Towards understanding the process of e-Government application design in South Africa

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A thesis submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy (PhD)

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ABSTRACT

This research explores issues related to the design and development of South African e-Government applications. The South African government from the 1960s has invested substantially in computer technology for the purposes of automating government bureaucracy. Contemporary computer applications in the form of e-Government use the Internet as a platform to make services more accessible to citizens. It is estimated that South Africa is spending approximately $1.5 billion a year on government ICT initiatives.

The design and development of e-Government applications has not been extensively researched. There are gaps in the academic literature in that no current theory or model adequately explains or outlines how e-Governments applications can be optimally designed and developed to meet the expectations of the various stakeholders that have an interest in the e-Government application.

To understand how an e-Government application moves from conceptualisation through development to operationalisation, data was acquired inter alia through interviews with knowledgeable civil servants from different departments. The data was analysed using principles of content and interpretive analysis and this analysis was used to formulate a theoretical conjecture concerning the issues affecting e-Government application design and development.

One finding is that e-Government performance can be improved by proactive change which recognizes the limits of the current situation and the potential of the new system. Using appropriately trained civil servants and drawing on the skills of middle management is critical to the success of e-Government applications. Outsourcing can be helpful, but it has to be overseen by appropriately skilled civil servants. Meaningful evaluation of the applications and the people involved in these processes is a central issue.

The government space is complex with multiple agendas that have relatively little alignment. Government is traditionally not readily receptive to the use of Hi-tech solutions. There is an inherent 'conflict' between the tendency of technology to be most effectively used as an instrument of integration and the structure and philosophy of the organisation, which is profoundly based on attitudes of strict departmental boundaries.

DECLARATION

I, Shawren Singh, declare that this thesis is my own original work, except as indicated in the acknowledgements, the text and the references. It is submitted in full fulfilment of the requirements for the degree of Doctor of Philosophy (PhD) at the University of the Witwatersrand, Johannesburg. It has not been submitted before, either whole or in part, for any degree or examination at this or any other university.

Shawren Singh

Signed at ……

On the …….. day of …… 2014

DEDICATION

To my darling daughters Tāra and Harini

OTHER ACADEMIC OUTPUTS RESULTING FROM THIS RESEARCH

Journal

Singh, S., & Thakur, S. (2013). A Study of Some e-Government Activities in South Africa. African Journal of Computing & ICT, 6(2), 41-54

Conference

Singh, S., & Remenyi, D. (2011). Towards Understanding e-Government Application Development. In N. Bhatt & A. Aggarwal (Eds.), E-Governance Policies & Practices. New Delhi: Excel India Publishers. *

Singh, S. (2013). Challenges to e-Government Applications: A Delphi Study. Paper presented at the 13th European Conference on eGovernment – ECEG 2013, Como, Italy.

Book Chapter

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Postgraduate Research Symposium

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** Awarded second prize for best poster

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D.U.C.K

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Introducing the Research Problems

This thesis proposes a theory that may be used to facilitate e-Government stakeholders' understanding of the issues associated with the design and development of e-Government applications. The present chapter describes why this issue is important and its relevance to government.

1.1 The challenge of e-Government

Governments are being faced with a number of challenges which are due to the increase in the size of the population as well as a demand from citizens for more efficient and effective services (Tapscott, 2010). Citizens in many parts of the world are aware that government processes and practices are often in need of modernisation. Delays, duplication and waste, have led to increased costs, which are considered to be the hallmarks of government services (Cloete, 2012; Heerden & Rossouw, 2014). It is generally felt that it is time for these inefficiencies to be addressed. In this discourse, modernisation means restructuring, facilitated by the employment of Information and Communications Technology (ICT). At the core of government is data. Its effective collection, management and use are central to the effective administration and the delivery of efficient services.

ICT, used appropriately with organisational transformation, has been found to improve efficiency and effectiveness in the private sector and this has led to a demand for the application of this technology in the public sector in the form of e-Government. This has been the case since the mid-1990s, and from that date there has been growing enthusiasm for the use of e-Government, as it is perceived as not only offering a greater level of efficiency to government, but also engaging citizens by promoting information access. This should lead to faster services that are more cost effective. The increased availability of information is seen as one dimension of citizen-centricity. e-Government is therefore seen as a major step towards citizen-centricity (Bannister, 2000).

By their nature e-Government applications are extensive in their scale. In many cases, government delivers services to large numbers of people and over a considerable geographic area. This means that powerful computers connected by high speed data communications are necessary. Sophisticated systems developers are required. As government systems are based on confidential and personal data, special security arrangements and protocols are necessary. Further, e-Government systems have

important implications in the lives of individuals, therefore thorough testing is required[1].These tests are expensive to perform. The on-going cost of operating these systems is considerable. In short, e-Government is expensive and this represents a problem in the public sector where resources are increasingly scarce.

It is interesting to note that it was estimated that in 2013 worldwide investment in ICT would be $3.8 trillion (Rivera & Goasduff, 2013), with e-Government being one of the most rapidly growing sectors, consuming an important proportion of this sum of money. There are problems with expenditure on e-Government, as Heeks (2011) pointed out when he said:

'If e-government is so great at cutting costs, how come my taxes haven't gone down?'

In general, governments have been consuming larger portions of the national income and many people believe that the payments made by the citizens, i.e. their taxes, should either be reduced or at least curtailed. To make matters more difficult for those advocating e-Government, there have been a number of high profile failures. But it is important to state that the application of ICT has never been straightforward and throughout the nearly 70 years that computers have been available, there is a long history of poor investment decisions in all the industrial sectors in which this technology has been applied (Robertson, 2008; Al-Ahmad et al., 2009). In this context, poor investment decisions have not only been in situations where there has been an inadequate return on investment, but also include incidents where ICT applications failed to work or caused considerable disruption to the organisations attempting to apply the technology (Mitev, 1996; Heeks, 2002a, 2002c; Belardo et al., 2004; Gauld & Goldfinch, 2006). e-Government applications are no exception (De Brí & Bannister, 2010; Uusikylä, 2013). Estimates of the extent of e-Government failures range considerably. The New Zealand government lost a modest $17 million on ICT for health care, when it purchased an American developed ICT system designed to manage health information and then abandoned the system within two years (Gauld & Goldfinch, 2006). The Irish government spent an estimated €156 million on a Health Services Administration system called PPARS and obtained no return on the investment (Comptroller and Auditor General, 2005). But in the UK where government services are much larger, the National Health Service wasted an estimated $24.5 billion on an ICT healthcare system which they were not able to implement successfully (Heeks, 2007).

[1] In the early days of the British electronic tax system, unauthorised individuals could view the personal tax data of other users (Beynon-Davies, 2005; Stibbe, 2005). Similar types of data breaches have been reported with the City of Johannesburg's online billing systems (W7, 2013), prompting the city managers to suspend the online billing service indefinitely.

1.2 ICT in South Africa

Before considering South Africa's e-Government, it is important to point out that South Africa has traditionally been a leader in the application of ICT in business and industry. From the 1960s,[2] most if not all the major international vendors[3] of computers and associated technologies established significant market presence in South Africa and computerisation became a prominent theme in many organisations, including government. The use of computers by the South African government[4] has a long history and not all applications were necessarily in the interest of the citizens. In a number of instances, the South African government used computers to enforce apartheid laws. In fact, by some reckonings, the South African Government has been the largest user of computers in the country especially if the parastatal organisations such as ESKOM, South African Railways and Harbours (SAR&H) and ISCOR[5] are included.

It was therefore inevitable that the South African Government would follow world trends and devote considerable resources to e-Government. The South African Government's use of computers has not always been successful. There are considerable challenges related to infrastructure, expertise, and demographics. The implementation of e-Government in South Africa has had to contend with a number of specific challenges. These included: a high level of digital illiteracy and financial inequality, a relatively weak ICT infrastructure, and a general lack of government's ICT preparedness. In addition, as an African country, there are other more pressing demands on the public service such as access to potable water and electricity, which made ICT development a lower priority in budgetary terms (Trusler, 2003).

The machinery of the apartheid government used ICT extensively to monitor and control people's movement (Edwards & Hecht, 2010). Pre-1994 the South African government's

[2] The first computer to be installed and used in South Africa was in 1959, which was supplied by ICL of the United Kingdom. The literature is unclear as to what this computer was used for. However, during that period the South African government introduced the 'Book of life' program (Wa Kabwe-Segatti et al., 2006). It is reasonable to assume that this computer formed part of this program. During the 1960s the computer industry in South Africa expanded at a rate of more than 30% annually, and by 1970 there were an estimated 400 computers in South Africa with a value of $100 million (Leonard, 1980). The South African government was actively investing in computers for the purposes of population control.

[3] The following US companies were active in South Africa: IBM, Burroughs, Control Data, NCR, Sperry Rand, HP, Data General, Data-point, Computer Automation, Digital Equipment and Foxboro Corporation and the British computer company International Computers Ltd (ICL) (Leonard, 1980).

[4] This does not include the use of computers by the military, police, ARMSCOR (the South African Arms Development and Production Corporation), and the South African nuclear program.

[5] ESKOM - established in 1923 as the Electricity Supply Commission (ESCOM), SAR&H - South African Railways and Harbours which has been unbundled and restructured, and ISCOR - established in 1942 as the Iron and Steel Industrial Corp.

ICT systems were not geared for a democratic society. There is little consolidated information available with regard to the progress and current practices of e-Government in South Africa (Trusler, 2003). Netchaeva (2002) reports that during the initial launch of South Africa's e-Government campaign, Business Day reported:

> *'Since every department will be linked to one central system, the customer that is you and I will make one inquiry no matter what we require. No more queuing around the block. No more filling out a yellow form only to find you needed a green one. No more paper documents mysteriously going astray.'*

However, the full potential of e-Government has not been realised (see Chapter 2, Section 2.9), though South Africa is spending approximately $1.5 billion a year on ICT.

1.3 Some interesting examples of problems with South African e-Government applications

The Durban Metropolitan Municipality in 1999 spent an estimated $1 million on a project to provide Web-based community and council information (Community Information Link) to the residents of Durban; by 2002 the project had failed (Heeks, 2002b). The Health Information System Programme (HISP) was launched in 2000; this initiative was intended to reform healthcare in South Africa's public sector. The project partially failed due to high cost (Braa & Hedberg, 2000a; Braa & Hedberg, 2000b). 'Golaganang', meaning 'come together', was a project launched 2002. It was a joint initiative between the South African government and the private sector to provide civil servants with affordable personal ICT. The estimated cost of the project was $80 million, and the project failed in the same year (Levin, 2002; The Institute for Public-Private Partnerships, 2009). Thakur and Singh (2012) reported that in 2003 the eThekwini municipality launched the eThekwini Revenue Management System at an estimated cost of R250m and the costs have escalated to R474m. The city manager has stated that the municipality will enlist the services of an independent risk assurer, at a cost, to test the system as they cannot give a guarantee that the new billing system would work. The Johannesburg City Council is experiencing similar challenges with its ICT services, causing both business and citizens to engage in legal action over poor services, such as inconsistent bills and disrupted services (Thakur & Singh, 2012). A set of touch-screen kiosks were installed for remote rural communities in South Africa's North-West Province. These were initially well received. However, the kiosks' lack of current or local content and lack of interactivity led to disuse, and the kiosks were removed less than one year later (Heeks, 2008b). In 2007, the electronic National Traffic Information System (eNaTIS) was implemented. One month after its implementation, it was reported that the Auditor-General warned the Department of Transport that the eNaTIS system

was flawed and that there was an 80 percent chance of eNaTIS failing. The department, however, went ahead and installed the R408 million system. This caused the country's vehicle licensing process to stop. In that same year, a High Court found that eNaTIS posed a security risk in terms of the confidentiality of citizens' data. Passwords were not administered adequately and 'security patches' were not installed appropriately. Although the eNaTIS system has now been operational for five years, it still does not offer complete client satisfaction (Rajapakse et al., 2012). In 2009, the State President launched the Presidential Hotline for citizens to log complaints. The launch led to a flood of calls, stimulating a denial-of-service attack (Thakur & Singh, 2012).

These examples suggest that South Africa has not made a great success of some of their e-Government initiatives. It further suggests that in different parts of the country the government has failed to successfully implement e-Government systems. This view is supported by the United Nations e-Government surveys (Hafeez, 2003, 2004, 2005; Hafeez et al., 2008; Kerby et al., 2010; Hafeez et al., 2012). South Africa has been slipping in the e-Government application league.

Table 1.1[6] shows that the overall consistent trend is that South Africa is falling lower in the e-Government ranking. In 2003 South Africa was ranked 45 out of 191 member states, which was a reasonable level for a country of its size and resources. By 2012, South Africa was ranked 101 out of 193 member states, which is in the lower half of countries. Though South Africa is investing in government ICT initiatives, it seems that the investments are not realising the expected benefits (Sekese, 2012).

Year	Ranked	Member States	%	Trend
2003	45	191	24	
2004	55	191	29	↓
2005	58	191	30	↓
2008	61	192	32	↓
2010	97	192	51	↓
2012	101	193	52	↓

Table 1.1 South Africa's e-Government developments ranking

A closer inspection of the components that are used to construct the e-Government ranking reveal that the components have behaved inconsistently over the years. The

[6] The UN e-Government survey is not conducted every year. After 2008 the survey has been conducted after every two years. No details are provided as to why the survey was not conducted for the years 2006 and 2007.

components are online services, infrastructure, and human capital[7], as displayed in Table 1.2.

Years	2003	2004	2005	2008	2010	2012
Rank	45	55	58	61	97	101
Online Services	0.539	↑ 0.515	↓ 0.5692	↑ 0.5518	↑ 0.3079	↓0.4575
Infrastructure	0.126	↑ 0.125	↓ 0.1234	↓ 0.1752	↑ 0.0476	↓0.2214
Human Capital	0.88	↑ 0.83	↔ 0.83	↑ 0.8061	↓ 0.8432	↑ 0.7817

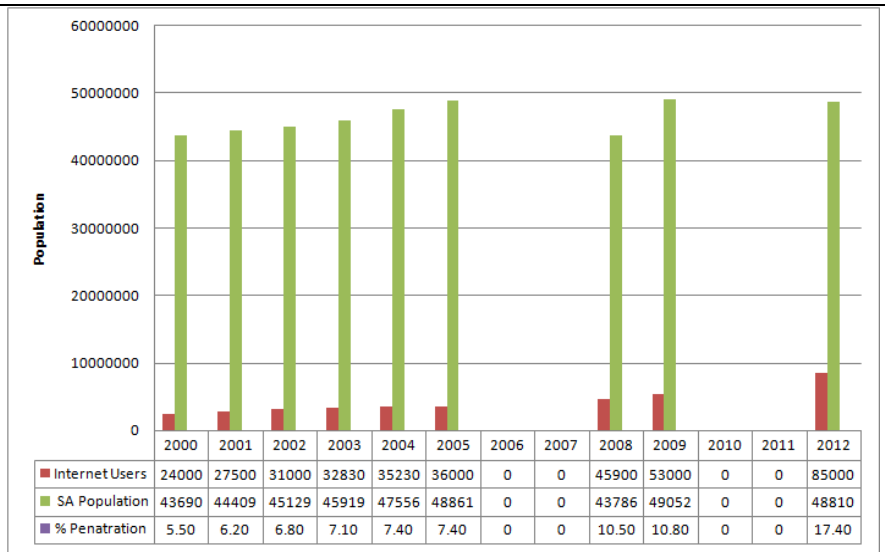
Table 1.2 South Africa's e-Government developments by components

Online service can be measured by the country's national websites such as National Central Portal, e-Services portal and e-Participation portal[8], as well as the websites of the related ministries of education, labour, social services, health, finance, and environment as applicable. The infrastructure component is an assessment of the ICT infrastructure of the country: it estimates the number of Internet users per 100 inhabitants, the number of main fixed telephone lines per 100 inhabitants, the number of mobile subscribers per 100 inhabitants, the number of fixed internet subscriptions per 100 inhabitants, and number of fixed broadband facilities per 100 inhabitants. The human capital component is an assessment of the literacy of the citizens in the country. Each component will be discussed.

Online services are affected by issues such as cultural, language and social diversity. Some citizens prefer to interact with a human being and not a computer when seeking services from the government. These issues contribute to creating a suitability divide (Guomundsdottir, 2005) that affects e-Government initiatives. When considering infrastructure, the Department of Communication has several ongoing initiatives to develop the ICT infrastructure, although there have been many delays (Sekese, 2012). Another dimension of South Africa's e-Government involvement may be seen in Figure 1.1 which presents the Internet usage and population statistics for South Africa (Internet World Stats, 2013). From the year 2000 to the year 2012[9] the usage of the Internet in South Africa was low. From this relatively slow growth in the Internet user base it is reasonable to assume there is a material divide (Guomundsdottir, 2005), which

[7] See the United Nations e-Government knowledge base: http://www.unpan.org/egovkb/global_reports/08report.htm for detailed reports on how online services, infrastructure, and human capital are constructed and assessed.
[8] see http://www.gov.za as an example.
[9] No data was available for the years 2006, 2007, 2010 and 2011.

is characterised by poor access to costly technology, and this type of divide affects e-Government initiatives.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Internet Users	24000	27500	31000	32830	35230	36000	0	0	45900	53000	0	0	85000
SA Population	43690	44409	45129	45919	47556	48861	0	0	43786	49052	0	0	48810
% Penatration	5.50	6.20	6.80	7.10	7.40	7.40	0	0	10.50	10.80	0	0	17.40

Figure 1.1 Internet Usage in South Africa (Internet World Stats, 2013)

Human capital which has been considered low, has been addressed by the South African education system. There are, however, several gaps in the education system (van der Berg et al., 2011; Spaull, 2013). These educational gaps led to utilisation divides (Guomundsdottir, 2005), which are characterised by a lack of basic computer skills. This in turn has an effect on the adoption of e-Government services. These components are important because they suggest that e-Government applications in South Africa have not reached a level of stability.

But the issue described above concerning e-Government is only one aspect of the greater problems relating to the use of ICT in government. The Auditor General of South Africa reported in 2012:

> *'The majority of departments and public entities experienced challenges with the design and implementation of information technology (IT) controls that provide assurance on the confidentiality, integrity and availability of financial information.' (Auditor-General South Africa, 2012)*

The opinion of the Auditor General provides an unambiguous statement on the important issues which South African e-Government initiatives face.

1.4 e-Readiness of South African Government

e-Readiness is a measure of the degree to which a government and citizens may be ready, willing or prepared to obtain the benefits which arise from ICT in the form of the Internet and Web (Dada, 2006; Sachs, 2013). Prosser and Krimmer (2004) proposed a model to evaluate readiness to implement e-Government services, as displayed in Figure 1.2. This model is important because it can be used to evaluate whether and how e-Government may be driven in South Africa. Thakur (2012), for example, used this model to evaluate e-voting as a possibility for South Africa. The dimensions of this model are: technology, law, society, and politics. The model is now extended to evaluate the e-readiness of government for e-Government.

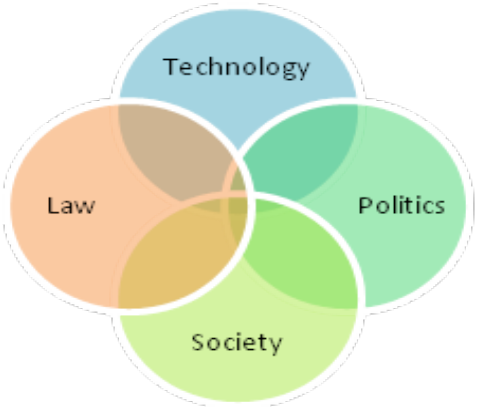


Figure 1.2 The Prosser-Krimmer e-Readiness Model (Prosser & Krimmer, 2004)

In Table 1.3 is an assessment of the South African government's readiness to take advantage of the benefits of ICT.

Dimension	Attribute	Example	Comment
Society	The society dimension is concerned with the level of political participation of citizens as well as the penetration rate of telephones, mobile phones, personal computers, the Internet and Internet transactions in the society (Prosser & Krimmer, 2004).	• Internet penetration is increasing at a slow but constant rate, see Chapter 1.	South Africa meets the requirements for this dimension. √
Law	Does a legal framework exist that supports electronic activities (Prosser & Krimmer, 2004).	• Promotion of Access to Information Act ("Promotion of Access to Information Act," 2000) • Independent Communication Authority of South Africa Act ("Independent Communication Authority of South Africa," 2000) • Electronic Communications Act ("Electronic Communications Act," 2006)	South Africa has progressive laws that meet the requirements for this dimension. √
Technology	The technology dimension is concerned with what type of general e-Government services are available, for example are there lists of eligible voters (Prosser & Krimmer, 2004).	• See section 2.8.1 in Chapter 2	South Africa meets the requirements for this dimension. √
Politics	The politics dimension is concerned with the type of political system, method and frequency of elections, for example, politicians' attitude to technology and policies that promote e-Government (Prosser & Krimmer, 2004).	• parliamentary democracy • 4 year election cycle • politicians recognise the importance of technology • policies that promote e-Government are being developed	There is no white paper or policy for e-Government in South Africa at a national level. KZN is a provincial leader to address this gap. At a national level, however, South Africa is evaluating e-democracy with an international study of electronic voting to evaluate e-participation (Thakur, 2012). √

Table 1.3 Assessing South Africans' e-Readiness

For each dimension South Africa meets the basic requirements, suggesting that South Africa is indeed ready for e-Government systems. Though there may be some perceived weaknesses for each of the dimensions, the view that is adopted for this study is:

> '*it is time to stop identifying gaps and setting priorities at a high level. Anyone working in ICT and development in the country will already know these things, and it is a waste of time and money to keep writing papers and holding conferences that do these same things over and over again. If e-readiness assessment is going to remain useful as a tool, it needs to become far more focused and action-oriented*.' (Bridges.org, 2005)

Dada (2006) suggests that when considering e-Government initiatives, it is important to investigate government readiness at all levels.

1.5 Making e-Government work

e-Government application design and development is at the heart of any e-Government initiative, because during the design process it is decided what is offered to the citizens and how it will be of value to the citizens. The design of e-Government applications is a challenging issue because the applications are frequently large, complex, require large sums of money, the system's objective can be difficult to define, senior government officials who do not have adequate ICT expertise sometime interfere, and they have a fairly wide range of stakeholders that need to feel that the e-Government application is providing some form of benefit for them. Furthermore, unlike many other ICT applications, e-Government is often conducted under public scrutiny. When mistakes are made in e-Government applications, they tend to be expensive, impact large numbers of citizens and they tend to be embarrassing to civil servants and politicians.

e-Government requires adequate online services, infrastructure and human capital, but even if all of these are in place there is still the issue of making individual systems work and that depends on how government designers design, develop and implement the systems. It is at this level that this research is focused.

1.6 Positioning this Research

Hofmann et al. (2012) claim that

> *'The digital revolution has arrived in the halls of public administrations. E-Government, which has been a buzzword for all kinds of computer usage in the*

public administrational and governmental context for several years, has started to become an ordinary way for public administrations to organise their work'.

Though there is some truth to this claim, however, technology has been used in government since the 1890s (this will be explored further in Chapter 2). One reason why e-Government is being considered the new arrival is that ICT has been the Cinderella of government. Much like in the fairytale where the stepsister toiled without recognition, but was destined for greatness, so too is the fate of ICT. ICT has been in the background, keeping the machinery of government working, but was treated as the step child of the government. The key stakeholders in government did not know how to use ICT productively in the service of the government because of gaps in their understanding of and prejudices towards ICT. Several governments at an early stage understood the need to have a department of transportation as the department of transportation had a strategic mandate to invest in and protect the transportation network within a country. However, ICT was still not seen as a strategic enabler, therefore ICT was outsourced. Furthermore, when citizens are affected by a natural disaster, for example, the citizens want immediate assistance. The citizens measure the effectiveness of the government on how fast they receive assistance in their time of need and not on the effectiveness of the e-Government systems. As researchers began to realise the important contributions that ICT in the form of e-Government can make to the government and citizens, e-Government has been studied under the following themes: development and design methodology issues, tools and technology application, utilisation and application of technology, organisational and social implications of technology, managerial impact, critical issues and emerging trends. This research is at the intersection of development and design methodology issues, utilisation and application of technology and managerial impact.

1.7 The objective of this research

The objective of this research is to explore issues related to the development of e-Government applications in order to postulate a theory on how these systems may be conceptualised, developed and implemented and as a result facilitate a more effective use of this technology.

1.8 Statement of the Research Problem

It is postulated that e-Government applications do not achieve desired results because the actual problem that an e-Government application is meant to address, may have never been well-described or well-defined, or the e-Government application is seen as the solution to the problem, and not as a tool to assist in the solving of the problem. The following research problem has been postulated:

The literature highlights that e-Government applications are affected by several issues. e-Government applications are conceived, designed and developed in a dynamic and complex environment (Abrahams, 2009). No current theory or model adequately explains or outlines how e-Governments applications can be optimally designed and optimally developed (Purao & Desouza, 2011) to meet the expectations of the various stakeholders that have an investment in the e-Government application. This calls for a better understanding of how e-Government applications are designed and developed. In order to optimise the acceptance of e-Government applications, it is required that the design and development processes of these applications be evaluated.

1.9 The Research Question

A well-founded, coherent understanding of the concepts associated with e-Government development is lacking. Without the conceptual basis for understanding e-Government development, the implementation of any e-Government system would prove problematic. Thus the principle research question is:

How can the industry specific development issues and processes of South African e-Government applications be improved to deliver required benefits?

This question can be divided into the following sub-questions:

- In what way can system obstacles[10] affect the success of e-Government applications?
- In what way do the relationships between key actors affect the success of e-Government applications?
- In what way do drivers of change affect the success of e-Government applications?

1.10 The Importance of this Research

The Third Global Forum on Reinventing Government concluded that e-Government can consistently improve quality of life, reduce cost and time for service delivery and improve governance:

'e-Government must be given serious consideration also in the developing countries not only for its potential for stronger institutional capacity-building, for better service delivery for citizens and business (thus increasing local social and economic development), for reducing corruption by increasing transparency and social control, but also for "showing the way" to the civil society and business community ... [It]

[10] Systems obstacles are barriers within the e-Government ICT environment that are obstructions in the design and development of e-Government applications.

transforms governance like no previous reform or reinvention initiative. e-Government potentially empowers individual citizens by providing them with an alternative channel for accessing information and services and interacting with government.' (UN-DPEPA, 2001)

Further, when e-Government systems do not achieve their objectives, it results in the loss of large amounts of money and considerable organisational trauma. The organisational trauma caused by unproductive e-Government systems can result in frustrated citizens, high turnover of staff and sometimes even disruptions to the country's economy.

Why such issues occur in the 21st century with more than 50 years' experience behind the information systems community is difficult to understand.

1.11 Research Strategy

The research strategy that will be used in this research is qualitative in nature. A qualitative approach is important because the evidence that is required to develop a credible theory cannot be collected using an experimental design. The evidence that is required has to be collected from knowledgeable informants, in the form of interviews, who have been involved with or interacted with e-Government applications. In addition to interviews, the evidence also comprises reports, government website examinations, project documents and media reports. The collected evidence will be analysed using an interpretive approach. Once the analysis is complete, a theory will be proposed.

1.12 Ethical Considerations

This research is conducted in strict compliance with the code of research conduct as required by the University of the Witwatersrand and the University of South Africa[11].

1.13 Delimitations of the Research

e-Government applications are affected and influenced by political-administrative structures and the appropriate use of ICT. This research is in the field of Information Systems (IS) and focuses only on the information systems aspect of e-Government application design and development.

[11] The registration for this research is at the University of the Witwatersrand; the research candidate is employed by and partially funded by the University of South Africa. The University of South African requires all its academic staff to comply with the universities' research policies. It therefore was necessary to apply for ethics clearance from both universities.

IS has a long tradition of research that aims to understanding the use of ICT in the business environment because there is an abundant supply of research problems in the business environment. Research into the application of ICT in government has not been as actively pursued by IS researchers, in part because of the difficulty in gaining access to government. In recent years IS researchers have been turning their interest to government and in particular e-Government. What makes e-Government unique is that an e-Government application will have many of the countries citizens as prospective users of that application. This diverse set of heterogeneous user of an ICT application has not been fully researched and understood in IS. In information's systems design and development it is important at the outset to identify key stakeholders (Pressman & Maxim, 2015), this approach is particularly useful in the business environment. However, when it comes to e-Government adopting traditional IS approaches is not adequate because of the unique nature of e-Government which has a wide range of stakeholder (Garson, 2008). Further, unlike the business environment, e-Government applications are opened to a wider level of scrutiny from a broader heterogeneous group. Also, within the business environment there are generally accepted standards for calculating the return-on-investment and depreciation of the applications, for e-Government applications it is not that clear because of the complex competing agendas that e-Government applications face. In addition, in the business environment projects have a defined period in which the project must be completed and will only be abandoned if key stakeholders agree that the project is not profitable. This is not the case with e-Government applications, it appears to be common practice for ministers to scrap e-Government projects, ministers to insist on implementing e-Government project, and when ministers change e-Government projects may be abandoned.

A review of the academic literature on e-Government research indicates that research articles are published mostly in non-IS government-related journals such as Government Information Quarterly and Public Administration Review. Leading IS journals only started publishing e-Government research form about 2003, this has created a gap in the IS reference literature. The most highly cited articles from these IS journals often tend not to use specific theories (Bélanger & Carter, 2012).

