think it's a clear and equal ranking. I would say that the environmental and stakeholder management is probably the primary driver, given that it is out of the control of the organisation and resides outside the organisation itself. And in terms of the remaining factors, they relate to activities inside of the funding agency. I would say then that the remaining factors are of equal importance, from an internal perspective."*

Interview participant 8: *"I do. All of them are equally important."*

Minor theme 2.2: Environmental and stakeholder management is the only factor that is external to the funding agency. All other factors can be internally managed by the agency

The second minor theme that was linked to the second major theme related to the following: Environmental and stakeholder management is the only factor that is external to the funding agency. All other factors can be internally managed by the agency. This minor theme occurred five out of eight times, which was indicative of 62.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 2: *"If I had to contextualise these factors, then environmental and stakeholder management influences the effectiveness of the funding agency from outside, and is out of the control of the organisation. The rest of the factors are internal to the organisation and can be controlled by the organisational leadership itself."*

Interview participant 4: *"... all of the factors are equally important, whether they reside as a factor external to the organisation or factors that reside within the organisation."*

Interview participant 5: *"Environmental and stakeholder management is a key driver, but it resides outside the organisation. This factor also relates to relationship management: i) the relationship between the funding agency and the funder is important; and ii) the relationship between the funding agency and the research community is also important."*

Interview participant 7: *"I would say that the environmental and stakeholder management is probably the primary driver, given that it is out of the control of the organisation and resides outside the organisation itself. And in terms of the remaining factors, they relate to activities inside of the funding agency. I would say then that the remaining factors are of equal importance, from an internal perspective."*

Interview participant 8: *"If I am forced to rank these, then: Number one, would be environmental and stakeholder management. It is probably the one factor that would have the opportunity to influence funding agencies mostly, given that they are dependent on government resources or public funding, so I would say it's very important. The remaining factors: Finance management; business processes; learning and growth (including HR*

management) are of equal importance. If you do these well, then you will probably succeed with being effective as a funding agency [engaging your researchers].”

Minor theme 2.3: The funding agency must be responsive to changes in the external environment in order to be effective

The third minor theme that was linked to the second major theme related to the following: The funding agency must be responsive to changes in the external environment in order to be effective. This minor theme occurred six out of eight times, which was indicative of 75% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 2: *“...funding agencies continuously evolve in order to address the changes in the external environment – this relates to changes in research investment areas according to researchers, or changes in the government demands on the other. In addition, changes could relate to the manner in which technology evolves or socio-cultural norms change.”*

Interview participant 3: *“... This strategy must ensure that there are continuous reflections relating to the agency meeting its mandate and what must be changed in order to meet the changing demands of the world and the researcher community (is the agency evolving to meet the changing demands of its stakeholders?).”*

Interview participant 4: *“In addition, the organisation must steer towards being a listening organisation and a responsive organisation to the evolving needs of the stakeholder community.”*

“I want to say here that there must be an organisational structure in place that allows for the agency to be: (i) responsive to a changing environment; (ii) being customer-centric which means that processes must be streamlined such that there is a culture in place that focuses on customer-centricity.”

“Thirdly the responsiveness of the organisation to change. We need to always be cognisant that we’re dealing with a changing higher education landscape. And therefore we might have

to sometimes terminate existing instruments, revise current instruments, or even create new instruments in response to this change.

Interview participant 5: *"... there is always a need to constantly review the role of the agency at a given time. Has it evolved to meet the changes in either the research community or government landscape?"*

Interview participant 7: *"Processes that are put in place must be responsive and fluid to accommodate changes in the research landscape. So I think processes must be tailored to the science or research community they serve in terms of matching the level of funding applied for, with the level of rigour employed in the processes employed. This must be balanced off, with the funding agency achieving this in a timely manner."*

Interview participant 8: *"Also because one of the reasons why I see them as effective is that they are also always trying to improve. I would also say it's an evolving organisation [that] learns on the job. I think they learn from every cycle and they implement what they've learned. Within the Research Council, it's easy to give feedback and it's easy to effect changes. The ministry had undertaken a thorough review of the Research Council's effectiveness and the review has been very good."*

Major theme 3: Remaining independent whilst developing and nurturing relationships with the external environment is imperative for the funding agency to be effective

The third major theme that emerged related to the following: Remaining independent while developing and nurturing relationships with the external environment is imperative for the funding agency to be effective. Two minor themes were linked to this major theme and are discussed in detail in this section. The third major theme received a total of six responses, which comprised 75% of the total sample population. The implication was that 75% of the interview participants felt that the funding agency must remain independent while developing and nurturing relationships with the external environment in order to be effective. The perceptions of the interviewees are highlighted below.

Interview participant 2: *"Finally, all funding agencies need to manage government on the one hand and researchers on the other – I think the DFG does well in managing these two*

stakeholders by virtue of it being an independent private organisation that manages public funds.”

“In the case of the DFG, there is no direct linkage to the political space, as we are an autonomous, and independent private organisation that uses public or state funds to support top quality science and researchers.”

Interview participant 3: “I would therefore say a funding agency needs to concentrate and focus on funding. The funding of basic research must also be independent of political and economic reasoning – such research is funded by the universities themselves. The funding agency needs to keep a critical distance from the demands of political bodies, especially government, when it comes to government looking for an immediate return, that has an effect on the labour market, economic development, innovation and so on. The funding agency needs to be autonomous and independent of these demands in order to be able to fund research, on the basis of scientific excellence.”

Interview participant 4: “Fourthly the interfacing of the funding agency with the stakeholder community. The stakeholder community is two-fold: (i) government on the one hand, that provides the funding to the agency; and (ii) the research community on the other, that play a dual-role: they firstly play a key role in the peer review process and secondly, they are recipients of grants from the agency. As a funding agency, you have to be communicating all the time. You have to be a listening organisation and a caring organisation. Largely it’s about creating partnerships with our stakeholders.”

Interview participant 5: “So personally I don’t think that funding agencies should be autonomous, as is the case with the DFG. A funding agency can’t be an agency and do whatever they want to do. Then it cannot be an agency – it may as well be an independent philanthropic organisation. An agency acts on behalf of a group of people: in the case of funding agencies, they act on behalf of the research community. So it is important for the agency to understand that it’s got an obligation to government on the other hand, and the research community it serves on the other.”

Interview participant 6: “I think that funding agencies can be most effective when they steer away from: i) government and researcher interference; ii) becoming too bureaucratic; and iii)

adopt a service provision approach to their functions. These just help to make funding agencies more effective.”

Interview participant 8: “Trust-based management is important for government to understand the Research Council and for the research community to understand and appreciate the role of the Research Council. I think that’s a factor, which would be hard to explain if you’re not used to working in such an environment, but it’s probably one of the things where, both the Norwegian government and businesses succeed the most – trust based management.”



Table 4.37: Summary of theme 3

Major theme	Number of occurrences	% occurrences
3. Remaining independent while developing and nurturing relationships with the external environment is imperative for the funding agency to be effective	6	75
Minor themes	Number of occurrences	% occurrences
3.1 The funding agency must develop and nurture good relations with government and the research community	8	100
3.2 Clear and regular communication is important for the funding agency to be effective.	7	87.5

Minor theme factor 3.1: The funding agency must develop and nurture good relations with government and the research community

The first minor theme that was linked to the third major theme related to following: The funding agency must develop and nurture good relations with government and the research community. This minor theme occurred eight times, which was indicative of 100% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: “Funding agencies are like banks, people come to ask for money and the repayment is generating research knowledge. Relationships between the funding agency and government, as well as funding agency and the research community is important to

ensure that monies received [from government] can be transparently and effectively awarded in the form of research grants that can benefit society in the long-term."

Interview participant 2: *"Externally, trust is important especially with respect to the relationships between the funding agency and government, as well as the funding agency and the research community."*

Interview participant 3: *"... there needs to be an awareness of the demands (by the way, these demands are the factors you described) by the researcher community, and probably a course of action for the management of these demands. These demands relate to the factors you mentioned earlier. So then there's this sort of demand management needed by the funding agency. The demands that come from the government sector must be understood by the research sector – this is the role of the funding agency. And then, as a funding agency you would probably need to put in place business processes, such as the peer review processes so that there is transparency and fairness in the system, which links to the level of trust that the research community has in the funding agency."*

Interview participant 4: *"Fourthly the interfacing of the funding agency with the stakeholder community. The stakeholder community is two-fold: (i) government on the one hand, that provides the funding to the agency; and (ii) the research community on the other, that play a dual-role: they firstly play a key role in the peer review process and secondly, they are recipients of grants from the agency. As a funding agency, you have to be communicating all the time. You have to be a listening organisation and a caring organisation. Largely it's about creating partnerships with our stakeholders."*

Interview participant 5: *"So it is important for the agency to understand that it's got an obligation to government on the other hand, and the research community it serves on the other. It is therefore important for the funding agency to nurture relationships with government who they are accountable to, as well as the research community they serve. There must of course be some level of conversation that transpires between government and the research community that may not necessarily include the funding agency. However, the agency role in mediating and facilitating as well as fostering the relationship between government and the research community must not be underestimated, especially when translating the research outputs of the researchers into a return on investment for*

government. As much as these relationships need to be in place and managed, the agency must not lose sight of what its core mandate and objectives are.”

Interview participant 6: “... I would add that broad stakeholder consultation and government engagement must be allowed in order to develop clear long-term strategic priorities for the system.”

Interview participant 7: “I think in terms of effectiveness, the biggest problem is managing the relationship between funding agencies who have to report to government and in this relationship demonstrate the value accrued through the awarding of grants in terms of wealth creation, job creation and other metrics, such as research outputs. I think the biggest contribution would be to demonstrate how research outputs such a publications, patents, and human capital development, amongst others, can accrue to wealth creation in a rather direct way. On the other hand, the relationship between funding agency and the research community is equally important. I think it’s important to ensure that the application process is, it’s always onerous and that there is the awarding of grants on the basis of scientific merit or excellence.”

Interview participant 8: “Good order and trust are also important, both on the side of the ministry or funder as well as on the side of the research community or grant recipients. This does not mean this is not necessary for the Research Council in any way. Good order or governance and trust within the Research Council itself will lead to improved effectiveness in the council’s implementation processes or business processes. This means transparency is ensured which would ensure a better image and reputation of the Research Council itself.”

Minor theme 3.2: Clear and regular communication as part of relationship management, is important for the funding agency to be effective

The second minor theme that was linked to the third major theme related to the following: Clear and regular communication as part of relationship management, is important for the funding agency to be effective. This minor theme occurred seven out of eight times, which was indicative of 87.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: *"CONICYT operates jointly with other institutions in charge of similar topics, mostly in organising open competitions and administering funds. Some of these institutions are related to international conventions financing scholarships. The problem is that all these institutions work separately and there is not good communication between these institutions. If these can be fixed, then CONICYT will be more effective, as well as the other institutions."*

"I propose that transparency and communication be used to improve the effectiveness of the funding agencies."

Interview participant 2: *"This needs to be re-visited in order to address the changes in the external environment, as well as display an appreciation for science. As such, the DFG would need to undergo a review, prior to engaging such a change in which communication or open exchange of experiences is facilitated. I say this, as in my opinion, communication is akin to democracy or an open society."*

Interview participant 4: *"Communication is fundamental in both the active and passive forms:*

- *Good clear communication; and*
- *Consistent communication."*

Interview participant 5: *"So the overarching part for me effectiveness, is primarily being able to do the mandate that we are given as efficiently and effectively and on time as quickly as possible, with due consideration afforded to clear communication to researchers as well as government departments. As an agency, we need to ensure that there is effective communication with government, so that they know what our role is. On the other hand, the research community needs to understand our purpose in representing their best interests."*

"Communication is critical and it's not just a once-off activity."

Interview participant 6: *"... I would add that broad stakeholder consultation and government engagement must be allowed in order to develop clear long-term strategic priorities for the system. This will then guide the funding investments over time."*

Interview participant 7: *“An effective funding agency I think has to do several things. The funding agency firstly has to establish good communications and links into research community, who are ultimately stakeholders in that funding agency. It also has to establish strong links with the ministry or government department/s who support the funding agency with funding. And finally, it has to put in place appropriate transparent processes to manage both of those stakeholders.”*

“The second one is really all about communication. I think it’s vital that funding agencies engage with and have ongoing dialogues with the research community when they set their own investment priority areas that they have decided to fund. In general the EU are quite good at that.”

Interview participant 8: *“One is communication. Through every process from setting the agenda that defines the strategies that influence the research and innovation landscape to the implementation phase, communication is important – especially in the process of implementation itself.”*

Major theme 4: Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies

The fourth major theme that emerged related to the following: Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies. Two minor themes were linked to this major theme and are discussed in detail in this section. The fourth major theme received a total of six out of eight responses, which comprised 75% of the total sample population. The implication was that 75% of the interview participants perceived that maintaining adequate levels of funding was an important contributor to the organisational effectiveness of funding agencies. The perceptions of the interviewees are highlighted below:

Interview participant 1: *“Funding levels at CONICYT in general [play a key role in the effectiveness of CONICYT]”*

Interview participant 2: *“The funding budget is important and must be used to fund science, excellent science. Despite the need for additional funding, which is fundamental to the*

functioning of a funding agency, there is also the need for funding agencies to be able to find [their] niche, or place in the science system, as a whole.”

Interview participant 3: *“A limitation is clearly funding or the ability to acquire funds. If we do not receive enough funding from the government and from the federal state, through tax payers’ money, then it would pose an actual limitation for us, in terms of achieving our mission.”*

Interview participant 5: *“Relationship with the principle funder or the government department that provides funding [is important]: funders need to appreciate the role of the funding agency and understand their limitations as well as those of the funding agency. Poor relationships with government translate into poor resources available to award in the form of grants: The actual resources that we have, that is, financial resources.”*

“Level of funding: One thing that plays a significant role, is funding.”



Interview participant 6: *“First of all, make sure that the funding levels are meaningful, that is the budget available to the funding agency for awarding grants on a competitive basis, can make an impact on the system.”*

Interview participant 8: *“I think it is important that: The budget allocation letters from ministry must be explicit in terms of the level of funding that will be made available to the Research Council as well as define precisely the research outputs, goals and other key performance indicators that need to be met by the Research Council.”*

Table 4.38: Summary of theme 4

Major theme	Number of occurrences	% occurrences
4. Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies	6	75
Minor themes	Number of occurrences	% occurrences
4.1 Appropriate levels of investment must be directed towards human capital development	6	75
4.2 The funding available to the funding agency must be used to support as many research projects as possible	3	37.5

Minor theme 4.1: Appropriate levels of investment must be directed towards human capital development

The first minor theme that was linked to the fourth major theme related to the following: Appropriate levels of investment must be directed towards human capital development. This minor theme occurred six out of eight times, which was indicative of 75% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: *“Human capital development is very important. We are lacking a great number of people with skills, that is, there is a need to increase the number of people or the critical mass of people willing and able to do good quality research and create knowledge including attracting people from overseas or getting Chile[an] students or young researchers to go overseas and come back with experience and knowledge. This is a challenge for developing countries like Chile and it is important that this is addressed for funding agencies to be successful and effective. This will also allow for accruing economic value and benefits to society.”*

Interview participant 2: *“Additional funds are required to support basic research at universities as this is fundamental for researchers to grow and build their career and track record. This would mean that there is a contribution to supporting the human capital development pipeline in ensuring that top science and top scientists are always in the system to receive the top-up funding from the DFG.”*

Interview participant 4: *“Meeting targets set by government as well supporting the advancement of science. So indicators should extend to achieving the objectives of the funding agency’s mandate, meeting the key performance indicators (KPIs) that relate to publications and human capital development, etc.”*

Interview participant 5: *“Grant funding is awarded against set criteria, which includes human capital development and research outputs such as publications. The primary aim of funding research is for advancing research itself, but we also expect those people that receive grant funding to train students, postdoctoral fellows, and young academics that will advance the objectives set by government.”*

Interview participant 6: *“We measure it in terms of science outputs that are generated by the recipients of the grants. Outputs are defined as: a) research publications; b) student training at the post-graduate level; and c) investments in key infrastructure (of course the last one is an input variable rather than an output variable). I think we also measure the impact of the funding that we disburse in terms of successes or failures in meeting the national transformation agenda: how many grants have been awarded to black and female researchers or how many black and female students have been trained or have benefited by virtue of the grant being awarded?”*

Interview participant 7: *“I think the biggest contribution would be to demonstrate how research outputs such a publications, patents, and human capital development, amongst others, can accrue to wealth creation in a rather direct way.”*

“Something I should point out is when funding agencies measure academic outputs, during, pre and also post grant award, we measure (i) research publications, (ii) patents, (iii) software, (iv) conferences attended, (v) human capital development or student training, (vi) other funding that has been generated due to the initial or primary funding received. This last one, perhaps the most recent indicator, draws the theme back to wealth creation, or the building of research infrastructure.”

Minor theme 4.2: The funding available to the funding agency must be used to support as many research projects as possible

The second minor theme that was linked to the fourth major theme related to the following: The funding available to the funding agency must be used to support as many research projects as possible. This minor theme occurred three out of eight times, which was indicative of 37.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 3: *"I think success rates are important but again that comes along with funding levels that are accessible to the funding agency."*

Interview participant 5: *"Numbers in terms of the how many applying researchers are funded based on how many people have applied and are eligible (it's almost a sprinkler system)."*

Interview participant 6: *"We measure it [effectiveness] in terms of the effectiveness of the disbursement of funds in the form of the number of research grants awarded."*

Major theme 5: Strong, effective and efficient leadership is important for a funding agency to be effective

The fifth major theme that emerged related to the following: Strong, effective and efficient leadership is important for a funding agency to be effective. Three minor themes were linked to this major theme and are discussed in detail in this section. The fifth major theme received a total of four out of eight responses, which comprised 50% of the total sample population. The implication was thus that 50% of the interview participants perceived strong, effective and efficient leadership to be important for a funding agency to be effective. The perceptions of the interviewees are highlighted below:

Interview participant 1: *"Leadership and people management are important factors to achieving success and being effective."*

Interview participant 2: *"You need a structured organisation with clear responsibilities and roles including competent leadership to deal with the scientific community."*

Interview participant 4: *"In some instances, the funding agency may be concerned that the judgment may extend to the capability of the leadership to deliver on its mandate, in other instances, it may demonstrate that the funding agency role is not needed and finally, a major concern may be that there could be public exposure relating to tax payers funds not directly benefiting the public in general (the public is important, as it is their tax funds that are used) – these may be some of the concerns of the funding agency leadership."*

Interview participant 8: *"Third is good leadership, management and good staff. In each of the above, I would say transparency, is fundamental – this builds trust with the research community and government stakeholders."*

Table 4.39: Summary of theme 5

Major theme	Number of occurrences	% occurrences
5. Strong, effective and efficient leadership is important for a funding agency to be effective	4	50
Minor themes	Number of occurrences	% occurrences
5.1 Leadership is important in responding to changes in the external environment: government, researchers or other external demands.	3	37.5
5.2 Leadership is important in ensuring that staff are incentivised and exposed to international best practices	3	37.5
5.3 Strong leadership as well as skilled and competent staff are key constituents for the effective allocation of grants	5	62.5

Minor theme 5.1: Leadership is important in responding to changes in the external environment: government, researchers or other external demands

The first minor theme that is linked to the fifth major theme relates to the following: Leadership is important in responding to changes in the external environment: government, researchers or other external demands. This minor theme occurred three out of eight times, which was indicative of 37.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 2: *“You need a structured organisation with clear responsibilities and roles including competence leadership to deal with the scientific community.”*

“In the case of the DFG, the culture and funding priorities have remained constant since the 1950s. This needs to be re-visited [by the organisation] in order to address the changes in the external environment, as well as display an appreciation for science.”