1.14 Overview of the Research Study

This section provides a brief outline of the chapters that follow:

Chapter Two explores the extant literature in the e-Government field. The chapter addresses contextual issues in the field of e-Government as well as some issues that are

faced by e-Government applications. In this chapter there is also an analysis of some South African e-Government issues.

Chapter Three sets out the methodological framework within which this research will be conducted and accounts of how the actual research was executed. The choice of the interpretivist research paradigm is discussed. The case study, based on multiple sources of evidence, is outlined as the chosen research method. Evidence collected from semi-structured interviews is analysed. The data analysis was supported by Atlas.ti. The steps involved in developing the theory are also outlined. Finally, the research study is evaluated with respect to rigour.

Chapter Four is an analysis of the outcomes of the research and is presented as eight findings. The findings are used to develop a theory that accounts for how e-Government applications are developed and developed.

Chapter Five draws the research to a conclusion. It reflects on the importance of the study's theoretical contributions. It outlines an intellectual and event audit trail to the research. Thereafter, limitations of the study are presented, followed by a reflection on possible areas of future research.

1.15 Summary

Research into e-Government offers opportunities for exploring how the design and development of information systems can be improved in order to allow government applications to be more efficiently and effectively implemented. It is for this reason that the research project was undertaken. South African has risen to the challenge of improving government service delivery through the use of technology, and in a country like South Africa where there is a considerable depth of expertise, it can be expected that this technology will make a difference to the lives of citizens.

This chapter considered a number of subjects. It addressed the importance and relevance of the issues to be tackled in the thesis, and therefore established the need for this research. The chapter highlighted some of the issues that affect e-Government applications and considered the South African context.

The research is then positioned in the field of study. The objectives of the research are outlined and are then distilled into research questions. These give the guiding principles

for the design of the research project. This chapter explains the structure of the thesis which will operate as a roadmap to this research.

Chapter 2
Setting the Scene

2.1 Contextual Background and Overview

In this chapter the extant literature is reviewed to explore the nature and characteristics of e-Government and to consider how this technology may be employed to facilitate the achievement of government service objectives. Modernisation in government is a concept which allows government to rethink the role that it plays in service delivery and how it should interface with citizens. The concept of modernisation has been associated with customer orientation which will be discussed. This leads to a discussion on the terminology associated with e-Government and what successful e-Government applications are, followed by an analysis of some e-Government applications. The stage is then set to discuss the challenges associated with e-Government. The chapter closes with a reflection on the appropriate application of e-Government technologies.

The design and development of e-Government applications is not an extensively researched area for either the developed or the developing world's; current e-Government research appears to be policy focused (See Appendix A). Grönlund and Horan (2004) point out that the literature on ICT in government can be traced back to the early days of data processing in the 1970s which was long before the development of the Internet and the web[12]. In more recent years governments became aware of the advantages of employing Internet technologies to facilitate service delivery as a result of becoming aware of its success in the e-business sector (Becker et al., 2006). The term e-Government came into use in 1993 (Annttiroiko, 2008), when the US National Performance Review first used it (Heeks & Bailur, 2007).The Government Direct Green Paper, one of the first government publications on e-Government in the UK, was published in November 1996[13] and outlined the way in which the government was going to use ICT (ePractice.eu, 2007) to deliver services. In 1997, the National Performance Review in the US recommended the use of ICT to deliver services to citizens (Relyea & Hogue, 2004). The first academic paper to use the term electronic government was published in 1996 by Milward and Snyder, who defined electronic government as the 'use of technology to link citizen to government services' (Milward & Snyder, 1996).

[12] It is argued by some authors that governments' use of technology began with the use of Herman Hollerith's card readers in the 19th century when it was employed in order to facilitate the completion of the census counting.
[13] This green paper represents a prospectus for the Electronic Delivery of Government Services.

Almost two decades of experience, with numerous types of e-Government systems being developed, have made it challenging to produce a comprehensive definition of e-Government (Kim & Kim, 2003; Joia, 2008), as it covers a broad spectrum of service delivery facilities. Some definitions are technology driven, while other definitions focus on the ability of e-Government as a modernising and transformative device for government (Grant & Chau, 2005). In the examples below, e-Government is described as:

- the use of ICT, and particularly the Internet and the web, as a device to achieve better government performance (OECD, 2003), to support responsive and cost-effective government by facilitating administrative and managerial functions, providing citizens and stakeholders such as business and civil society with convenient access to government information and services, facilitating interaction and transactions with internal and external stakeholders, and providing better opportunities to participate in democratic institutions and processes (Annttiroiko, 2008).
- government using Internet and the web to offer citizens and businesses the opportunity to more easily and efficiently interact and conduct business with government by using different electronic media such as telephone touch pads, fax, smart cards, self-service kiosks, e-mail/Internet, and electronic data interchange. It is about how government organises itself: its administration, rules, regulations and frameworks to carry out service delivery and to co-ordinate, communicate and integrate processes within itself (Almarabeh & AbuAli, 2010).
- the use of Internet and the web and its application by the government for the provision of information (which previously was only available to selected internal users) and public services to the people and other arms of government. The aim of e-Government therefore is to provide efficient government management of information to the citizen; better service delivery to citizens; and empowerment of the people through access to information and participation in public policy decision-making (United Nations, 2010). The resulting benefits are claimed to be less corruption[14], increased transparency[15], greater convenience, revenue growth, and/or cost reductions (The World Bank,

[14] This is not universally accepted and there is no clear evidence to support the claim that e-Government might reduce corruption.
[15] The World Bank does not provide any details on how increased transparency can result from e-Government. Perhaps this is an optimistic view which should be seen as an aspiration.

2011). These benefits are debatable. The question that arises is the effort of designing and implementing e-Government applications worth the benefits. Do the promised benefits of e-Government applications outweigh the efforts used to design and implement e-Government applications?

While these descriptions are useful they do not provide a comprehensive understanding of the nature and the opportunities implied by e-Government. They focus on service delivery and not on wider issues such as how this technology can facilitate modernisation (Bannister, 2013). To understand the importance of e-Government, the following definition of e-Government was suggested by Grant and Chau (2005):

A broad-based transformation initiative, enabled by leveraging the capabilities [of] information and communication technology;

- *to develop and deliver high quality, seamless, and integrated public services;*
- *to enable effective constituent relationship management; and*
- *to support the economic and social development goals of citizens, businesses, and civil society at local, state, national, and international levels*

Grant and Chau's (2005) definition is useful as it is a major step forward towards recognising e-Government as more than a way of providing efficient service delivery.

For the purpose of this research e-Government is defined as follows:

e-Government is the application of ICT, together with transformation or restructuring where appropriate in order to facilitate improvements in the efficiency and effectiveness with which a government serves its citizens and other members of its society.

The term e-Government will normally be applied to all levels of government such as national, provincial and municipal as well as to other public sector organisations such as museums, concert halls, game parks etc. The roots of e-Government are deeply embedded in supporting service delivery through Internet and web based on-line ICT, but e-Government has been extended in the eyes of some commentators to cover a wider range of issues including e-Tendering, e-Democracy, e-Participation, e-Canvassing to mention only four areas. Systems internal to government, such as

payroll, inventory keeping and general recordkeeping are not normally described as e-Government even if they employed Internet technology[16].

e-Government solutions are sometimes overlaid onto existing government structures without considering whether or not these structures are actually relevant or how they might be improved though the uses of the Internet. Government departments and the services they offer are bureaucratically complex and traditionally siloed departments have different mandates because of how they developed differently over time. This silo mentality can lead to conflicts of interest because it discourages a high level understanding of the organisation by getting people to focus on short term objectives. In relation to government services, citizens have no choice in the service that they receive (Weerakkody & Dhillon, 2009), because government holds the monopoly on the services that are provided. However, as the needs of citizens evolved, the pressure on government to manage the requests appropriately for a higher level of service while containing costs required that government invest in other technologies such as ICT to make the management and delivery process more cost-effective.

2.2 The Genesis of e-Government

Government, which is considered as the great record-keeper of the nation with an insatiable appetite for data, believes that the continual accumulation of information will inevitably lead to better service delivery (Rosenberg, 1992). In doing this the relationship between citizens and the government, in democratic societies, has evolved and undergone fundamental changes[17] (Klingemann & Fuchs, 2002). The consequences of this change required that government become more administratively efficient, control cost, optimise service delivery systems, and transform its internal modus operandi. To facilitate this change, computers were used in the automation of these tasks.

2.2.1 Automation as a first step towards e-Government

Using technology to automate the counting of large volumes of data has often been the first step in the application of ICT in organisations both in the public and the private sector. The needs of the Census Bureau in the United States of America were historically one of the most significant drivers of the adoption of computer technology in government. The 1880 census data took 7 years to be processed, and the 1890 census

[16] Increasingly even internal ICT has Internet implications as the use of the Cloud becomes accepted and it plays a role within organisations in a variety of respects. The Internet has directly or indirectly insinuated itself into most aspects of computing.

[17] Many citizens are demanding that the government provide a higher degree of transparency with regard to how it utilizes the resources at its disposal, and that efficiency and effectiveness should be a central concern of government departments.

was expected to take even longer. Senior civil servants recognised that the slow processing of census data posed a problem for the government and its policy development (Agar, 2003). This problem progressively led to the idea that mechanical tools could be used to assist governments with their data processing. The Director of the Census announced a competition and invited the submission of schemes to speed up data processing. Winning the competition was Herman Hollerith's punch-card machine which was used to process the census data within 2 years (Augarten, 1984; Agar, 2003). While Hollerith invested his own resources to invent the punch-card machine, modern day governments use taxes to develop expensive ICT solutions and then struggle to get economic value from the new system. From an Information Systems perspective Zuboff (1988) indicated that information systems could be used to *automate*, *informate* or *transformate* processes, and these concepts have influenced thinking in government (Nygren, 2010). From empirical evidence of the punch-card machine, Zuboff's first notion of 'automate' is well established in government, where computers are performing routine tasks, such as updating records for the Bureau of the Census[18].

2.2.2 Contemporary e-Government History

e-Government began in the 1990s with a fairly modest agenda of giving citizens access to information. This is similar to how ICT began in the private sector with a modest agenda for record keeping within organisations. e-Government has evolved and taken on a number of other dimensions which now allow it to be seen as a facilitator of modernisation. Prior to e-Government, the literature on 'IT in government' can be traced back to the 1970s where ICT was used internally within government (Grönlund & Horan, 2004). The computerisation of internal aspects of government administration proceeded unnoticed by citizens (Dugger, 1988):

> *'During the past quarter of a century, with hardly anyone noticing, the inner workings of democracy have been computerized. All our elections* [in the United States]*, from mayor to President, are counted locally, in about ten thousand five hundred political jurisdictions, and gradually, since 1964, different kinds of computer-based voting[19] systems have been installed in town after town, city after city, county after county.'*

[18] Further, an unplanned effect of the Hollerith punch-card machine was that women began to enter the ranks of the civil service as punch-card clerks (Agar, 2003); the use of technology by governments began to influence the stereotypes held within society which had a transformative effect on society. This is an example of the law of unintended consequences.

[19] Some academics regard e-voting as a subset of e-Government. With regard to the elections of representatives, voting is normally considered outside the ambit of government as voting is typically

In recent years, there has been an increasing interest in ICT development with particular focus on the Internet and web technologies. For example, in the United States the then Vice President, Gore led the National Performance Review, which placed strong emphasis on the role of the 'information superhighway' in the form of e-Government for delivering federal services (Grönlund & Horan, 2004; Margetts, 2006). e-Government has become a global agenda associated with modernising government. The concepts and models within the general e-Government arena have been developing and this has been reflected in the terminology used to describe this evolution. In Table 2.1 a summary is provided of the key terms that have been used to describe e-Government thus far, with one of the latest terms being 'open government'. This has led to a progressive enlargement of the scope of thinking on which e-Government is based where ICT is seen as the main facilitator of open government (Meijer et al., 2012; Dennis et al., 2013).

Terms	Author	Connotation
One-stop government	(Chakravarti & Krishnan, 1998)	Service Oriented
Digital government	(Aldrich, 2000)	e-Government
Online government	(Peled, 2001)	Internet Driven
Joined-up government	(Pappa & Makropoulos, 2004)	Connected
Connected government	(Kaczorowski, 2004; Kawtrakul et al., 2011)	Seamless
Whole-of-government	(Humpage, 2005; Christensen & Lægreid, 2007)	Integration
Transformational government (t-Government)	(King & Cotterill, 2007; Janssen & Shu, 2008)	Reform of practice
Open government	(Meijer et al., 2012; Dennis et al., 2013)	Transparency

Table 2.1 Evolving terms used to describe e-Government

2.2.3 Raison d'état[20] - Military and Defence

To meet this imperative, the US government for example, acting on the basis of raison d'état, has spent significant amounts of money on World Wide Military Command and Control Systems. The US government has created agencies such as the Defence

managed by an independent electoral commission. However, voting in parliament and in other government bodies facilitated by electronic devices can be regarded as a possible e-Government application.

[20] A French phrase meaning "for the national interest"

Advanced Research Project Agency (DARPA)[21] which has had a significant impact on the research, development and funding of ICT technologies. DARPA was involved with the development of the Internet; while government envisaged the Internet as tool to be used in wartime, the entrepreneurs used this technology in the form of e-Commerce to increase revenue. As e-Commerce began to produce promising returns on investment, government began to notice the advantages of using the internet in the form of e-Government.

2.2.4 Raison d'être[22] for e-Government

The raison d'être for e-Government has been based on strategies to achieve (Singh & Naidoo, 2005):

- improved public access to government information and services,
- improved quality and cost-effectiveness of government services,
- effective information sharing and communication with its citizens,
- improved opportunities for participation in democratic institutions, and
- better relationships with business people and private citizens.

In addition the government gathers, stores, and processes vast amounts of data. This large cache of data requires systematic management, storage, space, appropriate security protocols and considerable human effort. To add a level of efficiency to the government's collection of data, it recognised the advantage of using computers to automate the data bureaucracy. Government departments built their own unique domain specific computer systems that were not integrated with other government departments. Governments have not fully begun to acknowledge that these silo-computer-systems are ineffective for the automated bureaucracy and e-Government is seen as one approach to bridge this gap.

Furthermore, with governments under increasing pressure to modernise silo-computer-systems, automation has become important in the following areas (Michel, 2005):

- service delivery functions,
- legislative, record-keeping and communications functions,
- voting in parliament.

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[21] DARPA was originally called Advanced Research Projects Agency (ARPA). The Advanced Research Projects Agency Network (ARPANET), which was funded by ARPA, was one of the world's first operational packet switching networks and the progenitor of the Internet.

[22] A French phrase meaning "reason for existence"

2.2.5 e-Government as an Academic Field

When e-Government began to emerge, one of the first knowledge-sharing platforms was practitioner-oriented conferences. These were conferences that invited academic papers but also tried to attract a mixed audience, such as European DEXA E-GOV (http://www.dexa.org/previous/dexa2002/index.html), the US Digital Government (http://www.diggov.org/) and the European Conference on e-Government (ECEG, http://www.academic–conferences.org/eceg2005/eceg2005-home.htm). Then there were the academic conferences that focused on research knowledge exchange only, such as: IFIP WG 8.5 (International Federation of Information Processing - Information Systems in Public Administration) and EGPA, the European Group of Public Administration.

In addition, from an academic perspective, it has been argued that e-Government is multidisciplinary in nature involving several disciplines such as information systems, psychology, economics, management sciences, political science, and sociology (Grönlund & Horan, 2004). Each field will therefore have a different definition and view of the purpose of e-Government. These different views may be difficult to align.

2.2.6 e-Government Journals

The first paper alluding to the idea of e-Government was published by Howard Gammon in Public Administration Review in 1954. Gammon[23] (1954) stressed the importance of understanding how and when to deploy technology, as opposed to understanding how to create or maintain technology, the need to re-engineer government processes rather than automate existing processes, the importance of agile skills that combine an understanding of the processes of government with knowledge about the application of technology, the need for senior management support, particularly to reduce corruption, and the human and financial impacts of technology in government[24]. Gammon argued:

> *'The goal in government, as in business, is not just to have information on tap, but rather to have action information quickly available for the consideration of those who are charged with deciding the action to be taken.'*

Almost 60 years later, in an environment rich with ICT, we are still dealing with the same type of issues outlined by Gammon in 1954.

As the research interest in e-Government increased, several scholarly journals were established for the purpose of publishing research on e-Government. One of the first

[23] Oddly, Gammon's paper is published under the Book Review section of the journal. Intertwined with the review he also discusses ICT in government.
[24] Heeks has reclassified Gannon's comment on ICT in government; I have used this reclassification in the section.

journals to be published was the Electronic Journal of e-Government in 2003. Table 2.2 outlines the different journals that have been published; the UK, US and Austria are the countries that have recognised the importance of researching e-Government.

Title	First Publication	Country	Publisher	Status	Comment
Electronic Journal of e-Government	2003	United Kingdom	Academic Conferences and Publishing International Ltd.	Active	
Electronic Government	2004	United Kingdom	Inderscience Publishers	Active	
Journal of E-Government	2004	United States	Taylor & Francis	Active	Journal changed its name in 2007 to Journal of Information Technology & Politics
International Journal of Electronic Government Research	2005	United States	IGI Global	Active	
Datenschutzrecht und E-Government	2008	Austria	Austria Neuer Wissenschaftlicher Verlag	Active	
eGovernment Review	2008	Austria	Fachhochschule Kaernten	Active	
Journal of E - Government Studies and Best Practices	2010	United States	IBIMA Publishing	Active	

Table 2.2 e-Government Journals

2.2.7 Benchmarking e-Government

As governments became increasingly aware of the potential of the Internet and web-based technologies to improve the efficiency of government, there was increased investment in e-Government. It has become important to benchmark these e-Government activities (Zandi & Tavana, 2011).

e-Government benchmarking refers to a measurement of e-Government-related activities and/or government performance according to specified standards in order to compare and provide tools for improvement of these e-Government activities; the first study was published in the late 1990s (Yigitcanlar & Baum, 2006; Annttiroiko, 2008). Grönlund and Horan (2004) point out that these studies cover issues ranging from implementing

services to multidimensional 'e-readiness' indexes[25]. These types of studies are important because they provide valuable information for politicians, senior civil servants, and developers on the progress of their e-Government initiatives compared to other countries (Annttiroiko, 2008).

2.3 Customer Orientation

Recognising the need to modernise, government has become more accessible to members of the community by making the relationship less one of fear for the organisation. In so doing, customer-orientation has been proposed as a way in which governments have attempted to improve the quality of services offered to members of the community both corporate and private (Bannister, 2000; Helbig et al., 2009). There is a debate in the literature as to which is the most appropriate term to use in describing the individuals who obtain direct benefits from ICT systems in the e-Government environment and the terms 'customer' or' citizen' are both used (Mintzberg, 1996; Brewer, 2007). The term customer suggests a number of issues, one of which has to do with the organisation satisfying a particular need and service. The term customer also suggests the possibility that the person receiving the service has some degree of freedom to choose the service provider. In the majority of e-Government systems the person who utilises the service *does not* have any choice. Further, in government it is difficult to describe the customers. Could the customer be taxpayers for the revenue service? Children registered at government schools? or pensioners receiving social grants? Customer-orientation in the private sector seeks to increase consumer demand. However, there is no corresponding purpose in the public sector (Garson, 2008). It is argued that the term customer is inappropriate, and the term citizen serves to better describe the relationship between the provider and the user of the e-Government services[26]. The term citizen-oriented has been adopted in this research.

The current South Africa government which is using a citizen-orientation philosophy has coined the term *Batho Pele* (1997). Batho Pele is a Sotho expression which means 'people first', and in this context it is aimed at improving service delivery to citizens. This philosophy requires a transformation in delivery method that is regarded as fair or just, transparent, economic, realistic, reasonable, and transformative (Mofolo & Smith, 2009). The South African e-Government policy framework states that 'the starting

[25] See for example Benchmarking E-Government Development of the United Nations Member States (http://egovernments.wordpress.com/) or Benchmarking e-Government: A Global Perspective (http://unpan1.un.org/intradoc/groups/public/documents/un/unpan021547.pdf)

[26] Despite this it is important to state that e-Government services are used by corporate bodies and there is debate as to how appropriate it is to refer to these entities as 'citizens'.

point in the e-Government drive should always be to identify what the customer wants' (Department of Public Services and Administration, 2001). This is supported by the Batho Pele principles of: consultation with citizens, setting service standards, increasing access to services, ensuring a culture of courtesy to citizens, providing accurate information to citizens, openness and transparency in terms of how recourses are used, redress which is related to explaining why the services level is not as advertised, and value for money in terms of services provided (Department of Public Service and Administration, 1997). Batho Pele is also supported by the following acts and policies:

- The Constitution of the Republic of South Africa of 1996 (as amended), which is an overarching legislative framework.
- The White Paper on the Transformation of the Public Service of 1995, which is an overarching policy framework.
- Public Service Regulations of 1999 and 2001, which is an overarching legislative framework.
- Open Democracy Act of 2000, which deals with access to information.
- Promotion of Access to Information Act of 2000, which deals with access to information.
- Electronic Communications and Transactions Bill of 2002, which deals with ICT.
- e-Government strategy of 2001.
- White Paper on Transforming Public Service Delivery of 1997, which deals with transforming the civil service.
- Promotion of Administration Justice Act of 2000, which deals with transforming the civil service.
- Public Finance Management Act of 1999, which deals with transforming the civil service.

Therefore e-Government is considered part of the civil service transformation which is guided by Batho Pele principles (Farelo & Morris, 2006). It is important to note that this is an aspiration and there are many challenges to achieving Batho Pele (Trusler, 2003).

2.4 Contextualising the Concept of Success in e-Government Applications Design and Development

The issues relating to success of e-Government applications are viewed differently by the various stakeholders (Chigona et al., 2010; Matavire et al., 2010). One possible reason for these varying views on success may be related to the differences in perceptions of the meaning of success in the minds of the people who evaluate e-

Government applications. For example, external stakeholders associated with e-Government applications may use budgets and time-frames as an indicator of success, while internal stakeholders may use the delivery of service of the project as an indicator of success. Hence, evaluations by different groups of stakeholders on the success of e-Government applications, do not always match (Agarwal & Rathod, 2006). Further, with e-Government applications, success is often comprised of the ability to cope with an extended period of trial and error within the project before the appropriate results are achieved. Thus, evaluation of the success of the application may be difficult.

Success in this thesis is defined as an e-Government application that produces required outcomes to stakeholders, and an unsuccessful e-Government application is defined as an application that does not produce required outcomes. Required outcomes are defined by the key internal stakeholders involved with the e-Government application, and when the key stakeholders understand the context specific language of e-Government, the stakeholders can communicate more efficiently amongst themselves and project developers. leading to a greater possibility of understanding the requirements, appropriate design and acceptance of the application.

2.5 An Analysis of Some e-Government Applications

It is a challenge to classify 'failures' in e-Government systems. However, one definition of failure in an e-Government application is when the system does not meet expectations. Heeks (2006b; 2006a) estimates that 60% to 80% of known e-Government projects are unproductive in some way. According to the UK government's chief information officer:

> *'Not many private sector projects have to deal with the number of requests and people that government schemes do, and those that do, often suffer the same problems when it comes to whether the system works and end customers can actually use it.' (NHS Modernisation Agency, 2004)*

The number of stakeholders is higher, and the process and outcomes are more complex in e-Government applications as compared to commercial systems (Scholl & Klischewski, 2007). The reason for this is sometimes referred to as 'turf wars' (Bannister, 2005). Turf wars in e-Government applications cover issues relating to localised power plays in the project and territorial games which have a negative effect on the design and development of e-Government applications.

Unsuccessful e-Government initiatives have been attributed to multiple factors [organisational, institutional, technology and structural] (Gasmelseid, 2008). The failure to identify and document the required innovative processes and requirements has also been identified as a key cause of concern resulting in costly setbacks (Wernberg-Tougaard et al., 2008). These setbacks affect the quality of policy and decision making in government. The idea of utilising ICT for the purpose of providing information for managers in government is not a new idea, and applications, such as those employed in the South African Revenue Service, have been in use for the past 20 years.

An issue which has had some influence on the outlook of e-Government development has been business process re-engineering. Although business process re-engineering was not regarded as a great success, the ideas behind business process re-engineering did cause organisations to reconsider how business was configured. Hammer (1990) argued that significant investment in ICT had delivered disappointing results, largely because organisations tend to use technology to automate existing inefficient and ineffective processes. Automating existing inefficient and ineffective processes does not address their fundamental performance deficiencies in delivering services. Hammer (1990) further argued that organisations should be re-engineered by using the power of ICT to achieve improvements in performance. Using ICT to facilitate the types of systems that Hammer (1990) was proposing in business process re-engineering can be seen as an example of what Zuboff (1988) referred to as *transformate* systems. Finally Hammer (1990) claimed that at the heart of transformation is the notion of 'discontinuous thinking', of recognising and breaking away from the traditional rules and fundamental assumptions that underlie current operations. However, a premature break from traditional rules and fundamental assumptions could have some negative effects, as the recipients of the e-Government system may not be ready to deal with the benefits of the system.

The evaluation of e-Government applications by Heeks (2008a), as displayed in AppendixB, has been extended. Each e-Government application was classified using Zuboff's (1988) concepts of *automate*, *informate* and *transformate*. It is interesting to have these three categories, but any one particular system will have aspects of all three concepts built into it, and it may be that a system is strongly *automate* with some minor implications of *informate* and *transformate,* or it may be that the system is strongly *informate,* with smaller implications of *automate* and *transformate*.
The table in Appendix B is constructed as follows:

- location of the e-Government application;

- the type of e-Government application;
- an evaluation of the application. The evaluation criteria are defined as follows:
- largely successful: most stakeholder groups attained their major goals and did not experience significant undesirable outcomes,
- largely unsuccessful: some goals were attained but most stakeholder groups did not attain their major goals and/or experienced significant undesirable outcomes,
- partially unsuccessful: major goals for the initiative were not attained and/or there were significant undesirable outcomes,
- partially successful: some major goals for the initiative were attained but some were not and/or there were some significant undesirable outcomes,
- successful: most stakeholder groups attained their major goals and did not experience significant undesirable outcomes,
- totally unsuccessful: the initiative was never implemented or was implemented but immediately abandoned,
- uncertain: applications that were not evaluated.

This analysis provided by Heeks (2008a) is interesting. However, there are a number of substantial problems with this analysis. For example, the semantic differentials that are used in the analysis are not clear;

- where possible the estimated cost of the application;
- and finally a classification of the applications with reference to Zuboffs' (1988) notions of automate, informate and transformate.

From the analysis of the 68 different e-Government applications, 38 were classified as *automate*, 30 as *informate* and there were no *transformate* systems; see Figure 2.1. The tables for *automate* and *informate* systems indicate the semantic differential and the number of e-Government systems associated with that category. For both *automate* and *informate* systems there are more unproductive applications than productive applications.

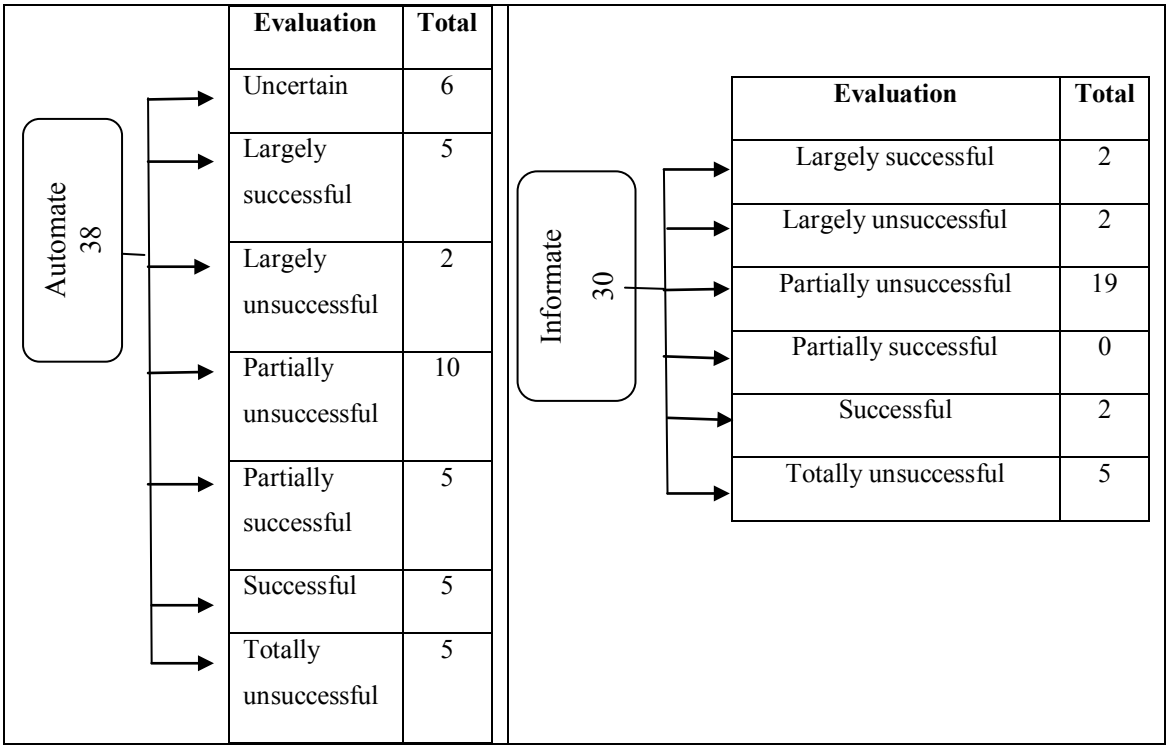

Figure 2.1 Summary of Analysis of e-Government Applications

Despite the perception that e-Government applications are unsuccessful, Sarantis, Askounis, and Smithson (2009) report that an increasing number of countries are formulating ambitious action plans for implementing e-Government systems. Bannister as quoted by Jenner (2009) asserted: "Alas, the history of government computing is dotted with what, in the worst case can only be described as computer disasters, and in the best as poor investments." From the considerable number of partially unsuccessful and totally unsuccessful applications shown in Figure 2.1, it is reasonable to assume that e-Government application design, development and implementation faces multiple challenges.

2.6 Challenges associated with e-Government systems

In this research the challenges affecting e-Government have been categorised as: systemic obstacles to success; relationships between key actors; drivers for change; gaps in understanding and managing stakeholders.

2.6.1 Systemic Obstacles to success

There have been several successful e-Government initiatives. For example, the Republic of Korea, the Netherlands and the United Kingdom and Northern Ireland have been ranked as the top three countries in the United Nations e-Government development index (United Nations, 2012). However, Sarantis, Askounis, and Smithson (2009) argue that some of the project management approaches that are proposed for e-Government project implementation are more suited to the management of the overall development of

information systems, rather than being directly targeted to a specific e-Government need. The resulting effect of this is a poor understanding of the key issues required to make e-Government a success, and it also detracts from the ability to conceptualise what the benefits are. Inappropriate project management approaches further complicate an already complex ICT project. As stakeholders are both internal and external to the project, it becomes a difficult task to ensure that the project satisfies the various needs of the community of stakeholders (Juciute, 2007; Kamal et al., 2011).

Maumbe et al. (2007) argue that e-Government applications can benefit from an internal plan to monitor and address specific challenges to the application. Technological complexities, complex social processes and independent human agents according to Moodley (2005a) are not seriously factored into e-Government applications. Guanghua (2009), in a similar light, contends that e-Government applications are largely constrained by the social context of the stakeholders. From a different perspective, the UK National Audit Office (2011) pointed out that

> *'the ICT profession across both private and public sectors is immature in comparison to traditional professions such as medicine, law or accountancy. There is no core set of recognised qualifications and a very wide variety of entry points into the profession. This has made it harder for those in the senior civil service without ICT experience to understand the full value that the profession can deliver.'*

The National Health System in the UK (Brooks, 2007) highlights the impact of the above mentioned problem on the success and failure of an e-Government system.

With regard to intragovernment and intergovernment data-sharing and data-mining, there is a privacy and data security concern (Maumbe et al., 2008; Fedorowicz et al., 2010). The recent hacking of several Malaysian e-Government websites (Ribeiro, 2011) highlights the need for data privacy and data security in e-Government systems. These types of attacks erode the confidence of citizens in the leadership of government.

2.6.2 Relationships between key actors

Leadership and key stakeholders' involvement affect the success of e-Government applications (Luk, 2009). In the context of government departments, civil servants, influenced by their ministers, may attempt to be agents of technology change. It has been known that ministers issue directives to their departments to implement particular systems within a pre-defined time period often attached to their term of office (Sudan, 2002; Mooij, 2007) without an appropriate development process in place. The ICT

personnel, who do not wish to disappoint the minister, hastily try to develop solutions and in their endeavours may compromise the development process.

Achieving e-Government success requires active partnerships between government, citizens and the private sector (Farelo & Morris, 2006). It is therefore demanding to succeed with e-Government, as there exists a complex set of dynamics with citizens and how they use government services. The total number of US citizens that are actively engaged with e-Government applications is relatively small (Heeks, 2006a). In Europe, e-Government services are used on an average of 3.1 times a year, compared to citizens who would rather personally visit a government department, which they do 1.5 times a year (Millard, 2006). In Africa there are no reliable statistics on how frequently e-Government services are used by citizens.

Complexity in e-Government applications also poses a particular challenge (Purao & Desouza, 2011) to designers and developers of e-Government applications. For example, Lips (2008) reports on the 'Kafkabrigade' project in the Netherlands. This project attempted to tackle what she refers to as the '*wicked*[27]' problems or excessive administrative burdens from a citizen-centric point of view. The Netherlands national government has launched a website (www.kafkabrigade.nl) where Dutch citizens can post their problems concerning disjointed government departments. Relationships within e-Government structures are complex, for example, government-to-citizen, citizen-to-government, government-to-government, government-to-business, business-to-government, government-to-employee, and employee-to-government (Annttiroiko, 2008). Governments adopting other countries' e-Government systems have an implementation problem.

2.6.3 Drivers for Change

Agarwal (2007) points out that a top-down management approach has been followed by several e-Government projects which have often not worked and the resultant system has not been able to fulfil the needs of the citizens despite the cost of these projects. Using the top-down management approach, the managers have an understanding of the goals of the system and the users may have a different understanding of the goals of the system.

[27]The term 'wicked problem', originally used in social planning, describes a situation where any proposed solution to a complex problem makes other aspects of the problem worse, thus creating another problem. The problem is characterised by a series of interrelated issues that are difficult to articulate and sometimes they are contradictory. There are a number of stakeholders who have an interest in solving the problem, therefore it is important that the stakeholders buy into any proposed solution. The solution is constrained by limited resources (Rittel & Webber, 1973; Rosenhead & Mingers, 2001).

This introduces an 'understanding gap'. Throughout the world there has been a considerable level of e-Government activity and different countries have applied these technologies in different ways to achieve their objectives (United Nations, 2012). Despite various claims of success, there is a lack of published data on successes and failures of these e-Government applications (Agarwal, 2007).

Following on Agarwal's (2007) evaluation of international e-Government applications, Moodley reiterates (2005b) that South African ICT government programs are adopted and implemented in a top-down approach. The top-down management approach tends not to focus on the needs of the citizens. Singh (2010) argues that ICT can be used to facilitate a particular desired objective; it is not the objective. This misunderstanding between government and the citizen affects e-Government applications and may contribute to creating understanding gaps.

The task of implementing productive e-Government applications has been further complicated by budgetary constraints which are imposed by governments. e-Government projects can be subjected to a higher degree of scrutiny to evaluate whether or not they deliver the benefits which they have promised (Gupta et al., 2007) for government and the citizens. e-Government applications are also affected by digital divide issues (Guomundsdottir, 2005; Hossan et al., 2006; Helbig et al., 2009) as discussed in Chapter 1.

Another challenge that e-Government applications face is that of adoption, getting the new e-Government system implemented and used by the target audience (Al-Eryani, 2009; Heeks & Santos, 2009). Each application must take into account the variable factors influencing the problem. Abrahams (2009) asserts that a significant number of e-Government initiatives are information based, and only a few include interactive content, making the applications less attractive to use. This is confirmed by Naidoo et al. (2011) that, for example, the South African government is predominantly concerned with efficiency and improvement through information dissemination, rather than adopting a more comprehensive e-Government system. An example of stakeholders disregarding the information provided by an e-Government system is the case of the Natural Resource Ministry's Scientific Information System (Heeks, 2002a). The application was developed to provide scientific information for decision-making on fisheries management and development activities. However, decisions made by senior officials and senior committees did not take into account the information provided by the system.

2.6.4 Gaps in understanding

A gap in understanding ICT design, development and implementation may be defined as a difference between senior management's understanding and/or potential citizens' understanding and the way in which these understandings are received and acted upon by ICT professionals. The problem of understanding gaps in the perceptions related to investment in ICT systems between stakeholders is a feature of both the private and public sectors. It is well established that in ICT development, problems often stem from the original challenge or opportunity not being adequately defined (Pressman, 2009; Murer et al., 2011). This in turn may be seen as a result of inadequate corporate communication to express what the requirements are. It has been suggested that one way of improving this situation is to employ an IS/IT benefits realization process (Lin et al., 2007). An IS/IT benefits realization process is an approach to information systems conceptualisation and development in which there is continuous formative evaluation[28] and this is seen as an ongoing co-development and joint learning endeavour. The essence of an IS/IT benefits realization process is that the key stakeholders of the information systems are identified at the onset and that they accept and agree their continuous involvement and co-development in the project (Remenyi et al., 1997).

Emery et al. (2009) and Maumbe et al. (2008) point out that e-Government models are primarily developed for first world countries. These models cannot be imposed on developing countries as they cause further understanding gaps. Wastage and damage of government ICT resources further hamper the implementation of e-Government systems. Civil servants do not understand, or policy does not provide, adequate guidance on how to deal with 'redundant ICT resources'. In the light of scarce resources and the global financial crisis, government departments are experiencing increasing fiscal, public and political pressure to increase return on investment from their e-Government applications (Moodley, 2005a; Naidoo & Palk, 2010).

2.6.5 Managing Stakeholders

In some government departments there are internal inefficiencies in terms of ICT and human resources (Farelo & Morris, 2006). According to Abrahams (2009), e-Government applications face challenges because of the fragmented nature of government administration and its communications processes. The use of silo structures can optimize the efficiency of individual parts of government, but it often does so at the expense of understanding the organisation as a whole and seeing how they can relate to

[28] Formative evaluation is a process where key stakeholders contribute their views and values as to how the proposed system be developed.

the environment in a more effective and holistic manner. It has been proposed that a holistic approach be adopted where public service agencies work across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues. These approaches can be formal and informal. They can focus on policy development, program management and service delivery simultaneously (Australian Public Service, 2004).

Kaisara and Pather (2009) contend that even a well designed and developed e-Government system has a latent defect. If policy-makers do not incorporate access and adoption strategies which take into account the environment in which the e-Government system is designed, the chance that the project will fail is high. Further, a private sector solution cannot be imposed as an e-Government solution (Heeks, 2003). The National Data Bank project was designed to provide a broad range of statistical data and information to key Bangladeshi stakeholders (Heeks, 2002c). However, in attempting to satisfy multiple levels of stakeholders in different sectors, the project did not meet users' expectations.

2.7 The Environment within which e-Government Operates

Democratically elected governments have been given multi-faceted mandates over the years. These governments have responded by 'democratising' information flows to citizens by making government services available on the Internet in the form of e-Government. There are a whole range of government services available online for those citizens who have access to the Internet. Paradoxically, it is those citizens that do not have access to the Internet who are the ones that are most dependent on publicly provided services (Worrall, 2011).

As discussed earlier, government is working towards changing the authoritarian image associated with their departments and this has led to a situation where the services are now available at multiple service points and with claims that these services are more cost effective (Hsiao et al., 2012). The citizen now has the opportunity to choose the service provider[29] that is the most conveniently located to visit. It is important to note, however, that e-Government applications have the potential appearance of ‘opening up’ government services and making them transparent and efficient, the services remain monopolistic and non-competitive.

[29] Pick 'n Pay, Spar and Checker are examples of commercial outlets which have been used by parastatals or local government bodies in order to receive certain payments such as water bills, telephone bills and electricity bills in order to add a level of convenience for the users of these services.

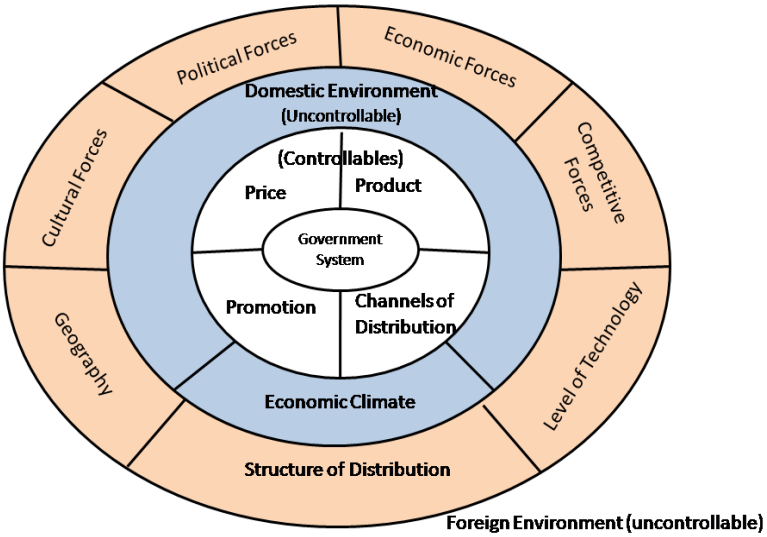

Figure 2.2 The Government Environment (adapted from Ricks (1993)

Figure 2.2 shows a graphical representation of the environment in which e-Governments systems operate. The inner ellipse represents the heart of the government department in the form of an e-Government application. The second ellipse represents the controllable variables for a government service. The government controls the price, product, promotion of the product and channels of distribution. (Table 2.3 illustrates examples of government's controllable channels of distribution.) The third ellipse represents the domestic uncontrollable environment and the outside ellipse relates to the foreign uncontrollable factors that affect government systems. Thus, there exists an intricate and complex relationship between these interlinked ellipses. Figure 2.2 is important in the context of South Africa because after years of sanctions, economic exclusion and dysfunctional government systems, the current government systems are affected by these legacy issues.

Product	Motor Vehicle Licence	Traffic Fines	Television Licence	Taxes
Price	Regulated by government	Regulated by government	Regulated by government	Regulated by government
Promotion	• Legal Enforcement • Advertising	• Legal Enforcement • Advertising	• Legal Enforcement • Advertising	• Legal Enforcement • Advertising
Channels of Distribution	• Government licensing office • By mail • At the South African Post Office online	• Metro Police Departments • By mail • Online • Third party service providers e.g. Banks	• Commercial Retailers e.g. Spar • Easypay Point e.g. Woolworths • SABC Regional Offices • Online	• SARS offices • Through a tax consultant • Online via SARS eFiling

Table 2.3 Service Provided by Government

From Figure 2.2 it is reasonable to conclude that the environment in which governments operate is complicated and these aspects influence e-Government development and implementation. As discussed earlier, Hammer (1990) has suggested that organisations need to break away from traditional approaches. The traditional approach to eliciting information in government was that a citizen would request specific information via a government department. The government department would request the information from the IT department, the IT department would deliver the information to the government department and the government department would relay the information to the citizen.

Assuming the civil servant understands the request, the relevant government system may or may not be able to process the request. This traditional approach typifies government information systems. For example, in the South African content, citizens still queue in long lines at government departments to process documents. This system is inflexible and largely closed to citizens and the world. In this model, the IT people are viewed as the 'knowledgeable elite'.

The more modern approach is that the system is opened up to the citizens, and all key stakeholders can interact with the system using Internet based technologies. The system and all key stakeholders can interface with each other. The domain of information systems development and implementation is still that of the IT department. This more contemporary approach adds a new level of complexity to systems development and

implementation. For example, understanding the particular needs of the citizen is an important aspect in developing functional and usable e-Government systems.

Further, Norris and Benjamin (2006) have argued that few e-Government research articles adequately use the available literature (such as IT and government or specialised literatures), and few create or test theory. Coursey and Norris (2008) confirm that there are poor theoretical explanations as to why governments conceive, develop and use e-Government applications; they further argue that the existing models are not grounded in e-Government research or in the literature of how government adopts ICT. Nasr and Galal-Edeen (2012) have identified several e-Government development models, such as the models developed by Layne and Jungwoo (2001) and Baum and Maio (2000). These models have been influenced by e-business and have been extrapolated into the e-Government world. They provide some basis for an initial understanding of how e-Government may function. However, these models do not outline how governments go about conceiving and then developing an e-Government application. This means that there is currently no clear model that explains how e-Government systems are conceived. Figure 2.3 shows a model of how e-Government applications are conceived. An e-Government initiative is decided upon during the strategic IS planning process (SISP) or to use open source or business process re-engineering, or is sometimes influenced by a less formal processes (a minister who proposes some type of technology change - see Section 2.6.2)

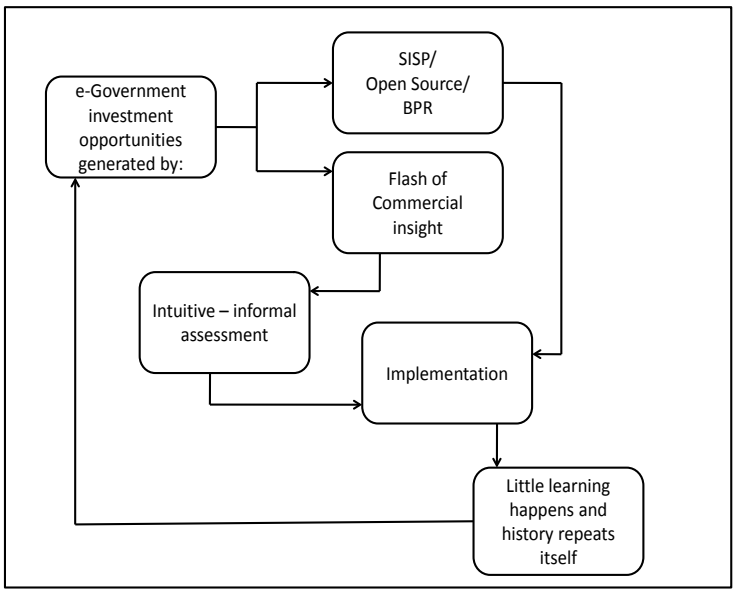

Figure 2.3 e-Government investment process (adapted from Lubbe (1996)

This initiative is then assessed during a formal process using a top-down hierarchical management approach (see Section 2.6.3). After this assessment, the e-Government initiative is designed and implemented. Little learning takes place during the e-Government development process because the initiative was based on less formal processes, and history again repeats itself. This process is thus repeated by all government departments without any learning taking place and information sharing across government departments. This type of approach occurs frequently in South African e-Government initiatives because there is no clear e-Government framework that exists.

2.8 The South African e-Government Environment

South African e-Government applications face other context specific challenges. Moodley (2005b) claims that exclusive emphasis is being placed on ICT projects, "*at the expense of careful analysis and consideration of the broader economic, social, and political elements that interact to improve the lives of individuals*". Moodley (2005b) and Singh (2010) further claim that there are several gaps in policy, gaps in understanding of ICT, gaps in understanding social process, bureaucratic incompetence, and gaps in understanding "independent human agency[30]". There are frequent yearly public commitments by successive South African presidents to provide e-Government services in their state of the nation addresses (State of the Nation Addresses 2010, 2011, 2012), but these commitments are partially realized as government is constrained by limited resources and appropriate skills. It is argued that the government promises e-Government services because some citizens are engaged in violent, fatal protests demanding improved service delivery (Alexander, 2010). These services delivery protests are interpreted as citizens wanting more effective and efficient service delivery, while there are promises that e-Government programs will lead to more effective and efficient service delivery.

2.8.1 Some South African e-Government Initiatives

SARS introduced its e-filing initiative in 2001 (South African Revenue Services, 2013). The aim of the e-filing system is to facilitate the electronic submission of tax returns and payments by taxpayers and tax practitioners. Taxpayers may however still submit their returns in the traditional paper-based way. e-Filing is aimed at improving operational efficiency in order to deliver a better and quicker service. There are a number of internal

[30] In this context, independent human agency refers to people's spontaneous reactions to events. It is a challenge to understand these reactions.

and external factors that have contributed to the success of SARS (South African Revenue Services, 2013). Externally, it enjoys strong political support from government, as well as functional governance practices. In this regard, there is a zero tolerance approach to corruption within the department. There has been an increase in SARS revenue by over a R100 billion since its inception. Furthermore, SARS has simplified the tax return forms, making the process easier. The system has also helped SARS to understand the risk profiles of citizens and industry segments. The electronic service is supported by a number of useful services such as 'same-day processing' of transactions. This addresses the problems previously created by backlogs in the system (Naidoo et al., 2011). The initiative is characterised as *transformate* systems.

The KwaZulu-Natal government (KZN) launched an e-Government initiative in 2011 called KznOnLine (http://www.kznonline.gov.za/). It is largely static and only provides information resources. The site displays a hotline number and two social media links. The social media content is mainly public relations. The Provincial Department of Economic Development also launched a website to facilitate job creation http://www.kznunemployedgrads.gov.za/. This site also has two social media links, a Facebook (link:http://www.facebook.com/pages/KZN-Unemployed-Graduates-Database/187978511243616) and a Twitter link @kznugrads (https://twitter.com/kznugrads). The FaceBook link is difficult to remember due to the long link name. This initiative is characterised as *informate* systems.

Newcastle Municipality in KZN purchased 32 iPads[31] for its councillors. The goal is to move towards 'paperless' council meetings. The municipality calculate the investment will repay itself in 24 months with the savings from photocopying and reprinting expenses. Ladysmith municipality purchased 53 notebooks for city councillors. The goal here is to reduce the 2 million rand cost on paper used in meetings (Reddy, 2012). Although these may be viewed as top-down projects, the benefits of inculcating an electronic culture and the resultant economic cost on paper saving could make these important projects for government as a whole. These projects are ongoing and have not been adequately evaluated. These initiatives are characterised as *automate*.

[31] This is an unusual e-Government delivery as it is hardware driven. iPads are particularly expensive hardware items which deliver a degree of prestige to the users. It is difficult to know how the municipality could have calculated a payback of 24 months with the small savings that are likely to be achieved through reduction in photocopying costs.

The South African Social Security Agency (SASSA) has successfully used ICT to speed up the processing and distribution of grants as well as to streamline the process. According to the Social Pensions System (SOCPEN) an average of 15977667 social grants were successfully processed during the period September 2012 to October 2013 (South African Social Security Agency, 2013). SOCPEN has further been used to identify and remove fraudulent grant claims (Reddy & Sokomani, 2008). These initiatives are characterised as *automate*.

The following e-Government projects are at various stages of implementation. The e-Justice programme is designed to improve judicial processes. The Home Affairs National Information System (e-Hanis) programme is designed to streamline and integrate personal identification data across government departments through the use of unique identifiers, and the National Automated Archival Information Retrieval System (NAAIRS) is designed to facilitate access to public archived records (Cloete, 2012).

2.8.2 Civil society's initiatives to govern

The ubiquity of mobile devices has begun to displace several government functions with citizen-led initiatives, leveraging the Internet and social media to self-manage civil and societal functions. eBlock is a South African community project striving to fight crime by providing the community with information about crime and to empower its members by using Geo-referencing (W5, 2012). The eBlockWatch 'incident map' shows all crime-related incidents reported by their members. The incidents are organised by geographical location and members can see what is happening in their neighbourhood (W5, 2012).

In one South African incident, a hijack victim, stuck in the boot of his car, used social media, Twitter to inform his girlfriend that he was hijacked. She used Twitter services and posted the message "Be on the look for DSS041GP my boyufriend (sic) has just been hijacked and is in the boot please RT[32]." This message went viral and the hostage was saved two hours later, demonstrating the power of positive crowd-sourcing.

It is important to consider how government itself assess its e-Government capabilities. For this assessment the audit findings from the Auditor-General of South Africa (AGSA) will be reviewed.

[32] In the language of social media application Twitter, RT means ReTweet. It is the equivalent to the forwarding of an e-mail message.

2.9 Self Assessment of e-Government activities in South Africa

The Auditor General of South Africa (AGSA) was established in terms of the constitution of South Africa and is a government institution that supports constitutional democracy. AGSA annually produces audit reports on government departments, public entities, municipalities and public institutions (AGSA, 2013). AGSA uses the following dimensions in its assessment of e-Government readiness in government:

- **IT Governance** consists of the leadership, organisational structures and processes that ensure that the organisation's IT resources sustain its strategies and objectives.
- **Security Management** consists of security measures that are in place to prevent unauthorised access to the departmental network and operating systems.
- **User Access Control** consists of systematic process of managing access of users to the department's computer applications.
- **IT Service Continuity** consists of the process to manage the availability of hardware, system software, application software and data that enable an organisation to recover/re-establish information systems services in the event of a disaster.

Percentage of Entities with Findings				
Year	IT Governance Challenges	Security Management Challenges	User Access Control Challenges	IT Service Continuity Challenges
Government Departments				
2011 - 2012	85%	53%	56%	68%
2010 - 2011	79%	81%	92%	100%
2009 - 2010	82%	93%	93%	82%
Public Entities				
2011 - 2012	65%	63%	67%	68%
2010 - 2011	75%	92%	95%	83%
2009 - 2010	56%	84%	86%	58%

Table 2.4 Heat Map of AGSA's IT Audit Findings (AGSA, 2010, 2011, 2012)

An analysis of the heat map[33] in Table 2.4 indicates that there are problems (red) with e-Government in both government departments and public entities. This heat map is constructed by calculating the percentage of audited government entities that have the same audit findings. One possible reason for this is that there is no prescribed government-wide IT framework (AGSA, 2012). The findings demonstrate problems or potential problems. The view taken in this research is that the Auditor General's (AG)

[33] A heat map is a graphical representation of data where the individual values contained in a matrix are represented as colours. In the above heat map; red, orange and yellow are used. Red represents a high value, orange lower values than red, and yellow lower values than orange.

findings should not be interpreted negatively; the AG has identified legitimate challenges. The AG's findings encourage the re-examination of issues relating to e-Government in government. However, the application of e-Government cannot be seen as the 'silver bullet' (Brooks, 1987) to the challenges facing government, citizens and business.

2.10 What can e-Government Deliver?

e-Government solutions cannot be seen as a response to corruption, poor service delivery, lack of transparency, or disjoined bureaucracies within government. African governments score poorly in terms of governance, anti-corruption and transparency. For instance, according to the Transparency International 2012 Corruption Perception Index which measures the extent of corruption in the public sector in 176 countries, South Africa is ranked 69 (Transparency International, 2012). The challenge of poor government, corruption and transparency cannot be solved by the application of e-Government. They may be partially mitigated by the appropriate use of e-Government as follows:

- electronic identification of citizens
- improving financial transactions between citizens and government
- monitoring policy, government assets and internal administration
- data collection
- tax collection and payments
- improving the way that the judiciary operates and
- procurement.
- However, it requires a change in people's personal moral codes as well.

e-Government applications have the potential to produce large volumes of data. This creates the e-Government paradox, large volumes of data but "no intelligent policies in place to mine the data" (Misuraca, 2013)[34]. When governments implement e-Government applications, these applications become long term assets that produce data requiring analysis and action. For example SARS analysis their tax data for anomalies in taxpayers year-to-year declarations, and then investigates these anomalies. Cordella[35]

[34] Keynote address by Dr G. Misuraca from the European Commission, Joint Research Centre, Institute for Prospective Technological Studies, Seville, Spain and Gianluca, at the 13th European Conference on e‐Government (ECEG 2013), Academic Conferences and Publishing Limited, Reading, UK. These comments are from the keynote address of the conference and are sourced from the PowerPoint slides.

[35] Keynote address by Dr A Cordella from the London School of Economics, London, UK, at the 13th European Conference on e‐Government (ECEG 2013) , Academic Conferences and Publishing

(2013) also argues that e-Government application "fails to create public value when the expectation of citizens on a given service change over time, a flexible and adaptive service delivery strategy is required to accommodate these period changes".

Furthermore, there are those who believe that e-Government will reduce costs (van Veenstra & Janssen, 2011) and also be a mechanism to create jobs. e-Government is not the holy grail that will solve these problems, e-Government can be used to facilitate policy implementation under the watchful eye of human agents.

2.11 Summary

The e-Government literature is relatively new and is still developing. It has not been explored in great depth. There are a relatively small number of active authors in the field (Dwivedi, 2009a; Cheng & Ding, 2012; Scholl, 2013).

A review of current literature shows that e-Government articles continue to be published in non-IS journals. Public administration journals are the main outlets for e-Government research (Bolívarxc et al., 2010; Hernández et al., 2012a). This indicates that policy related issues are a priority in e-Government research as opposed to design, development and implementation. IS researchers have not adequately focused on government and e-Government. There is little e-Government theory, but there are several definitions (Grönlund, 2010).

Further, the leading journasl that publish e-Government research (Scholl, 2013), such as Government Information Quarterly, Information Polity, International Journal of Electronic Government Research, Transforming Government: People, Process and Policy Journal of Information Technology & Politics, Electronic Government, an International Journal and Electronic Journal of Electronic Government are published out of the Europe or the US. There are no journals published in Africa that are focused on e-Government research.

e-Government initiatives have not always been successful in developing countries, partly due to the complex nature of e-Government, lack of resources, and other challenges that need to be addressed before the benefits of e-Governance can be fully realized. e-Government in Africa is under-researched. For the period of 2009 only 4 papers were

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Limited, Reading, UK. These comments are from the keynote address of the conference and are sourced from the PowerPoint slides.

published out of South Africa while in China[36] 172 papers were published (Khan et al., 2011; Hernández et al., 2012a). A search of the South African National Research Foundation database only retuned 6 results. Burke (2012) confirms that e-Government is an under-researched field in Africa. Further, a systematic literature review (Dogan et al., 2014) to assess how many peer reviewed scholarly articles were published about e-Government in Africa was conducted for the period between 2013 to 22 July 2014, consulting the following databases: EbscoHost, Science Direct, SpringerLink, Proquest and Sabinet. A search strategy was developed for each database using a combination of the following terms: e-government, information systems and Africa. Applying the search strategy to each database and eliminating duplications the following results obtained:

- EbscoHost - there are 2 papers,
- Science Direct - there are 7 papers,
- SpringerLink - there are 4 papers,
- Proquest, - there are 18 papers, and
- Sabinet - there are 10 papers

These results indicate that e-Government is not being adequately researched in Africa.