Interview participant 5: *“As leaders in funding agencies we must remember that the external stakeholder group comprises of various types of stakeholders: From government officials to senior researchers, young researchers as well as students and the general public. Within this stakeholder group, there is also a changing dynamic, that is, an evolving external stakeholder group. Today you may be talking to deans, tomorrow researchers, and the next day one of those individuals become a government or NRF official. The stakeholder community is rather small and changing jobs is a reality.”*

Interview participant 7: *“And finally, the leadership has to put in place appropriate transparent processes to manage both of those stakeholders.”*

“Processes that are put in place must be responsive and fluid to accommodate changes in the research landscape.”

Minor theme 5.2: Leadership is important in ensuring that staff are incentivised and exposed to international best practices

The second minor theme that was linked to the fifth major theme related to following: Leadership is important in ensuring that staff get incentivised and exposed to international best practices. This minor theme occurred three out of eight times, which was indicative of 37.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: *“Leadership is important: People can be very difficult and there is a need to break down barriers. If leadership, climate and people management are addressed, then effectiveness can be achieved, in that the resources within the organisation are working towards a common goal (must be the organisation’s strategy).”*

Interview participant 2: *“In addition, we [funding agencies] need to have cross-border exchanges in order for staff in key positions to be able to share experiences and learning with similar organisations across the globe. In such an instance, a global perspective or a global view is important.”*

Interview participant 8: *“Third is good leadership, management and good staff.”*

*“In my experience, from working abroad and working in Norway, that a **trust-based management approach** is crucial. This applies to a) trust in your employees on every level and implementing that in your organisation to get the most out of people to make decisions in a manner that contribute to i) a better understanding of the organisation’s strategy by the external stakeholders, be that government or researchers; and ii) meeting the objectives of the funding agency.”*

Minor theme 5.3: Strong leadership as well as skilled and competent staff are key constituents for the effective allocation of grants



The third minor theme that was linked to the fifth major theme related to the following: Strong leadership as well as skilled and competent staff are key constituents for the effective allocation of grants. This minor theme occurred five out of eight times, which was indicative of 62.5% of the total sample population. The interview participants shared their perceptions relating to this minor theme as follows:

Interview participant 1: *“In addition, leadership is important: People can be very difficult and there is a need to break down barriers. If leadership, climate and people management are addressed, then effectiveness can be achieved, in that the resources within the organisation are working towards a common goal (must be the organisation’s strategy).”*

Interview participant 2: *“The calibre of staff within the DFG is also important. Staff must be as professional as possible in all aspects, for instance we have about sixty people serving science directly through the peer review process. They [staff] have direct access to the scientific communities.”*

“In addition, a good staff complement is essential in order to ensure professionalism as well as support flexibility.”

Interview participant 4: *“To me what is the fundamental to the NRF is: The quality of staff that we have recruit: we need to get into the system people with the right mindset, skills and attitude. If you don’t have the right people who understand the system, then you’re going to have poor service provision.”*

Interview participant 5: *“The staff of the NRF, at all levels within the organisational structure, must be appropriately skilled and know their role in contributing to the agency’s mandate. This also delivers on a customer-centric offering to the stakeholder community by the funding agency.”*

“Good staff, is also important. They are critical, to ensuring a customer-centric offering to the research community and they play a role in teaching new staff, therefore they play a role in learning and growing.”

Interview participant 6: *“I think we struggle sometimes with getting the right people with the right skills set and mind set into the organisation. Attracting and retaining the right staff on board is critically important.”*

4.4.3 Summary of findings: qualitative study

This section of the chapter described the results from the data gathered through the interviews with eight senior representatives of funding agencies and other relevant organisations. The researcher conducted the interviews with the participants using Skype and analysed the transcripts using qualitative thematic analysis. The analysis indicated that the following key factors contributed to the organisational effectiveness of funding agencies:

- 1) An effective funding agency must adopt transparent and fair processes in the allocation of grants.
- 2) The factors: environmental and stakeholder management, organisational business processes, financial management and organisational learning and growth, play a key role in influencing the organisational effectiveness of funding agencies.

- 3) Remaining independent while developing and nurturing relationships with the external environment is imperative for the funding agency to be effective.
- 4) Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies.
- 5) Strong, effective and efficient leadership is important for a funding agency to be effective.

4.5 Integration of the quantitative and qualitative findings

The aim of this study was to investigate the organisational effectiveness of funding agencies using a five-factor balanced scorecard. Using a sequential explanatory mixed methods design, a web-based survey was initially conducted. Following quantitative data analyses, the following four factors were identified that were linked to the organisational effectiveness of funding agencies: environmental and stakeholder management, organisational learning and growth, organisational business processes and financial management. These four factors were analysed across the total sample population and it was found that there were no statistically significant observations between the four factors. When the four factors were analysed across the South African National Research Foundation, the Comisión Nacional de Investigación Científica y Tecnológica de Chile and the Research Council of Norway, it was found that positive and moderately strong correlations existed between the four factors. In addition, statistical analyses indicated differences in the environmental and stakeholder management factor, and that there were observed differences between the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica de Chile, and the Research Council of Norway and the South African National Research Foundation. While significant differences were observed between the Research Council of Norway and the Comisión Nacional de Investigación Científica y Tecnológica de Chile, marginally significant differences were observed between the Research Council of Norway and the South African National Research Foundation.

The findings of the quantitative study, motivated and informed the qualitative research process. Eight semi-structured interviews were conducted with senior representatives of funding agencies and other relevant organisations. The analysis indicated that the following key factors contributed to the organisational effectiveness of funding agencies:

- 1) An effective funding agency must adopt transparent and fair processes in the allocation of grants.
- 2) The factors, environmental and stakeholder management, organisational business process, financial management and organisational learning and growth, play a key role in influencing the organisational effectiveness of funding agencies;
- 3) Remaining independent while developing and nurturing relationships with the external environment is imperative for the funding agency to be effective.
- 4) Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies.
- 5) Strong, effective and efficient leadership is important for a funding agency to be effective.

4.6 Conclusion

This chapter described the results obtained from the quantitative and qualitative data collection tools, namely the web-based survey and the interviews respectively. Owing to the fact that a sequential explanatory mixed methods approach was used in this study, this chapter first described the quantitative findings that were obtained using the SPSS statistical software package, and then explained the qualitative findings that were recorded manually. In conclusion, the findings from both the quantitative and qualitative data analyses were integrated.

Chapter 5 contains a detailed discussion of the data analysis and findings and also makes recommendations.

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

5.1 Introduction

Based on the discussions in chapter 4, the key findings are reported below, following the sequential explanatory mixed methods study that focused on investigating the factors that influence the organisational effectiveness of funding agencies.

5.2 Findings of the quantitative study

The findings of the quantitative study were as follows:



- 1) A total of 76.7% of the respondents strongly agreed that the funding agency at which they were employed had competent staff. The respondents also concurred that financial controls were in place to ensure that funds were spent in a transparent manner (71.4%). The financial management practices were also deemed effective by the respondents (67.2%). In addition, the respondents were generally positive about the support structures in place for staff to improve their formal qualifications (66.7%) and the image of the organisation (66.6%).
- 2) The main five elements that respondents were negative were as follows: performance (including under performance) was ineffectively managed (43.4%). A total of 41.3% of the respondents were disillusioned with the reward system that was in place for staff who go the extra mile. The respondents were negative about communication being clear at the funding agency at which they were employed (40.2%), as well as the agency being first to market new offerings (40.2%). Finally, respondents felt that the agency was unable to clearly define a return on investment for the organisation (38.6%).
- 3) Initially, a five-factor balanced scorecard was adopted to evaluate the organisational effectiveness of funding agencies, comprising the following factors: external environment, customer service, organisational learning and growth, financial management and organisational business processes. However, it was found after conducting a factor analysis that a four-factor scorecard appeared better suited to this purpose, comprising the following factors: environmental and stakeholder management,

organisational business processes, organisational learning and growth and financial management.

- 4) The four factors, namely environmental and stakeholder management, organisational learning and growth, financial management and organisational business processes, were analysed across the total sample population, and it was found that no statistical significance was observed between the four factors. This implied that the factors had a similar perceived impact on the organisational effectiveness of funding agencies.
- 5) When these four factors were analysed and compared across the South African National Research Foundation, Comisión Nacional de Investigación Científica y Tecnológica in Chile and the Research Council of Norway, it was found that the factor, external environmental and stakeholder management, was significantly different. Furthermore, both the South African National Research Foundation and the Comisión Nacional de Investigación Científica y Tecnológica in Chile, which are based in middle-income countries, were statistically different to their counterpart in the high-income country, Norway. No statistical significance was evident between the South African National Research Foundation and the Comisión Nacional de Investigación Científica y Tecnológica in Chile. Based on this finding, it is evident that the environmental and stakeholder management factor played a key role in influencing the effectiveness of funding agencies, especially across countries with different economic classifications.

5.3 Findings of the qualitative research

The findings of the quantitative study motivated and informed the qualitative research process. Semi-structured interviews were conducted with eight senior representatives from funding agencies and other relevant organisations. Based on the outcomes of a thematic analysis, it was found that the following key factors contributed to the organisational effectiveness of funding agencies:

- 1) An effective funding agency should adopt transparent and fair processes in the allocation of grants.
- 2) The factors, environmental and stakeholder management, organisational business process, financial management and organisational learning and growth, are interrelated

and interdependent and thus play an equal role in influencing the organisational effectiveness of funding agencies.

- 3) Remaining independent while developing and nurturing relationships with the external environment is imperative for the effectiveness of funding agencies.
- 4) Maintaining adequate levels of funding is an important contributor to the organisational effectiveness of funding agencies.
- 5) Strong, effective and efficient leadership is vital to the effectiveness of funding agencies.

On the basis of these findings, a conceptual framework was proposed, following the integration of the literature with the study outcomes.

5.4 Integration of the literature review with the study outcomes

The aim of this section is to integrate the literature review with the quantitative and qualitative results of this research study. The four factors that were identified during factor analysis are also discussed here, and substantiated with the findings that emerged from the thematic analysis.

5.4.1 The balanced scorecard

It can be inferred from this research that the use of a balanced scorecard helps public funding agencies to be more transparent, especially with regard to their processes and expenditure behaviours. The four-factor scorecard adequately acknowledges the principles of the original business scorecard, proposed by Kaplan and Norton (1992). The four-factor scorecard encourages funding agency to be transparent in the manner in which objectives, performance outputs and resource allocation are reflected through the integration of both financial and nonfinancial indicators (De Waal, 2010).

5.4.2 Environmental and stakeholder management

The environmental and stakeholder management factor refers to the opportunities and threats presented to the organisation by the external environment. This factor has a ripple effect on the other factors associated with the organisational effectiveness of funding agencies. In the quantitative analysis, it was found that this factor comprised the following subfactors: (1) organisational image and reputation; (2) political environment; (3)

communication strategy to customers; (4) sociocultural environment; (5) customer service and satisfaction; and (6) skills and competencies. The subfactors linked to this factor illustrate that the external environment influences not only the organisational effectiveness of funding agency, but also how the funding agency is able to respond to the external environment. One of the major challenges funding agencies face is managing the risk associated with government interference in their operations (Qian & Baek, 2011; Braun, 1998).

The subfactors linked to this factor that were associated with stakeholder management, that is, the manner in which the funding agency responded to the external environment, included: image and reputation, communication strategy to customers, customer service and satisfaction, and skills and competencies. The image and reputation of the organisation are determined by the perceptions and impressions of multiple audiences relating to the employees' behaviours and attitudes, communication styles, the organisation's value system, its environmental policy and the quality of products and services (Akin & Demirel, 2011). The organisation's reputation is deemed to have greater stability in the eyes of customers and other stakeholders, and this reputation is developed as more information on the organisation is collected over a longer period of time (Akin & Demirel, 2011). The perceptions of those outside the organisation are deemed to be the sum of a number of characteristics, which include credibility, reliability and trustworthiness, to name a few, that are associated with the organisation itself. These characteristics are fundamentally important for safeguarding the organisation's reputation and image (Kello, 2010). Communication tends to play a vital role in bridging the gap between the stakeholder's and customer's perception of the organisation with the image and reputation that the organisation wishes to project (Akin & Demirel 2011). This also applies to funding agencies that have to ensure that the above-mentioned characteristics are adopted when engaging both government, which provides funds for the funding agency, and the research community the funding agency serves.

Another key subfactor is that of the communication strategy used to inform customers of what is going on in the organisation (bin Haji, 2010). Communication is believed to directly affect the building of long-term relationships with both internal and external stakeholders (Poovalingam & Veerasamy, 2007). It has the capacity to build long-term and sustainable relationships between an organisation and its customers. Communication is therefore pivotal in an organisation's success and effectiveness, if it is implemented and managed

effectively and within the framework of a set of values or norms that embrace the organisation's philosophy. Besides communicating with customers, customer service and satisfaction play a key role in contributing to the effectiveness of the entire organisation. It is only recently that public sector organisations have realised this (Beevers, 2006). Some of the challenges facing the public sector include service delivery, dialogue with citizens and strong political and managerial leadership (Beevers, 2006). In addition, there must be a blend of competent people, processes and technology geared towards developing a customer-centric organisation. A study by Poovalingam and Veerasamy (2007) indicated that in multicultural and diverse countries such as South Africa, customers appear to appreciate well-trained and knowledgeable staff who ensure that relationships are maintained and that privacy is respected. In addition, staff must be skilled in the use of technological tools, verbal and written language and engaging in a diverse sociocultural context (Delobbe et al, 2014; Bryson, 2011; OECD, 2008; Rychen & Salganik 2000). Competent and skilled staff are integrally linked to the principles of emotional intelligence (Wasiluk, 2010; Boguslauskas & Kvedaraviciene, 2009; Srivastava, 2005; Rychen & Salganik 2000). Essentially, there are two objectives associated with competency, namely bringing the greatest value to the end customer, and ensuring the highest level of productivity for the company itself (Boguslauskas & Kvedaraviciene, 2009). Finally, if an organisation is to be totally competent, it also needs the technologies, information, unique operating methods and processes accessible to employees. Such a combination is deemed to facilitate the enhanced performance and competitive advantage of organisations in the marketplace (Rice, 2007).



The subfactors linked to this factor that are outside the organisation, include the political and sociocultural environments. The political environment of a country has a profound ability to affect the organisations in a country by introducing a risk factor that could cause significant losses (Pondent, 2011). Political risk and its measurement act as a barometer for organisations to measure their business risk in a specific political environment. This measurement is largely influenced by the sovereignty of nations, the legal systems, government policies, philosophes, interest groups and political parties amongst others (Qian & Baek, 2011). For organisations to be deemed effective, there is a need for a strong focus on monitoring the political climate in the countries in which business is conducted. In addition, organisations need to pay due attention to the socioeconomic challenges of the people they wish to serve, such as poverty, inequality, racism and varying consumer behaviours based on household income disparities. Organisations that are poised to address the current and emerging sociocultural trends and the economic and cultural backgrounds of

the society they aim to target, are best positioned to enhance their organisational effectiveness and performance (Wetherley 2011).

Associated with this factor, was the qualitative theme – remaining independent while developing and nurturing relationships with the external environment – which determined the effectiveness of the funding agencies. This major theme was subdivided into the following two minor themes: (1) The funding agency must develop and nurture good relations with government and the research community; and (2) Clear and regular communication is important for the funding agency to be effective. In essence, in as much as funding agencies need to nurture and maintain positive relationships with government and researchers, they need to also ensure that they are able to communicate clearly and regularly with both these stakeholder groups. This relates back to the works of Braun that were published in 1993, 1998 and 2003, in which he indicated that funding agencies need to deliver on the demands of the political powers that are accountable for the organisation's financial resources. Braun further postulated that funding agencies should establish good relations with the scientific community, who are the recipients of grant awards and who serve on peer review committees that advise funding agencies on the allocation of scarce resources in the form of fundable research grants (Braun, 2003; Braun & Guston, 2003; Braun, 1998; Braun 1993). While trying to achieve this and act as the intermediary organisation between government and the science community, the funding agency also needs to remain autonomous. It is imperative for the funding agency to remain independent of the demands of the different external role players so that it is able to achieve the objectives of its mandate. Furthermore, boundaries need to be established and maintained for funding agencies to be effective (Braun, 2003; Braun & Guston, 2003; Braun, 1998; Braun, 1993). Despite this recommendation, it is imperative that strong communication channels are established with the various stakeholder groups, comprising employees, customers and stakeholders, in order to build, nurture and sustain better relationships (Poovalingam & Veerasamy, 2007).

5.4.3 Organisational learning and growth

The subfactors linked to this factor, as identified in the factor analysis, were as follows: (1) talent management; (2) employee motivation; (3) employee development; and (4) organisational climate.

According to the literature, organisational learning and growth are associated with high-performing organisations, where incentives are in place for motivating employees to seek out learning and growth opportunities (Gonzalez-Padron et al, 2010; Atiyah, 1999). It is therefore not surprising that organisations continually invest in human capital by putting together a suite of incentives to attract, recruit, develop and retain talented individuals who are able to give the organisation a competitive edge (Rodgers, 2011). A practice that has been adopted by funding agencies is that of employing scientific staff. The reason for this is that the core business of funding agencies is fairly specific in the sense that employees need to have a reasonable knowledge of the scientific field, and to be able to leverage their contacts with key role players in the external environment who are familiar with the practices of funding agencies (Braun, 2003; Braun & Guston, 2003; Braun, 1998).

It is therefore essential for funding agencies to put in place incentives in order to retain highly skilled and talented staff. There is also the need to motivate staff by encouraging them to perform better and achieve the goals of the organisation, which in turn contribute to the effectiveness of the organisation (Weisbord 2011). Improved commitment to the job has been thought to be linked to support, fairness, rewards, favourable job conditions and supervisor support (Torka 2011). In addition, factors such as job security, pay benefits, job characteristics, development and promotion opportunities, general caring and open communication, as well as participating in problem-solving and decision-making processes, have been reported to enhance employee performance (Becker, Antuar & Everett, 2011). In summary, recruitment, compensation, training and development as well as succession planning, which are linked to performance and endorsed by the organisation's leadership, provide the mechanism to attract, engage, reward and develop a high-performing and talented workforce (Theron et al, 2014; Glenn, 2012; Collings & Mellahi, 2009; Kock & Burke, 2008). The reason for this emphasis on the effective management of talented, skilled and competent staff is largely the ability of such staff to bring the greatest value to the customer and to ensure a high level of productivity (Boguslauskas & Kvedaraviciene, 2009).

Supporting these subfactors, is employee development. Professional development, also known as skills development, encompasses various types of facilitated learning opportunities, ranging from university or college degrees to formal coursework, conference attendance and informal learning opportunities in situ (Noe & Tews, 2014; Jasper, 2007). In essence, the concept refers to the ongoing acquisition or refinement of skills and knowledge, which entails job mastery (Willemse 2011). Professional development therefore refers to the

skills and knowledge that go beyond the scope of the employee's job description, although they may indirectly improve job performance (Willemse 2011). This is therefore an ongoing and dynamic process in which employees need to be encouraged and supported by management through a review and evaluation of goals and activities. When such incentives are in place, the organisational climate then has the ability to influence the behaviours of employees. According to Watkin and Hubbard (2003), high-performing organisations have climates that make a difference to the performance of employees. Studies have demonstrated that climate is often an intermediary between employee motivation and skills and a number of performance variables (Ehrhart & Raver, 2014; Choudhury, 2012; Vashdi et al, 2012). Not only does organisational climate describe the experiences of employees and assist in understanding psychological phenomena in the workplace, but it also explains how organisations influence behaviour, attitudes and the well-being of individuals (Watkin & Hubbard 2003). In general, the organisational climate of the organisation relates to combined support from the various levels of management, the nature of communication within and between levels in the organisational structure, personnel policies and practices as well as attitudes towards staff development programmes in the organisation (Choudhury 2012). Talented staff with the relevant skills sets can be motivated, developed and trained to improve customer satisfaction, which enables them to better support the organisation's priorities and objectives (Willemse, 2011).