The concept of e-Government means different things to different stakeholders. While some view e-Government as a tool to add a greater level of efficiency to government, others take the view that a citizen-centric approach will have greater value, since it is the citizens that elect the government of the day. All democratic governments are using some form of e-Government. There are those e-Government applications that appear to use this technology more successfully, such as SARS e-Filing. However, there are more unsuccessful e-Government systems that are designed and developed using the latest thinking in IS, but do not meet the expectations of the users. e-Government applications are not only about hardware, networks and software, they are about the people who use this technology. It is about how people envisage that this technology will assist them in the execution of their duties. If there are perceived anomalies in the system, the system loses credibility, the developers are treated with suspicion and the traditional familiar approach that the user is comfortable with prevails. Therefore, what is required is a better understanding of how these e-Government designed and developed processes can be improved to deliver required benefits. The first step in this process involves establishing an appropriate research strategy. This is outlined in Chapter Three.

[36] Goldman Sachs economists Jim O'Neill coined the acronym - BRIC in 2001, referring to Brazil, Russia, India and China. South Africa joined the group and the acronym has changed to BRICS. These countries are regarded as a special group of rapidly growing economies. These countries are taking a leading role in their region(Atale, 2012).

Chapter 3
The Research Design, Informant Identification, Data Collection and Management

3.1 Introduction and Overview

The issue of research design is central to the collection and analysis of evidence in rigorous empirical research. This chapter outlines the research design followed in investigating the question: '*How can the industry-specific development issues and processes of South African e-Government applications be improved to deliver required benefits?*' and how the research design was operationalised. This research question requires an investigation into the processes that the South African government utilises in the creation and implementation of e-Government applications and the delivery of benefits there from. To understand how the South African government develops and implements its e-Government applications, it is necessary to investigate how proposed applications are conceived; how these ideas are taken from a conceptual state to a project or programming phase; how the planned applications are then actualised; and to investigate what type of benefits the project sponsors and/or champions expect to achieve. In order to understand how an e-Government application moves from conceptualisation through development to operationalisation, it was necessary to acquire data from interviews with informants[37] in different government departments, as well as other supporting information such as reports, government websites examinations, project documents and external media comments. The data required to answer this research question is primarily qualitative in nature.

A qualitative approach to academic research is sometimes questioned but in this case it is the most suitable. An interesting way of thinking about the effectiveness of qualitative research was presented by Myers (2009) who argued that qualitative research may usefully be compared to the investigation of a complex question such as that involved in solving a crime. Myers asks us to imagine a scenario where the crime scene investigators try to solve a crime without being able to question or interview potential witnesses. He

[37] The concept of 'informants' from a South African perspective has negative political connotations. However, Ogden (2008) defines the informant as a 'special category of qualitative research participant because of a particular expertise or knowledge that is brought to research. Informants know and understand the kind of information that is of interest to the researcher.' The word informant is solely used in this research as Ogden (2008) defines the concept.

argues that if crime scene investigators were restricted to using only quantitative data, the crime would not be solved unless a thief was caught red-handed or a murderer was found with a smoking gun in his or her hand. He further goes on to say that if the representatives of the criminal justice system were not allowed to probe witnesses in court, the court's verdict would be questionable. Myers argues that it is important to use a focused, structured context-specific dialogue for the open exchange of ideas and meanings in order to lead to understanding. In the context of this qualitative research, dialogue is not only an appropriate method for data collection (Costantino, 2008) but a highly effective one. Furthermore, qualitative research is iterative by nature (Mills et al., 2010; Yin, 2011); a useful way of understanding this is provided by Remenyi (2012), who outlines the processes of qualitative academic research in a way similar to that described in Figure 3.1 below.

3.2 The Research Process

Remenyi (2012) points out that when using a qualitative approach for data collection, such as interviews, the researcher is involved in a learning experience in which the data collection technique as well as the instrument may be improved by means of an iterative feedback loop, as outlined in Figure 3.1.

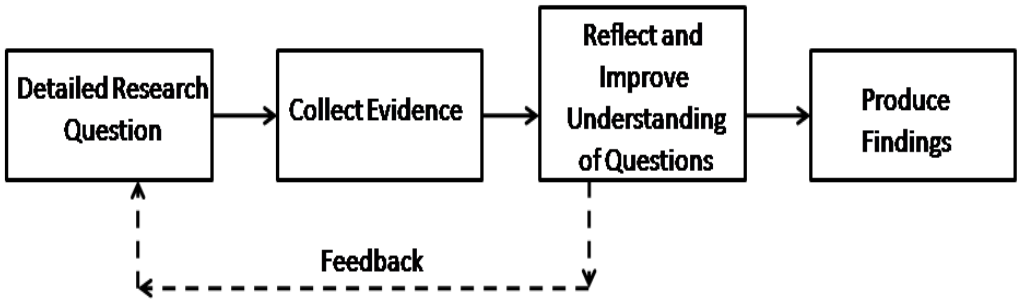


Figure 3.1 The Feedback process in Qualitative Research

This feedback loop is important because it gives the researcher the opportunity to reflect on the research instrument and the process of data collection.

Yildiz (2007) in his study classifies e-Government research into 'output', 'outcome' and 'process-oriented'. Yildiz points out that e-Government research has focused on observation and evaluation of the outputs of e-Government initiatives. These studies are classified as output-oriented and outcome-oriented, as outlined in Table 3.1. Studies that examine the contents of government websites, list the types of online services, and present heuristics for benchmarking, are classified as output-oriented. Output-oriented

studies are descriptive in nature, use secondary data rather than primary data, and focus on a particular point in the development of e-Government applications. From a public administration perspective, outcome-oriented studies examine which government performance indicators are improved as a result of a particular e-Government initiative. However, output-oriented and outcome-oriented studies do not examine the unique context specific processes and issues that affect e-Government applications design and development. This research area is in its infancy and therefore there are gaps in the understanding of how to design and develop e-Government applications. Process-oriented studies use primary data collected from fieldwork. Data collection methods such as interviews, participant observation, and archival analysis are used to understand and explain the e-Government development processes and to generate theory.

By mapping the objectives of the research against Yildiz's (2007) framework (see Table 3.1 under the heading 'This Research'), the research is classified as process-oriented. Based on this mapping, the research strategy that will be used is the development of theory based on evidence collected from informants in contemporary e-Government applications development (Myers, 2009). In the context of the research, it appears that e-Government project sponsors and project champions have prematurely designed and developed e-Government solutions without adequately understanding the context and effect that these solutions have on citizens or business. The required evidence will be collected systematically using a rigorous research method.

Dimensions	Orientation					
	Output		Outcome		Process	
		This Research		This Research		This Research
Focus	Web sites, online government services, front office	√	How does an e-Government application affect a certain variable such as trust, accountability, transparency, corruption, government effectiveness, customers' perceptions of service quality	X	Processes of decision making, planning, implementation, back office	√
Method	Content analysis, determining best practices, benchmarking, surveys, case studies	X	Content analysis, determining best practices, benchmarking, surveys, case studies	X	Interviews, archival analysis, discourse analysis, case studies	√
Data	Primary and secondary	√	Primary and secondary	√	Primary	√
Mode of analysis	Deductive	X	deductive	X	Inductive	√
Outcome	Descriptive, exploratory	X	Descriptive, exploratory	X	Theory generation, explanatory	√

Table 3.1 An e-Government Research Classified Criteria

Key: √ = yes x = no

3.3 The Research Method

Methods are the procedures, tools and techniques employed by a researcher to generate, analyse and understand data (Schwandt, 2007b; Bazeley, 2013). The research method involves identifying informants within the South African Public Service Sector who have direct involvement with e-Government policy development or project implementation and evaluation. These informants were interviewed on a face-to-face basis, and the discussions with them were recorded. Transcripts were prepared and used in conjunction with other documentary evidence for the data analysis.

The data analysis was performed by using principles of content analysis and interpretive analysis. This analysis was used to facilitate the formulation of a theoretical conjecture concerning the design of e-Government applications.

Figure 3.2 displays a 5 stage diagram that outlines how the research design was applied.

1. In stage one, the extant literature was critically reviewed. This provides a platform on which to build an understanding of the issues involved in the topic and provide suggestions as to where there are gaps in the current state of knowledge in this field of study.
2. However, because e-Government is a relatively new phenomenon, the debate in the literature was supplemented by a Delphi Study. This study was used to develop consensus around the issues affecting e-Government.
3. The third stage of the research involves developing a deeper understanding of the research issues.
4. The fourth stage involves data collection primarily in the form of interviews. Using interpretive analysis the data was be analysed.
5. In the fifth stage a theory is proposed.

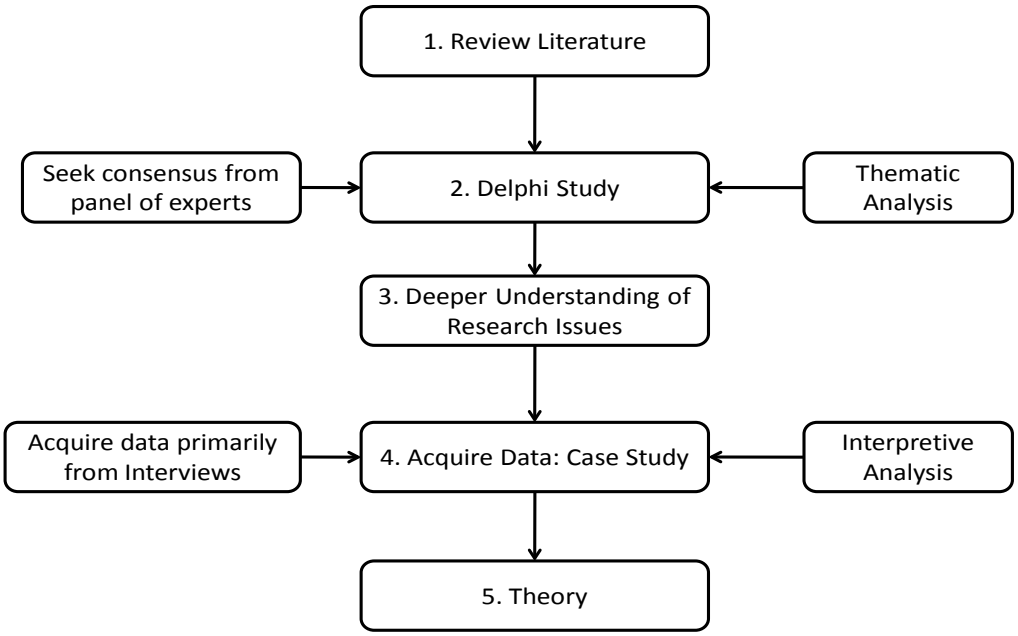


Figure 3.2 The Stages of the Research Design

3.4 The Delphi approach to acquiring a deeper understanding of the context of the research question

As noted in Chapter 2, the concept of e-Government is wide ranging which involves many different aspects of how governments use the Internet and the web to support the services offered to citizens. In the ICT development world, the research problem could be understood in a number of different ways and be answered depending on the context in which potential informants might view the question. In order to reduce possible misunderstandings in this regard and to explore potential sub questions it was decided to conduct a Delphi study which would tap into the insights of e-Government professionals, academics and other stakeholders. A Delphi study is a structured technique utilising a team of experts which uses a questionnaire for soliciting opinions and encouraging respondents towards a position of consensus (Linstone & Turoff, 2002; Powell, 2002). A series of issues are presented to the Delphi group and they are asked to indicate their agreement with a proposition on a scale. The average score is calculated for each of the statements. The questionnaire is then distributed a second time to the same group allowing the participants in the study to see the average score for each statement from the previous round and to reconsider their opinion in the light of this average. Often participants in a Delphi study change their opinion as reflected in their responses in the light of the data indicating the average score from the previous round. This process is repeated a third time. Figure 3.3 outlines this three phase Delphi study.

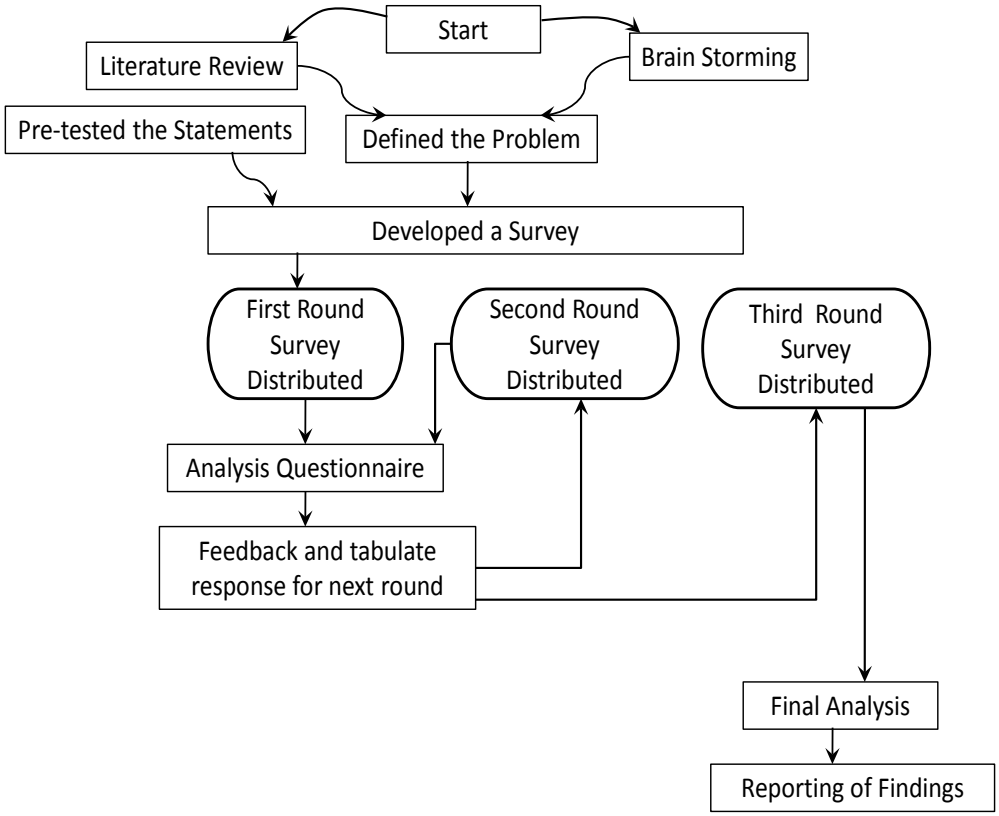


Figure 3.3 Flow Diagram Showing 3 Round Delphi Study

The value of the Delphi study lies in obtaining a view of the relative importance of the issues presented to the informants. It is also useful to see how the opinions of the informants change over the three rounds and how closely or how dispersed their opinions are by the final round.

3.4.1 Setting up a Delphi Study

The Delphi method has been used in Information Systems research at least since the 1980s (Päivärinta et al., 2011). Some researchers commence a Delphi study by distributing an open-ended questionnaire to a group of experts (Linstone & Turoff, 2002), because there may be gaps in the literature. However, in this case, the open-ended questionnaire is not considered to be necessary since a literature review was conducted (Hsu & Sandford, 2007; Watson, 2008), as well as, a brainstorming (Geist, 2010) session with four e-Government researchers.

A total of 20 statements which reflect issues within the field of e-Government applications was identified. To ensure that the members of the Delphi study will be able to understand the issues addressed in this exercise, a pre-test was conducted. The pre-test

process lead to the refinement of the statements. The Delphi study consisted of three rounds. In the first two rounds there are no open-ended questions, but in the third round the informants are asked to evaluate the statements again, as well as to list five major obstacles that they are aware of which have caused problems in the deployment of e-Government applications.

The distribution and collection of the data will be electronic (Avery et al., 2005; Gordon & Pease, 2006; Espinosa & Caro, 2011). Regarding informed consent, informants accept the terms and conditions on the survey website. In accordance with the ethics protocols governing the research, informants will be sent a letter of consent (see Appendix C) and a research participants' information document (see Appendix D).

3.4.2 The Delphi Studies Expert Panel

An invitation to participate in the study was posted on a community mailing list[38] dedicated to e-Government. This list is was managed from the University of Washington. The panel that completed the study consisted of 41 respondents, all with experience in e-Government, see Table 3.2.

Respondents	
Academics	26
Practitioners	4
Consultants	2
Researchers	8
Other: (Government statistics and data systems)	1
Total	41

Table 3.2 Respondents to Delphi Study

3.4.3 Three Round Delphi Study

The statements presenting the 20 selected e-Government issues were distributed to the informants using LimeSurvey[39].

A pilot test or field test was conducted. The purpose of the pilot study was to examine and rectify any potential problems before full implementation of the Delphi study.

[38] see http://mailman1.u.washington.edu/mailman/listinfo/egov-list

[39] LimeSurvey is a free and open source on-line survey application, distributed under the GNU General Public License. LimeSurvey is a web server-based application that enables users to develop and publish on-line surveys and collect survey responses.

For the first round of the study, informants can only proceed to the survey if they indicated that they have read and accepted the Informed Consent statement on the website. On completion, the electronic survey is submitted and an automatic e-mail from LimeSurvey was received stating that there are new responses added to the database. After the due dates of each round, the data was exported from the LimeSurvey database to a spreadsheet which had been specifically designed to calculate the average response from the group for each issue and reprint the statements showing each individual's actual response and the average score for each question.

3.4.4 The Delphi Study

After conducting the literature review and brain storming session, 20 statements were identified. The statements were pre-tested at the University of South Africa with six academics and with three practitioners. This led to the refinement of the statements. The final list of twenty statements that was sent to the expert panel were:

The success of e-Government systems is affected by:-

1. The pressure to modernise government.
2. The need to contain government expenses and thus keep tax from increasing.
3. The short time horizon of a government i.e. 5 years.
4. Lack of knowledge within government departments as to how to justify governments investment.
5. Complicated internal bureaucratic policy requirements by government departments.
6. Attitude of outsourcers to government contracts.
7. Civil servants struggle to manage outsourced contracts.
8. Governments' outsourcing processes are complicated.
9. Civil servants lack of understanding of outsourcings.
10. Integrating civil servants and outsourced team members is difficult.
11. The influence of politicians.
12. Interference by government Ministers.
13. Influence of policy shifting in government.
14. Civil servants are generally not sufficiently technologically savvy to understand the consequences of their decisions regarding the project.
15. Civil servants decision making processes are complex and bureaucratic.
16. The scarcity of in-house ICT expertise and resources.
17. The tendency towards 'turf wars' within government departments.
18. Civil servants inability to understand the point of view of the citizen.
19. Challenges of competition from other government departments.
20. Civil servants often do not know what is actually required from the system/project.

The final round of the Delphi study had an open ended question requesting respondents to list up to 5 major obstacles that they were aware of which caused problems in the deployment of e-Government applications.

This Delphi study was conducted in the spirit of an e-Delphi study (Avery et al., 2005; Gordon & Pease, 2006; Espinosa & Caro, 2011).

3.4.5 Results of the Delphi Study

In Figure 3.4 a bar chart shows the average third round scores for the whole population of this study, together with a line graph showing the standard deviation of each issue. The supporting number for this graph may be seen in Table 3.3.

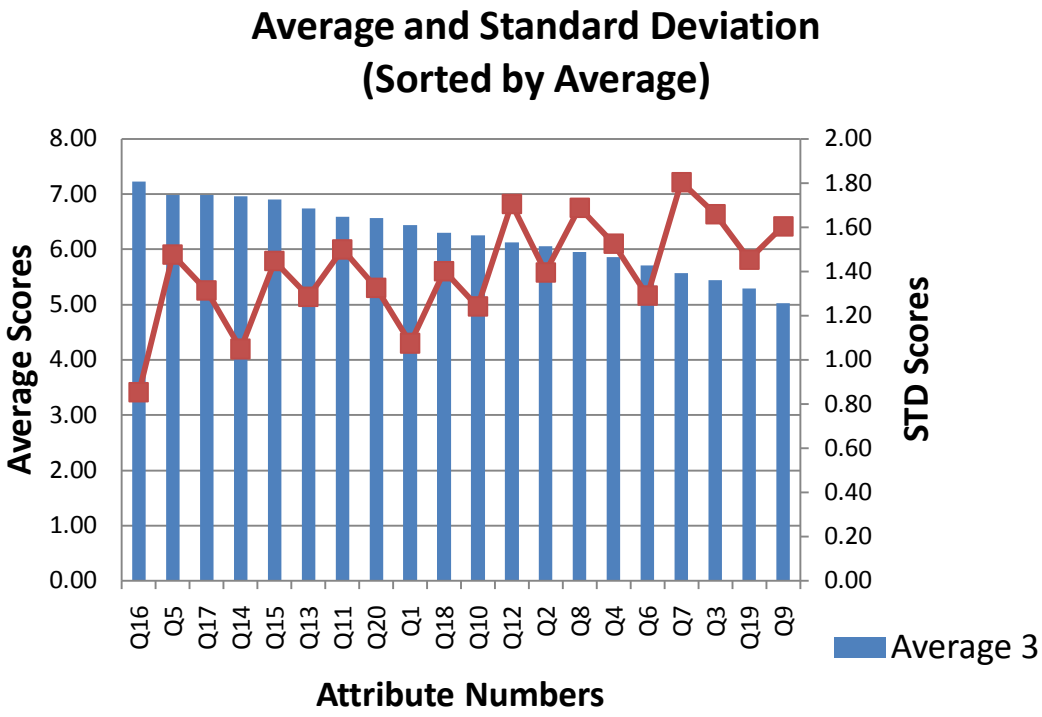


Figure 3.4 Graphical Representation of the Third Round Average Scores and Standard Deviations for the Whole Group

From this graph it is clear that top scores are in the order of 5.56 to 7 out of 9. Thus it can be concluded that these issues were regarded as being relatively more important to the participant. Since these statements scored 5.56 or more out of 9 it is evident that these 17 statements were in general regarded as relevant by the respondents. The exceptions are statements 3, 19 and 9, which appear to be on the brink of neutrality (a neutral score is 5). These statements scored 5.44, 5.29 and 5.02; in prior rounds these statements were scored consistently the same, see Figure 3.5. These statements are also in general regarded as relevant by the respondents.

Issue No.	Statement	Average Score	Std Dev.
Q16	The scarcity of in-house ICT expertise and resources.	7.22	0.85
Q17	The tendency towards 'turf wars' within government departments.	6.98	1.31
Q5	Complicated internal bureaucratic policy requirements by governmental departments.	6.98	1.47
Q14	Civil servants are generally not sufficiently technologically savvy to understand the consequences of their decisions on the project.	6.95	1.05
Q15	Civil servants decision making processes are complex and bureaucratic.	6.90	1.45
Q13	Is influenced by policy shift within government.	6.73	1.28
Q11	The influence of politicians.	6.59	1.50
Q20	Civil servants often do not know what is actually required from the system/project.	6.56	1.32
Q1	The pressure to modernise government.	6.44	1.07
Q18	Civil servants inability to understand the point of view of the citizen.	6.29	1.40
Q10	Integrating civil servants and outsourced team members is difficult.	6.24	1.24
Q12	Interference by government Ministers.	6.12	1.71
Q2	The need to contain government expenses and thus keep tax from increasing.	6.05	1.40
Q8	Governments' outsourcing processes are complicated.	5.95	1.69
Q4	Lack of knowledge within government departments as to how to justify governments' investment.	5.85	1.53
Q6	Attitude of outsourcers to government contracts.	5.71	1.29
Q7	Civil servants struggle to manage outsourced contract	5.56	1.80
Q3	The short time horizon of a government i.e. 5 year	5.44	1.66
Q19	Challengers of competition from other governmental departments.	5.29	1.45
Q9	Civil servants do not understand the need for outsourcing.	5.02	1.60

Table 3.3 Average Third Round Scores and Standard Deviations for the Group

All statements scored five or more with standard deviations of less than 1.80. This suggests that not only are the statements considered of relative importance by the population, but also that there is a relatively high consensus of this view.

Figure 3.5 shows the 20 statements, sorted by the third round average score, but with their average score per round and their standard deviation per round plotted on the same diagram. It is important to note that the standard deviation in all but five cases declined each round. This is not considered a setback, because in round one there were fifty four respondents. In round two there were thirty nine respondents. Round two lost fifteen respondents. Using active encouragement techniques for round three, there were forty one respondents, which affected the final scores. Overall, this indicates that a degree of consensus was established.

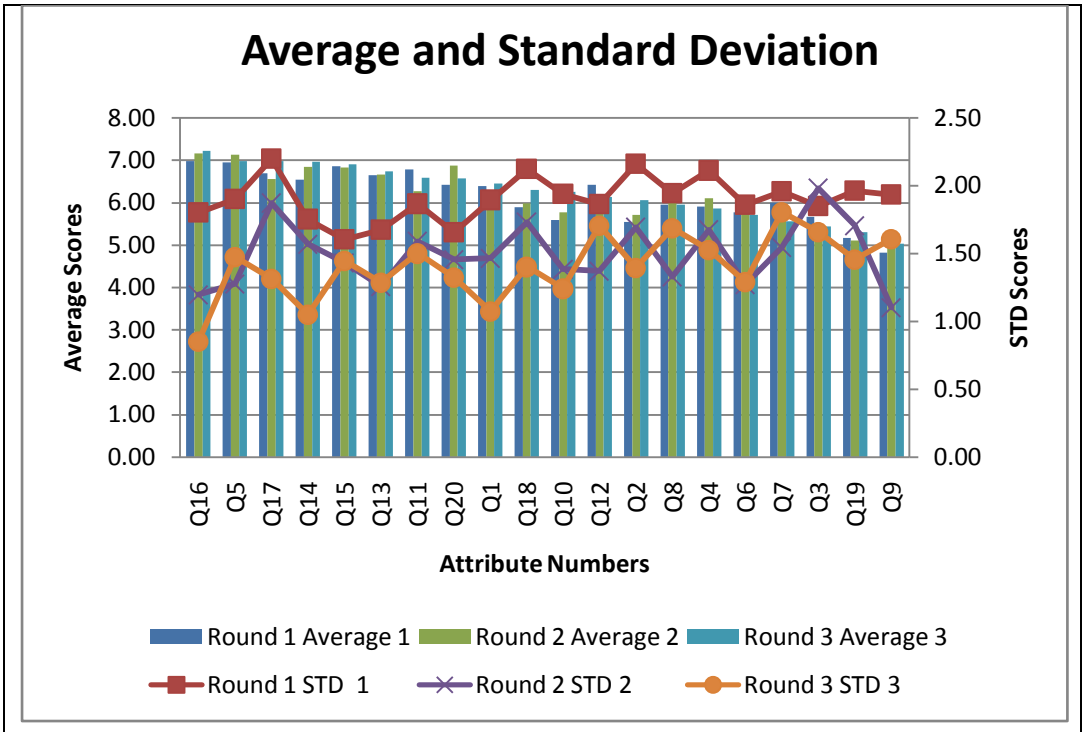


Figure 3.5 Average and Standard Deviation Scores for Each Round

3.4.6 General Discussion

Having established that all the statements were considered as important to the respondents, the statements were then thematically categorised. Table 3.4 is the newly categorised attributes. The group average and group standard deviation for the new categories were calculated. The new categories were ranked based on the group average. The new categories in rank order are:

1. System obstacles to success
2. Relationships between key actors
3. Drivers for change
4. Gaps in understanding
5. Managing stakeholders

No.	Statement	Average Score	Category	Rank	Group Average	Group STD
16	The scarcity of in-house ICT expertise and resources.	7.22	System obstacles to success	1	6.44	1.56
5	Complicated internal bureaucratic policy requirements by governmental departments.	6.98				
15	Civil servants decision making processes are complex and bureaucratic.	6.90				
13	Is influenced by policy shift within government.	6.73				
8	Governments' outsourcing processes are complicated.	5.95				
4	Lack of knowledge within government departments as to how to justify governments' investment.	5.85				
3	The short time horizon of a government i.e. 5 year	5.44				
17	The tendency towards 'turf wars' within government departments.	6.98	Relationships between key actors	2	6.25	1.57
11	The influence of politicians.	6.59				
18	Civil servants inability to understand the point of view of the citizen.	6.29				
12	Interference by government Ministers.	6.12				
19	Challenges of competition from other governmental departments.	5.29				
1	The pressure to modernise government.	6.44	Drivers for change	3	6.24	1.25
2	The need to contain government expenses and thus keep tax from increasing.	6.05				
14	Civil servants are generally not sufficiently technologically savvy to understand the	6.95	Gaps in			

No.	Statement	Average Score	Category	Rank	Group Average	Group STD
	consequences of their decisions on the project.					
20	Civil servants often do not know what is actually required from the system/project.	6.56		4	6.18	1.57
9	Civil servants do not understand the need for outsourcing.	5.02				
6	Attitude of outsourcers to government contracts.	5.71	Managing stakeholders			
7	Civil servants struggle to manage outsourced contract.	5.56		5	6.18	1.57
10	Integrating civil servants and outsourced team members is difficult.	6.24				

Table 3.4 Newly Categories Attributes

Using the newly formed categories, the comments to the open ended question were also categorised. There were a total of one hundred and fourteen comments. Figure 3.6 is a graphical representation of the classified comments.