Supporting the organisational learning and growth factor and its associated subfactors, was the following major theme that emerged from the quantitative findings: Strong, effective and efficient leadership is important for the effectiveness of a funding agency. Linked to this major theme were the following three minor themes: (1) Leadership is important in responding to changes in the external environment; (2) Leadership is important in ensuring that staff are incentivised and exposed to international best practices; and (3) Strong leadership and competent staff are key constituents for the effective allocation of grants. In essence, the effectiveness of the funding agency is measured by the ability of management (or leadership) to adapt to environmental changes, which involves changes in customer demands, competitors, suppliers, labour unions, government and other players in the external environment (Morgan, 2006; Walonick, 1993; Woodward, 1970).

The leadership of a funding agency should be able to put in place systems and processes to incentivise and motivate staff to be able to effectively deliver on the allocation of grants, in a transparent, accountable and customer-centric manner that relates to international best

practices. With these key elements in place, an organisation is able to effectively manage changes in the external environment.

5.4.4 Financial management

The findings of the factor analysis indicated that the financial management factor comprised the following subfactors: (1) return on investment; (2) organisational productivity; (3) economic environment; (4) customer attraction and retention; and (5) governance. The economic environment impacts on a country's spend on R&D, which in turn has a cascading effect on the scientific productivity of a nation (Ribeiro et al, 2009, Chudnovsky, 1999). The economic climate therefore has the ability to impact on the effectiveness of a funding agency, because government controls the purse strings or the budget available to the agency (Braun, 1993).



According to the literature, the aim of the financial management factor is to ensure that organisations, particularly public sector organisations, adopt strict monetary policies in order to contain excessive demands and moderate price pressures in the economy (International Federation of Accountants, 2012). In addition, it allows the organisation to be more accountable and transparent in its financial management practices in order to address the demands of the people it serves in an increasingly complex organisational environment (Steiss & O'C Nwagwu, 1998). According to Moore (2006), there is a view that returns should be measured by the efficiency and effectiveness of processes, technology and other systems on service delivery and cost savings. These in turn, can be measured by improvements in productivity, quality, time saving, outputs and direct cost reductions, which in turn are linked to measuring performance against set goals and targets (Philips & Philips, 2009). Productivity can also be improved in the public sector through the motivation, skills development and incentivisation of employees (Carrigan, 2011). These all contribute to a greater return on investment for public funding agencies, which tend to link the investment in research grants to research productivity. This was substantiated in the research of Bybee and Fuchs (2006) and Quirk (2004).

Productivity is a key issue, especially when there are economic constraints nationally or internationally. Challenges in the economic environment have led many organisations to re-engineer their business processes in order to improve productivity and competitiveness (Attaran, 2004). During changes in the economic environment, limited resources need to be

effectively and efficiently managed in order to improve financial performance and reduce costs (Norton & Kaplan, 2000). The use of marketing therefore becomes crucial in not only attracting, but also retaining customers, which is more economically feasible than attracting new customers (Jain et al, 2009). The retention of customers is part of the new wave of thinking in that a loyal customer base can enhance the sustainability of the organisation and secure future revenues and growth. This largely hinges on customer service encounters being consistently delivered at the same level of quality (Jain et al, 2009). An underpinning subfactor linked to the financial management factor is that of good governance, which has been described as follows: participatory, transparent, accountable, responsive, consensus oriented, effective and efficient, law abiding, and equitable and inclusive (United Nations Economic and Social Commission for Asia and the Pacific, 2012). In public sector organisations, good governance ensures that corruption is minimised; the views of minorities are taken into account; the voices of the most vulnerable in society are heard in decision-making processes; and the present and future needs of society are considered and addressed (United Nations Economic and Social Commission for Asia and the Pacific, 2012). The use of tools such as new public finance has aided some organisations to increase transparency on government spending and link performance measures to government expenditures (Dodor et al, 2009).

Linked to the financial management factor was the qualitative theme: Maintaining adequate levels of funding, is an important contributor to the organisational effectiveness of funding agencies. This theme comprised the following two minor themes: (1) Appropriate levels of investment must be directed towards human capital; and (2) The funding available to the funding agency must be used to support as many research projects as possible. When marrying the theoretical perspective with the findings linked for this factor and associated subfactors, it appears that the funding agency needs to acquire and maintain adequate levels of funding to support the science system. The ability to acquire resources is usually a proxy measure for organisational effectiveness (Malik et al, 2011), which can be further quantified by the ability of the organisation to exploit its environment for the acquisition of scarce and valued resources (Morgan 2006; Abernethy & Brownell, 1997). This also ties in with awareness of the changing structures associated with critical resources and patterns of resource dependencies (Morgan, 2006).

In as much as there is a need for transparent and accountable governance policies and procedures to be in place for the effective management of public funds, there is also a need

to ensure that such investments can be used to support as many research projects as possible and train young researchers (human capital development). This substantiates the recommendations of the National Research Council (2005), which highlights the fact that funding agencies are under growing pressure by government to demonstrate greater accountability and accomplish more with fewer resources in order to improve productivity and efficiency.

5.4.5 Organisational business processes

Following a factor analysis, the following subfactors were linked to this factor: (1) technological environment; (2) customer support; (3) global competition; (4) organisational processes and technology usage; (5) organisational communication; (6) financial management; (7) risk management; (8) organisational structure; (9) leadership; and (10) performance measurement and assessment.

According to Wang (2010), the alignment of the internal systems and processes with the external technological environments, helps the organisation to gain further legitimacy in the marketplace, which contributes to the organisation's performance and success. Using tools interactively provides opportunities in which the organisation is able to address the demands of the external environment and position itself to better address customer needs (Chao et al, 2014; Haar & White, 2013; Bybee & Fuchs, 2006). The adoption of new technological trends that complement internal technological processes contributes not only to the organisational effectiveness, but also to its innovative capacity, which is linked to improving business processes and enhancing customer support and satisfaction (Jeston & Nelis, 2014; Lichtenthaler, 2008). Adopting technological systems and processes in line with the introduction and replacement of new technologies in the market, also helps the organisation to be competitive in a global market (Saetang & Haider, 2014; Fripp, 2011). In addition, in order to stay ahead of the competition, organisations need to focus on customer service and support as well as leadership styles that support innovative thinking (Pinto, 2010). Business processes that focus on satisfying stakeholder and customer needs are critical for the organisation's effectiveness (Koigi, 2011). Funding agencies therefore need to continuously invest in the development of employees, which not only supports the attraction and retention of top quality staff, but also plays a vital role in ensuring that the organisations are both competitive and innovative against competitors, especially in rendering quality services to customers (Cummings & Worley, 2014; Willemse, 2011; Ngcelwane, 2008). In addition, the systems and processes that support financial and risk management in an organisation are

crucial to its effectiveness. This includes organisations adopting systems and processes for risk management, which identify, capture and isolate risk events and manage and/or mitigate catastrophic consequences (Kello, 2010). Owing to the increasing pressure on organisations to become more transparent in their strategic management actions and cost containment efforts, governance is integrally linked to risk management (Bhimani, 2009). Linked to the organisational business processes factor is strong leadership and financial controls to not only acquire additional resources, but also manage those resources using sound practices. These in turn contribute towards the credibility, transparency and accountability linked to the usage of public funds (Steiss & O'C Nwagwu, 1998; International Federation of Accountants, 2012).

Over and above these technological systems and processes are those used for performance measurement and assessment, which are geared towards improving employee efficiency and effectiveness (Ngcelwane, 2008). This usually entails practices such as regular feedback, recognition of employees' achievements and supporting professional development opportunities (Rasheed et al, 2011). The whole concept of performance management revolves around a set of processes that includes a clear articulation of management expectations, knowledge of the employees, their motivation to perform well, mentoring requirements and development and training needs. Performance management therefore requires the use of performance measurements in order to manage and improve performance and demonstrate what has been accomplished (Rasheed et al, 2011). Performance measures, particularly in public agencies, must address the needs of political leaders and also be aligned to measures of effectiveness. Areas of excellent performance as well as those areas that require development need to be highlighted in order to improve effectiveness (Joaquin & Park 2009). Such measures facilitate the prioritisation of strategic initiatives, assist with decision-making linked to the allocation of resources, improve the value of the organisation to stakeholders and customers and strengthen the organisation's competitive position (Martz, 2008).

Communications is closely associated with leadership and performance measurement and assessment. Regardless of the type of organisation, intra-organisational communication forms the foundation for maintaining and sustaining relationships in the organisation. Communication between co-workers and with managers plays a significant role in employee motivation, job satisfaction and performance (Richmond et al, 2005). The function of communication is to inform, regulate, integrate, manage and persuade people in an

organisation (Richmond et al, 2005). Finally, the organisational structure contributes to effective organisational business processes. This structure refers to the hierarchy of roles and responsibilities that shape the relationship between different parts of an organisation (Ashworth et al, 2009). Organisational structure determines the manner and extent to which roles, power and responsibilities are delegated, controlled and coordinated. It also influences the way in which communication flows between levels of management, and lays the foundation for standard operating procedures and determining the organisation's decision-making processes (Aycan et al., 2014; Jung & Kim, 2014; Guadalupe et al, 2012; Lim et al, 2010). In addition, a smaller and less diverse upper management and a stronger more empowered middle management have been reported as a success factor in organisational success and effectiveness (Guadalupe et al, 2012). It is therefore not surprising that the manner in which the organisational structure is defined and implemented in an organisation can have a direct influence on productivity (Prokopenko, 1987). This challenge was highlighted in the review of the South African National Research Foundation, which illustrated that the effectiveness of the agency was constrained by decision-making structures and the manner in which resources were allocated to grants and overhead costs (Cruz et al, 2011).

In the light of the theoretical discussion above, which explained each of the subfactors linked to the organisational business processes factor, one can infer that funding agencies need to have in place transparent, rigorous and efficient processes. This in turn implies that scientific excellence and quality must inform the awarding of research grants on time and within budget. Scientific excellence and merit tend to form the main criteria used by funding agencies to evaluate proposals (Rowlands & Olivieri, 2006; Braun, 1998). In addition, grants must be awarded to projects that demonstrate innovative and/or economic potential. These are all supportive of the qualitative findings linked to this factor, that is, an effective funding agency must adopt transparent and fair processes in the allocation of grants. Linked to this major theme were the following minor themes: (1) Scientific excellence and quality must inform the awarding of research grants; (2) Grants must be awarded to projects that demonstrate innovative and/or economic potential; (3) Grants must be awarded on time within budget; and (4) Robust, effective, and transparent peer review systems and supporting processes need to be in place for the effective allocation of grants.

5.4.6 Summary

From the theoretical findings above, one can infer that the factors are interdependent and inter-related to the extent that each factor has an equal level of influence on the organisational effectiveness of funding agencies. This finding was also substantiated by the qualitative study described in chapter 4. Since the quantitative and qualitative outcomes indicated that all four factors were of equal importance, it is posited that the environmental and stakeholder management factor relates not only to activities in the external environment, but also to how the organisation is able to respond to those activities. The remaining three factors, namely organisational business processes, organisational learning and growth, and financial management, relate to those activities that can be directly or indirectly managed and influenced by the organisation. The findings indicated that the leadership of the funding agency is of paramount importance because each of the four factors is not easy to address. A strong leader is needed to ensure that the factors associated with the organisational effectiveness of funding agencies are defined and appropriate measures and systems are in place in order for the agency to be deemed effective. Given this context, a conceptual framework was proposed and discussed in the section below.

5.5 Propositions for a conceptual framework

The propositions for the conceptual framework suggested here indicate that the funding agency role is complex. In as much as funding agencies need to nurture relations with government, they also need to nurture relations with the researchers they serve. The relationship with government is imperative because government is responsible for the allocation of public funds to funding agencies. This budget allocation from government to the funding agency is what feeds the science system through the allocation of grants using peer review processes. It is the responsibility of the leadership of the funding agency to ensure this relationship is positive in order to maintain adequate levels of funding, such that an impact can be made on the science system. This objective of the latter relationship is two-fold – that is, while researchers are the recipients of funds in the form of research grants from the funding agency, they also participate in the funding agency's peer review processes. As much as the funding agency is dependent on these two external bodies, that is, government and researchers, they need to be autonomous in their functioning, so that scientific excellence and quality, as opposed to political targets, are the cornerstone for awarding research grants.

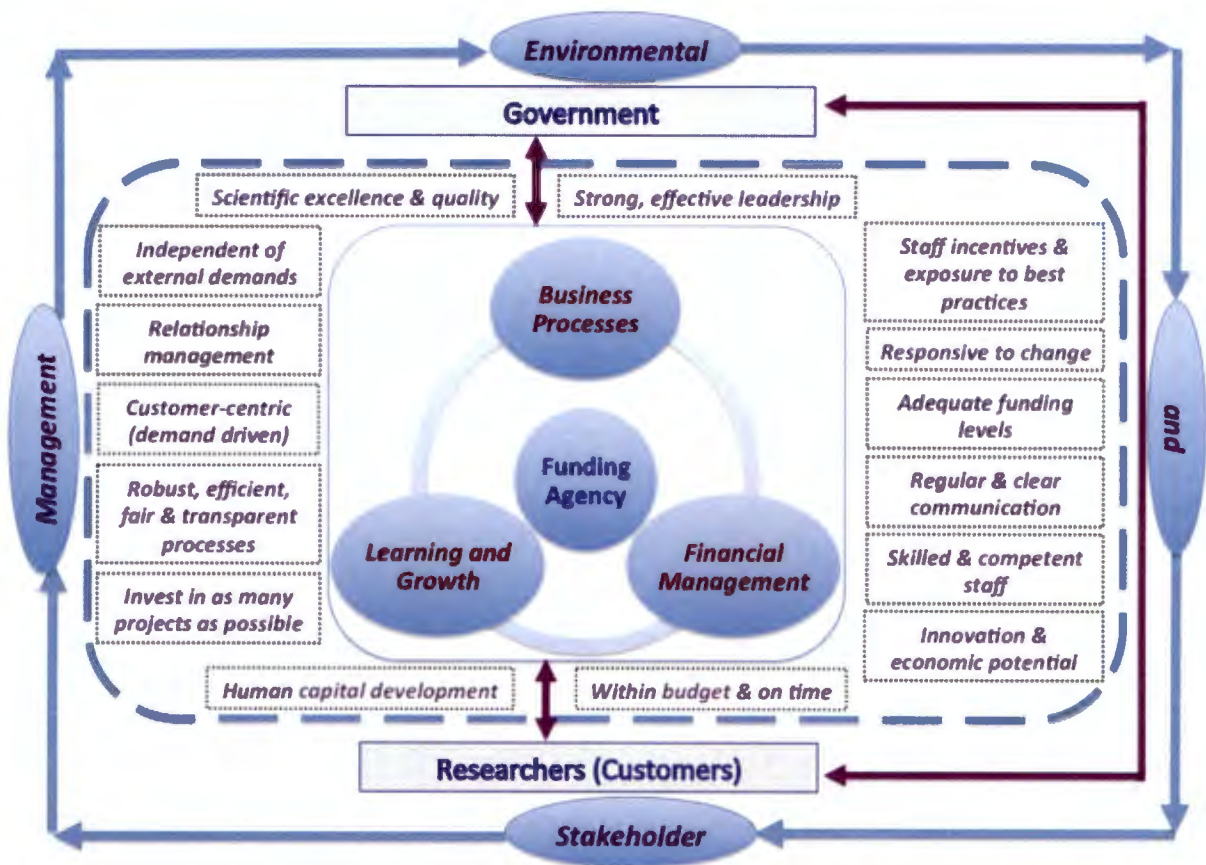


Figure 5.1: A proposed conceptual framework for the organisational effectiveness of funding agencies

Based on the conceptual framework presented here, the effectiveness of funding agencies is equally influenced by the four factors, which in turn comprise the following subfactors:

- environmental and stakeholder management
- financial management
- organisational business processes
- organisational learning and growth

The environmental and stakeholder management factor is an external driver and relates not only to factors that are outside the control of the funding agency, but also to how the agency is able to address and manage the demands of the external environment. The political and

sociocultural environments impact on a funding agency's ability to be effective. Stability in the political environment plays a key role in ensuring that the budget allocation for funding agencies is secure. The funding agency therefore needs to ensure that it is able to develop, nurture and sustain relations with government bodies such that these agencies remain relevant as recipients of a large portion of public funds that can be used to serve the research community. In nurturing and sustaining such political relations, funding agencies also need to focus on addressing the socioeconomic challenges facing the masses in a country, for example, socioeconomic, racial, gender and other inequalities. These sociocultural challenges are closely intertwined with the political environment. In the South African context in particular, there is a focus on ensuring that historically disadvantaged groups are afforded adequate opportunities to contribute to the nation's scientific outputs (AJ van Jaarsveld 2014, pers. comm., 19 June). In essence, funding agencies need to be responsive to changes in the political and socioeconomic environment in order to be effective.

When addressing and managing the external environment, one of the subfactors that plays a vital role, is the organisation's image and reputation, which is based on the perceptions of external stakeholders and customers, namely government officials and researchers, respectively. The image and reputation of the organisation are influenced by the level of satisfaction experienced by researchers (customers), as well as the service offerings and products, in the form of funding instruments that are accessible to this target group. Also contributing to the organisation's image and reputation are the manner, relevancy and frequency with which communication is disseminated to the external environment. Finally, transparency, credibility and the level of accountability in the manner in which public funds are utilised is imperative in sculpting the image and reputation of the organisation. Supporting this factor is also the level of skills and competencies of the staff employed at the funding agency. The ability of staff to communicate in an emotionally intelligent manner, address the complex demands of researchers and use the systems and processes to support the organisation's core business is important in ensuring a positive image and reputation of the organisation. Finally, in supporting a skilled and competent staff complement, the funding agency must have in place the appropriate technologies, information and operating systems and processes.

The financial management factor relates to the manner in which funding agencies are able to manage and utilise public funds fairly and transparently so that grants are awarded timeously

and within budget. Governance processes need to be robust and in line with international best practices in terms of accountability and credibility. In delivering on this factor, the funding agency needs to curb its overhead costs and increase organisational productivity. This is particularly important during an economic crisis, where funding agencies must be able to allocate, manage and utilise limited resources effectively in an effort to improve its financial performance, reduce costs and provide funds for as many research projects as possible, with a limited budget. In all of these factor characteristics there is also the need for the funding agency to attract and retain its researcher cohort. This is primarily based on the nature of the core business of funding agencies, namely peer review. The funding agency must be able to ensure that it has a large enough number of researchers who apply for funding, such that the budget available to the funding agency can be used to support as many research projects as possible. In addition, the funding agency needs to draw on discipline-specific experts from the research community to aid the peer review processes. The return on investment for funding agencies is usually measured through the awarded research grants, that is, how the investment in a specific research project contributes towards knowledge generation, namely patents and publication, human capital development – that is, the training and education of young and emerging researchers and contribute towards the wealth creation for the nation.

In the organisational learning and growth factor, the organisational climate must be conducive to supporting the growth and development of talented staff. In ensuring that there are measures in place to attract, recruit and retain skilled and competent staff, who are able to tackle complex challenges and meet their targets on a daily basis, the funding agency needs to continually motivate staff. This involves keeping employees abreast of organisational developments through communication and providing training and growth opportunities. Such incentives and exposure to best practices across funding agencies through a staff exchange programme are crucial in the management of skilled, competent and talented employees.

Finally, when examining the organisational business processes factor, it is evident that there is a need to ensure that the systems and processes employed in the organisation comply with international technological trends and best practices. This applies particularly to IT systems that must be easy and simple to use for the end-user. Hence user-friendly and supportive systems and processes should be in place for researchers (customers) to apply for grants, as well as employees to conduct their daily tasks, which ensures that researcher

needs or requests have a quick turnaround time. These factors contribute to a customer-centric organisation. Robust, efficient, fair and transparent processes are needed to drive peer review processes and manage public funds in the agency. In addition, the systems in place to track and measure the performance of employees must be geared towards improving efficiency and productivity in the funding agency. The installation of such effective systems and processes tends to be driven by strong, effective and efficient leadership. The leadership function is also important in putting in place an organisational structure that is cost effective, productive and facilitates clear and open communication across all levels in the agency. It is the role of the leader to ensure that measures are in place for the identification and management of risk events that relate both to the external and internal environment. In such instances, the function of the leader extends to ensuring that the agency is responsive to changes in the external environment, which include political, socioeconomic and cultural changes, as well as the changes in the demands and needs of the research community. In summary, such organisational business processes, as well as learning and growth opportunities, financial management and environmental and stakeholder management practices, all collectively contribute towards a globally competitive agency.

In a nutshell, for a funding agency to be effective, it must be able to manage the inter-related and interdependent environmental and stakeholder management, organisational business processes, organisational learning and growth, and financial management factors.

5.6 Recommendations for implementation

In improving the effectiveness of funding agencies, it is of utmost importance that an implementation strategy be designed to specifically address the context of such organisations. An implementation map for the organisational effectiveness of funding agencies is provided in figure 5.2 below.



Figure 5.2: An implementation map for the organisational effectiveness of funding agencies

5.7 Revisiting the research questions

Research question 1: Do the factors and subfactors cluster according to the balanced scorecard that was proposed in this study?

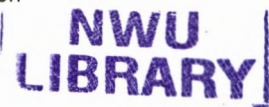
Outcome: According to the factor analysis, the subfactors rearranged themselves and clustered around four factors, instead of the original five factors that were theoretically proposed in this study.

Table 5.1: A transformation of the balanced scorecard for improving the organisational effectiveness of funding agencies

FACTOR	Subfactor 1	Subfactor 2	Subfactor 3	Subfactor 4	Subfactor 5
HR MANAGEMENT /LEARNING & GROWTH	Skills and competencies	Talent management	Employee motivation	Employee development opportunities	Performance management & assessment
BUSINESS PROCESSES	Leadership	Climate	Technology	Communication	Organisational structure
CUSTOMER SERVICE	Customer support	Communication strategy	Customer service and satisfaction	Customer attraction and retention	Organisational image and reputation
FINANCES	Governance	Ability to acquire resources	Productivity	Return on investment	Risk management
EXTERNAL ENVIRONMENT	Global competition	Political	Economic	Sociocultural	Technological



NEW FACTOR	ASSOCIATED SUB-FACTORS
ENVIRONMENTAL AND STAKEHOLDER MANAGEMENT	<ul style="list-style-type: none"> • Organisational Image and Reputation • Political Environment • Communication strategy to Customers • Socio-cultural Environment • Customer Service and Satisfaction • Skills and Competencies
ORGANISATIONAL LEARNING AND GROWTH	<ul style="list-style-type: none"> • <i>Talent Management</i> • <i>Employee Motivation</i> • <i>Employee Development</i> • <i>Organisational Climate</i>
FINANCIAL MANAGEMENT	<ul style="list-style-type: none"> • Return on Investment • Organisational Productivity • Economic Environment • Customer Attraction and Retention • Governance
ORGANISATIONAL BUSINESS PROCESSES	<ul style="list-style-type: none"> • <i>Technological Environment</i> • <i>Customer Support</i> • <i>Global Competition</i> • <i>Organisational Processes and Technology Usage</i> • <i>Organisational Communication</i> • <i>Financial Management</i> • <i>Risk Management</i> • <i>Organisational Structure</i> • <i>Leadership</i> • <i>Performance Measurement and Assessment</i>



Research question 2: What are the main factors influencing/impacting the organisational effectiveness of funding agencies?

Outcome: It was found from the quantitative findings that none of the factors were significant ($p > 0.05$). Supporting this finding were the outcomes of the qualitative study, which related to the following theme: The factors play a key role in influencing the organisational effectiveness of funding agencies. This, in turn, was substantiated by the following minor theme: The factors are interdependent and have an equal level of significance in influencing the organisational effectiveness of funding agencies.

Research question 3: Can a conceptual framework for improving the effectiveness of funding agencies be developed?

Outcome: The quantitative and qualitative findings did contribute to the development of a conceptual framework aimed at improving the organisational effectiveness of funding agencies.

5.8 Recommendations for future research

This research was confined to only a few countries. The following recommendations are therefore made for possible future research:

- A number of funding agencies across several countries should be encouraged to participate in a quantitative study so that a rigorous comparative study could be conducted. This would hopefully further substantiate the conceptual framework proposed in this study and propose possible revisions or changes to accommodate the contextual environments linked to low-, middle- and high-income countries.
- A number of senior officials, including senior staff members and board members, need to be approached to participate in interviews relating to validating the conceptual framework proposed in this study. Such a project could form the basis of a grounded theory approach to understanding the organisational effectiveness of funding agencies.

5.9 Limitations of this study

One of the major limitations of this study was obtaining a large enough sample size for the quantitative study. This challenge was further exacerbated by the poor buy-in from the leadership of the various funding agencies that were approached to participate in the web-based survey. In addition, there were long lead times linked to obtaining the approval of the respective interview participants. These challenges were a definite limitation in this study. However, by adopting a sequential mixed methods approach, these challenges were minimised, in terms of their potential impact on the study outcomes.

5.10 Conclusion

In this study, a theoretical perspective was provided in the form of a literature review that described funding agencies, organisational theory, organisational effectiveness and the factors and subfactors associated with the effectiveness of funding agencies. A sequential explanatory mixed methods approach was adopted in addressing the research questions of this study. The research findings were then related to the literature, and on the basis of the empirical and nonempirical findings, a conceptual framework was proposed. Finally, recommendations were provided for improving the organisational effectiveness of funding agencies.

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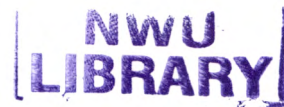
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ANNEXURES

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ANNEXURE A: LINKING THE SURVEY QUESTIONS TO THE FACTORS AND SUBFACTORS

Responses were based on a five-point Likert scale: 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree; and 5 = unable to provide a response

Question	1	2	3	4	5
ORGANISATIONAL LEARNING AND GROWTH					
Skills and Competencies					
<i>The organisation has competent staff</i>					
<i>The skills set of employees in the organisation are highly specialised</i>					
Talent Management					
<i>Identified talent are developed for promotion</i>					
<i>The best talent is sourced to fill internal positions</i>					
Employee Motivation					
<i>Rewards are given to staff who go the extra mile</i>					
<i>A staff wellness programme motivates staff to better manage work-life pressures</i>					
Employee Development					
<i>Effective on-the-job skills training programmes are in place</i>					
<i>Support is provided for staff to pursue formal qualifications</i>					
Performance Measurement and Assessment					
<i>Roles of individual employees are clearly defined</i>					
<i>Performance (including under-performance) is effectively managed</i>					
ORGANISATIONAL BUSINESS PROCESSES					
Leadership					
<i>The CEO/President/Director embraces the organisation's corporate values by "walking the talk"</i>					
<i>Trust in leadership of the organisation is high</i>					
Organisational Climate					
<i>Trust is the basis for interactions among</i>					
<i>Employees feel valued for their contribution in the organisation</i>					
Organisational Processes and Technology Usage					
<i>Adequate resources are allocated to improving business processes</i>					
<i>Technological systems effectively support the organisation's core business</i>					
Organisational Communication					
<i>The communication style allows for the sharing of information</i>					
<i>Communication is clear</i>					
Organisational Structure					

<i>The organisational structure supports an efficient decision-making process</i>					
<i>Employees understand their contribution to the organisation's strategy</i>					
ORGANISATIONAL CUSTOMER SERVICE					
Customer Support					
<i>Customer suggestions are dealt with utmost care</i>					
<i>The current customer support structures at the organisation are effective</i>					
Communication Strategy to Customers					
<i>An informative website is used to share information with stakeholders</i>					
<i>Communication with external stakeholders is managed in an effective manner</i>					
Customer Service and Satisfaction					
<i>The organisation's offerings meet the evolving demands of customers</i>					
<i>Customer satisfaction is regularly assessed</i>					
Customer Attraction and Retention					
<i>The organisation's portfolio of offerings attracts new customers</i>					
<i>Quality customer service underpins customer loyalty</i>					
Organisational Image and Reputation					
<i>The organisational image is positive</i>					
<i>The organisation has a reputation for quality assurance</i>					
FINANCIAL MANAGEMENT					
<i>The organisation's financial management practices are effective</i>					
<i>Financial controls are in place to ensure that funds are spent in a transparent manner</i>					
Governance					
<i>The board uses appropriate Key Performance Indicators to measure the organisation's effectiveness</i>					
<i>Oversight of the organisation's performance is through the country's President's office</i>					
Organisational Productivity					
<i>The organisation is able to manage resources effectively</i>					
<i>Employees in the organisation are productive</i>					
Return on Investment					
<i>Return on investment is clearly defined</i>					
<i>Employees know how to increase the return on investment for the organisation</i>					
Risk Management					
<i>The organisation is able to mobilise resources to minimise the impact of risk events</i>					
<i>Corrective measures are undertaken to manage identified risk factors</i>					
THE EXTERNAL ENVIRONMENT					

Global Competition					
<i>The organisation is often first to market new offerings</i>					
<i>The organisation is able to counteract the effect of threats posed by competitors</i>					
Political Environment					
<i>The organisation's business strategy articulates effective measures to deal with political volatility</i>					
<i>The organisation is able to adapt to political changes</i>					
Economic Environment/Ability to Acquire Resources					
<i>In the case of an economic crisis, the organisation is able to honour the payment of all committed grants</i>					
<i>In the case of an economic crisis, the organisation is able to secure additional resources to ensure operations are minimally affected</i>					
Socio-cultural Environment					
<i>All socio-cultural groups are able to access funding</i>					
<i>The organisation is able to adapt to socio-cultural changes in the external environment</i>					
Technological Environment					
<i>The organisation re-engineers its systems in accordance with environmental demands</i>					
<i>The organisation manages its technological systems in accordance with international industry standards</i>					

How would you rank the following factors in terms of importance, in terms of each of each factor impacting on the effectiveness of the funding agency? (1=most important and 5=least important)

Factor	Rank from 1-5
<i>Organisational Learning and Growth (HR management)</i>	
<i>Organisational Business Processes</i>	
<i>Organisational Customer Services</i>	
<i>Organisational Financial Management</i>	
<i>The External Environment</i>	

ANNEXURE B: ENGLISH SURVEY

Introduction

My name is Rakeshnie Ramoutar-Prieschl and I am currently doing my doctoral research at the North-West University Business School, Mafikeng Campus in South Africa under the supervision of Professor P.D. Gerber.

Name of Doctoral Study: A theoretical framework for the effectiveness of funding agencies in the science sector

Research Institution: North-West University, Faculty of Business Management

Supervisor: Professor P.D. Gerber

This study is mapped across several countries. The primary objective is to identify the key perceived factors that are linked to organisational effectiveness. Using the balanced scorecard approach, this study aims to evaluate the perceptions of employees within specific funding agencies. The study focuses primarily on factors such as organisational learning and growth; business processes; financial management; customer services and the impact of the external environment on the effectiveness of the organisation. Secondary factors include organisational climate; leadership styles; financial systems; technological systems and state of the political and economic environments, amongst others.

From an academic perspective, I would need for each participating organisation to have their employees fill in the questionnaire - 80 responses per organisation are required for statistical purposes. In addition, at least four organisations need to be part of this study for it to be considered a comparative study. The primary objective is to measure employee perceptions of organisational effectiveness of funding agencies across developing and developed nations.

The results will be analysed using quantitative methods such as factor analysis, means analysis and correspondence analysis to:

1. Assess the level of inter-relatedness of the various factors;
2. Identify which factors impact the most on organisational effectiveness of funding agencies (organisational learning and growth; business processes; financial management; customer services and the impact of the external environment); and
3. Develop a model for enhancing the effectiveness of funding agencies, in general

As an employee and/or stakeholder that closely interacts with a specific funding agency, I would like to invite you to participate in this survey. The survey is based on a five-point scale that prompts you to choose one of the following responses: strongly agree – agree – disagree – strongly disagree - unable to provide a response. Each question does afford you the opportunity to provide a comment or substantiate your response.

Your participation in this survey will be anonymous and your responses treated with confidentiality.

For any information please send any queries to: prieschl@gmail.com

I thank you in advance for your contribution to this study and **I kindly request that your responses be submitted by 16 August 2013.**

Notes to the Questionnaire

In response to each question, please select one of the following options:

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- Unable to provide a response

In addition, each question does afford you the opportunity to substantiate your response with a comment.

Glossary of terms:

"core business" refers to the awarding of research grants.

"leadership" refers to the CEO/President/Director or equivalent of the organisation.

"customers" refer to the researchers and/or other recipients that may benefit either directly or indirectly from interacting with the organisation.

"stakeholder" refers to any party associated with the organisation (e.g. consultants) or responsible for advising the organisation on strategic issues.

"offerings" refer to the organisation's products and services.

"organisation" makes reference to a specific funding agency.

Demographic Information

1. Which organisation would you be evaluating?

- National Research Foundation-South Africa: South African Respondents
- Research Council of Norway
- National Science Foundation: American Respondents
- Australian Research Council: Australian Respondents
- Fundação de Amparo à Pesquisa do Estado de São Paulo: Brazilian Respondents
- Deutsche Forschungsgemeinschaft: German Respondents
- Other (please specify)

2. Which of the following categories best describes your employment status?

- Senior/Executive Management at the Funding Agency
- Middle Management at the Funding Agency
- Junior Staff at the Funding Agency
- Administrative Staff at the Funding Agency
- Other (please specify)

3. How many years have you worked at the organisation?

- <1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26-30 years
- >30 years

4. What is your highest qualification?

Graduated from high school

Diploma

Degree

Masters

Doctoral

Other (please specify)

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Questionnaire

5. The organisation has competent staff

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

6. The CEO/President/Director embraces the organisation's corporate values by "walking the talk"

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

7. Customer suggestions are dealt with utmost care

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

8. The organisation's financial management practices are effective

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

9. The organisation is often first to market new offerings

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

10. The organisation is able to mobilise resources to minimise the impact of risk events

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

11. The organisational image is positive

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

12. The organisational structure supports efficient decision-making processes

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

13. Roles of individual employees are clearly defined

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

14. The organisation re-engineers its information technology systems in accordance with environmental demands

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

15. The skills set of employees in the organisation are highly specialised

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

16. Trust in the leadership of the organisation is high

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

17. The current customer support structures at the organisation are effective

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

18. Financial controls are in place to ensure that funds are spent in a transparent manner

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

19. The organisation is able to counteract the effect of threats posed by competitors

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

20. Performance (including under-performance) is effectively managed

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

21. Employees understand their contribution to the organisation's strategy

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

22. The organisation has a reputation for quality assurance

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

23. Corrective measures are undertaken to manage identified risk factors

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

24. The organisation manages its information technology systems in accordance with international industry standards

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

25. The organisation's offerings meet the evolving demands of customers

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

26. Rewards are given to staff who go the extra mile

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

27. Adequate resources are allocated to improving business processes

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

28. The organisation is able to manage resources effectively

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

29. In the case of an economic crisis, the organisation is able to honour the payment of all committed grants

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

30. An informative website is used to share information with stakeholders

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

31. The board uses appropriate Key Performance Indicators to measure the organisation's effectiveness

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

32. The organisation's business strategy articulates effective measures to deal with political volatility

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

33. Trust is the basis for interactions among employees

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

34. The organisation is able to adapt to socio-cultural changes in the external environment

Strongly Agree Agree Disagree Strongly Disagree Unable to provide a response

Comment

35. Support is provided for staff to pursue formal qualifications

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

36. Communication is clear

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

37. Quality customer service underpins customer loyalty

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

38. Employees know how to increase the return on investment for the organisation

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

39. In the case of an economic crisis, the organisation is able to secure additional resources to ensure operations are minimally affected

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

40. Employees in the organisation are productive

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

41. Levels of customer satisfaction are regularly assessed

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

42. Technological systems effectively support the organisation's core business

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

43. A staff wellness programme motivates staff to better manage work-life pressures

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment



44. Employees feel valued for their contribution in the organisation

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

45. Communication with external stakeholders is managed in an effective manner

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

46. Identified talent are developed for promotion

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

47. The organisation is able to adapt to political changes

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

48. The organisation's portfolio of offerings attracts new customers

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

49. Oversight by the President's office of the country enhances organisational performance

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

50. Effective on-the-job skills training programmes are in place

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

51. The communication style in the organisation allows for the sharing of information

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

52. The best talent is sourced to fill internal positions

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

53. Return on investment is clearly defined within the organisation

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

54. All socio-cultural groups are able to access funding

Strongly Agree

Agree

Disagree

Strongly Disagree

Unable to provide a response

Comment

55. How would you rank the following factors in terms of their level of influence on the effectiveness of the funding agency? (1=highest level of influence and 5=lowest level of influence)

Organisational Learning and Growth (HR management)

Organisational Business Processes

Organisational Customer Services

Organisational Financial Management

The External Environment

Conclusion

Thank you for your time and co-operation in completing this questionnaire

ANNEXURE C: SPANISH SURVEY

Introducción

Mi nombre es Rakeshnie Ramoutar-Prieschl y actualmente estoy realizando mi investigación doctoral en North-West University (Facultad de Administración de Empresas y Negocios), cuyo campus está ubicado en la ciudad de Mafikeng en Sudáfrica, bajo la supervisión del Profesor PD Gerber.

Nombre del Estudio de Doctorado: Marco teórico para la eficacia de los organismos de financiamiento en el sector de la ciencia

Investigación de la institución: Facultad de Administración de Empresas y Negocios de North-West University

Supervisor : Prof. P. D. Gerber

Este estudio se desarrolla en varios países y el objetivo principal es identificar los factores clave vinculados a la eficacia organizacional. Mediante el uso del cuadro de mando integral (Balanced Scorecard), este estudio tiene como objetivo evaluar las percepciones de los empleados dentro de organismos de financiamiento públicos. El estudio se centra principalmente en factores tales como el aprendizaje y crecimiento organizacional, los procesos de negocios, gestión financiera, servicios al cliente y el impacto del medio externo sobre la eficacia de la organización. Factores secundarios incluyen clima organizacional; estilos de liderazgo, sistemas financieros, sistemas tecnológicos y el estado de los ambientes políticos y económicos, entre otros.