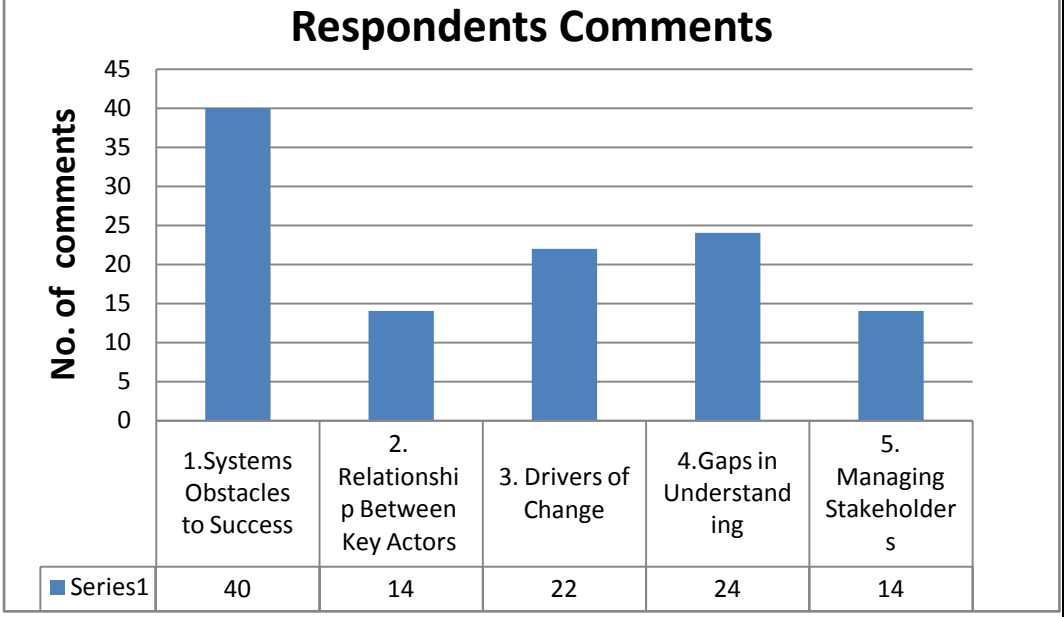


Figure 3.6 Classification of Comments

3.4.7 Implications for e-Government Applications

From the results of the Delphi study it appears reasonable to assume that

1. system obstacles to success,
2. relationships between key actors,
3. drivers for change,
4. gaps in understanding and
5. managing stakeholders

influence the success of e-Government applications, as illustrated in Figure 3.7. The degree to which these factors affect the success of e-Government applications requires further investigation. The open comments from respondents for each classified factor lends insight into some of the challenges facing e-Government application.

1. System obstacles to success
   The various needs of the community of stakeholders are not adequately understood as demonstrated by the following comments:
   - "e-gov (e-Government) applications are developed and deployed in individual depts (departments) while citizens' needs cross departments"
   - "Institutional logic of bureaucrats is to implement policies, not to serve citizens"
2. Relationships between key actors
   The complex nature of disjointed government relationships and its effect on government is articulated in these comments:
   - "Lack of inter-departmental infrastructure leading to silo-based systems"
   - "ICT related projects are perceived as solely the jurisdiction of the IT department"
3. Drivers for change
   The comments below highlight the complex nature of change in government:
   - "Timeline is too long which changes the goal posts each time the technology changes."
   - "Too short a term of office for decision makers/strategists/implementers to see strategy through to the end."
4. Gaps in understanding
   Senior management's understanding of the e-Government applications are expressed in these comments:
   - "Many of the decision makers are not computer literate or knowledgeable enough to understand the technologies and capabilities in the market."
   - "Poor IT skills base among civil servants who are supposed to manage e-Government services."
5. Managing stakeholders
   The lack of citizen-orientation and internal inefficiencies are conveyed in these statements:
   - "E-gov (e-Government) applications being built to suit the needs of govt (government) rather than citizens (i.e. not citizen-centric)"
   - "Laziness"

   It appears that senior managers need to evaluate how the development process of e-Government applications can be improved to deliver required measurable benefits.

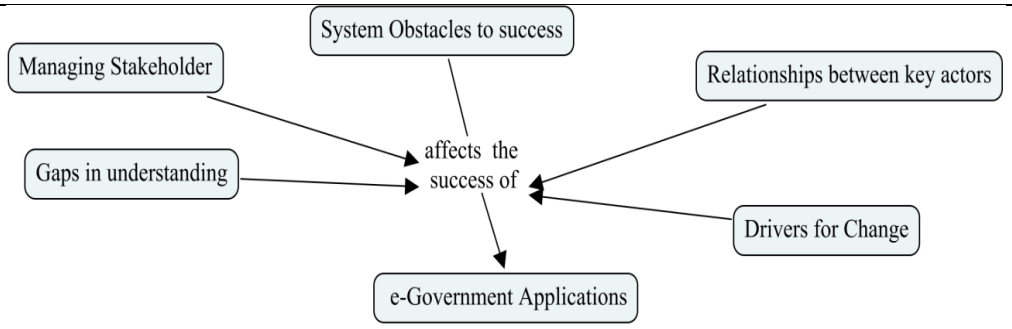


Figure 3.7 Factors Affecting e-Government Applications

3.5 Refining the research questions after the Delphi Study

The insights gained from the Delphi study were used to facilitate the refining of the research question. Firstly, the findings have benefited this research by providing some insight into the factors that affect the success of e-Government applications. Secondly, the findings have offered the researcher a guide to structuring the research instrument. Thirdly, the list of statements identified from the literature review and brainstorming session have been used as conversation starters with informants. Fourthly, the comments from the open-ended question have provided some insight into the issues being studied.

An insider researcher is a person who is studying an organisation in which he or she is working and who has an understanding of the organisational practices (Sherry, 2008). This is important because the researcher of this thesis is not an insider researcher, but a doctoral candidate, which Pushor (2008) classifies as an outsider researcher. An outsider researcher may not be aware of some of the organisational practices.

3.6 Research Informants and other evidence

Data or evidence was collected from informants who are senior managers in the South African Public Sector Services with direct involvement with e-Government investment decision-making. They were selected on the basis of their position assuming that it is a reflection of their knowledge and expertise. In this case purposeful sampling was used. Purposeful sampling ensures that key research themes are addressed and that each category is fully explored because of the specific knowledge of the informants (Ritchie et al., 2003; Silverman, 2005).

In addition to interview evidence this researcher acquired other sources of data in the forms of

- portable document files government, such as reports;

- internal reports;
- internal newsletters;
- trade/professional journals;
- annual reports; and
- strategic planning reports.

Another source of evidence are the websites of the various government agencies contacted. All the evidence collected are in terms of the case study protocol.

3.7 The Unit of Analysis

The unit of analysis is of central importance in that it offers the researcher a focal point for his or her exploration of the issues concerned. The unit of analysis may be a corporate entity, department or it may be an individual. The unit of analysis is the 'what' or 'who' that is being studied. Patton (2002) reports that the unit of analysis could, for example, be people-focused or structure-focused. The unit of analysis can also be the study of an activity, for example the activity of decision-making (Hak & Dul, 2010). In the context of this research, the unit of analysis is the decision-making process which is employed across a number of different government entities. There are a number of different dimensions to the decision-making process and in understanding these issues various sources of data as described above were used.

The unit of analysis involved here may be studied effectively through a case study research design. The advantages of a case study in this instance are that:

1. it provides a great amount of description and detail about a particular real-life situation that would not normally be easily obtained by other research designs. The data collected is richer and of greater depth than can be collected through other designs;
2. it offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon; and
3. it is not necessary to have a large sample of similar participants.

It is worth noting that Yin (2014) points out that there are '*More Concrete'* and '*Less Concrete'* units of analysis. More Concrete units of analysis will have clearer boundaries and these will be situations where individuals or corporate entities are involved, to mention only two examples. Less Concrete units of analysis involve situations which address relationships, communities and decisions. The unit of analysis in this study should be regarded as one in which there is a Less Concrete unit of analysis.

3.8 The Case Study

Lazar et al (2010) defines a case study as a detailed examination of one or more specific contexts. Yin (2014) also highlights the importance of context, and has a two part definition of a case study as follows:

1. A case study is an empirical enquiry that:
    - investigates a contemporary phenomenon in depth and within its real-life context, especially when
    - the boundaries between phenomenon and context are not clearly evident.
2. A case study inquiry:
    - copes with the technically distinctive situation in which there will be many more variables of interest than data points,
    - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion,
    - benefits from the prior development of theoretical propositions to guide data collection and analysis.

Although Yin's definition of a case study is useful, the definition does not fit all case studies within Information Systems. Therefore, Yin's definition has been extended as follows:

> *Case study research in Information Systems is a detailed analysis of a particular real life context-specific event or phenomenon that is of interest to an Information Systems researcher. Multiple sources of data, mainly empirical evidence in the form of interviews, are collected from willing and knowledgeable informants. The interview data is often triangulated against other sources of data, such as internal policies and published documents. This is for case study rigour and helps to develop an authentic and deeper understanding of the issue under investigation.*

According to Yin (2014), a case study should be considered when (a) the focus of the study is to answer 'how' and 'why' questions; (b) the behaviour of those involved in the research cannot be manipulated; (c) the researcher understands the importance of exploring environmental conditions relevant to the phenomenon being researched; or (d) the boundaries are not clear between the phenomenon and the context. A case study approach has been chosen for this research because the researcher wants to understand the decision-making process that senior civil servants use when involved in the designing and developing of e-Government applications. It is in this setting that senior civil servants are making their decisions. It would be difficult for this researcher to have

a full understanding of how senior civil servants make decisions without considering as many aspects as possible of the context within which the decision-making process occurs.

There are different types of case study designs used in research (Yin, 2009; Mills et al., 2010). Yin (2014) points out there are four types of case study designs as shown in Figure 3.8. These case studies are based on whether there are single or multiple units of analysis. The dotted lines between areas, as shown in Figure 3.8, indicate that the boundaries between the two areas may not be well-defined. This is because the case and the unit of analysis are similar (Yin, 2014). Therefore, where there is a single unit of analysis, it is the same as the case and has not been drawn separately. Where there are multiple units of analysis, they are dedicated parts of the whole case. In this research a holistic case study design was adopted because the researcher only examines government management at a macro level. The holistic case study designed is appropriate in this research because a contemporary real-life situation is being investigated where there is no control on the part of the researcher (Myers, 2009). Further, a case study is a tool for building new theory (Oates, 2006; Berg, 2009) because case studies lead to the in-depth exploration and development of new concepts.

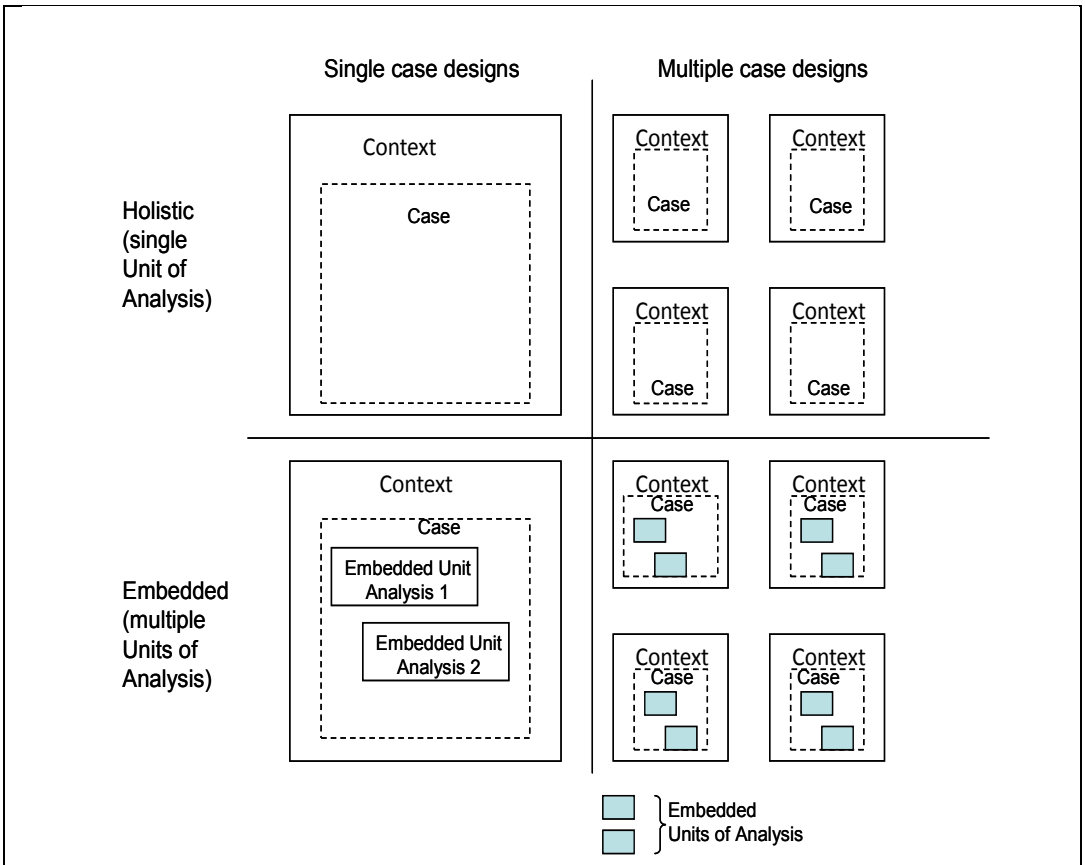


Figure 3.8 The Four Different Case Study Designs Described by Yin (2014)

3.9 Case Study Research Protocol

The case study research protocol is a document that outlines the set of procedures required to ensure rigour in the research, to identify the data that needs to be collected, and to collect and manage the required data. The protocol is important because the researcher must adhere to the universities ethics protocol and be reminded about field procedures. For this research the protocol was as follows:

- Find at least three informants for each site.
- At least two informants should be senior managers.
- Obtain access to informants through a trusted intermediary or gatekeeper and ensure that everyone concerned provides appropriate evidence of Informed Consent.
- Make initial contact with the informants' organisation at the highest level.
- Digitally record interviews.
- Support verbal information with documentary evidence.
- Attempt to interview informants in their offices rather than interview rooms.
- Engage with as many staff members as possible, such as secretaries and support personnel, in general conversation about the topic being researched.
- Produce field notes

The data collection sources for this study are outlined in Figure 3.9. The case study was based on data collected from semi-structured interviews, government reports, trade/professional journals, and government websites.

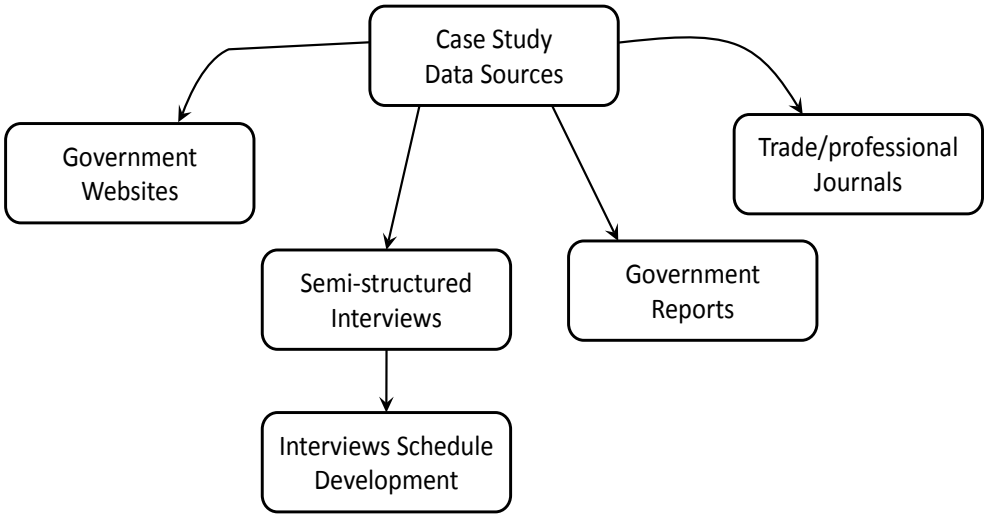


Figure 3.9 Data Collection Sources

The data collection process, as displayed in Figure 3.10, consists of informant identification for semi-structured interviews, conducting pilot interviews, interviews schedule refinement, conducting the interviews, writing up file notes and transcribing recorded interviews.

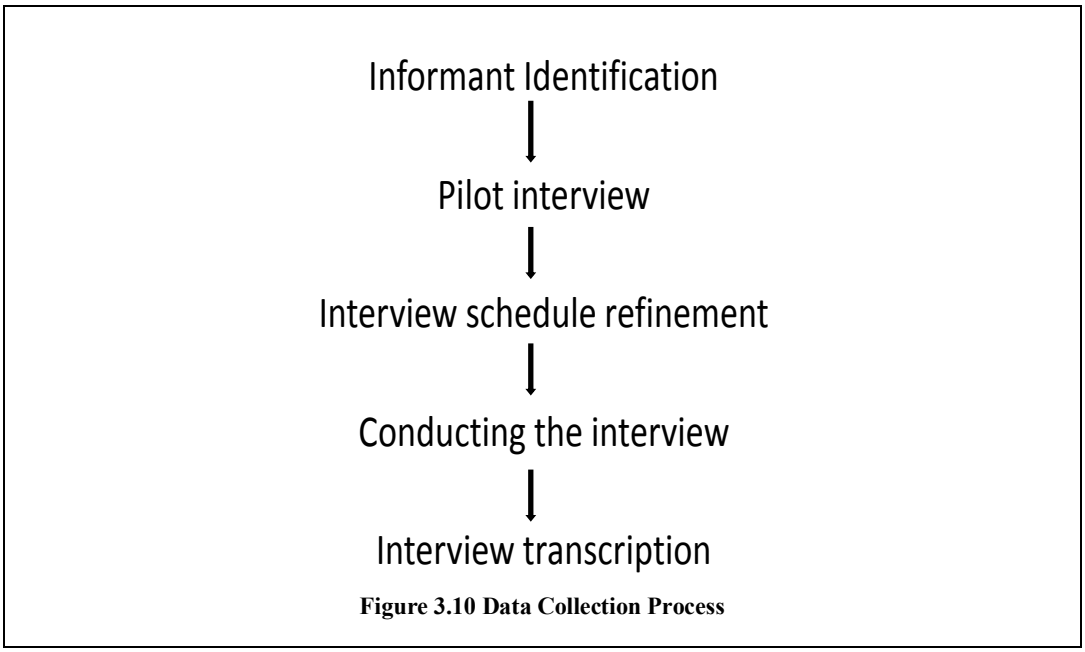


Figure 3.10 Data Collection Process

3.10 Informant Selection

It is not unusual to find in qualitative research the term 'sampling/sample' (Myers, 2009; Creswell, 2013). The term sampling/sample is in the mind of the reader associated with statistics. Sampling/sample is defined as 'a subset of the population, often *randomly* chosen or at least representative of the population as a whole' (Keller, 2005; Albright et al., 2009). In this context, it is argued that it is *inappropriate* to use the term sampling/sample as the researcher has not applied the rules governing statistical sampling. What is collected are informants that meet predefined criteria, hence, the more appropriate term to use in this instance is 'informant selection'.

Using the word 'sampling' is problematic. To follow with the rhetoric used in the literature, the sampling technique that was adopted is selective sampling. Patton (2002) defines selective sampling as the process of selecting 'incidents, slices of life, time periods, or people on the basis of their potential manifestation or representation of important theoretical constructs'. This sampling approach has the goal of developing a rich understanding of the dimensions of a concept across a range of settings and conditions. Selective sampling is appropriate in this research because the focus is on theory development and the objective is to develop theory that is connected to, grounded

in or emergent from, real life events and circumstances in e-Government application development.

Therefore, the selection process of informants was based on the case frame outlined in Figure 3.11. The researcher is further cognisant of the practical and logistic realities that will affect the informant selection process (Miles & Huberman, 1994).

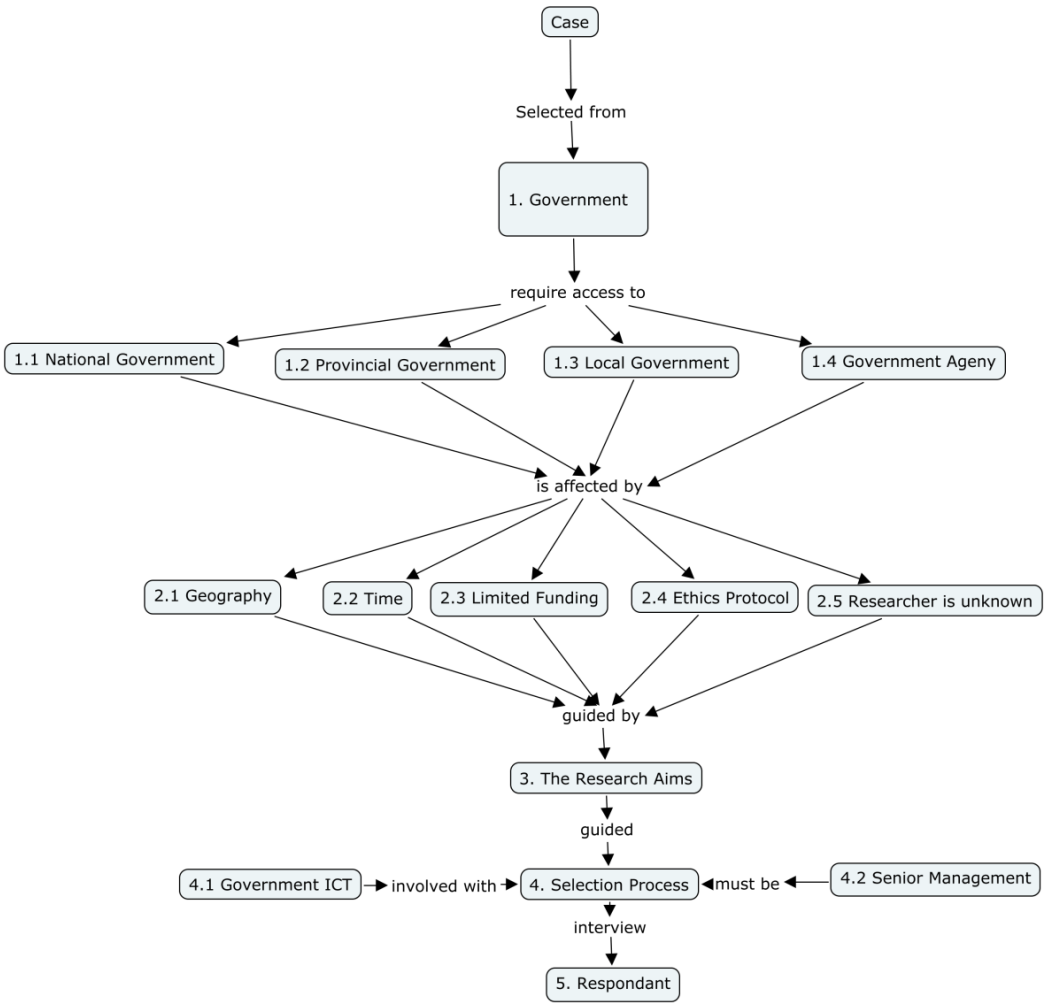


Figure 3.11 Case Frame

The following heuristic was used in the selection of informants. Informants had to have worked for government. Informants could be employed by national government, provincial government, local government or a government agency. Practical and logistical concerns that influence the selection of informants are:

- government officials are geographically dispersed,
- both the prospective informant and researcher have time constraints,
- the researcher has limited funding,

- the ethics protocol is a guide for the researcher not to wander outside the boundaries of the accepted interview questions, and
- the researcher is unknown to the prospective informants.

Guided by the research aims, a further selection of criteria are applied:

- prospective informants must be involved with, or be affected by, government ICT, and
- prospective informants must be at a senior or upper management level in the public sector.

If informants meet these requirements, they were interviewed. In qualitative data collection there is no predetermined number that indicates data saturation signalling the end of data collection.

The research protocol indicated that initial contact with the informants' organisation should be at as high a level as possible. In practice this was difficult to achieve and this strategy was modified because after contacting three departments and going through their process of requesting access, contact with them was unexpectedly and abruptly terminated without any reason being offered. This led to an alternative strategy where personal invitations to participate in the research were sent to possible informants as outlined in Table 3.5. The researcher sent 80 e-mails to appropriate government employees, and was granted permission to send a call for participation on two mailing list servers.

	Call to Participate	**Number of initiations sent**
1.	Direct e-mail sent by the researcher inviting participants	80
2.	e-Mail list managed by the postgraduate division at the University of the Witwatersrand	estimated at 500
3.	e-Mail list managed by the postgraduate division at the University of the South Africa	estimated at 340

Table 3.5 Invitation to Participate

A group of 63 prospective informants accepted the invitation to participate in the research. Applying the case frame heuristic from Figure 3.11, to the responses received from the invitations to participate, 60[40] prospective informants were selected as outlined in Table 3.6.

[40] Three persons who offered to participate in the research were from outside South Africa and were not considered as suitable informants.

	Informant to be interviewed	No.
1.	Persons selected to participate in the research	60
2.	Persons who did not confirm scheduled appointments, 3 e-mails sent and all ignored: • received out of office reply • e-mail address no longer active because person is no longer available • unknown reasons	 (6) (4) (7)
3.	Persons who made the researcher wait in their waiting room for more than an hour and then cancelled the interview	(2)
4.	Persons who accepted the invitation but had to cancel due to new commitments • called to parliament • called to another meeting	 (2) (3)
5.	Persons not suitable as informants because they were not directly associated with the South African government [41]	(9)
	Total	27

Table 3.6 Description of the group within the initial 60

From this group of 60 prospective informants, 33 were not interviewed (see Table 3.6; items 2, 3, 4 and 5), 27 informants were interviewed (see Table 3.7; item 1), there were 6 referrals and 3 serendipitous meetings that led to interviews.

	Informants that were interviewed	No.
1.	Persons who accepted invitation, confirmed and honoured appointments	27
2.	Persons who were referred by other informants, accepted invitation, confirmed and honoured appointments	6
3.	Serendipitous meetings	3
	Total	36

Table 3.7 Description of the Final Group of Informants

All informants who were interviewed were senior managers. They were not contractors and therefore are considered civil servants as they are permanently employed by government.

The informants are categorised into 4 groups: national government, provincial government, local government and government agencies. There are:

[41] These persons were inappropriately qualified and would have been unlikely to be adequately informed for this research.

- 16 informants from 9 different departments that represented national government,
- 4 informants from 4 different departments that represented provincial government,
- 3 informants from 3 different departments that represented local government, and
- 13 informants from 7 different government agencies.

In Table 3.7 there is a summarised breakdown of details pertaining to the 36 informants. The table shows the level at which the informants are employed in government, their job title, the length of the recorded interview and whether the informant shared any additional material with the researcher.

Informants	Department	Government Level	Title	Length of interview (minutes)	Shared extra material with me
1	Department of Basic Education	National	Chief Educational Specialist & Project Manager	42	
2	Department of Communication	National	Director: ICT Policy & Strategy	52	x
3	CSIR	Agency	Senior Researcher	57	
4	CSIR	Agency	Chief Director of e-Government	55	
5	CSIR	Agency	Director Technology Applications	52	
6	South African Reserve Bank	Agency	Senior Information Technologist	73	x
7	Department of Art & Culture	National	Director Technology Applications	61	
8	SITA (worked there for 13 years)	Agency	Senior Manager	43	
9	Auditor General SA	Agency	Audit Software Systems Architect	51	
10	Department of Water Affairs	National	Assistant Director SAP Development	49	
11	Auditor General SA	Agency	Chief Financial Officer	39	
12	Department of Basic Education	Provincial	Deputy Chief Education Specialist	18	
13	Ethekwini Municipality	Municipal	IT Project Manager	31	x
14	Department of Health (CT)	Provincial	Head of Security Services	16	
15	Ethekwini Municipality: Strategic Projects Unit	Municipal	Manager: Finance	54	
16	Dept of Economic Dev. and Finance, KZN	Provincial	Senior Manager	36	

Informants	Department	Government Level	Title	Length of interview (minutes)	Shared extra material with me
17	Auditor-General of South Africa	Agency	Information Manager - ICT	66	
18	Auditor-General of South Africa	Agency	Business Analyst - Business Process Management	56	
19	National Treasury	National	Finance Specialist: Neighbourhood Development Programme	28	
20	Department of Transport: Railway Safety Regulator	Agency	Senior Manager: ICT	40	
21	Department of Art and Culture	National	Senior Functional Analyst	53	
22	National Treasury	National	Director: System Integration and Development Information & Communication Technology	69	
23	Department of Transportation	National	Chief Director: Engineering Standards	40	x
24	Department of Transportation	National	Director: ICT	128	
25	Department of Transportation	National	Chief Director: Research and Innovation	40	
26	Department of Justice	National	Project Manager	33	
27	SITA	Agency	Senior Manager	61	x
28	National Treasury	National	Director: Public Funds	30	
29	Transnet	Agency	Business Relationship Manger	43	
30	Salga	Agency	International advisor for ICT and Development	53	x
31	Department of Communication: eskills Insistution	National	Chief Director	48	x
32	Transnet	Agency	Senior Manager	41	
33	Department of Cooperative Governance	National	Chief Information Officer	40	
34	Department of Cooperative Governance	National	Senior Manager	54	
35	Department of Cooperative Governance	National	Senior Manager	36	
36	Municipality	Local	Chief Information Officer	54	

Table 3.8 Summary of Informants Post in Government

3.11 When has enough data been collected?

The generic answer to the question, 'When has enough data been collected?' is that data should be collected until data saturation has been reached. Data saturation is achieved in

qualitative academic research when no further 'concepts' are identified in the data and the exiting 'concepts' meaningfully describe the phenomenon being researched (Chenail, 2008; Bryant & Charmaz, 2010). Grant (2013) reports that qualitative research practice is silent about 'sample' size. Patton (2002) further points out that there are no generally accepted rules that govern sample size.

Patton's (2002) assertions on sample size are confirmed by Baker and Edwards (2012), who surveyed prominent social scientists. The findings of Baker and Edwards (2012) are summarised in Table 3.9.