Desde un punto de vista académico, se requiere que cada organización participante completen el cuestionario con una cantidad esperada de 80 empleados, quienes entregarán sus respuestas para fines estadísticos.

Los resultados se analizarán utilizando métodos cuantitativos, como el análisis factorial, análisis de medios y los correspondientes análisis para:

1. Evaluar el nivel de interrelación de los diversos factores;
2. Identificar los factores que afecta a la mayor parte de la eficacia organizativa en los organismos de financiación (el aprendizaje organizacional y el crecimiento, los procesos de negocio, gestión financiera, servicios al cliente y el impacto de lo externo medio ambiente), y
3. Desarrollar un modelo para mejorar la eficacia de los organismos de financiación, en general

Como empleado y / o grupos de interés que interactúan estrechamente con un organismo de financiación específico en ciencia y tecnología, me gustaría invitarlo a usted a participar en esta encuesta
<https://www.surveymonkey.com/s/LGNTBFR>

La encuesta se basa en una escala de cinco puntos que solicita escoger una de las siguientes respuestas:

- Muy de acuerdo
- Acuerdo
- En desacuerdo
- Muy en desacuerdo
- No es posible dar una respuesta

Cada pregunta permite la oportunidad de ofrecer un comentario o fundamentar su respuesta.

Su participación en esta encuesta es anónima y sus respuestas serán tratadas con absoluta confidencialidad.

Para cualquier información, dudas o comentarios, por favor comunicarse a: prieschl@gmail.com

Le doy las gracias de antemano por su contribución en este estudio y le ruego que sus respuestas sean entregadas

antes del 31 de Julio de 2013.

Saluda atte.

Rakeshnie

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Notas para el Cuestionario

En respuesta a cada pregunta, por favor seleccione una de las siguientes opciones:

- Muy de acuerdo
- De acuerdo
- En desacuerdo
- Muy en desacuerdo
- No es posible dar una respuesta

Además, cada pregunta da la oportunidad de justificar su respuesta con un comentario.

Glosario de términos:

"Core business" se refiere a la concesión de becas de investigación.

"Liderazgo" se refiere al CEO / presidente / director o equivalente de la organización.

"Clientes" se refieren a los investigadores y / u otros que pueden beneficiarse, ya sea directamente o indirectamente a partir de interacción con la organización.

"Parte interesada" se refiere a cualquiera de las partes asociadas con la organización (por ejemplo, consultores) o encargado de asesorar al organización en las cuestiones estratégicas.

"Ofertas" se refieren a los productos y servicios de la organización.

"Organización" hace referencia a un organismo de financiación específica.

Información Demográfica

1. ¿A qué organización pertenece usted?

- Fundación Nacional de Investigación de Sudáfrica: Los encuestados de Sudáfrica
- Fundación Nacional para la Ciencia: Los encuestados estadounidenses
- Consejo Australiano de Investigación: Los encuestados de Australia
- Fundação de Amparo à Pesquisa do Estado de São Paulo: Los encuestados brasileños
- Deutsche Forschungsgemeinschaft: Los encuestados alemanes
- Comisión Nacional de Investigación Científica y Tecnológica: Los encuestados chilenos
- Otros (especificar)

2. ¿Cuál de las siguientes categorías describe mejor su situación laboral?

- Senior / Dirección Ejecutiva / Jefe Programa de la Agencia de Financiamiento
- Subdirector / Coordinador / Jefe Proyecto de la Agencia de Financiamiento
- Analista de la Agencia de Financiamiento
- El personal administrativo de la Agencia de Financiamiento
- Otros (especificar)

3. ¿Cuántos años ha trabajado en la organización?

- <1 año
- 1-5 año
- 6-10 año
- 11-15 año
- 16-20 año
- 21-25 año
- 26-30 año
- >30 año

Otros (especificar)

4. ¿Cuál es su más alta calificación?

Título Técnico Profesional

Universitario

Magister

Doctorado

Otros (especificar)

Cuestionario

5. La organización cuenta con personal competente

Muy de acuerdo



De acuerdo



En desacuerdo



Muy en desacuerdo



No es posible dar una respuesta



Comentario (especificar)

6. El CEO / Presidente / Director está comprometido con los valores institucionales de la organización y "Predica con el ejemplo"

Muy de acuerdo



De acuerdo



En desacuerdo



Muy en desacuerdo



No es posible dar una respuesta



Comentario (especificar)

7. La sugerencias del cliente son tratadas con sumo cuidado

Muy de acuerdo



De acuerdo



En desacuerdo



Muy en desacuerdo



No es posible dar una respuesta



Comentario (especificar)

8. Prácticas de gestión financiera de la organización son eficaces

Muy de acuerdo



De acuerdo



En desacuerdo



Muy en desacuerdo



No es posible dar una respuesta



Comentario (especificar)

9. La organización es la primera en proponer nuevas ofertas

Muy de acuerdo



De acuerdo



En desacuerdo



Muy en desacuerdo



No es posible dar una respuesta



Comentario (especificar)

10. La organización es capaz de movilizar recursos para minimizar el impacto de riesgos

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

11. La imagen de la organización es positiva

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

12. La estructura de la organización apoya una eficaz toma de decisiones

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

13. Los roles de los empleados están claramente definidos

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

14. Los rediseños organizacionales en sus sistemas de tecnología de la información son en conformidad con las exigencias externas

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

15. Las habilidades en conjunto de los empleados de la organización son altamente especializados

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

16. La confianza en el liderazgo de la organización es alta

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

17. Las estructuras actuales de atención al cliente en la organización son efectivas

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

18. Los controles financieros están en su lugar para asegurar que los fondos se gasten de manera transparente

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

19. La organización es capaz de contrarrestar el efecto de las amenazas planteadas por los competidores

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

20. El rendimiento (incluyendo el bajo rendimiento) es gestionado de forma efectiva

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

21. Los empleados comprenden su contribución a la estrategia de la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

22. La organización tiene una reputación de asegurar la calidad

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

23. Se toman medidas correctivas para controlar los factores de riesgo identificados

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

24. La organización gestiona sus sistemas de tecnología de la información, en conformidad con estándares internacionales de la industria

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

25. Las ofertas de la organización satisface las demandas cambiantes de los clientes

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

26. Las recompensas se dan al personal que va más allá de lo inicialmente exigido/solicitado

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

27. Se asigna recursos suficientes a la mejora de procesos de negocio

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

28. La organización es capaz de gestionar eficazmente los recursos

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

29. En el caso de una crisis económica, la organización es capaz de cumplir el pago de todas las subvenciones comprometidas

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

30. El sitio web corporativo se utiliza para compartir información con los interesados

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

31. Se utilizan indicadores claves de rendimiento adecuados para medir la eficacia de la organización

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

32. La estrategia de negocio de la organización articula medidas eficaces para hacer frente a la volatilidad política

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

33. La confianza es la base de las interacciones entre los empleados

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

34. La organización es capaz de adaptarse a los cambios socio-culturales en el exterior

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

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35. Se brinda apoyo al personal para obtener especialización profesional

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

36. La comunicación es clara dentro de la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

⌋ ⌋ ⌋ ⌋ ⌋

Comentario (especificar)

37. La calidad de servicio al cliente sustenta la fidelidad del cliente

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

⌋ ⌋ ⌋ ⌋ ⌋

Comentario (especificar)

38. Los empleados saben cómo aumentar el retorno de la inversión para la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

⌋ ⌋ ⌋ ⌋ ⌋

Comentario (especificar)

39. En el caso de una crisis económica, la organización es capaz de asegurar recursos adicionales necesarios para garantizar las operaciones que son mínimamente afectadas

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

⌋ ⌋ ⌋ ⌋ ⌋

Comentario (especificar)

40. Los empleados de la organización son productivos

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

⌋ ⌋ ⌋ ⌋ ⌋

Comentario (especificar)

41. Los niveles de satisfacción del cliente se evalúan periódicamente

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

42. Los sistemas tecnológicos apoyan efectivamente la actividad principal de la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

43. El programa de bienestar personal motiva al personal para gestionar mejor la vida laboral y liberarla de presiones

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

44. Los empleados se sienten valorados por su contribución en la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

45. La comunicación con las partes externas interesadas se gestiona de forma eficaz

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

46. La identificación de talento se utiliza en la promoción

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

47. La organización es capaz de adaptarse a los cambios políticos

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

48. El portafolio de instrumentos de la organización atrae nuevos postulantes

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

49. La supervisión de la oficina del Presidente de la República mejora el rendimiento organizacional

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

50. Los programas de capacitación son eficientes

Muy de acuerdo

De acuerdo

En desacuerdo

Muy en desacuerdo

No es posible dar una respuesta



Comentario (especificar)

51. El estilo de comunicación en la organización permite el intercambio de información

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

52. El mejor talento disponible es atraído para ocupar cargos internos

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

53. El retorno de la inversión está claramente definido dentro de la organización

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

54. Todos los grupos socio-culturales son capaces de acceder a la financiación

Muy de acuerdo De acuerdo En desacuerdo Muy en desacuerdo No es posible dar una respuesta

Comentario (especificar)

55. ¿Cómo calificaría usted los siguientes factores en términos del nivel de influencia en la eficacia de su agencia de financiamiento? (1 = el más alto nivel de influencia y 5 = nivel más bajo de influencia)

<input type="text"/>	Aprendizaje organizacional y crecimiento (gestión de recursos humanos)
<input type="text"/>	Procesos de Negocio de la organización
<input type="text"/>	Apoyo a los Clientes Organizacionales
<input type="text"/>	Gestión Financiera Organizacional
<input type="text"/>	El entorno externo

Conclusión

Gracias por su tiempo y colaboración en la realización de este cuestionario

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ANNEXURE D: INTERVIEW PROTOCOL

Country:	Name of interviewee:
	Title:
	Tel:
Name of agency discussed:	Email:
	Skype:
	Date of interview:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie and I am interviewing you as part of my doctoral study, which is entitled

“A conceptual framework for improving the effectiveness of funding agencies on the science sector”

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I would send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated with utmost confidentiality.

1. Please provide me with your title in the organisation and tell me about your experience with funding agencies.

2. Given your experience, how would you describe an effective funding agency?

3. Do you consider the funding agency you are employed at effective?

4. In your opinion, what are the most suitable indicators for measuring the organisational effectiveness of funding agencies?

5. How is effectiveness measured in your organisation?

6. What factors do you consider to play a key role in influencing the effectiveness of your organisation? Please explain.

7. Of the factors you have identified, which do you consider to be the most and least significant in terms of influencing the effectiveness of the funding agency? Please explain.

8. How would you rank these factors in order of importance?

9. If the factors

- *environmental and stakeholder management +*
- *financial management +*
- *business processes +*
- *organisational learning and growth (HR management)*

were to be identified as key factors influencing the organisational effectiveness of funding agencies,

a) would you agree, and

b) if so, how would you rank these in terms of importance?

10. Based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

11. Can you provide any additional information or considerations on how best to improve the effectiveness of funding agencies?

12. Given the scope of this study, why do you think funding agencies globally were reluctant to participate in this study?

ANNEXURE E: INTERVIEW TRANSCRIPTS

INTERVIEWEE 1: Coordinator of studies: CONICYT (Chile)
ORGANISATION DISCUSSED: CONICYT
DATE: 16 June 2014
QUALITY OF AUDIO: Satisfactory – Skype
DURATION: ± 38:42 minutes
NATURE OF TRANSCRIPTION: Interview



Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector."

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audio-taped, but also note that your participation in this study will be treated with utmost confidentiality.

Please provide me with your title in the organisation and tell me about your experience with funding agencies.

Respondent:

I am the co-ordinator of studies at CONICYT. Some background to CONICYT: The Ministry of Education, created in 1967 as an advisory body to the President on matters of scientific development, the National Commission for Scientific and Technological Research, CONICYT oriented today by two goals or strategic pillars: 1) the promotion of capital formation human and 2) strengthening the scientific and technological base of the country. Two cross-cutting policies 1) access to scientific

information and 2) international networking and linkages. CONICYT has created a number of instruments to develop and strengthen our national science and technology capacity. This diversification has allowed for specialisation in distinct areas, to achieve coherent and balanced development in research, science and technology. An annual budget exceeding US\$50 million is provided for this purpose. I have eight years' experience in high technical research projects and further writing report[s]. Permanent involvement with technical and R&D department within organisations. My past duties were on innovation driven firms, in [a] position related to marketing and/or strategic planning for the introduction of new products and services. Currently, I am engaged [in] defin[ing] strategic planning for the public policy on Science and Technology. I [have been] working at CONICYT for two years now.

Interviewer:

Thank you for that.

Given your experience, how would you describe an effective funding agency?

Respondent:

When asking for funding from government, because we are a public organisation, it is necessary to quantify the money you need and show how you are serving the objectives you identified at the beginning. That is, explicitly indicate how much money you will need and what objectives will be met. This is very important, as tax payers' monies are used by CONICYT.

Interviewer:

So: Do you consider CONICYT as effective?

Respondent:

Yes. CONICYT funds scientists, universities and undergraduate students to conduct basic research and there is limited funding of applied research. In this regard, CONICYT has been very successful. CONICYT depends on the Ministry of Education, and jointly with the other two main innovation agencies – the Corporation for the Promotion of Production (CORFO), and the Foundation for Agriculture Innovation (FIA) – it is part of the Inter-ministerial Committee for Innovation chaired by the Ministry of Economy.

CONICYT operates jointly with other institutions in charge of similar topics, mostly in organising open competitions and administering funds. Some of these institutions are related to international conventions financing scholarships (i.e. Fulbright, DAAD, etc.). The problem is that all these institutions work separately and there is not good communication between these institutions. If these can be fixed, then CONICYT will be more effective, as well as the other institutions.

Interviewer:

Thank you.

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness of funding agencies?

Respondent:

Traditionally, the publishing of scientific research is the major indicator externally. Other internal indicators exist, which I am not fully sure of, but we do look at the concept for funding submitted by researchers. We grant the funds based on the concepts and give it to the researchers. We try to make sure that the funds we have given researchers are used in the way they said it would be in the concept application. Funding of competitive research is very important but so too is measuring the funding and the associated outputs. It is imperative to ensure that monies are spent transparently, that is why we employ the international benchmarking process, peer review.

Interviewer:

Thank you.

How is effectiveness measured at CONICYT?

Respondent:

The funds of each instrument are allocated to the beneficiaries (individuals or organisations), according to the rulings of the calls that are held regularly throughout the year. The programmes with the largest funds are scholarship funds (48%), FONDECYT (29%), the Associative Research Programme PIA (19.6 %) and FONDEF (13.7%). There is no available data [on] the funds perceived by type of beneficiary. However, most of the funding goes to individual grant holders (i.e. scholarships), followed by universities and research centres.

We tend to measure the publishing of scientific research outputs as effectiveness. I don't know about other indicators. Perhaps this is a weakness on the side of CONICYT.

Interviewer:

Thank you.

What factors do you consider to play a key role in influencing the effectiveness of CONICYT? Please explain.

Respondent:

The following factors tend to play a role in my opinion:

- 1) Calibre of research-performing academic staff at universities who submit concepts (research proposals) to CONICYT for funding.
- 2) Young researchers trying to pursue and achieve research careers and build their track record.
- 3) Funding levels at CONICYT in general.

Within CONICYT, we have 11 funding programmes and we need to work better across the programmes to achieve a common goal. People tend to prefer to work in silos – which plays a role in the effectiveness of the organisation. Leadership and people management are important factors [in] achieving success and being effective.

The identified factors are important, because CONICYT does not have its own researchers. We administrate the granting process through the peer review process – CONICYT needs to affiliate itself with the research community – CONICYT depends largely on people outside the agency such as researchers and university people to review or evaluate the proposals and advise CONICYT staff on what proposals/concepts are able to add value to society and government objectives.

Given this context, people working in CONICYT need to be able to work together across programmes. Strong leadership therefore is important to ensure people break down barriers and work together. I propose that transparency and communication be used to improve the effectiveness of the funding agencies.

Interviewer:

Okay. thanks.

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the CONICYT?

Respondent:

[The] calibre of research-performing academic staff at universities is most important. This is followed by young researchers trying to pursue and achieve a research career. Lastly, is the level of funding available for awarding as grants.

Interviewer:

Okay, thank you.

If the factors,

- 1) environmental and stakeholder management
- 2) financial management
- 3) business processes, and
- 4) learning and growth, which include HR management,

were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree? And how would you rank these factors in order of importance?

Respondent:

- 1) Environmental and stakeholder management: Leadership is very important to get buy-in from stakeholders as well as secure the financial resources for awarding grants. Getting these right would ensure a positive name for the organisation. People find it hard to work with each other, especially at CONICYT. Leadership or the director need to assist in facilitating the breaking down of barriers and getting people to work together.
- 2) Financial management: Finances are needed to fund grants and there is a need to get a return on that money. Money must also be awarded in a transparent process, which is dependent on the business processes and systems.
- 3) Business processes: These processes must be transparent and rigorous as [they] allow for CONICYT to control the research undertakings of researchers such that there is a benefit to society that comes from the funded research. This is done by transparent and effective peer review and evaluation processes.
- 4) Organisational learning and growth: This is not as critical for CONICYT, but it is on the cards for prioritisation in the future.

If I had to make a last comment: all these factors are equally important – it is difficult to rank one over the other in terms of importance, as they are interdependent and a funding agency cannot be effective without paying equal attention [to] each of the factors you mentioned.

Interviewer:

So what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

Human capital development is very important. We are lacking a great number of people with skills, that is, there is a need to increase the number of people or the critical mass of people willing and able to do good quality research and create knowledge including attracting people from overseas or getting Chile students or young researchers to go overseas and come back with experience and knowledge. This is a challenge for developing countries like Chile and it is important that this is addressed for funding agencies to be successful and effective. This will also allow for accruing economic value and benefits to society.

In addition, leadership is important: people can be very difficult and there is a need to break down barriers. If leadership, climate and people management are addressed, then effectiveness can be achieved, in that the resources within the organisation are working towards a common goal (must be the organisation's strategy).

Interviewer:

Thank you. Is there anything you wish to add – any additional information or considerations that would contribute towards the effectiveness of funding agencies?

Respondent:

Monies are very important and funding agencies are dependent on government. Funding is important in the following areas:

- 1) receiving funds from government
- 2) awarding research grants to the researchers
- 3) supporting quality research (excellence) and human capital development

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Effectiveness therefore should be measured against how the above [are] achieved, that is, the process, rather than assessing quantitative numbers.

Funding agencies are like banks, people come to ask for money and the repayment is generating research knowledge. Relationships between the funding agency and government, as well as funding agency and the research community, [are] important to ensure that monies received can be transparently and effectively awarded in the form of research grants that can benefit society in the long-term.

Interviewer:

Thank you.

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

People are wary or confused that participation in the study will affect the image of the organisation or it may affect the relationship within the organisation, especially with the boss and other stakeholders.

People also don't understand the scope of the study and worry more about what they are doing on a daily basis at the office, rather than looking at the long-term value such a study could add.

Finally, people don't have enough time, or enough experience to be able to complete this survey.

Interviewer:

Thank you very much. This has been most useful and once again thank you for participating in the study.

INTERVIEWEE 2: Director: Deutsche Forschungsgemeinschaft
ORGANISATION DISCUSSED: Deutsche Forschungsgemeinschaft (DFG)
DATE: 26 June 2014
QUALITY OF AUDIO: Good
DURATION: ± 49 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector".

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated with utmost confidentiality.

Please provide me with your title in the organisation and tell me about your experience with funding agencies.

Respondent:

I am a director at the DFG and I am responsible for international relations. My experience with funding agencies, started as early as 1978. I spent five years at the Max Planck Institute in Munich which is not a funding agency, but [a] research performing organisation. Then I went to the European Foundation for five years. Since 1990, I [have been] at the DFG and I will complete 25 years at this organisation.

Interviewer:

Thank you for that.

Given your experience, how would you describe an effective funding agency?

Respondent:

A funding agency is a type of research council, and the term indicates that funding comes from the public sector, mainly the taxpayer. This means funds that come through from the government or public authorities. There can be other funding agencies that perform their duties using private money, but I only speak of funding agencies or organisations with public money.

For funding agencies, there must exist the possibility of bringing competitive funds into the system in order to support science and research. And a research funding agency needs distance and independence to carry out competitive funding according to best practices. In awarding grants, on a competitive basis, funding agencies, must set criteria that put scientific merit at the forefront, not any political agenda. Politics must not influence scientific research, which has the potential to benefit the country. An independent funding agency ensures credibility and ensures that scientific merit or excellence is most valued or prized at universities and also non-university research institutions.

Interviewer:

Do you consider the DFG effective?

Respondent:

It is effective, but effectiveness is limited in the sense that the DFG is mandated to fund top scientists and top science with limited funds. In essence, the DFG funds projects. So we do not provide funding for basic research at universities – this cost is covered by the university itself. The DFG then provides additional or top up or supplementary funding to the university sector. Given the limitations of the budget available to the DFG, peer review is imperative in ensuring that these limited funds are awarded in a transparent and competitive manner. For effectiveness to be improved at the DFG, there needs to be constant interactions and communication between project funding, which is funded by the DFG, and institutional funding of basic research, [which] is funded by universities; in order to improve synergies between these two funding mechanisms, with the objective of creating a robust science system.

Interviewer:

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent:

The funding budget is important and must be used to fund science, excellent science. Despite the need for additional funding, which is fundamental to the functioning of a funding agency, there is also the need for funding agencies to be able to find [their] niche, or place in the science system, as a whole, which in Germany comprises of researchers, universities and extra-university institutions. The funding agency also needs to define the types of projects they are willing to fund, the processes to be followed as well as the how money will flow. For the various funding instruments, researchers submit research proposals, which get screened, then are subjected to peer review processes where a recommendation is made to either fund or not fund a project. The message for the funding agency at the end of the day is: top science is what gets funded – so the principle of awarding grants hinges on scientific merit. The role of the funding agency is to protect science from political and socio-cultural influences, as well as other external agendas. The DFG, as with other funding agencies, use peer review to achieve this objective. The challenge is that the applicant to a specific funding instrument, can also be a reviewer on another funding instrument, and this is the challenge that the peer review system faces. The DFG tries to ensure that such conflicts are minimised, so as to ensure that a transparent and fair process transpires. So with the peer review process, the DFG makes sure that the best experts are invited to evaluate research proposals. At the end of the day, the peer review system can be compared with the concept of democracy. It is a fundamentally flawed system which is nonetheless the only system available to funding agencies for awarding grants. There isn't any better system that can be employed, that I am aware of.

Interviewer:

Thank you.

How is effectiveness measured at the DFG?

Respondent:

We use statistics. We have detailed accounts of success according to the number of grants awarded and the value of grants to: states, universities, extra-universities, researchers, disciplines and so on. So I would say these give you quantitative data, but that is only [one] side of success.

Secondly, we compare demand versus success. This tends to fluctuate, but the DFG is lucky in that we have never had a decline in the grants budget or curtailments in our budget. So we always have increased the budget by 3 to 5%, because that increase is triggered by the

federal government, which doesn't own any of those universities – universities belong to the regional state. The regional state has a keen interest [in] obtaining supplementary funds from the DFG into their universities and for this they pay one euro into the system and get out three euros. So it's attractive.

Interviewer:

Okay, thank you.

What factors do you consider to play a key role in influencing the effectiveness of the DFG?

Please explain

Respondent:

Good governance, which includes a structured organisation comprising of governing bodies who represent the: (1) various areas of science, and they define priority areas for investment; (2) as well as a finance governing body; and (3) a policy governing body, amongst others. The science budget for the DFG is put together by 17 ministries who also put together the key performance indicators, as well as the objectives that need to be met with that budget. These are achieved very much on a consensus basis.

At the DFG, the following are important:

- 1) Transparency and fairness.
- 2) We do not encourage appeals or rebuttals.
- 3) We do not encourage lawsuits against the DFG. So someone who fears that with all the letters he wrote after a negative answer, he or she will not get any further, can go to court. Hence we must ensure that all our processes are fair and transparent. In addition, we are an independent organisation which is mandated by law to do a specific task. Hence the DFG is a private organisation that uses public funds to advance science, which in a way is a decentralisation of the function.



In addition, a good staff complement is essential in order to ensure professionalism as well as support flexibility.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the DFG?

Respondent:

In terms of ranking these, I would say:

- 1) You need a structured organisation with clear responsibilities and roles including competence leadership to deal with the scientific community. So a scientific member of our senate (governance body) must undoubtedly be a performing scientist with a very good track record. We have 40 of them and they are distributed across the scientific fields. The president of the DFG is a scientist and so too is the vice president.
- 2) The calibre of staff within the DFG is also important. Staff must be as professional as possible in all aspects – for instance, we have about sixty people serving science directly through the peer review process. They have direct access to the scientific communities.
- 3) Finally, from a professional point of view, you also need a certain degree of flexibility and mobility within the office and within the system to accommodate the needs of the research community you serve.

Interviewer:

Thank you for that.

If the factors,

- 1) environmental and stakeholder management
 - 2) financial management
 - 3) business processes, and
 - 4) organisational learning and growth, which include HR management,
- were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree?

Respondent:

Yes. Externally, trust is important especially with respect to the relationships between the funding agency and government, as well as the funding agency and the research community. In as much as the DFG funds life sciences, through 40% of its budget, there is flexibility linked to the usage of those funds by the recipients of grants. In addition, industry must be confident that the DFG, as a funding agency, is funding what is best in terms of scientific quality. Internally, on the other hand, working conditions at the DFG are under discussion. There is a discussion relating to the heavy workload within the organisation, to the point that there is consideration afforded towards restructuring, especially with regard to

the HR or personnel management and finance management within the organisation, which is rather complicated and challenging.

In terms of ranking these factors, I would say that they are all complementary to one another and hence they are of equal importance to any funding agency, including the DFG. If I had to contextualise these factor, then the environmental and stakeholder management influences the effectiveness of the funding agency from outside, and is out of the control of the organisation. The rest of the factors are internal to the organisation and can be controlled by the organisational leadership itself.

Interviewer:

Okay.

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

As I said, a funding agency is an entity with money (grants) which has to get across to the recipients (researchers) through certain mechanisms (funding instruments). The funding agency cannot move money without a reputable procedure in place, and that is where the peer review process comes into play. If I had to propose a strategy, given the DFG context, I would suggest that:

- 1) The relationship between the university funding of basic research and the DFG funding of projects, or top-up funding to the university sector, needs to be re-examined. Additional funds are required to support basic research at universities as this is fundamental for researchers to grow and build their career and track record. This would mean that there is a contribution to supporting the human capital development pipeline in ensuring that top science and top scientists are always in the system to receive the top-up funding from the DFG.
- 2) That funding agencies continuously evolve in order to address the changes in the external environment – this relates to changes in research investment areas according to researchers, or changes in the government demands, on the other. In addition, changes could relate to the manner in which technology evolves or socio-cultural norms change. In the case of the DFG, the culture and funding priorities have remained constant since the 1950s. This needs to be re-visited in order to address the changes in the external

environment, as well as display an appreciation for science. As such, the DFG would need to undergo a review, prior to engaging such a change in which communication or open exchange of experiences is facilitated. I say this, as in my opinion, communication is akin to democracy or an open society.

Interviewer:

Thank you. Are there any additional information or considerations on improving the effectiveness of funding agency that I may not have covered with my questions?

Respondent:

The last point is something I would like to elaborate on. I think what we need to form is a national funding agency, that addresses the demands of the various states and the socioeconomic challenges or demands. In addition, we need to have cross-border exchanges in order for staff in key positions to be able to share experiences and learning with similar organisations across the globe. In such an instance, a global perspective or a global view is important. But so too is the micro-economic condition: that is, how does Germany fare against other EU states or how does South Africa fare against other African states. What I am trying to state here, is that international best practices must form the basis for the awarding of grants, across all funding agencies. Finally, all funding agencies need to manage government, on the one hand, and researchers, on the other – I think the DFG does well in managing these two stakeholders by virtue of it being an independent private organisation that manages public funds.

Interviewer:

Okay. Thank you.

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

As far as I understand, the debate from last year, when you invited the DFG to participate in the study; the question that was raised was related to the manner in which you proposed to measure the effectiveness of the DFG. One of the challenges that we faced, was the concept of the external environment – as with other funding agencies, the external environment plays a significant role. In the case of the NSF in the USA, for example, there is political clout linked to the appointment of the Director, that is the President of the USA appoints the Director of the NSF, who is responsible for supporting science and researchers

with state funds. In the case of the DFG, there is no direct linkage to the political space, as we are an autonomous, and independent private organisation that uses public or state funds to support top quality science and researchers. So I think it was difficult to relate to the questions that you posed in the survey. In addition, I think people generally have a disinterest in such activities that do not have a direct impact on their daily life, or they are far too busy or overwhelmed with a heavy workload.

Interviewer:

Thank you for participating in this interview. Your inputs have been most valuable.

INTERVIEWEE 3: Programme director: Global Research Council head office in Bonn at the DFG Offices

ORGANISATION DISCUSSED: Deutsche Forschungsgemeinschaft (DFG)

DATE: 26 June 2014

QUALITY OF AUDIO: Good

DURATION: ± 62 minutes

NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector".

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I would send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped but also note that your participation in this study will be treated with the utmost confidentiality.

Please provide me with your title in the organisation and tell me about your experience with funding agencies.

Respondent:

I'm the programme director for Northern America at the DFG, or the German Research Foundation, which is a position in the division of International Cooperation in the German Research Foundation, and it comes along with my position and the responsibility for German North American and North Americans who serve US and Canada, German North American affairs. I'm also in charge of the Global Research Council, which is I think the reason why you originally approached me. I was one of the key organisers for the second annual meeting of the Global Research Council in Berlin last year.

Before I joined the DFG in 2012, I was a programme director for the Alexander Von Homburg Foundation, which is a German public foundation that promotes international exchange of researchers. It is different from the DFG in that it promotes the exchange of people, whereas the DFG funds projects and also of course international cooperation, but in the framework of project funding. Before I joined the Homburg Foundation, I was involved in academic student exchange programmes and summer academies and so on.

All in all, I have about six years of experience with funding agencies.

Interviewer:

Okay, thank you.

Given your experience, how would you describe an effective funding agency?



Respondent:

This is a tricky question because it would always depend on the contextual environment, especially the political, social and economic conditions of a country. With the DFG, effectiveness is not quite dependent on this contextual environment, I would hesitate to consider the DFG a blueprint for any funding agency in the world, in a way. But leaving that aside, I would like to say that I consider the DFG as an effective funding agency.

I would say a research funding agency that focuses on basic research (with the view that basic research forms the basis for innovation, new ideas, new knowledge and indirectly economic development. I would therefore say a funding agency needs to concentrate and focus on funding. The funding of basic research must also be independent of political and economic reasoning – such research is funded by the universities themselves.

The funding agency needs to keep a critical distance from the demands of political bodies, especially government, when it comes to government looking for an immediate return that has an effect on the labour market, economic development, innovation, and so on. The funding agency needs to be autonomous and independent of these demands in order to be able to fund research in a transparent and fair manner, that is, on the basis of scientific excellence. The DFG is an agency that is publicly funded, even though we are a private organisation. Despite this arrangement we are mandated to award grants on the basis of scientific merit. Hence, we may say that the DFG is an autonomous funding agency, that follows a bottom-up or demand-driven research approach in that it supports the needs and demands of about 60 research intensive universities plus a few extra non-university research institutions, academies, and so on.

In essence, those three things define an effective funding agency in my opinion:

- 1) Support of basic research projects.
- 2) Be autonomous from the political, social and economic environment.
- 3) Adopt a bottom-up or a demand-driven approach to funding.

As a country, basically we are now at a time where Germany can harvest the results of its investment in science. German universities are very competitive in the world and we are successful at attracting international researchers to Germany. In the years before we had an exodus of excellent German researchers, especially to North America and to the UK. I think that development has been successfully reversed, [but I am] not saying that we [do] not have problems. A considerable investment in research funding, geared towards advancing science and research, is essential or a key driver for innovation.

If you think how Germany has fared during the economic and financial crisis over the past few years then I would think that it is due to the fact that we did not have a decrease in our science and research budget. We have upheld the investment in research and science and we have consequently been very successful when it comes to innovation and economic development. The German economy, is the economy that is strongest in Europe. That is to a large share due to the German science and innovation system.

I think in the end an effective science system comprises of funding agencies that focus on funding basic research and are autonomous from political and economic reasoning; and that there is also supplementary funding of programme or project-oriented research. The former is funded by universities and the latter by the DFG. Research that involves large-scale infrastructures and so on that cannot be dealt with by one funding agency alone, need[s] to consider complementary investments from several agencies.

Interviewer:

Thank you for that.

Do you consider the DFG effective?

Responderit:

The DFG follows the bottom-up response mode – so DFG would be in a less effective position to deal with political demands, with a changing political or economic context, because we really rely and are dependent on our member organisations, universities and non-university research institutions. We also fund research based on scientific excellence or

scientific justification not projects that address a specific political agenda. This is due to the DFG being independent of political influences.

So if there is a change in the political climate, if there is changing political circumstances, or new questions coming up from a political point of view then DFG would be less effective. So the DFG might need a bit more time to react, as we certainly do not fund political topics such as the global challenges or energy resources, because there's no scientific demand for it.

The DFG is effective when it comes to international cooperation. But, the DFG is a very national organisation, that's what I'm trying to say, so we have received our funding from the state and from federal government, so we fund research projects that have been carried out in Germany, not outside of Germany, obviously, and that also sets a couple of limits to the effectiveness in which we fund international cooperation.

In a way, if I compare it to the Homburg Foundation, the Homburg Foundation, had different limits. I already mentioned that the Homburg Foundation funds people not projects, so there again, there are certain limits that they cannot cross, but by funding people they were essentially more flexible than the DFG is.

Interviewer:

Okay. In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent:

It's very difficult, because the concept of effectiveness is rather controversial. But I do think that the innovation potential of funded research projects need[s] to come up as an indicator in a few years to come, so that we can link what we fund to how it can accrue economic benefit for the country.

From a DFG's perspective, we fund basic research, we do not know what impact will come out of the research, or what type of results will come from the research projects we fund – so I will be very hesitant to answer that. Again maybe it's a question that relates to the science system as a whole, and to the research system, such as

- 1) employment figures,
- 2) percentage of the population, involved in science and research, and
- 3) percentage of the public budget spent on science and research .

However, it is really difficult to translate the funding of research into a number. I would advise against the use of publications as an indicator, as it is language specific. So from the DFG's perspective, as an agency that funds basic research, we would be very hesitant to suggest universal indicators to measure effectiveness when there are some countries that are plagued by social and health challenges – in such instances, there may be a political drive to fund the humanities or social sciences.

Interviewer:

The next question is: How is effectiveness measured at the DFG?

Respondent:

I'm not aware of what kind of research is undertaken to address the effectiveness of the DFG, but there is a[n] M&E unit in the DFG that looks at impact and effectiveness of our various funding instruments. But it would be interesting to see

- 1) How do German universities fair against international standards; and
- 2) How attractive is Germany (or any country) to the top ranking researchers globally?
- 3) How does the mobility of researchers affect a country? Is it more like an outgoing location where people leave the country to perform their research elsewhere, because they find employment elsewhere[?] Or is there any incoming stream of researchers that's comes into the country and performs the research there[?]

Interviewer:

That's actually a very interesting point.

What factors do you consider play a key role in influencing the effectiveness of the DFG? Please explain.

Respondent:

A limitation is clearly funding or the ability to acquire funds. If we do not receive enough funding from the government and from the federal state, through tax payers money, then it would pose an actual limitation for us, in terms of achieving our mission. This limitation has a cascading effect, in that if there is increasing demand for public research funding, that is, there is an increase in proposals received from researchers, then the success rates go down considerably. This would then impact on researchers who in the future would be more or less deterred from submitting proposals to the DFG, as these proposals take time to conceptualise and to write, and with a small funding budget, these proposals are declined or not funded. This would in turn impact on the success of the DFG as a funding agency, as we

have had success rates of around 20 to 25 and higher (this rate measures the number of applications that have been submitted versus the number of applications that are actually funded). So I think success rates are important but again that comes along with funding levels that are accessible to the funding agency. I think what's also important is again the independence of funding agencies. Of course we have to answer to our members, but we are essentially autonomous how we spend our money and this money is spent according to scientific standards. So we have our scientists and researchers on all our panels and they make the ultimate decision on the funding.

We have a joint committee that consists of a few representatives from the state and the federal government and the scientific members that also have a voice in the DFG senate. The senate is sort of the scientific body, and together with the representatives of the states and the federal government they make up the joint committee and the joint committee, in the joint committee, scientists and researchers have the majority of votes.

I think that is important in that the funding agency must have autonomy – basically without that autonomy, it would be hard for funding agencies, especially the DFG, to achieve its goals.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the DFG?

Respondent:

Hmmm ... in terms of ranking:

- 1) Most important is the level of public funding or the level of public funds received by the funding agency (ability of the funding agency to acquire financial resources from the state); and
- 2) Independence or autonomy of the funding agency.

Interviewer:

Thank you for that.

If the factors,

- 1) environmental and stakeholder management
- 2) financial management
- 3) business processes, and

4) organisational learning and growth, which include HR management, were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree? And how would you rank these?

Respondent:

Yes.

- 1) I would probably think environmental and stakeholder management first.
- 2) And then second, financial management.
- 3) Then third would be business processes.
- 4) Learning and growth last.

Interviewer:

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

Firstly, it depends on the funding agency and the country it is in, that is, the state of the national context with respect to politics, economy, and other sociocultural issues. In addition, there needs to be an awareness of the demands (by the way, these demands are the factors you described) [of] the research community, and probably a course of action for the management of these demands. These demands relate to the factors you mentioned earlier. So then there's this sort of demand management needed by the funding agency. The demands that come from the government sector must be understood by the research sector – this is the role of the funding agency. And then, as a funding agency, you would probably need to put in place business processes, such as the peer review processes so that there is transparency and fairness in the system, which links to the level of trust that the research community has in the funding agency.

Interviewer:

Okay. Thank you. Are there any additional information or considerations you can think of on improving the effectiveness of funding agency that I may not have covered in my questions?

Respondent:

I think what probably is also necessary is to have (1) international review panels; (2) international advisory panels; and (3) internationally conducted evaluations, in order to

ensure independence from political demands again and neutrality which links to the long-term strategy development of the funding agency. This strategy must ensure that there are continuous reflections relating to the agency meeting its mandate and what must be changed in order to meeting the changing demands of the world and the researcher community (is the agency evolving to meet the changing demands of its stakeholders?).

Interviewer:

Thank you.

Finally, given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

I think there could be many reasons.