	Researcher	**Affiliation**	**How many qualitative interviews is enough?**	**Comments**
1.	Harry Wolcott	University of Oregon	*it depends*	"It depends on your resources, how important the question is to the research, and even to how many respondents are enough to satisfy committee members for a dissertation"
2.	Patricia A. Adler and Peter Adler	University of Colorado University of Denver	*12 - 60, with 30 being the mean*	
3.	Les Back	University of London	*it depends*	
4.	Howard S. Becker	author of Tricks of the Trade	*has no reasonable answer, no magic number you can do and then you're out of danger*	
5.	Julia Brannen	Thomas Coram Research Unit, Institute of Education, University of London	*no rule of thumb*	"In my own work the number of cases I have studied has ranged from twenty-two married couples (Brannen & Collard, 1982), twenty four generation families (71 persons interviewed) (Brannen et al., 2004) to a longitudinal study in which around 260 mothers and their children were followed up over several years (Brannen & Moss, 1991). When I first started in qualitative research it seemed to me common among those carrying out qualitative interviews **for their doctoral research for sample size to be around 40 persons**."
6.	Alan Bryman	University of Leiceste	*given the lack of agreement on this issue among practitioners and methodologists, it is the only responsible guidance that can be supplied*	"It reflects the fact that there is little definitive and unambiguous guidance in the qualitative research community regarding how large a sample should be. In both my book on social research methods (Bryman, 2012) and in offering guidance to students, I tend to prefer to point to a number of factors they should consider (see also Morse (2000)."
7.	Kathy Charmaz	Sonoma State University	*it depends on your research purpose*	
8.	Norman Denzin	University of Illinois at Urbana-Champaign		"How many interviews? The answer to this question, following Psathas (1995), p. 50 (also Denzin (1999); Fiske (1994)), is given in the use of the 'method of instances'. This method takes each instance of a

	Researcher	Affiliation	How many qualitative interviews is enough?	Comments
				phenomenon, for example an interview, as an occurrence which evidences the operation of a set of cultural understandings currently available for use by cultural members."
9.	Andrea Douce	Brock University	*it depends*	"I also had to balance such decisions with time and available resources, appropriate project design, the level of diversity needed within my research sample, and estimated 'outputs' aimed at diverse audiences."
10.	Uwe Flick	Alice Salomon Hochschule Berlin	*it depends*	
11.	Jennifer Mason	University of Manchester	*it depends*	
12.	Daniel Mille	University College London		"Given the constraints of time and money I also carry out projects based in some measure on interviews. Typically I find that as I start the research each interview seems so special and unique I can't even imagine being able to generalise. But after a while certain patterns and repetitions arise, that give me the sense that I can make claims about what people have said. **So the quantitative criteria in practice is not an absolute number, but refers to that point at which you sense you have encountered the amount of repetition that gives you the confidence to write and make analytical generalisations**. In my experience this is unlikely to be less than 70 encounters/interviews, but in practice I just carry on until that point seems to have been reached."
13.	Luisa Passerini	Università di Torino	*There is no one number that can define successful qualitative interviews.*	
14.	Charles C. Ragin	University of Arizona	*20 for an M.A. thesis and 50 for a Ph.D. dissertation*	"The key issues for the qualitative researcher are (1) the degree of researcher confidence in the commonalities identified (i.e., the subset relations) and (2) the triangulation of a given pattern with what else is known about the category or outcome and also with what else is known about the larger case or whole."
15.	Paul ten Have	University of Amsterdam	*it depends*	
16.	Ben Baumberg,	University of Kent at Canterbury	*35-40*	
17.	Linda Sandino	CCW Graduate School, University of the Arts/Victoria & Albert Museum	*all depends on the project and the discipline in which one might wish to situate the research.*	

Table 3.9 Summary to 'How many qualitative interviews is enough?' adapted from Baker and Edwards (2012)

As can be seen in Table 3.9, in the third column the answer to the question "How many qualitative interviews is enough?" has been answered a number of times as *'it depends'* by 8 of the 17 researchers. It is important because all researchers are tasked with the responsibility of deciding when an adequate amount of data has been collected.

3.12 Informed Consent

Before any interviews could be conducted, informants needed to give Informed Consent. Informed Consent is an ethics principle in which informants are briefed on the nature of the research project, how the data will be handled so as not to expose them to any harm, and gives the prospective informant the choice to participate in the research project (Myers, 2009; Creswell, 2013). The informed consent process was guided by the code of ethics from the University of the Witwatersrand, which requires all informants to sign the Informed Consent Document, see Appendix E and Appendix F for participant information document. Research consent forms and information leaflets were provided in advance of the interview to the informants and on the day of the interview. Only when the informants had signed the Informed Consent Documents, did the data collection process start.

Guided by the code of ethics from the University of the Witwatersrand, ethics protocol: H120308, and the University of South Africa's ethics protocol: 028/SS/2012 (see Appendix G), all informants were briefed about the project including their right to withdraw. Using Microsoft Outlook, an appointment request was sent to all the informants with the informed consent document attached. Anticipating that some informants' personal assistants would accept the scheduled appointment on their behalf, it was also prudent on the day of the interview to take extra copies of the informed consent documents for the informants to read and sign. After going through the informed consent documents with the informants, all informants signed the informed consent document. Thereafter, the interview started.

3.13 The Instrument

The use of semi-structured interviews implies that the interview schedule contains a framework for the questions that will be posed to informants, but the researcher is at liberty to pursue the questions in a different order. The interviews was based around a broad set of themes to guide the interviews (Morgan & Guevara, 2008). In this research, the results from the Delphi study were used as a guide to design, develop and structure the interview instrument. The interview schedule was pre-tested before data collection

could commence. Once the data was collected, the data was transcribed, appropriately formatted for Altas.it and then analysed.

Figure 3.12 serves as the basis for the data collection. Interviews took place at a time and place convenient to the informant and ideally was limited to a maximum of one hour. All data was made anonymous and all confidences respected.

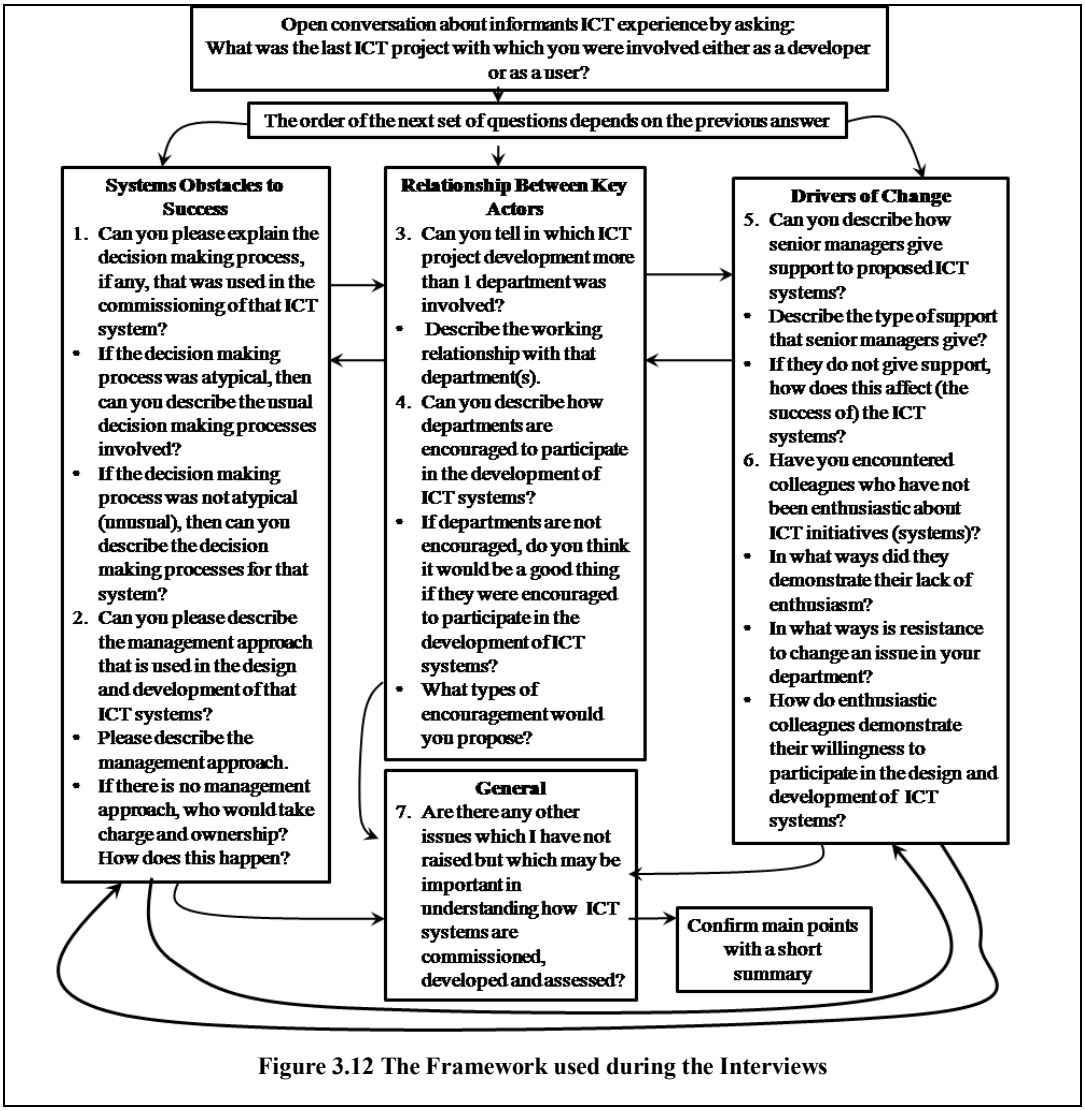


Figure 3.12 The Framework used during the Interviews

3.14 The Interview Schedule

The interview schedule in Table 3.10, had been pre-tested at a University of the Witwatersrand post-graduate research seminar[42] which led to the refinement of the questions, see Appendix H. The questions were in three categories. These were 1) systems obstacles to success; 2) relationship between key actors; and 3) drivers of change.

[42] Three members of this group were employed by the South African government.

Overall issue	Interview Questions
Systems Obstacles to Success	1. Can you please explain the decision-making process, if any, that was used in the commissioning of this e-Government system? a. If the decision making process was atypical, then can you describe the usual decision-making processes involved? b. If the decision-making process was not atypical (unusual), then can you describe the decision-making processes for that system? 2. Can you please describe the management approach that is used in the design and development of e-Government systems? a. Please describe the management approach. b. If there is no management approach, who would take charge and ownership? How does this happen?
Relationship Between Key Actors	1. Can you tell in which e-Government system development more than one department was involved? a. Describe the working relationship with that department(s). 2. Can you describe how departments are encouraged to participate in the development of e-Government systems? a. If departments are not encouraged, do you think it would be a good thing if they were encouraged to participate in the development of e-Government systems? b. What types of encouragement would you propose?
Drivers of Change	1. Can you describe how senior managers give support to proposed e-Government systems? a. Describe the type of support that senior managers give? b. If they do not give support, how does this affect (the success of) the e-Government systems? 2. Have you encountered colleagues who have not been enthusiastic about e-Government initiatives (systems)? a. In what ways did they demonstrate their lack of enthusiasm? b. In what ways is resistance to change an issue in your department? c. How do enthusiastic colleagues demonstrate their willingness to participate in the design and development of e-Government systems?

Table 3.10 Interview Questions

3.15 Data Collection

As mentioned above, the primary data collection method for this research was based on interviews. An interview is a structured dialogue with purpose and direction, with the objective of seeking knowledge and understanding through dialogue (Brinkmann, 2008; Barlow, 2010). There are three types of interviews: unstructured, structured and semi-structured (Saunders et al., 2009; Leedy & Ormrod, 2010). Unstructured interviews are informal from the point of view that there is no list of predetermined questions. Structured interviews use a list of predetermined questions that are read and the

responses captured. This is the equivalent of a questionnaire being completed by the researcher. In semi-structured interviews, the researcher will have a list of issues to cover, and these may vary from informant to informant. The method of data collection for this study was semi-structured interviews. Semi-structured interviews were appropriate because the semi-structured interview gives the researcher some structure, while allowing the researcher the opportunity to explore in depth important issues as they arose.

The researcher first established rapport with the informants. Thereafter the main body of the interview began, and there was a summarisation session at the end. After signing the informed consent documents and some introductory remarks, the researcher posed the following question to the informant, signalling that the interview had begun:

> *"What was the last ICT project with which you were involved, either as a developer, or as a user?"*

In addition to digitally recording the interviews, the researcher also made notes while the interview was being conducted, see Appendix I, and field notes after the interview. Some respondents, during the interview would show the researcher documents and files, and with their consent the researcher took a digital picture of the document, see Appendix J.

Creswell (2013) and Myers (2009) provide some useful advice on how to conduct an interview. The interviews followed these guidelines:

- The interview questions served as a useful guide to focus the discussion with informants.
- The informants were given the freedom to elaborate on their response and to give as much detail as they were comfortable with.
- The researcher approached the interview as an audience[43] member who listened intently while interviewing, but probed the informant when the need arose. This was a useful strategy to prevent the interview from becoming one long monologue.
- The researcher verbally summarised important points during the interview from time to time to clarify/develop a deeper understanding of the informant's responses.

[43] Myers (2009) suggests the use of the 'dramaturgical' model for interviewing, which treats the interview as a drama. This approach is useful because each interview is produced under unique conditions.

The first question was used to assess the appropriateness of the informants, as well as to decide on the next appropriate question. The next series of questions 1 to 6 were not asked sequentially. The reason being that depending on how the informant answered the questions, the next appropriate question was asked, allowing the dialogue to flow. As and when required, the main points of the answers of the questions was verbally summarised to the informants. The final question that was asked was: "Are there any other issues which I have not raised but which may be important in understanding how ICT systems are commissioned, developed and assessed?" The main points of the interview were confirmed with a short summary and that signalled the end of the interview.

3.16 Timing of the data collection

The interviews were conducted over a period of seven months. During this time the researcher travelled to Pretoria, Johannesburg and Durban to meet with and interview informants.

Having collected the data from one interview, the researcher would then sit and reflect on the interview and would write a field note. The field note would cover issues such as: impressions of the interview, the informant, and interesting comments that the informant had made. Then during the transcription of the interview the researcher would again reflect on how the interview had been conducted. This provided an opportunity to improve the technique for the next interview.

3.17 Transcription of the Interviews

The interviews were transcribed (see Appendix K for a sample of a transcribed interview), and the transcription process consisted of three phases. In phase 1, the interviews were transcribed and time stamped after every five minutes. The time stamping on the transcripts was an important tool to allow the researcher to quickly and accurately go to the desired area of the audio recording and listen to the conversation. This phase produced 467 pages of transcripts. In phase 2, a sample of the transcribed interviews was read carefully by an independent person for accuracy. In phase 3, before the coding process, the researcher reviewed a sample of the transcripts against the notes and field notes. The transcripts and field notes were used as a basis for developing the narrative. During the coding process, it was often necessary to listen to parts of the recordings due to ambiguities in the text. Re-listening to the interviews allowed the researcher to develop a deeper understanding of the data.

3.18 Qualitative Data Analysis

Analysis is always performed on data and conducted with a question in mind. From a traditional point of view the analysis of an object or a phenomenon requires that it is closely inspected in order to establish its nature and its content. Analysis will explore the object or the phenomenon beyond its obvious or superficial appearance. In so doing it may be appropriate to take a holistic view and focus on the object or a phenomenon within its context. On the other hand it is sometimes more effective to take a reductionist stance and analyse the details of various dimensions or components of the object or a phenomenon. Sometimes both approaches may be conducted simultaneously.

The result of competent analysis is a greater understanding of data collected relating to the object or a phenomenon. The understanding resulting from the analysis is the basis on which any interpretation may be made and any subsequent theories may be developed.

The two principal approaches to analysing qualitative data are content analysis and interpretive analysis. Content analysis requires counting the concepts discussed with the informants to develop and understanding of the situation. Interpretive analysis looks beyond counts of concepts to a direct understanding of the meaning of the data obtained.

Traditionally these two approaches were undertaken by manual procedures but software is being increasingly used to manage the activity required for these types of analysis. Computer Aided Qualitative Data Analysis Software (CAQDAS) enables researchers to manage qualitative data in a more effective way than through manual 'pen and paper' methods. Atlas.ti facilitated the coding of the transcripts and allowed the researcher to group code, concepts and constructs. Finally by grouping of codes, Atlas.ti helped the researcher to develop a narrative which led to the development of a conjecture.

Figure 3.13 is a model of the application of the data analysis strategy that was applied in this research. The primary data from the transcribed interviews went through a process of first cycle coding in order to obtain an understanding of the relative importance of the prominent issues and the interconnections between them as reflected in the testimony obtained from the informants. The concepts identified in the data were then subject to second cycle coding where the concepts are thematically coded to develop code paradigms. Then in the third cycle coding process, the relationships between the code paradigms were established.

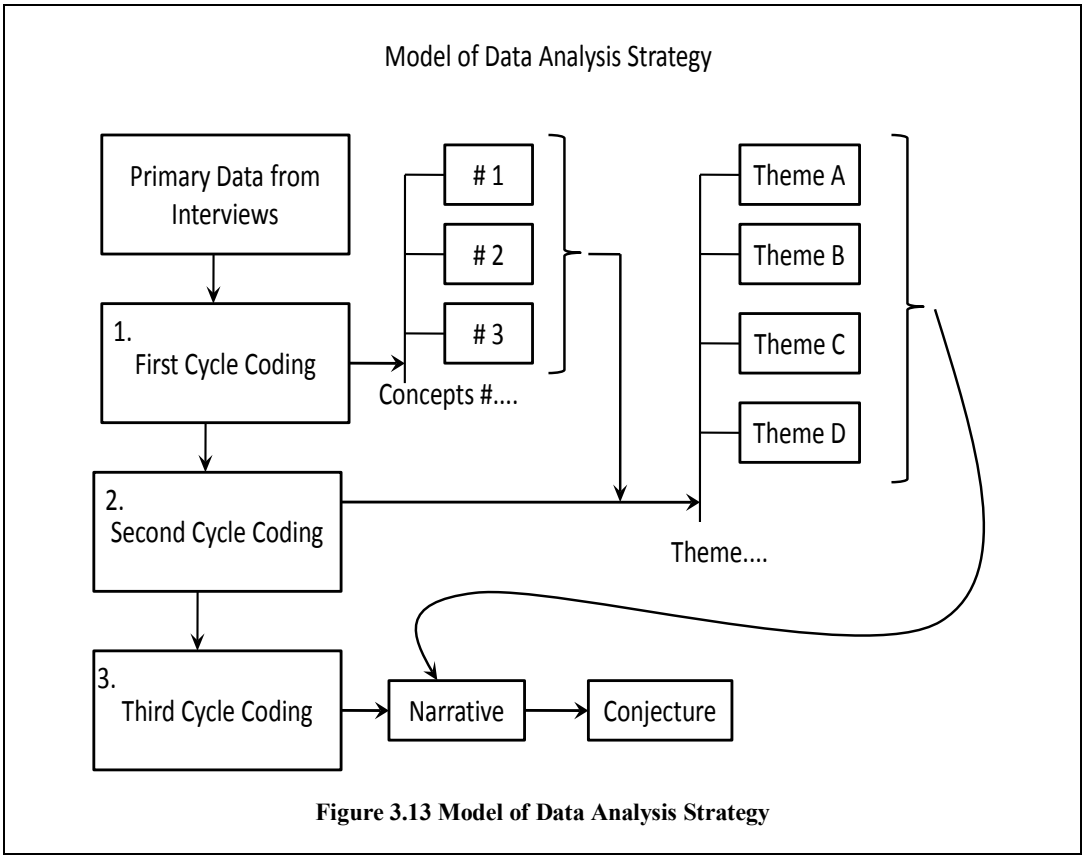


Figure 3.13 Model of Data Analysis Strategy

As outlined in Figure 3.14 the interview transcripts were imported into this software. Examination of these transcripts led to key words or ideas being identified. Memo creation was used to clarify ideas and identify relationships with other concepts. Constant concept comparison and iterative reflection on what was being coded were important steps in the coding process. The concepts identified through coding, as well as important details from the other sources of evidence, were synthesised into a detailed cross-case narrative of how e-Government applications were proposed, designed and developed.

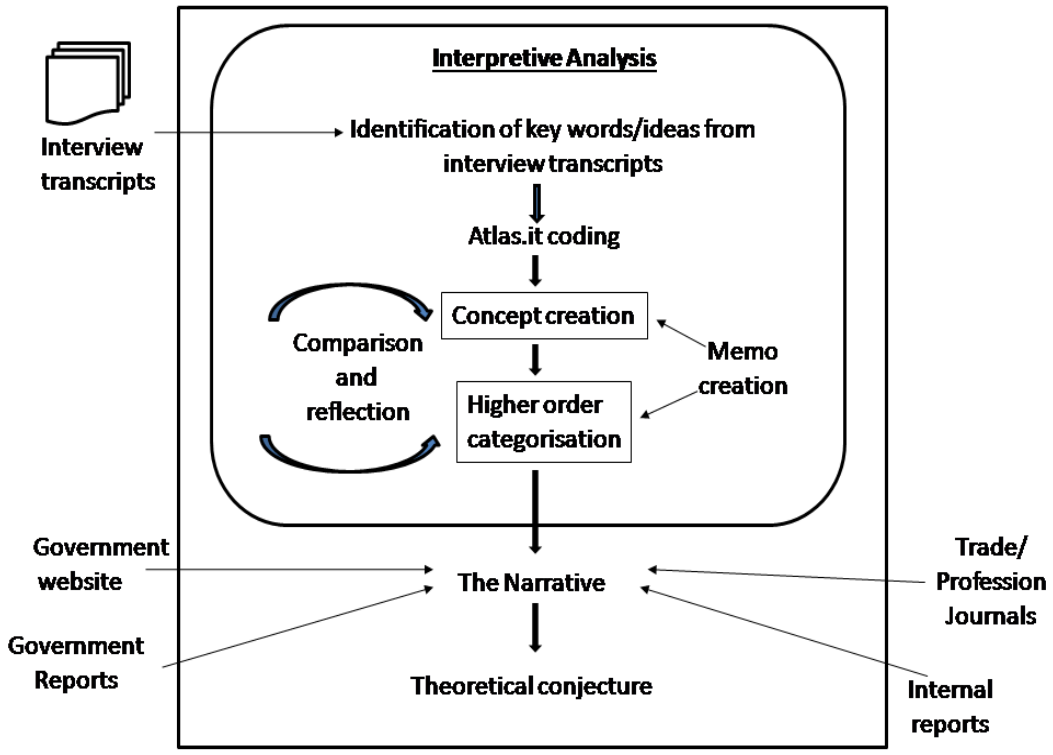


Figure 3.14 Proposed data analysis

It is recognised that objectivity is in practice a challenge (Bednar & Welch, 2008). In terms of rigour in the collection and analysis of evidence, it is important that the researcher is aware of researcher bias as well as informants bias. These biases can create, and/or affect thoughts and values of the informants and of the researcher. This may be a hindrance in capturing an understanding of the elements that could define the phenomenon (Hamel, 1993). Hamel (1993) suggests the following ways in which the problem of subjectivity can be contained:

- Triangulate informants' testimony with other informants.
- Use public and published evidence in the form of annual reports, strategic reports in such a way that the data can be triangulated to form a holistic picture.

The researcher was cognisant of the possibility of bias being introduced into the data and made every effort to minimize its impact on the results through a process of triangulation where possible and through reflection. Once the data analysis phase was completed, the next step was to develop the narrative and then the theoretical conjecture.

3.19 A Strategy for Developing the Theory

Over the years, the field of Information Systems has grappled with issues of theory and theory building (Gregor, 2002; Truex et al., 2006; Lyytinen, 2009). The word 'theory' is

a widely used term that has different meanings in different contexts (Maxwell & Mittapalli, 2008; Bakker, 2010). In the field of Social Science, Boeije (2010) defines theory as a coherent attempt to describe, understand and explain aspects of a social situation or phenomenon. There are several frameworks available to facilitate the development of theory (Whittaker, 2004; Rowlands, 2005; Hart & Gregor, 2012). Having considered the various frameworks, the framework proposed by Remenyi et al. (1998) has been adapted as the theory building model for this research. Figure 3.15 outlines the model that will be used in this research.

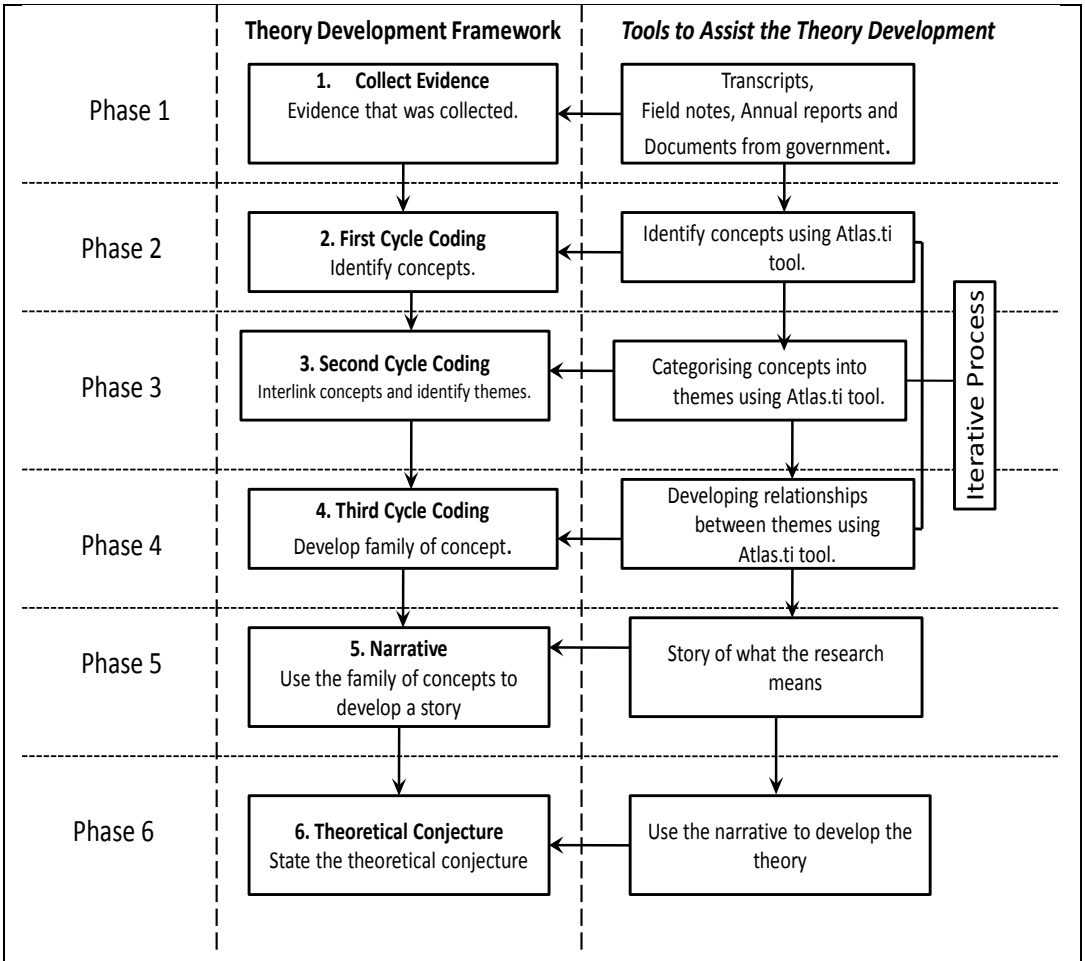


Figure 3.15 An Approach for the Development of the Theory

The model has six phases. In phase one, the required evidence is collected. Phases two, three and four are characterised by the collected evidence being conceptually categorised; in this case the first, second and third cycle coding processes. Then the concepts are thematically categorised, before finally reflecting on the relationships between themes. In phase five, a narrative of the relationships between concepts is developed. In phase six, a theoretical conjecture is proposed. This approach is important

in that it provides a route to the development of a convincing description of the e-Government design and development process.

3.20 Developing codes

The codes were developed with reference to three sets of ideas. The literature suggests important issues to identify in the text. The dialogue with informants offers ideas for codes and then finally the text itself. In preparation for the coding, the researcher went on an Atlas.it training course.

The transcripts were loaded into Atlas.ti and codes were developed (this is covered in Chapter 5). This process lasted four months. During the coding process the researcher reflected on the codes and developed themes, and then brought the themes together to develop a theoretical conjecture.

3.21 Data Management

In the field of Information Systems, issues relating to data management, data preparation and data recovery have been researched and strategies developed to protect the integrity of data. The same care is required for research data. Data management in research is essential because this ensures that the integrity of the data is preserved and it adds a level of credibility to the data and findings.

Bazeley (2013) and Boeije (2010) provide advice on how to manage research data. In this research, the data was managed using the following principles. Two types of data were collected: 1) data in the form of reports, internal publications, industry/professional journals; and 2) data stored electronically on CDs and memory sticks. The physical and electronic artefacts required different strategies for management.

The physical artefacts were managed as follows:

- signed informed consent documents were placed in individual plastic sleeves and filed by date;
- field notes were placed in individual plastic sleeves and filed by date; and
- documents provided by the informants were placed in individual plastic sleeves and filed.

These physical artefacts were at all times kept in a locked cupboard.