- 1) Effectiveness is hard to measure and therefore it would be difficult to address the requirements of this study. With the DFG I would say it's really difficult to talk about effectiveness. Because effectiveness of basic research funding is much harder to measure when it comes to measuring how the funding of basic research contributes to innovation, economic development and so on.
- 2) With other agencies, that are more dependent on political influences, they would be rather hesitant to really open up to a study that discloses how effectively they operate in a day to day business. That would be probably another one.
- 3) Some funding agencies are allowed to cooperate with other sister agencies around the world, while others are not. Such limitations are also included in employment contracts. I know, as an example, that there are limitations as to how the NSF can operate at any stage, and with whom they can cooperate. The fact that the director is appointed by the president, well, I would be surprised if that sets a limit to participating in studies like this.
- 4) I think it would be interesting really to compare different funding agencies, and how they achieve their mandates. As an example, the DFG and NSF have been able to cooperate on the issue relating to "Research Merit and Ethics".

Interviewer:

Thank you very much. This has been very fruitful, and I thank you for your time.

Respondent:

I apologise for any expressions that have been not to the point or not correct, because English is not my mother tongue. So I try to do my best, and hope that it was effective.

INTERVIEWEE 4: Deputy chief executive officer: NRF, South Africa
ORGANISATION DISCUSSED: National Research Foundation, South Africa
DATE: 24 June 2014
QUALITY OF AUDIO: Good
DURATION: ± 16 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector".

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated with the utmost confidentiality.

Please provide me with your title within the organisation and tell me about your experience with funding agencies.

Respondent:

Thanks, you can send me the transcript.



I've been at the NRF as Vice President and managing director of RISA. I've now been changed to deputy CO RESA. RISA as you know is research and innovation support advancement. You know the various pillars of the NRF so I don't have to explain that (*The three pillars are: (1) research performing national facilities; (2) the grants making division: RISA (Research and Innovation Support and Advancement); (3) outreach and communication: SAASTA (South African Agency for Science and Technology Advancement)*). So my experience with funding agencies, I work with funding agencies all over the world and this usually manifests itself in a number of multilaterals and bilaterals.

Interviewer:

Given your experience, how would you describe an effective funding agency?

Respondent:

An effective funding agency is

- 1) on budget and on time
- 2) transparent
- 3) customer-centric
- 4) efficient;
- 5) world-class governance systems, and
- 6) robust in its core processes that is, peer review.

These are the things that the NRF stands for. Excellence is the cornerstone of decision-making. Excellence, is not negotiable, especially in the peer review process and awarding of grants.

Interviewer:

Do you consider the National Research Foundation effective?

Respondent:

Yes. If you look at the whole national system of innovation and the impact the NRF has on the various institutions, you then have to ask the question: What [would] happen [to] these institutions, if the NRF did not exist? As an example, the consequences are dire, if these research-intensive institutions and universities do not receive funding, even for a single year. These extend to poor financial planning and in turn they impact negatively on the quality of research activities, student training, etc.

Interviewer:

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent:

Meeting targets set by government as well supporting the advancement of science. So indicators should extend to achieving the objectives of the funding agency's mandate, meeting the key performance indicators (KPIs) that relate to publications and human capital development, etc.

Interviewer:

Thank you.

How is effectiveness measured at the National Research Foundation?

Respondent:

We use the KPIs as a proxy to measure our efficiency. They are in terms of the targets that align to our mandate

- 1) knowledge generation
- 2) research outputs (publications, patents, etc)
- 3) human capital developments (student training), and
- 4) transformation of the researcher cohort

Interviewer:

Thanks.

What factors do you consider to play a key role in influencing the effectiveness of the National Research Foundation? Please explain.

Respondent:

To me what is the fundamental to the NRF is:

- 1) The quality of staff that we have recruit: we need to get into the system people with the right mindset, skills and attitude. If you don't have the right people who understand the system, then you're going to have poor service provision.
- 2) Secondly it's the quality of the systems that are in place that contributes to transparency, fairness and trustworthiness: so systems ought to demonstrate rigour and robustness. The quality of the systems that are at place is fundamental in terms of making an impact. If you have an NRF online submission system that's troublesome, then researchers are going to be frustrated and not apply during the call for the submission process – this can severely impact on the agency's ability to execute what you're supposed to do.
- 3) Thirdly, the responsiveness of the organisation to change. We need to always be cognisant that we're dealing with a changing higher education landscape. And therefore we might have to sometimes terminate existing instruments, revise current instruments, or even create new instruments in response to this change.
- 4) Fourthly, the interfacing of the funding agency with the stakeholder community. The stakeholder community is twofold: (a) government, on the one hand, that provides the funding to the agency; and (b) the research community, on the other, that play[s] a dual role: they firstly, play a key role in the peer review process, and secondly, they are

recipients of grants from the agency. As a funding agency, you have to be communicating all the time. You have to be a listening organisation and a caring organisation. Largely it's about creating partnerships with our stakeholders.

- 5) Fifthly, is the quality of the feedback of the applicants or researchers applying for funding from the agency. When they're successful they need to know why. If they're not successful they also need to know why. So the quality of feedback and the transparency of the process [are] fundamental to an efficient, effective funding agency.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the NRF?

Respondent:

In my view all of them are equally significant. It's not one or the other. It's the totality that defines the effectiveness of the funding agency as an organisation.

Interviewer:

Okay.

If the factors,

- 1) environmental and stakeholder management
- 2) financial management
- 3) business processes, and
- 4) organisational learning and growth, which include HR management,

were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree? And how would you rank these factors?

Respondent:

Yes. They are all interdependent. They all define the system that relates to funding agencies. As an example: there's no point in having financial management if there [are] no funds to manage. So you need resources. There's no point in having business processes if there[are] no stakeholders to serve. So the interdependency is very important. Of course the organisational learning growth, you can supplement that by the quality of staff you have. So in essence, you cannot rank these factors – all of the factors are equally important, whether they reside as a factor external to the organisation or factors that reside within the organisation.

Interviewer:

Thank you.

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

Communication is fundamental in both the active and passive forms:

- 1) good clear communication, and
- 2) consistent communication

In addition, the organisation must steer towards being a listening organisation and a responsive organisation to the evolving needs of the stakeholder community. Remember for funding agencies, stakeholders comprise both government and the research community. I would like to make a final comment on the strategy you requested I propose: I would go for a strategy that forms partnership (a partnership strategy): a strategy that develops, nurtures and sustains partnerships.

Interviewer:

Is there anything you'd [like] to add – any additional information or considerations that would contribute towards the effectiveness of funding agencies?

Respondent:

I want to say here that there must be an organisational structure in place that allows for the agency to be (1) responsive to a changing environment; (2) being customer-centric, which means that processes must be streamlined such that there is a culture in place that focuses on customer-centricity. At the NRF we are in the process of restructuring towards the matrix approach.

Interviewer:

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

They may be reluctant because they think that this study is about a judgement being made, rather than an assessment. And that this study might rank them. In some instances, the funding agency may be concerned that the judgement may extend to the capability of the leadership to deliver on its mandate; in other instances, it may demonstrate that the funding

agency role is not needed; and finally, a major concern may be that there could be public exposure relating to taxpayers' funds not directly benefiting the public in general (the public is important, as it is their tax funds that are used) – these may be some of the concerns of the funding agency leadership. Hence the need to protect information.

Interviewer:

Thank you. That's the end of the interview.



INTERVIEWEE 5: Executive director: National Research Foundation
ORGANISATION DISCUSSED: National Research Foundation, South Africa
DATE: 25 June 2014
QUALITY OF AUDIO: Good
DURATION: ± 16 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector".

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated regarded with the utmost confidentiality.

Respondent:

I am agreeable to that.

Interviewer:

Thank you.

Please provide me with your title in the organisation and tell me about your experience with funding agencies.

Respondent:

Okay. I'm the Executive Director for Knowledge Fields Development within the Research and Innovation Support and Advancement (RISA) business unit of the National Research Foundation. This directorate is directly responsible for funding projects and research

activities that support knowledge production. Grant funding is awarded against set criteria, which includes human capital development and research outputs such as publications. The primary aim of funding research is for advancing research itself, but we also expect those people that receive grant funding to train students, postdoctoral fellows and young academics that will advance the objectives set by government.

I have been in this position for well over six years now, but I've been in the NRF, since 2002, which makes it about 12 years. Although I was not in this directorate in the first five years, of course, I have been party to, as a member of the executive, to the strategic developments within the organisation for 12 years. Prior to that of course I was an academic and I was a beneficiary of grants from the NRF.

Interviewer:

Thank you for that.

Given your experience, how would you describe an effective funding agency?

Respondent:

I think effectiveness, has to be primarily based on what we have, as a funding agency, promised to do. And how well do we do it. With a basic definition of what effectiveness is in terms of making sure that we deliver on what we are mandated to do in a timeous fashion. That's primary, but in doing so, because we are an agency, we also want to make sure that people who come to us or who may want to come to us, clearly understand what we are about and what we do. In some instances, we may be doing things, but people don't understand what our role is and they have a different perspective. So the overarching part for me effectiveness, is primarily being able to do the mandate that we are given as efficiently and effectively and on time as quickly as possible, with due consideration afforded to clear communication to researchers as well as government departments.

As an agency, we need to ensure that there is effective communication with government, so that they know what our role is. On the other hand, the research community needs to understand our purpose in representing their best interests. Either way, we are supposed to be doing all the above efficiently and effectively, that is, meeting the requirements set forth in our mandate: to provide support and promote research, as well as facilitate knowledge production and human capital development. So what determines what we fund? There are two things.

- 1) Firstly, we are given contracts where government provides funds through a contractual arrangement to fund specific investment areas that align to their government priorities.
- 2) And [regarding] the other part, we as NRF decide what it is that we will invest in. The funds for this [are] from the NRF parliamentary grant. We then have to decide on defining investment principles, which at this stage becomes very important. So clear understanding of those investment principles help immensely in terms of being effective, because if people understand that as an agency we have an obligation to balance the act in terms of (1) maintaining the fund[ng of excellent research, but at the same time; (2) making sure that young researchers are trained, particularly from designated groups, which relates to race [and] gender.

Although we have two income streams to fund research, money is never enough to fund everyone that applies. So it is important to make sure that when we award grants to researchers, we ensure that best practices (in our case, peer review processes) are followed and the processes employed are fair and transparent as well as address the investment principles defined by the organisation.

Interviewer:

Do you consider the National Research Foundation as effective?

Respondent:

I think so. The NRF is relatively effective. Quantitative measures such as categorical numbers cannot always be used – It's the degree to which you get there, hence percentages are more fitting to measure effectiveness. Percentage can give you an indication of effectiveness by also defining the ranges. But I can't simply say "yes" or "no" to this question. So in essence, when I say relatively, I think we are doing a damn good job, but we can do better. Where do we fall short, is in making sure that people really understand what we are about. I think that message always is the major problem. Communication is critical and it's not just a once off activity. As leaders in funding agencies we must remember that the external stakeholder group comprises of various types of stakeholders: from government officials to senior researchers, young researchers as well as students and the general public. Within this stakeholder group, there is also a changing dynamic, that is, an evolving external stakeholder group. Today you may be talking to deans, tomorrow researchers, and the next day one of those individuals become[s] a government or NRF official. The stakeholder community is rather small and changing jobs is a reality.

Interviewer:

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent:

Firstly, I think funding agencies fund. So an indicator of effectiveness can be:

- 1) Are you funding as many applying researchers as you can, that meet the eligibility criteria? This is due to South Africa having only one funding agency, unlike the US and UK.
- 2) Are we funding people from the designated groups (race and gender) and making a difference in terms of addressing the transformation agenda?
- 3) How efficient are we in awarding grants with respect to points (1) and (2), bearing in mind the investment principles we have put in place as an organisation?
- 4) And finally, the feedback loop: are people satisfied with the NRF's investment principles and funding decisions and its impact (impact here is defined in a very loose manner)? In terms of the feedback, are we transparent and fair?

Interviewer:

Thank you.

How is effectiveness measured at the National Research Foundation?



Respondent: Well, the NRF measures:

- 1) Numbers in terms of the how many applying researchers are we funding, based on how many people have applied and are eligible (it's almost a sprinkler system).
- 2) Turnaround time: We need to undertake the review and evaluation process in a more systematic manner to ensure transparency and fairness.
- 3) It is here that the long-term impact (in its true meaning) becomes important. What strides are we making to[wards] realising the long-term impact we as a funding agency have set for ourselves, given our investment principles?

Interviewer:

What factors do you consider to play a key role in influencing the effectiveness of the NRF?
Please explain.

Respondent:

I think:

- 1) The staff of the NRF, at all levels within the organisational structure, must be appropriately skilled and know their role in contributing to the agency's mandate. This also delivers on a customer-centric offering to the stakeholder community by the funding agency.
- 2) Relationship with the principal funder or the government department that provides funding: funders need to appreciate the role of the funding agency and understand their limitations as well as those of the funding agency. Poor relationships with government translates into poor resources available to award in the form of grants.
- 3) The actual resources that we have, that is, financial resources.
- 4) Another important factor relates to the systems and business processes in use. That's critical. The effectiveness and nimbleness of the system and its processes which include both the manual and electronic submission of research proposals is key to a funding agency being transparent and trustworthy. Stemming from this point, is the issue relating to ensuring that rules and regulations are understood.
- 5) Finally, the stakeholder community. As I have indicated earlier, there are different categories, in that particular community, but in that, remember that some are more informed than others and some care more than others. The level of understanding of the role and processes of the NRF by the stakeholder community is another contributing factor.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the NRF?

Respondent:

I think the following ranking applies:

- 1) Level of funding: One thing that plays a significant role is funding.
- 2) Systems and processes.
- 3) People management.

You have put me on the spot to say which one is most significant and which is least significant, but these things play on each other – they are integrally integrated. Let me explain: You can have, all the money, but if you do not have people with the right skills set, and appropriate systems and processes – you can achieve very little, if anything. And this applies to each of the factors, I have identified.

Interviewer:

Thank you for that.

If the factors,

- 1) environmental and stakeholder management,
- 2) financial management
- 3) business processes, and
- 4) organisational learning and growth, which includes HR management,

were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree?

Respondent:

I would fully agree and I've already explained this to you. If I had to rank them, I would put them in the following order:

If I understand that:

- 1) Financial management relates to the sourcing of funds and managing them, therefore that's the highest ranking of all factors within or internal of the organisation.
- 2) Business processes and systems: these are imperative for managing the financial resources, once they have been sourced. Included here are rules, regulations and procedures. Every business system will have these rules and regulations and whatever.
- 3) Good staff, is also important. They are critical, to ensuring a customer-centric offering to the research community and they play a role in teaching new staff, therefore they play a role in learning and growing.
- 4) Environmental and stakeholder management is a key driver, but it resides outside the organisation. This factor also relates to relationship management: (a) the relationship between the funding agency and the funder is important; and (b) the relationship between the funding agency and the research community is also important. Balancing the demands of these two relationships is difficult, [because] you have to address the redress and equity targets set by the funders, on the one hand (funding a set number of researchers from designated groups in order to address the political and historical imbalances of South Africa's past), as well as fund excellent researchers, on the other. This is difficult as the NRF is the only funding agency in the country that has to service a multitude of disciplines, unlike the USA and EU, where the funding agencies fund specific disciplines or research areas only.

Just as a final point here: all these factors cannot be ranked or measured one against the other – all of them play an equal role in influencing the effectiveness of funding agencies, be it a factor that influences from the outside in, or factors within the organisation.

Interviewer:

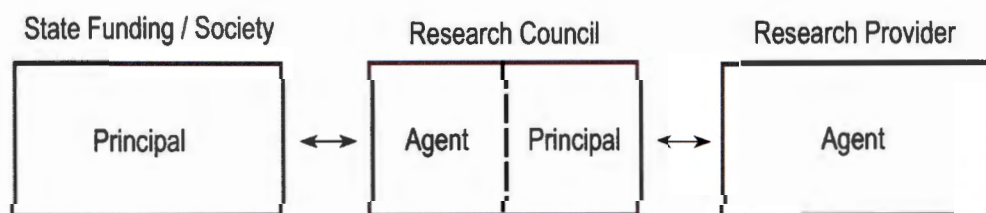
Okay.

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

The first thing I would say is:

- 1) Anchor the concept of organisational effectiveness in appreciating and understanding the context and environment in which that agency operates.
- 2) Having said that, then you start putting together relationships with the funder or government departments. This relationship must be one that can be defined as: arm's length, that is, the government department does not get involved in the strategy, operations and general management at the funding agency. The funder needs to give the funding agency the responsibility to run with projects without becoming micro-managers. That is: here are the resources, objectives and targets, go and do it.
- 3) Relationships with the people funding agencies serve, or the research community [are] also important.
- 4) The question at this point is: how best do we manage the above?



Funding agencies are the link in a chain of principal-agent relationships, with the government as principal to the funding agency, on the one hand, and the funding agency as [the] principal to the scientific community, on the other. Funding agencies can be both the agent (in relation to the government) and principal (in relation to the scientists) at once. This has been discussed in the commissioned study on science granting councils in sub-Saharan African countries that was conducted by Mouton (2014). I will share this document with you.

So personally I don't think that funding agencies should be autonomous, as is the case with the DFG. A funding agency can't be an agency and do whatever they want to do. Then it cannot be an agency – it may as well be an independent philanthropic organisation. An agency acts on behalf of a group of people: in the case of funding agencies, they act on behalf of the research community. So it is important for the agency to understand that it's got an obligation to government, on the one hand, and the research community it serves, on the other.

It is therefore important for the funding agency to nurture relationships with government who they are accountable to, as well as the research community they serve. There must of course be some level of conversation that transpires between government and the research community that may not necessarily include the funding agency. However, the agency role in mediating and facilitating as well as fostering the relationship between government and the research community must not be underestimated, especially when translating the research outputs of the researchers into a return on investment for government. As much as these relationships need to be in place and managed, the agency must not lose sight of what its core mandate and objectives are.

Interviewer:

Thank you. Can you think of any additional information or considerations on improving the effectiveness of funding agency that I may not have covered in my questions?

Respondent:

I think, you see we are operating from within the South African context; but if you were talking about the generic, there is always a need to constantly review the role of the agency at a given time. Has it evolved to meet the changes in either the research community or government landscape?

Interviewer:

Okay. Thank you.

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

The difficulty I think, is that the agency concept is not easy to understand.

- 1) The level of maturity with which people relate to such a study is the first challenge.
- 2) Government bodies that are accountable for the funding agency may be rather reluctant to share information relating to how they spend public resources, as this could impact on their reputation or performance – hence the level of maturity again emerges as a challenge.
- 3) General concern by funding agencies that their role may be questioned. In addition, there is a concern by employees filling out the questionnaire that their position in the organisation may become redundant.

The recent study survey that was done by Crest on behalf of the NRF looks at different agencies in sub-Saharan Africa and some of them are located in government, but you will see that they have got different stages of development or maturity. I think the major part of it will rest on what I consider to be lack of maturity in terms of understanding the agency role.

Interviewer:

Thank you very much!

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INTERVIEWEE 6: Chief Executive Officer: NRF, South Africa
ORGANISATION DISCUSSED: National Research Foundation, South Africa
DATE: 19 June 2014
QUALITY OF AUDIO: Good
DURATION: ±16:04 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled “A conceptual framework for improving the effectiveness of funding agencies in the science sector”.

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped but also note that your participation in this study will be treated with the utmost confidentiality.

Please provide me with your title within the organisation and tell me about your experience with funding agencies.

Respondent:

The CEO, and I've been here at the NRF for the last seven years.

Interviewer:

Given your experience, how would you describe an effective funding agency?