The electronic artefacts were managed as follows:

- digital recordings were immediately transferred from the recording device, renamed, numbered and saved to disk;
- the transcribed interviews were anonymised, named using a numbering strategy and from time to time saved to disk;
- all transcribed files were saved as MS Word files;
- other electronic artefacts were saved to disk in special folders;
- a special folder management approach was used to keep all the artefacts in different folders;
- these electronic files were saved on a personal computer that was ID and password protected;
- the files were backed up to a personal local hard drive which was password protected; and
- a further back-up was created in the cloud[44] that was password protected.

The collected data was then imported into Atlas.ti. Atlas.ti 6.2 is a flexible CAQDAS tool that requires minimal preparation of the data. However, for consistency purposes all the interview transcripts were in .doc[45] files. Using the built-in function in Atlas.ti, the data being analysed was periodically backed up to a local hard drive.

3.22 From codes to theme to narrative

Figure 3.16 presents the coding cycles. During the first cycle of coding 913 quotations were identified which led to the development of 280 codes. In the second cycle of coding these were reduced to 42 concepts, and in the third cycle of coding these were reduced to 8 themes. These represented the core themes of the analysis. These themes were then used to develop a narrative.

[44] A conscious choice was made to back up the data to the cloud. This was because of challenges caused by power surges and failure of hardware.
[45] ATLAS.ti supports: Text files, PDF documents, audio, video and image files, Google Earth and Google Earth snapshots

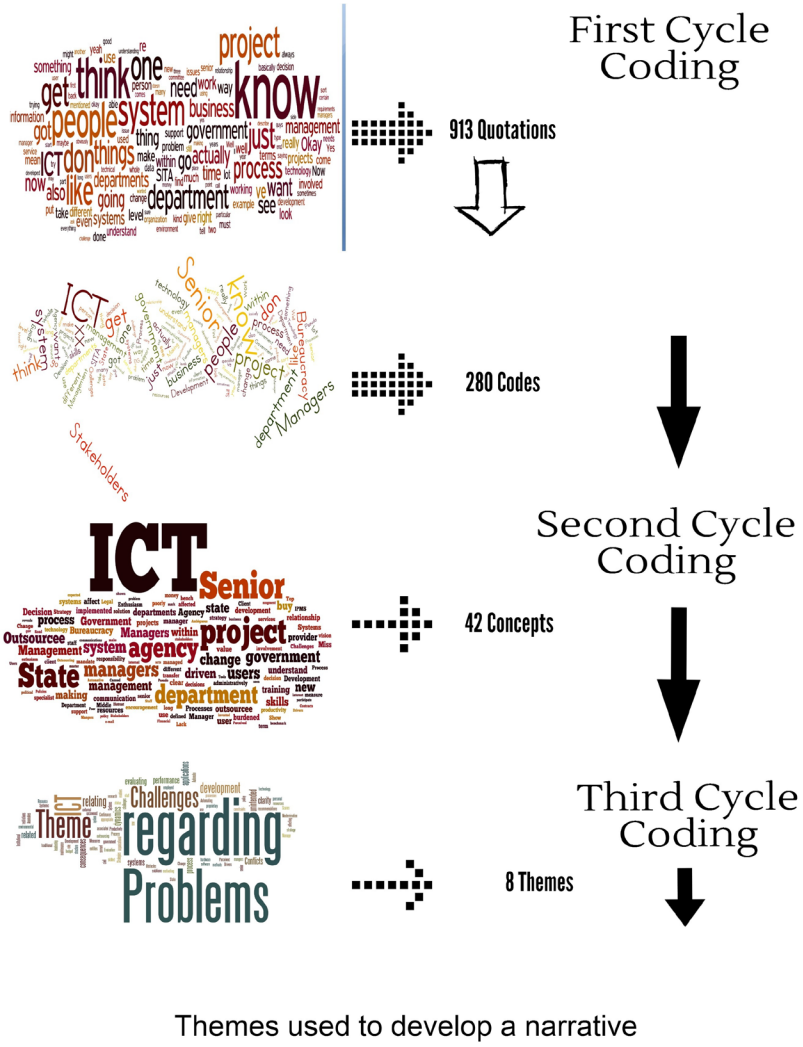


Figure 3.16 The Three Phase Coding Cycle

Figure 3.16 presents the coding cycles. The transcripts were uploaded to Atlas.it., and as outlined in Section 3.20, the codes were developed. In the first cycle of the coding, the text was read, reflected upon and then key issues in the text were identified and coded. The 913 quotations represented the key issues in the text. Further reflection on the quotations resulted in the quotations being reduced to 280 codes. During this phase quotations that presented the same type of issue were grouped together. In the second cycle of coding, after reflecting on the codes, the codes that presented similar issues were grouped together to develop 42 concepts. Then in the third cycle of the coding after reflecting on the 42 concepts, these concepts were reduced to 8 themes. The 8 themes were reflected upon, the relationships between the themes were identified and these themes and the relationship between them were used to develop the narrative.

3.23 Rigour of the Research

All academic research needs to be implemented with attention being placed on the issue of rigour. Some academics argue that this is especially important for qualitative research (Higginbottom, 2004; Saumure & Given, 2008). The research conducted for this degree was undertaken with the highest concern for rigour. The method used was implemented with care and with all the necessary attention to detail. In so doing the following was the major guideline. The research question was developed after careful consideration of the literature and other secondary data obtained from websites and the performance of a Delphi study. The researcher had ensured that only informants who may be regarded as having specific and appropriate knowledge of e-Government were approached and the data each provided was carefully recorded. The researcher remained vigilant for possible bias. Triangulation was used extensively to obtain a richer understanding of the situation. Transcripts were carefully developed from notes and recordings. The coding scheme was developed after due reflection on what had been heard during the interviews and after reading the documents supplied by informants. The process of coding was diligently undertaken to ensure that any ambiguities were identified and minimised if not eliminated. After the first cycle coding was completed a period for reflection was allowed before any second cycle coding was undertaken. The same procedure applied to the third cycle coding. The narrative was developed utilising the output of the coding activities, the themes developed and other secondary data supplied by informants. A carefully developed logical narrative based on the chain of evidence and reflecting a high level of rational argument was developed from which a theoretical conjecture was postulated. The research question was then answered and some practical guidelines which will be of use to practitioners were developed.

Lincoln and Guba (1985; 2000) have developed an approach for reinforcing the rigour of qualitative research. The approach is guided by the following: dependability, credibility, transferability and confirmability, as outlined in Figure 3.17.

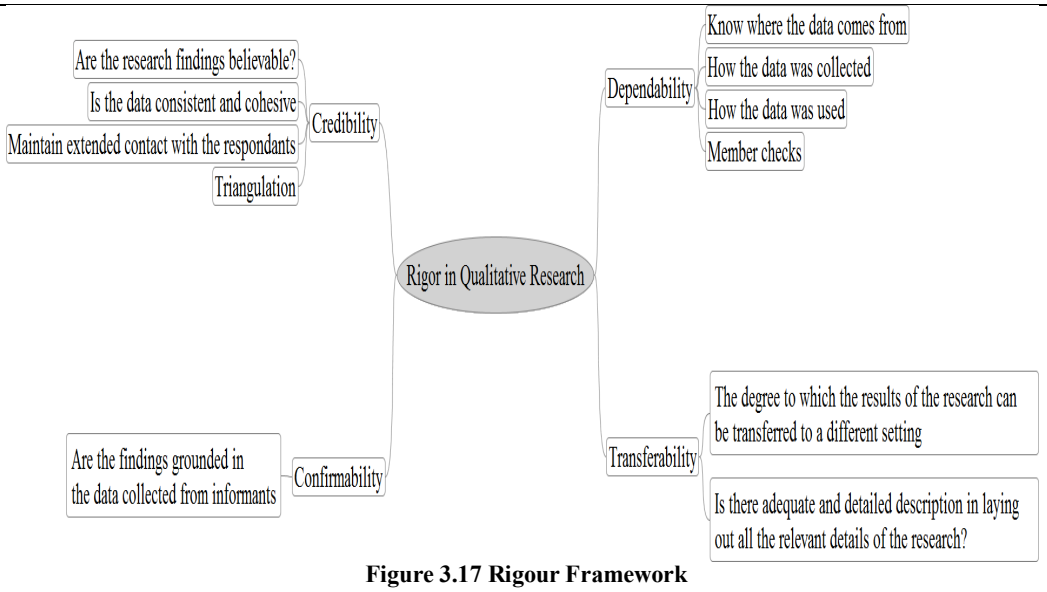


Figure 3.17 Rigour Framework

Lincoln and Guba's (1985; 2000) framework has been adopted to guide the rigour of this research.

3.24 Summary

In this chapter the merits of using a qualitative approach to understand the research question has been presented. It is demonstrated that Information Systems deal with contemporary real life situations and as such, the most appropriate manner in which to understand the problem is to use a case study approach. To understand the research problem, it is appropriate that South African government personnel be interviewed using a selective sampling approach to identify informants.

Having outlined the research method used in this research, the research informants, their selection and the different types of data that was collected were discussed. The ethical principle that governs the research was also discussed. Qualitative data analysis, the instrument and analysis were discussed. It is important to note that in the context of this research, the unit of analysis is the decision-making process which is employed across a number of different government entities.

An interview schedule was used to guide the dialogue with the prospective informants. A case frame had been developed and was used to guide the selection of informants. Before informants were interviewed, they were sent Informed Consent Documents, as well as on the day of the interview they were briefed concerning the research and their right to withdraw. The interview data and other evidence was analysed using an interpretive approach, a narrative was developed and than a theoretical conjecture was

proposed. The research is conducted with rigour in mind. It was also important to outline how the collected data would be managed. By the end of the data collection the following types of evidence were collected:

- Interview transcripts, which are the primary source of data (see Appendix K)
- Notes made during the interview (see Appendix I)
- Field notes that were made after the interview (see Appendix L)
- Excel templates that were used for data collection within government (see Appendix M)
- Word templates that were used for data collection within government (see Appendix N)
- Pictures of government documents, such as internal documents (see Appendix J)
- Internal electronic documents, such as reports (see Appendix O)
- Internal reports (see Appendix P)
- Internal newsletters (see Appendix Q)
- List of government websites (see Appendix R)
- Annual reports (see Appendix S)
- Strategic planning reports (see Appendix T)

All the evidence that was supplied were closely reviewed for issues that were directly related to the research question. Using Atlas.it the data was analysed, which will be discussed in the next chapter.

Chapter 4
Data Analysis and Findings

4.1 Introduction and Overview

As described in Chapter 3, data analysis involves the close inspection of the transcripts in order to understand the ideas conveyed by the informants. After the data is analysed the researcher is in a position to interpret it and create a narrative leading to a theoretical conjecture and then answering the research question.

4.2 Data Analysis

In this phase of the research the evidence was analysed in order to identify key themes that would be used to develop a narrative. With a view to triangulation the interview transcripts were supplemented by the following additional evidence: field notes, websites, documents provided by the informants and government internal reports. Figure 4.1 shows the different sources of evidence and how they relate to the interview transcripts. The different sources of evidence were used to support the themes that were generated using the interview transcripts.

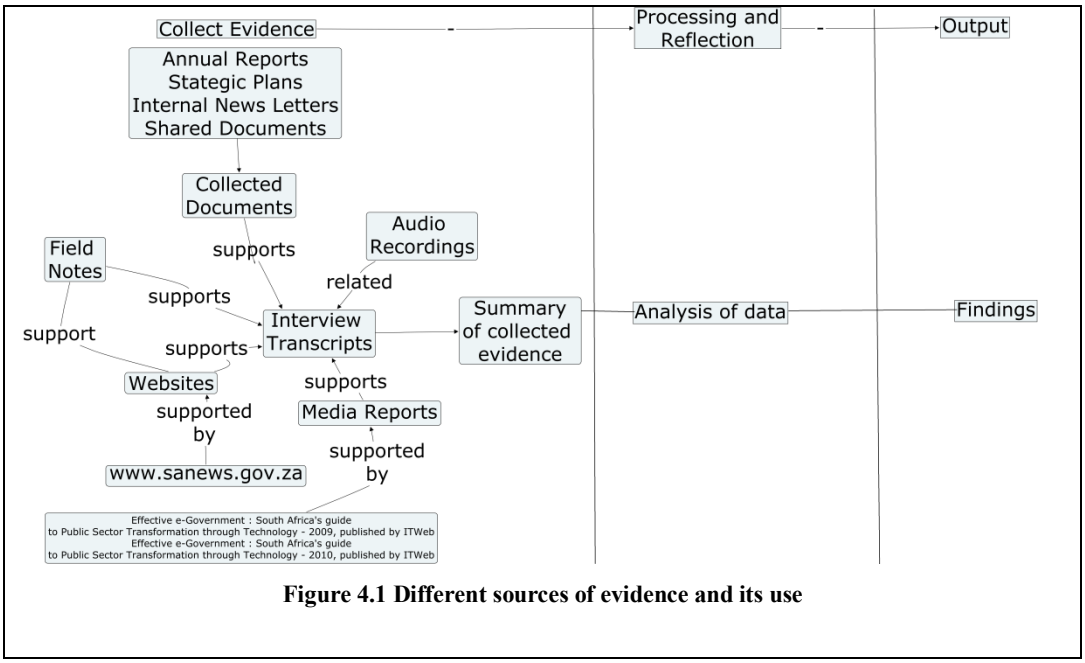


Figure 4.1 Different sources of evidence and its use

Having anonymised the transcribed interviews, the next step was to analyse the data using the approach outlined in, Chapter 3. These are the steps to this work:

1. Upload transcripts to Atlas.it as shown in Figure 4.2. The Primary Document Manager of Atlas.ti which provides information regarding the transcripts, has coded them and the number of quotations in each

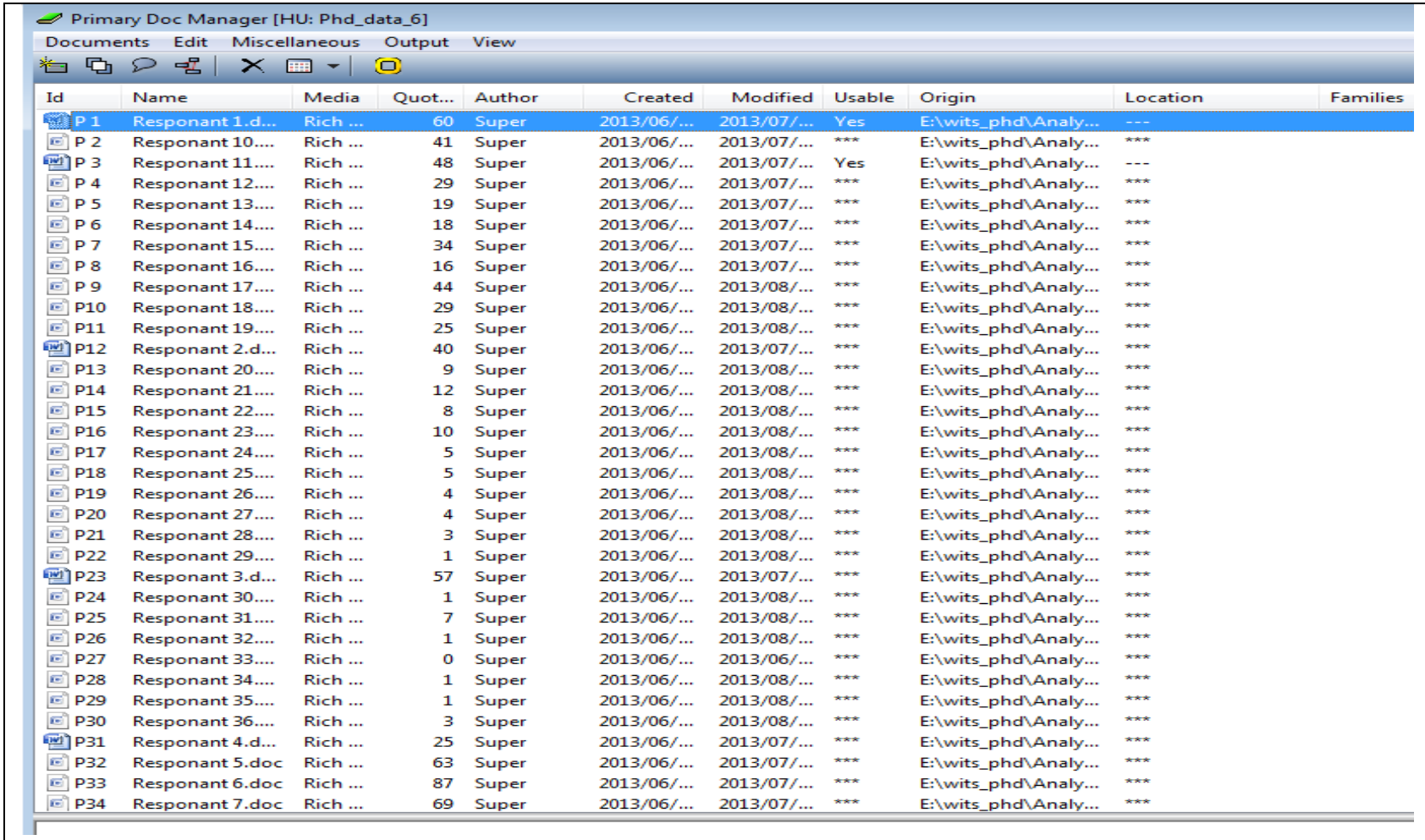
transcript. The Primary Document Manager is used to manage the documents.

2. First cycle coding is where codes are identified as shown in Figure 4.3. The transcripts are used as the primary source for the code creation process.
3. Second cycle coding is where interlinking concepts are identified as shown in Figure 4.4. The Network View provides a means of grouping codes (first cycle codes) into secondary cycle codes
4. Third cycle coding is where themes are developed as shown in Figure 4.5. Here concepts are clustered into themes.
5. Identify the relationships between the themes and create a diagram of the narrative as shown in Figure 4.6.

Using the diagram of the narrative developed in Atlas.ti the next step was to:

6. Develop a detailed textual description of the issues that affected e-Government applications, which is the narrative.
7. Using the narrative a theoretical conjecture was proposed.
8. The research question was answered.

To begin the process of analysing the collected data, the researcher engaged in the activity of coding. Coding is a procedure that breaks the data up into manageable segments, and identifies or names those segments. Codes may be developed prior to data collection or may emerge through the coding process. A code could be a single word or a group of words. Coding provides a level of abstraction whereby similar ideas are grouped on the basis that they represent a pattern to form a concept. There are three approaches to creating codes, as discussed in Chapter 4. The first approach is *in vivo* codes which are obtained directly from the data, for example, terms used by interviewees. The second approach is codes that are created by the researcher, who either derives them from the existing literature or may be influenced by the literature in their creation, and the third is the text itself (Schwandt, 2007a; Benaquisto, 2008; Remenyi, 2013). A combination of all three approaches was used to create the codes.



Id	Name	Media	Quot...	Author	Created	Modified	Usable	Origin	Location	Families
P 1	Responant 1.d...	Rich ...	60	Super	2013/06/...	2013/07/...	Yes	E:\wits_phd\Analy...	---	
P 2	Responant 10....	Rich ...	41	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 3	Responant 11....	Rich ...	48	Super	2013/06/...	2013/07/...	Yes	E:\wits_phd\Analy...	---	
P 4	Responant 12....	Rich ...	29	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 5	Responant 13....	Rich ...	19	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 6	Responant 14....	Rich ...	18	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 7	Responant 15....	Rich ...	34	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 8	Responant 16....	Rich ...	16	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P 9	Responant 17....	Rich ...	44	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P10	Responant 18....	Rich ...	29	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P11	Responant 19....	Rich ...	25	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P12	Responant 2.d...	Rich ...	40	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P13	Responant 20....	Rich ...	9	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P14	Responant 21....	Rich ...	12	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P15	Responant 22....	Rich ...	8	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P16	Responant 23....	Rich ...	10	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P17	Responant 24....	Rich ...	5	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P18	Responant 25....	Rich ...	5	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P19	Responant 26....	Rich ...	4	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P20	Responant 27....	Rich ...	4	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P21	Responant 28....	Rich ...	3	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P22	Responant 29....	Rich ...	1	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P23	Responant 3.d...	Rich ...	57	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P24	Responant 30....	Rich ...	1	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P25	Responant 31....	Rich ...	7	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P26	Responant 32....	Rich ...	1	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P27	Responant 33....	Rich ...	0	Super	2013/06/...	2013/06/...	***	E:\wits_phd\Analy...	***	
P28	Responant 34....	Rich ...	1	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P29	Responant 35....	Rich ...	1	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P30	Responant 36....	Rich ...	3	Super	2013/06/...	2013/08/...	***	E:\wits_phd\Analy...	***	
P31	Responant 4.d...	Rich ...	25	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P32	Responant 5.doc	Rich ...	63	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P33	Responant 6.doc	Rich ...	87	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	
P34	Responant 7.doc	Rich ...	69	Super	2013/06/...	2013/07/...	***	E:\wits_phd\Analy...	***	