Respondent:

I think there are two key parameters for me.

- 1) The first is effective funding agency must be able to inject sufficient funding into the system to make a meaningful impact. That's the first thing, and if it hasn't got the financial resources, it's unlikely to be effective.
- 2) The second thing is that the funding agency must be able to effectively ensure that all the money it has available for disbursement lands in the pockets of the research community, as quickly as possible, but at the same time having followed international best practices in terms of following a competitive peer review process.

Interviewer:

Do you consider the National Research Foundation as effective?

Respondent:

I think it's partially effective. I don't think you can say it's completely ineffective, and I don't think you can say it's 100% effective.

Interviewer:

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent:

I think one must be careful: funding agencies do not all have similar mandates. In my experience, funding agencies aren't the same – hence it is difficult to propose a universal set of indicators. The expectations from them are different, depending on what they do, but if you only look at the grant-making side of the business, if you focus on that, then I guess it would be very similar across different systems. If suitable indicators had to be identified, then I think:

- 1) the effective disbursement of funds,
- 2) the credibility of the processes used to disburse those funds, and
- 3) then ideally, at a system level, to measure the impact of the disbursed funding, or grants, in terms of science outputs (or research publications)

Interviewer:

Thank you.

How is effectiveness measured at the National Research Foundation?

Respondent:

We measure it in many ways:

- 1) We measure it in terms of the effectiveness of the disbursement of funds in the form of research grants.
- 2) We measure it in terms of science outputs that are generated by the recipients of the grants. Outputs are defined as (a) research publications; (b) student training at the post-graduate level; and (c) investments in key infrastructure (of course the last one is an input variable rather than an output variable).
- 3) I think we also measure the impact of the funding that we disburse in terms of successes or failures in meeting the national transformation agenda: how many grants have been awarded to black and female researchers or how many black and female students have been trained or have benefited by virtue of the grant being awarded?

Interviewer:

Okay.

What factors do you consider to play a key role in influencing the effectiveness of the National Research Foundation? Please explain.

Respondent: I think that:

- 1) The effective flow of money from government to the NRF is a roadblock for us, and, so I think that is something that we need to overcome as an organisation, collectively. Because that means that we as the NRF can plan better, execute better and fund more effectively. In essence, it allows well-structured funding instruments that serve the community in a systematic fashion. That's why the NRF would rather have its funds allocated through its baseline parliamentary grant, than through contractual arrangements with government departments.
- 2) I think we struggle sometimes with getting the right people with the right skills set and mind-set into the organisation. Having the right staff on board is critically important.
- 3) And ensuring that we have effective institutional infrastructure in place to deal with systems and processes that are core to the business of funding agencies. When I talk about infrastructure, I'm talking about IT systems and processes; procurement processes; records and document management; and governance. In other words, internal systems and processes that will ensure that we function effectively as a funding agency.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the NRF?

Respondent:

I think the ranking should be:

- 1) The flow of money from government to the funding agency.
- 2) Attracting and retaining the right skills sets in terms of staff.
- 3) Ensuring that effective institutional infrastructures is in place – from systems and processes to having the relevant and appropriate IT and other supporting infrastructure.

Interviewer:

Okay, thank you.

If the factors,

- 1) environmental and stakeholder management
 - 2) financial management
 - 3) business processes, and
 - 4) organisational learning and growth, which include HR management,
- were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree?

Respondent:

Yes, absolutely. The only factor that I didn't mention in my response to your earlier question, was environmental and stakeholder management, but essentially the other three factors, I have already identified and listed.

If I had to rank them in order of importance, I would put the factors in the following order:

- 1) financial management (this refers to the ability of the organisation to acquire resources from government)
- 2) business processes
- 3) environmental and stakeholder management, and
- 4) organisational learning and growth

Interviewer:

Okay.

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

Interesting.

- 1) First of all, make sure that the funding levels are meaningful – that is, the budget available to the funding agency for awarding grants on a competitive basis can make an impact on the system.
- 2) Secondly, make sure that you establish a funding agency that has credibility in the system. The agency must have a reputation for being transparent and trustworthy, and is able to award grants through best practices in a timeous manner – in our case, a competitive process that uses peer review. This must all be achieved without undue stakeholder or government interference.
- 3) Thirdly, I would add that broad stakeholder consultation and government engagement must be allowed in order to develop clear long-term strategic priorities for the system. This will then guide the funding investments over time.



Interviewer:

Is there anything else you would like to add – any additional information or considerations that would contribute towards the effectiveness of funding agencies?

Respondent:

I think I would. I think that funding agencies can be most effective when they steer away from: (1) government and researcher interference; (2) becoming too bureaucratic; and (3) adopt a service provision approach to their functions. These just help to make funding agencies more effective.

Interviewer:

Thank you.

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

Funding agencies don't share information with anybody. They refuse to. As the CEO, I know first-hand.

I think because they are government institutions, funding agencies do not like to share information about the way they operate and are not necessarily comfortable with being transparent in the way that they function and operate, with people that are not from similar organisations. If a student just approaches them, I think there's a reluctance to share information, especially if that information in turn will be shared in a noncontrolled manner to a large public audience.

Interviewer: Thank you!

Respondent: You're welcome.

INTERVIEWEE 7: Professor: Oxford University
ORGANISATION DISCUSSED: European Physical Sciences Research Council
(EPSRC)
DATE: 30 June 2014
QUALITY OF AUDIO: Good
DURATION: ± 17 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled "A conceptual framework for improving the effectiveness of funding agencies in the science sector".

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated with the utmost confidentiality.

Please provide me with your title within the organisation and tell me about your experience with funding agencies.

Respondent:

Okay. I'm Professor, University of Oxford, Professor of Physics and Materials, and I'm also currently the head of the division. So my direct experience with funding agencies nationally would be with

- 1) the European engineering and physical sciences research council (EPSRC)
- 2) the UK Department of Trade and Industry, which is a primary government agency
- 3) EU-Framework 7
- 4) within the EU, I'm a member of the ESFRI (European Strategy Forum on Research Infrastructures) expert panel, and
- 5) and of course I've also been working with the NRF in South Africa

Interviewer:

Perfect.

Given your experience, how would you describe an effective funding agency?

Respondent:

An effective funding agency I think has to do several things. The funding agency, firstly, has to establish good communications and links into research community, who are ultimately stakeholders in that funding agency. It also has to establish strong links with the ministry or government department/s who support the funding agency with funding. And finally, it has to put in place appropriate transparent processes to manage both of those stakeholders.

Interviewer:

Do you consider the funding agencies you are engaged with as effective?

Respondent:

I think so. In general, there are always improvements that one could make to funding agencies, but certainly in the UK we consider EPSRC as an effective funding agency, and within the EU although their remit is rather different and their processes are considered bureaucratic and rather difficult, the European Research Council is also considered effective.

Interviewer:

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness of funding agencies?

Respondent:

I think the most obvious indicator is the (1) level of satisfaction from the academic or research community, (2) the publication output that is linked to funded projects, and (3) communication and outreach linked to the funded projects, that is, how can the funded research benefit wealth creation or the general public, whose tax money has been used to fund such research?

Interviewer:

Okay. That's interesting.

How is effectiveness measured at the EU funding agencies?

Respondent:

EU-based funding agencies are slightly different. Indicators look at how investments in research contributes to the overall financial health of the EU and also in the provision of services, training and networks.

Interviewer:

What factors do you consider to play a key role in influencing the effectiveness of the EU funding agencies? Please explain.

Respondent:

There are two. I think that are key factors that influence the effectiveness of funding agencies:

- 1) Processes that are put in place must be responsive and fluid to accommodate changes in the research landscape. So I think processes must be tailored to the science or research community they serve in terms of matching the level of funding applied for, with the level of rigour employed in the processes employed. This must be balanced off with the funding agency being in a timely manner.
- 2) The second one is really all about communication. I think it's vital that funding agencies engage with and have ongoing dialogues with the research community when they set their own investment priority areas that they have decided to fund. In general, the EU are quite good at that. I think the national agencies perhaps are better.

If I had to rank these factors, I would say that the most significant factor is processes, because if the process is not validated and believed in (or trusted) by the research community, then the relationship between the end stakeholders or research community and funding agency breaks down fairly rapidly. The process has to be transparent and it has to be appropriate for the level of funding that is being requested. That would mean that the second ranking factor is communication.

Interviewer:

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the funding agencies?

Respondent:

- 1) processes, and
- 2) communication

Interviewer:

Thank you for that.

If the factors,

- 1) environmental and stakeholder management
- 2) financial management
- 3) business processes, and
- 4) organisational learning and growth, which include HR management,

were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree?

Respondent:

I would agree. I think all of those four are actually encapsulated in my two points in the previous question – that is, processes and communication. In terms of financial management of a funding agency, the funding agencies in the EU are all independently and externally audited by treasury directly.

In terms of ranking the factors, well, that's quite tricky. I think it's a clear and equal ranking. I would say that the environmental and stakeholder management is probably the primary driver, given that it is out of the control of the organisation and resides outside the organisation itself. And in terms of the remaining factors, they relate to activities inside of the funding agency. I would say then that the remaining factors are of equal importance, from an internal perspective.

Interviewer:

So based on your experience, what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

I think in terms of effectiveness, the biggest problem is managing the relationship between funding agencies who have to report to government, and in this relationship, demonstrate the value accrued through the awarding of grants in terms of wealth creation, job creation and other metrics, such as research outputs. I think the biggest contribution would be to demonstrate how research outputs such as publications, patents and human capital development, amongst other things, can accrue to wealth creation in a rather direct way. On the other hand, the relationship between funding agency and the research community is

equally important. I think it's important to ensure that the application process is streamlined – as it's always onerous – and that there is the awarding of grants on the basis of scientific merit or excellence. You always have to write applications, but the application process has to be appropriate to the level of funding and the duration of the project. Nobody likes writing 60 page proposals if you're asking for a single studentship.

Interviewer:

Are there any additional information or considerations on improving the effectiveness of funding agency that I may not have covered with my questions?

Respondent:

The only thing I would say with funding agencies, more and more what we see certainly in the UK and also across Europe now, are cross-council funding programmes. So in the UK we have four research councils and there's a lot of cross-fertilisation between them, especially due to co-investments in the same researcher or research project. As a physicist, for example, I can actually apply for medical research council for funding, or any other of the funding agencies, who may prioritise different disciplines or research areas. In such instances, [I] think numerous considerations need to be accounted for:

- 1) Consistency needs to be put in place, in terms of rules and regulations linked to funding, especially if the possibility of globalised funding comes into play.
- 2) The framework document that describes the funding instruments [is] important, so that the application and eligibility criteria is consistent across all funding agencies;
- 3) The biggest challenge is linked to the double-counting of research outputs, especially if a multiplier effect comes into play, as the different agencies count the same outputs from a single funded researcher (an exaggeration effect).

Something I should point out is when funding agencies measure academic outputs, during, pre- and also post-grant award, we measure (1) research publications, (2) patents, (3) software, (4) conferences attended, (5) human capital development or student training, and (6) other funding that has been generated due to the initial or primary funding received. This last one, perhaps the most recent indicator, draws the theme back to wealth creation, or the building of research infrastructure.

Interviewer:

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

There is still a significant amount of internal protection of the agency processes. In the agencies in the EU, there is a degree of resistance to opening up the internal components of the funding process. That's considered to be slightly confidential information. The USA, on the other hand, have other issues – there are legal frameworks, because of federal funding.

Interviewer:

Thank you for that.

Respondent:

No problem.

INTERVIEWEE 8: University professor and consultant
ORGANISATION DISCUSSED: Research Council Norway
DATE: 20 June 2014
QUALITY OF AUDIO: Good – Skype
DURATION: ± 32:38 minutes
NATURE OF TRANSCRIPTION: Interview

Interviewer:

Thank you for agreeing to participate in this interview. Just to confirm, my name is Rakeshnie, and I am interviewing you as part of my doctoral study, which is entitled “A conceptual framework for improving the effectiveness of funding agencies in the science sector”.

This is an exploratory study that focuses on identifying the key factors that play a role in influencing the effectiveness of funding agencies.

If you are available and agreeable, I will send you the transcript for your final approval, prior to analysis of the data.

Please be advised that your inputs will be audiotaped, but also note that your participation in this study will be treated with the utmost confidentiality.

Please provide me with your title within the organisation and tell me about your experience with funding agencies.

Respondent:

What you should take into consideration is that I do not work for the Research Council of Norway. I am a university professor. But I know the council fairly well as a user on the other side, both from the university perspective, and the workings of the council itself. I'm seconded as a consultant to the Research Council of Norway by the secretary of Brussels in an advisory capacity. That's the reason why I have the email address for the research council.

Interviewer:

Okay. Thank you for that.

Given your experience, how would you describe an effective funding agency?

Respondent:

Well, I think there are a couple of key principles. One is communication. Through every process, from setting the agenda that defines the strategies that influence the research and innovation landscape to the implementation phase, communication is important – especially in the process of implementation itself. Two is effectiveness and rigour of the business processes, especially the peer review processes for funding agencies such as the Research Council of Norway. Peer review is one of the implementation tools. That's one way of achieving transparency, but it's not the only, of course – peer review is the gold standard of reviewing applications, so I don't see any other standards coming up and replacing that, so yeah, the effectiveness and the peer review as well. It's important because you're actually using the resources of the research community in your peer review, so – so it's important to use the peer reviews in an open and transparent way. Third is good management and good staff. In each of the above, I would say transparency is fundamental – this builds trust with the research community and government stakeholders.

Interviewer:

So I can ask:

Do you consider the Research Council of Norway as effective?



Respondent:

Yeah, I would say that. Also because I am one of the reasons why I see them as effective is that they are also always trying to improve. I would also say it's an evolving organisation [that learns on the job. I think they learn from every cycle and they implement what they've learnt. Within the Research Council, it's easy to give feedback and it's easy to effect changes. The ministry has undertaken a thorough review of the Research Council's effectiveness and the review has been very good. I'm sure you read it: this document affords a lot of information relating to effectiveness.

Interviewer:

Yes. Thank you.

In your opinion, what do you think are the most suitable indicators for measuring the organisational effectiveness for funding agencies?

Respondent: So, more often than not, I think funding agencies have to bear the brunt of using indicators such as return of investments, that mostly apply to private sector entities

and it's quite difficult given the scope of the work, to use the same indicators in research management. I think two indicators should be considered for funding agencies:

- 1) Excellence: All funded projects and the management of projects must be awarded on the basis of either research or innovation excellence. I think excellence always has been the guiding star at the Research Council.
- 2) Of course the impact or contribution to society is also a determining indicator.

To have these in place, I think you'll come along way.

Interviewer:

Thank you.

How is effectiveness measured at the Research Council of Norway?

Respondent:

I think they would look at the output – that is, the ability of the overall investment to bring forward research and innovation results. These outputs must align to the targets and objectives set forth by the funding ministry or the ministry that has provided the financial resources. These targets could differ from one ministry to the next. As you might know the Research Council of Norway receives funding from almost 20 different ministries. So it might be different from let's say one ministry to the other; and of course in general they would also take into account the resources spent on managing the funding, the administration or management costs (overhead costs), the money that actually goes to supporting research and innovation. Overall though, the Council itself is able to benchmark itself internationally in terms of being an effective organisation.

Interviewer:

Thank you for that.

What factors do you consider to play a key role in influencing the effectiveness of the Research Council of Norway? Please explain.

Respondent:

It would be interesting to know if we had an economic crisis and the funding budget was strangled, would we be able to do more with less? But I guess it would be interesting but we wouldn't really want to go through it. But yeah it could be interesting to look at Norway and compare it against countries that have gone through an economic crisis. I guess Sweden has gone through it. Denmark, as well – maybe just compare those two and how they fared during the crisis and how have they performed in five or ten years' time afterwards.

So apart from the economic climate, I think it is important that:

- 1) The budget allocation letters from ministry must be explicit in terms of the level of funding that will be made available to the Research Council as well as define precisely the research outputs, goals and other key performance indicators that need to be met by the Research Council.
- 2) Good order and trust are also important, both on the side of the ministry or funder as well as on the side of the research community or grant recipients. This does not mean this is not necessary for the Research Council in any way. Good order or governance and trust within the Research Council itself will lead to improved effectiveness in the council's implementation processes or business processes. This means transparency is ensured which would ensure a better image and reputation of the Research Council itself.
- 3) At the end of the day, transparency of processes and good clear communication is paramount in influencing the effectiveness of funding agencies.

Interviewer:

Okay. Thank you.

Of the factors you have identified, which would you consider to be the most and least significant in terms of influencing the effectiveness of the Research Council of Norway?

Respondent:

I wouldn't rank them, I would just say they are all equally important – that is, the economic climate, the budget allocation letter from the different ministries as well as good order and trust. You need to work with all these things as you cannot have one without the other, [for] example, in my mind you cannot always have without the other – they are all integrally linked.

Interviewer:

Okay. Thank you.

If the factors,

- 1) environmental and stakeholder management
- 2) financial management
- 3) business processes, and
- 4) organisational learning and growth, which include HR management,
- 5) were to be identified as key factors that play a role in influencing the organisational effectiveness of funding agencies, would you agree? And how would you rank these in order of importance?

Respondent:

I do. All of them are equally important. If I am forced to rank these, then:

Number one, would be environmental and stakeholder management. It is probably the one factor that would have the opportunity to influence funding agencies mostly, given that they are dependent on government resources or public funding, so I would say it's very important. The remaining factors, finance management, business processes, learning and growth (including HR management) are of equal importance. If you do these well, then you will probably succeed with being effective as a funding agency [engaging your researchers].

Interviewer:

So what strategy would you propose for improving the effectiveness of funding agencies?

Respondent:

I think the question might be a bit too broad. However, my attempt to answer this question is to simply iterate that transparency must be ensured across every process – in setting the strategy, involving the user, and producer of knowledge – that is, the ministries and research community respectively and also the general society that's going to use the output of the research in their daily life.

Interviewer:

Thank you. Is there anything you wish to add – any additional information or considerations that would contribute towards the effectiveness of funding agencies?

Respondent:

In my experience, from working abroad and working in Norway, that a **trust-based management approach** is crucial. This applies to (1) trust in your employees on every level and implementing that in your organisation to get the most out of people to make decisions in a manner that contribute[s] to (2) a better understanding of the organisation's strategy by the external stakeholders, be that government or researchers; and (3) meeting the objectives of the funding agency. Trust-based management is important for government to understand the Research Council and for the research community to understand and appreciate the role of the Research Council.

I think that's a factor, which would be hard to explain if you're not used to working in such an environment, but it's probably one of the things where, both the Norwegian government and businesses succeed the most – trust-based management.

Interviewer:

Thank you.

Given the scope of the study, why do you think funding agencies globally were rather reluctant to participate in the study?

Respondent:

That's very interesting. I remember when we tried to assist you in the beginning as well, and even, we know how to navigate internally in the research council, I don't know how many respondents you got in the end from the Research Council. I am sure people will always say (1) they have too much on their plates then they put it aside; or (2) they feel it's difficult to answer; or (3) this issue does not affect me or my job directly.

It would be great if you had identified some success factors, where you were able to get a better response rate. I guess in your future work as well, doing similar kind of studies or just getting input from universities or when you do mapping exercises or whatever, you will encounter some of the same challenges – maybe we could learn from that as well. I know that this is difficult. Even when we target the correct audience, with the questionnaire, we have quite substantial challenges in getting responses.

Interviewer:

I will consider the suggestion of putting together the success factors, but thank you very much. This has been most useful, and thank you for participating in the study.