Figure 4.2 Screen Shot of Atlas.ti showing the loaded transcripts

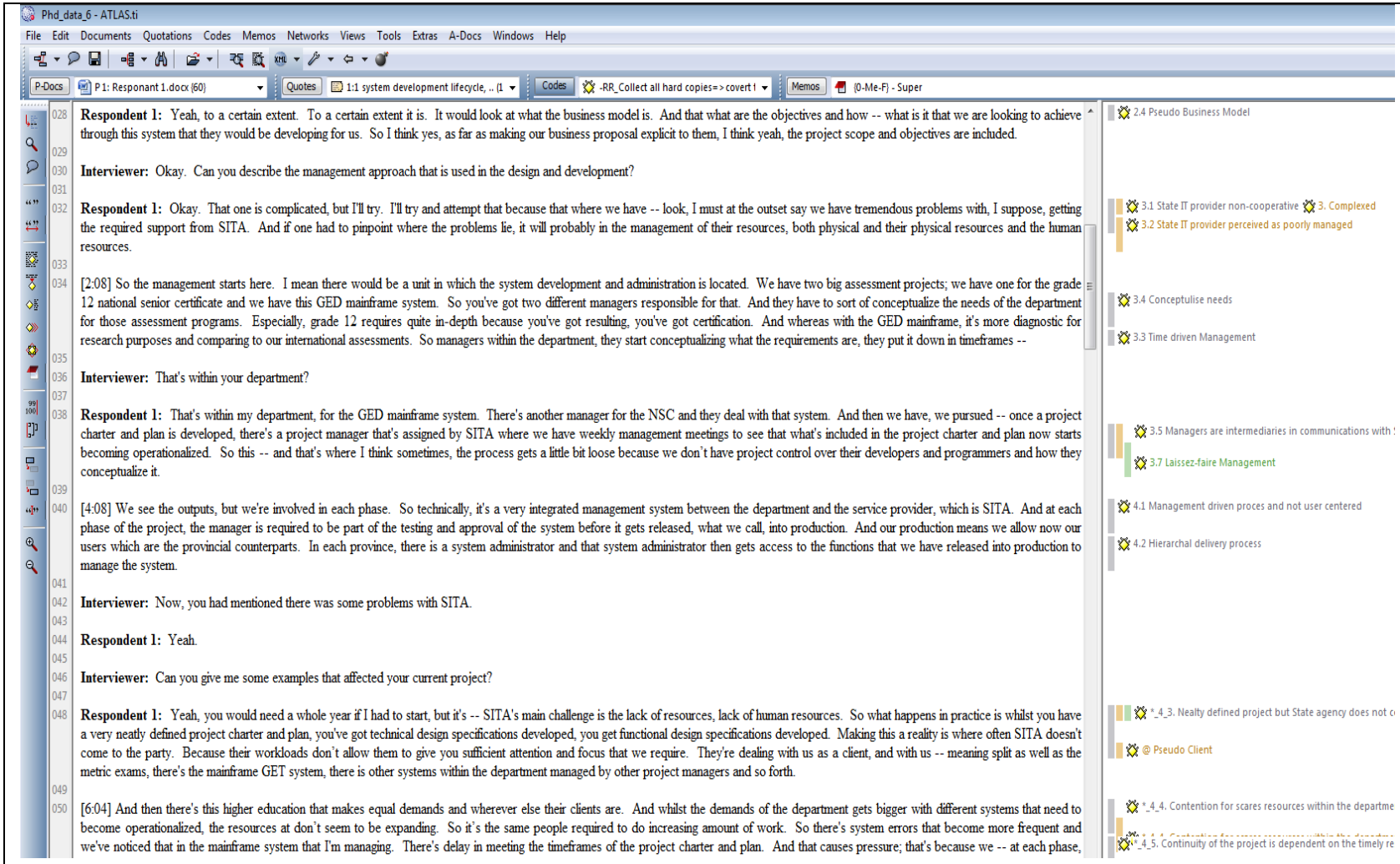


Figure 4.3 Screen Shot of Atlas.ti showing the first cycle of coding

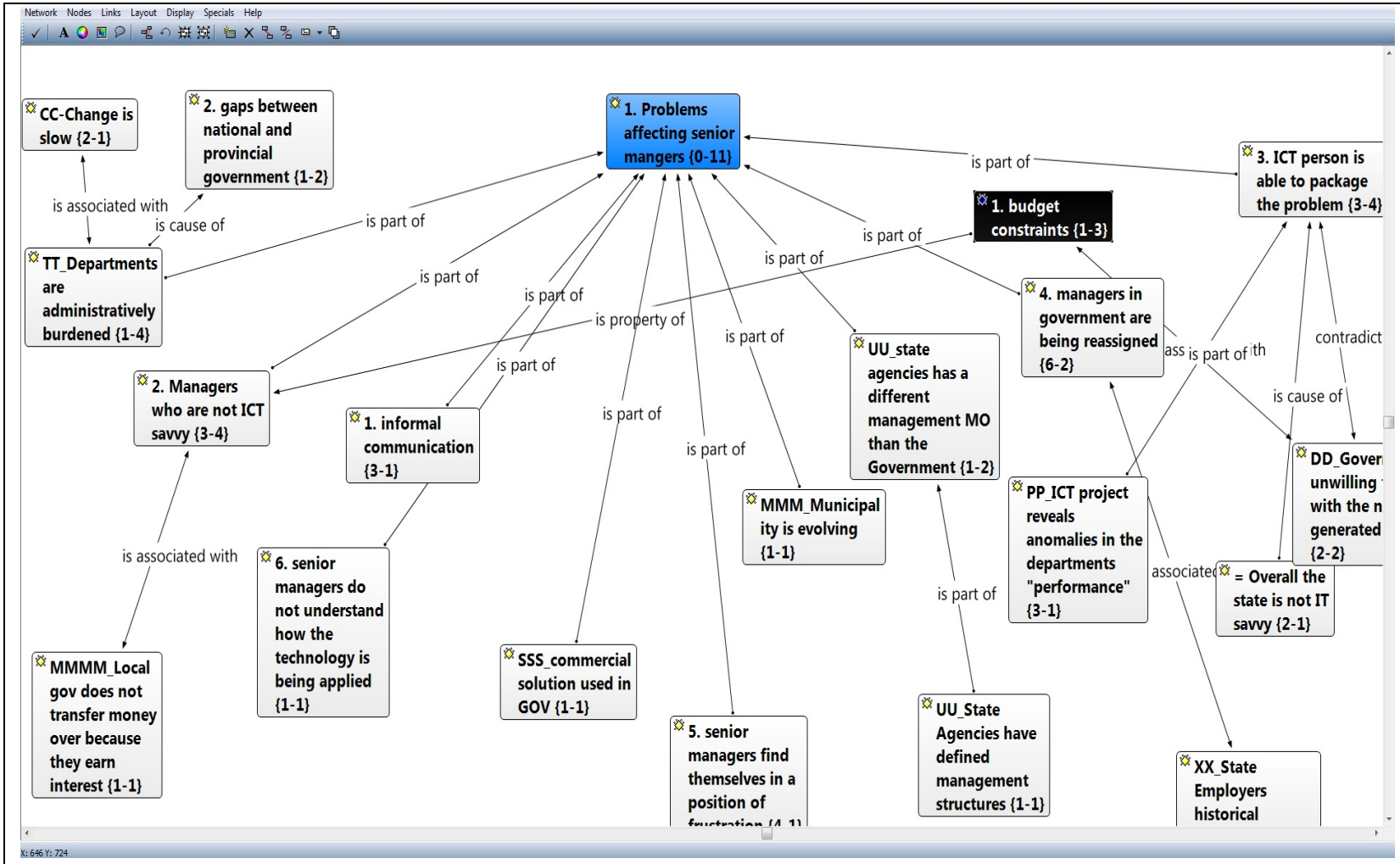


Figure 4.4 Screen Shot of Atlas.ti showing the second cycle of coding

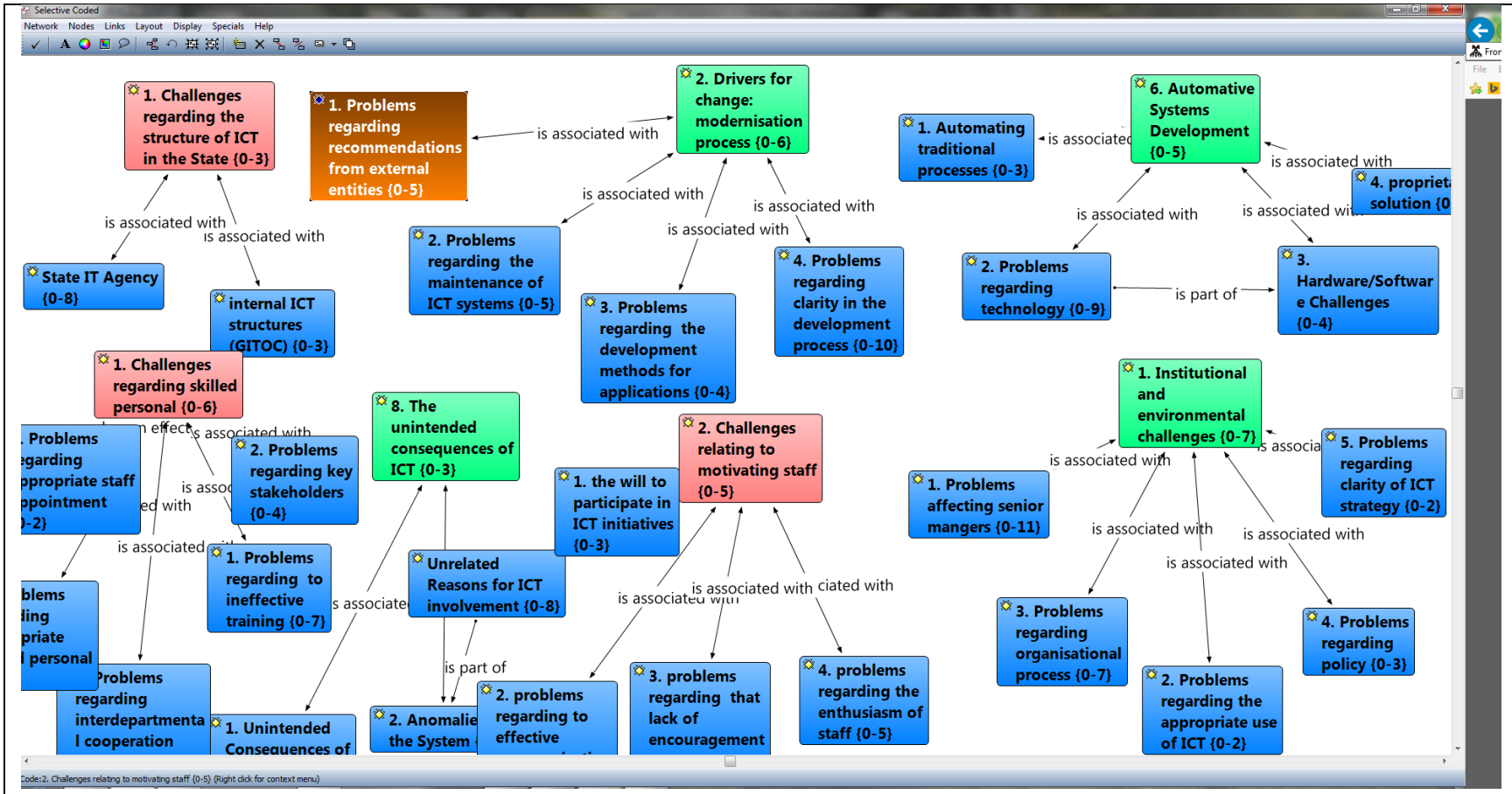


Figure 4.5 Screen Shot of Atlas.ti showing the third cycle of coding

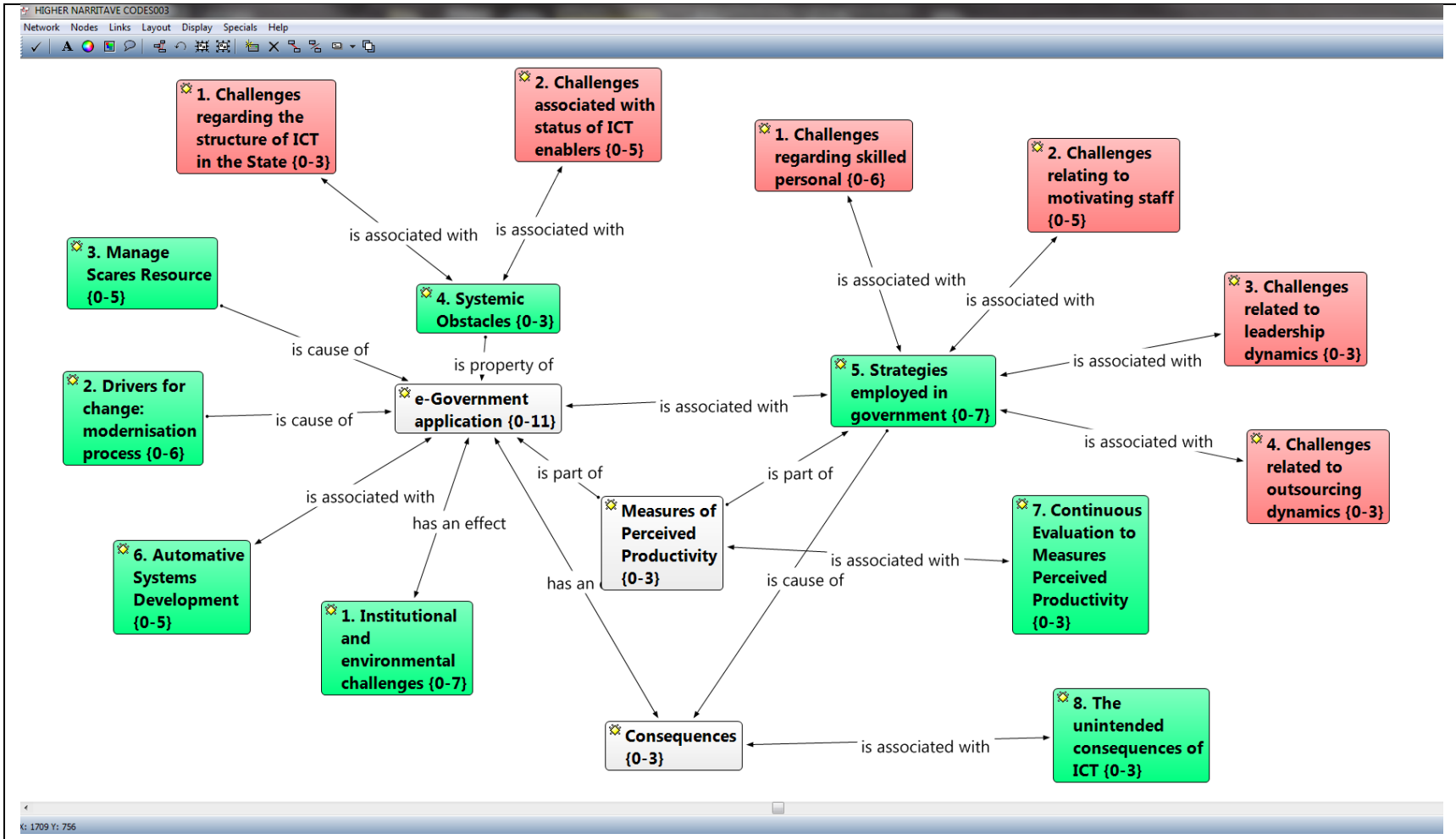


Figure 4.6 Screen Shot of Atlas.ti showing the creation of the narrative

The first cycle of coding exercises resulted in 280 codes. Woolf (2007) suggests that codes can be structured using symbols, numbers and letters. The researcher used Woolf's structured[46] coding approach. This approach is useful because similar items are clustered together and this clustering process assists with the second coding phase. The second cycle of coding resulted in the creation of 42 concepts and in the third cycle of coding this was reduced to 8 themes. These 8 themes were used to develop the narrative.

4.3 Understanding the themes identified during coding

The identified themes were not generated by counting words, but were generated by examining the constructs/ideas that occur in the data. Constantly reflecting on these themes and triangulating them against other related documents were used to support the themes that were generated from the coding process.

After the third cycle of coding, the following 8 themes were generated:

- institutional and environmental challenges;
- drivers for change: modernisation challenges;
- manage scarce resources;
- systemic obstacles;
- strategies employed in government;
- automate systems development;
- continuous evaluation to measure perceived productivity; and
- the unintended consequences of ICT.

Having identified the themes in the data, the next step was to explain the themes. In Figure 4.7 the 8 themes are shown, each theme has three nodes. For the theme *institutional and environmental challenges* these are:

1. How was this theme arrived at? Which relates to the coding and reflection process.
2. What does this theme mean? and
3. What are the elements of this theme? Which relates to the different sub-issues within the theme which is substantiated with informants' comments.

Using the framework above, each theme will be discussed.

[46] The structured coding approach must not be confused with Prof. Nigel King's template analysis, which is an a priori type of coding system. See http://hhs.hud.ac.uk/w2/research/template_analysis/index.htm for more details.

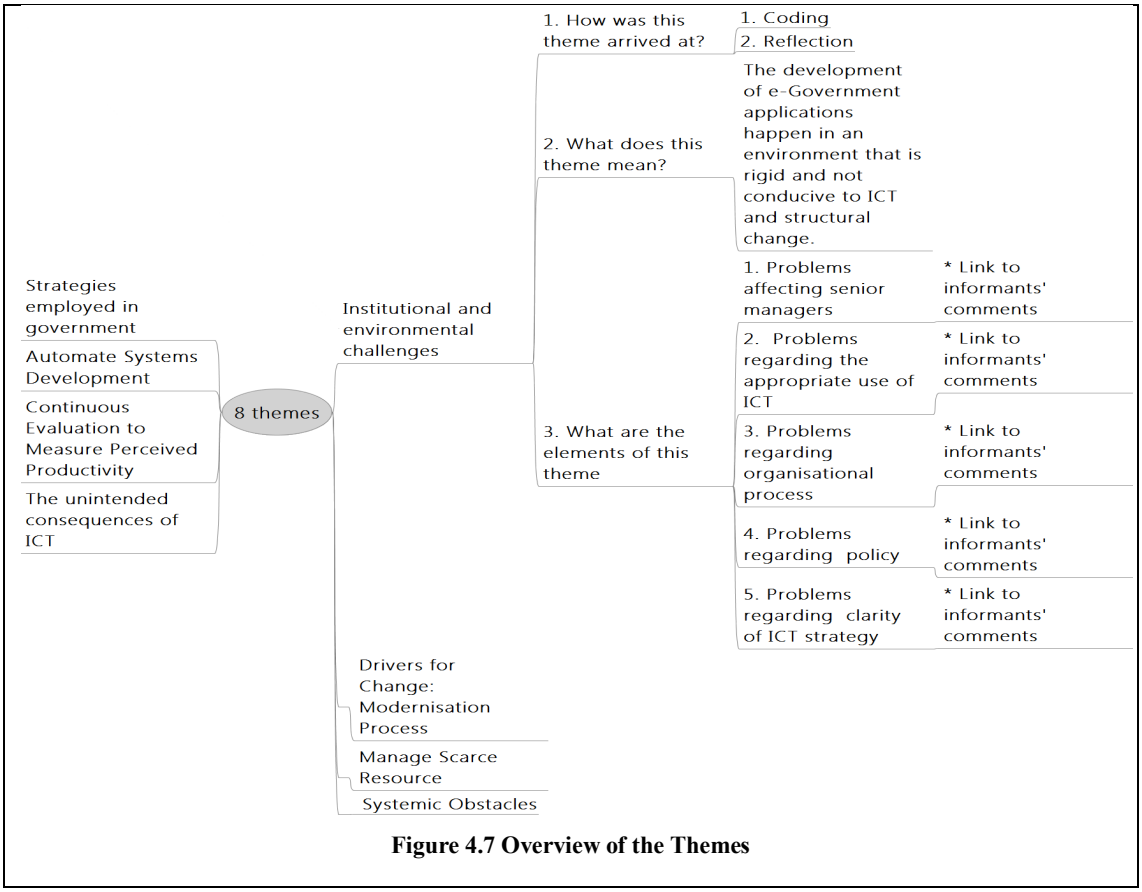


Figure 4.7 Overview of the Themes

4.4 The theme relating to institutional and environmental challenges

4.4.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to institutional and environmental challenges was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.4.2 What does this theme mean?

The institutional and environmental challenges refer to the organisational setting within which e-Government applications are designed and developed. Organisational setting has a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. The development of e-Government applications happens in an environment that is traditionally inflexible and not conducive to creative ICT development and structural change as a result of ICT initiatives. The implications are that government may not realise the benefits of the proposed e-Government application.

4.4.3 What are the elements of this theme?

The elements of this theme are: problems affecting senior mangers; problems regarding the appropriate use of ICT; problems regarding organisational process; problems regarding policy; and problems regarding clarity of ICT strategy. These will now be discussed.

4.4.3.1 Problems affecting senior mangers

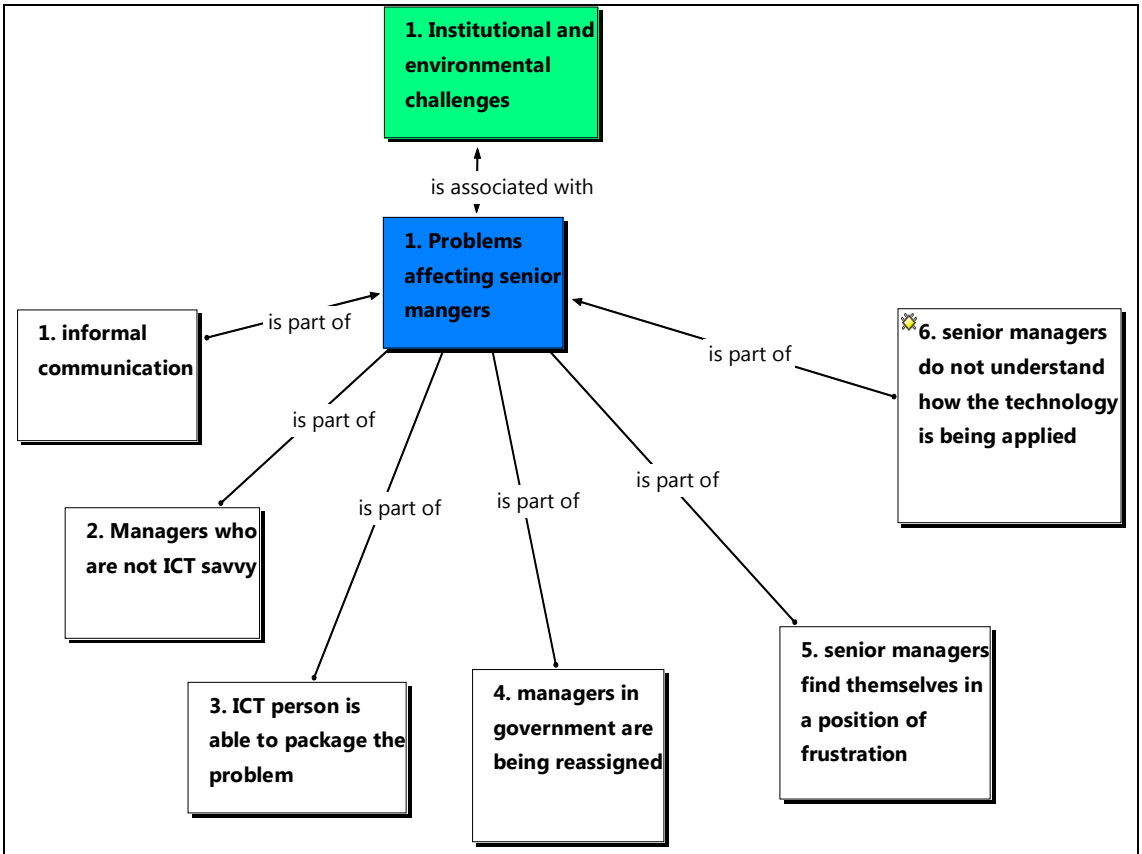


Figure 4.8 Problems affecting senior mangers

As displayed in Figure 4.8, informal communication affects senior managers' (and users') perceptions of e-Government applications. Informal communication is a casual exchange of information and some informants referred to this type of communication as the grapevine. This is demonstrated by the following comments from informants:

- *Most people [managers and users] would be vaguely aware through the grapevine that there is something happening.*
- *I [senior manager] tend to keep my ear to the ground whenever something [new ICT projects] is coming down the line.*
- *I think that was quite helpful because those are very influential people. If they [senior managers] say they are not happy regardless of whether there was a mistake in, you know, small thing as a semicolon, if he's not happy and he broadcast that then everybody is not going to be happy.*

Further, senior managers who are not ICT savvy assess the merits of e-Government initiatives. Senior managers who are not ICT savvy do not understand how ICT is used in the organisation or are under-prepared to understand ICT. These senior managers struggle to make decisions, as demonstrated by the following comments from informants:

- *So it's a crisis management [in relation to ICT projects]. It's not a management by objective.*
- *They [senior managers] can't see that, if they do this like this, the consequences a year, two years, three years, probably get down the line, is going to be that...*

However, if an ICT person is able to package the problem and solution in an elegant and understandable manner, then senior management will be inclined to accept the proposal. Packaging the problem refers to the senior manager understanding the economic issues related to the e-Government application. This is demonstrated by the following comment from an informant:

- *if I went to my leadership [director] with a problem and I said, look, we have to spend 5 million rand, doing a particular thing and that particular thing would enable the project to go live more smoothly, you know, the questions would be around budget availability and all that and does the cost justify it. But once they are satisfied with the fundamental information, they would then support me.*

In addition, senior managers in government are being reassigned or are being moved horizontally within government to other posts in different departments. These types of movement have an unsettling effect on the productivity of the department, as demonstrated by the following comments from informants:

- *I must say, last time I was in a different unit than where I am now because we were not restructured yet.*
- *We've had some structure changes lately. And those people [directors] are relatively new; they're finding their feet and one day they will be settled.*
- *We then went and did business processes and did full enterprise architecture for a further 10 million, so that's 13 million gone. New head of strategy [director] came in and said forget about that and they appointed consultants to reengineer the organization.*

Then, senior managers find themselves in a position of frustration, because they are stripped of decision-making authority because decisions are made by committees. This is demonstrated by the following comments from informants:

- *we [senior managers] do not have the powers to make decisions, because most of the time you know, you find that there is a challenge A [lack of skills, resources, understanding], you know how to resolve it technically, however because you haven't run this past your director or your superior you cannot say that in a meeting, in a project meeting.*
- *And then I just lost interest in Knowledge Management in government basically because you know, you can't ... on a stranglehold.*
- *people from private sector they don't last in the government because you [senior managers] are so alone in the process, you are trying to push, you are trying to make a difference and all that but people are not receiving it that way.*

Besides senior managers being frustrated, senior managers do not understand how the technology is being applied, as demonstrated by the following comments from informants:

- *They find it difficult to conceptualize technical problems or the technical jargon and so you might get some unreasonable requests.*

- *The previous DG [director general] came from arts-related background. I don't think he ever switched his laptop on.*
- *…it's literally just rubberstamped by the senior management [directors] because they do not have the technical background to really decide whether this is something that is going to fly or not. That's why they are going to the advisory panel I think.*

Senior managers' lack of understanding of how ICT is applied in government leads to the problems regarding the appropriate use of ICT.

4.4.3.2 Problems regarding the appropriate use of ICT

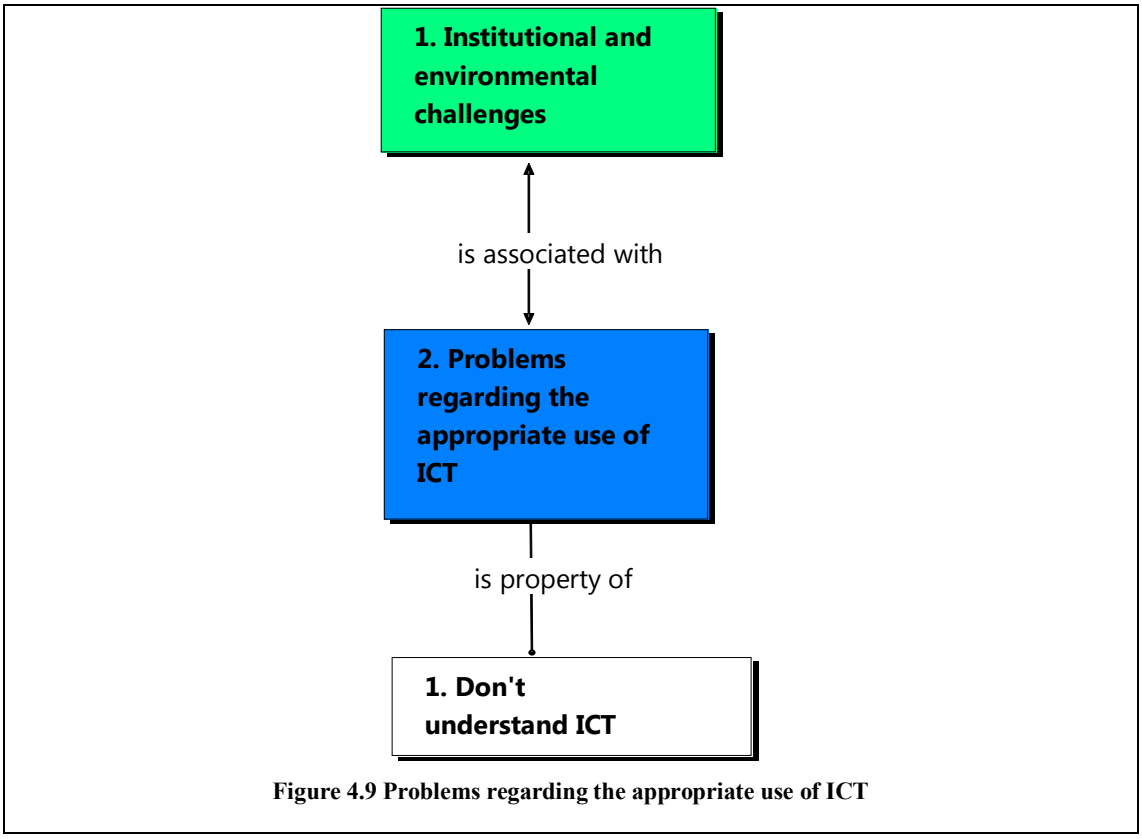


Figure 4.9 Problems regarding the appropriate use of ICT

The problems regarding the appropriate use of ICT in government is a phenomenon that is characterised by a low level of understanding of how e-Government applications are developed and designed, as displayed in Figure 4.9. This is demonstrated by the following comments from informants:

- *I think a lot of them [senior managers] don't understand information technology, they don't understand what information technology can do and sometimes when a project has possibly been not successful or it's been floored they may have a negative view about information systems what they can do.*
- *the application of ICT in particular areas of government is seen as a "foreign concept", for example the application of voice recognition applications.*

Also within government there is strong scepticism amongst civil servants as to the creditability of the information produced by e-Government applications, as demonstrated by the following comments from informants:

- *I think that is in their minds [managers and directors], I think in a way they are still sceptical about whether the system has really managed to get them the information that they are looking for.*
- *You see, even if you [managers and directors] are afraid to take that step you will also not trust those systems that keep that data, yeah.*

Next, senior managers are in ivory towers or are disconnected from the realistic application of ICT. Senior managers who are in ivory towers do not understand how or when to use ICT appropriately, as demonstrated by the following comments from informants:

- *a senior manager team would make a decision to implement something and even a guy that is at a level below me ask him a question that should have been asked by one of his peers in the meeting where they made a decision and you know, they don't respond.*
- *...it is very painful or sad because you sit in a meeting with senior management, executive management of the organization and you would see your CIO giving information that does not make sense there, but you can't say it to them and even when you come back and say you know what you have committed to this thing, and that's not the way you are doing, you are going to have problems here and here and here and being the way they are they will never go back and say you know what I made a mistake maybe you know for what reasons but I believe that if you go back and say you know what I think this might not work and come up with an alternative before you can spend the money they might respect you and trust you.*
- *But the senior managers [directors] they don't see that problem because it's just too distant from where they are sitting. It sounds like a very logical business requirement because everybody is using like this.*

A further reason why there are problems regarding the appropriate use of ICT in government is because some senior managers do not lead by example and use the technology at their disposal, as demonstrated by the following comments from informants:

- *Some of the very senior people won't even use a PC, some of them won't even type a word, some of them don't even know how to type in Word. So it's a huge challenge. It's a difficult thing, but the organization works around it.*
- *...secretaries answer all their bosses' email.*

Since senior managers are not using the technology and they have downward delegated the management of their communications, this downward delegation adds a level of bureaucracy in the organisational process.

4.4.3.3 Problems regarding organisational process

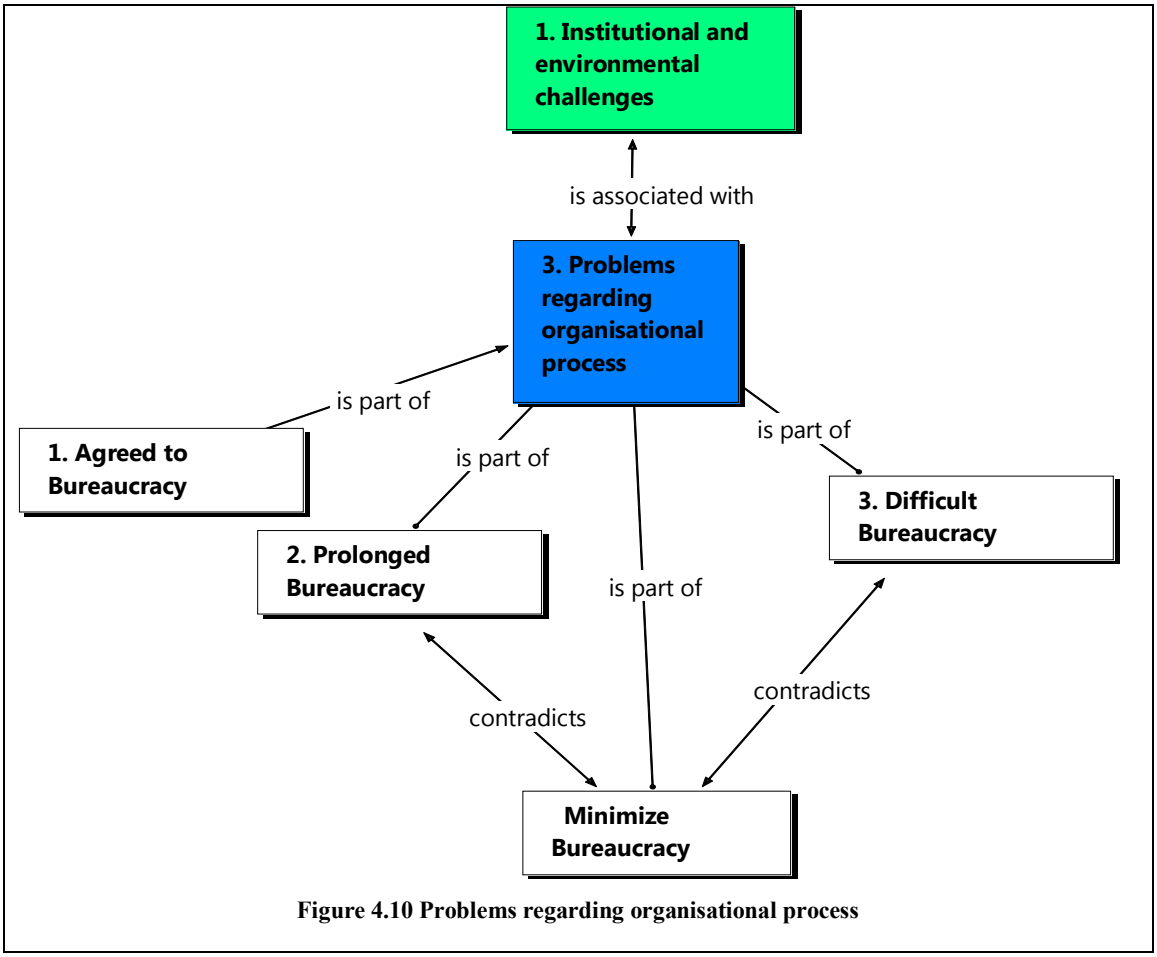


Figure 4.10 Problems regarding organisational process

There are several types of organisational process problems (bureaucracy) that exist in government, as displayed in Figure 4.10. These are agreed to bureaucracy, prolonged bureaucracy and difficult bureaucracy. Agreed to bureaucracy is bureaucracy that all key stakeholders have negotiated and agree to, as demonstrated by the following comments from informants:

- *...we decided to go through a committee structure in order to make sure that the decision making is appropriate.*
- *It is a bureaucratic approach but it's an agreed process on both sides, that is, the change request procedure that you would follow.*
- *Any project or any initiative that needs to be approved goes through the IT steering committee, and essentially after that goes to the head of department for approval. So nothing happens in the IT space without approval from the head of department.*

Prolonged bureaucracy is bureaucracy that is characterised by prolonged delays in time before any action can be taken, as demonstrated by the following comments from informants:

- *And that put the whole thing [ICT initiative] in another year, took another year to get everything signed. And struggled to trace where the documentation was and what was holding it up.*

- *..., it [approval] can take long, very long, what I mean by long is it's not a measure of few days or just a week, it can take very long because people have to sit and because ICT is a bit specialized, there aren't many people who are able...*
- *After 18 months of trying [seeking approval], there's a lot of, the internal processes are very sluggish, very, very sluggish.*

Then there is difficult bureaucracy. Difficult bureaucracy is characterised by ambiguities within the organisational process, as demonstrated by the following comments from informants:

- *We have many levels of management. In fact to be precise I think we have 22 levels of management.*
- *...but most of the time it's budgets are the problem. In order to get something done now, in the next financial year in March, you should have motivated for it long, long time ago, early last year already so that it's on the radar.*
- *I do not know how to make contact with another department, can I phone them, must I ask the DG [Director General] to phone them, and it's bad.*

The bureaucracy of government is associated with the policies within government.

4.4.3.4 **Problems regarding policy**

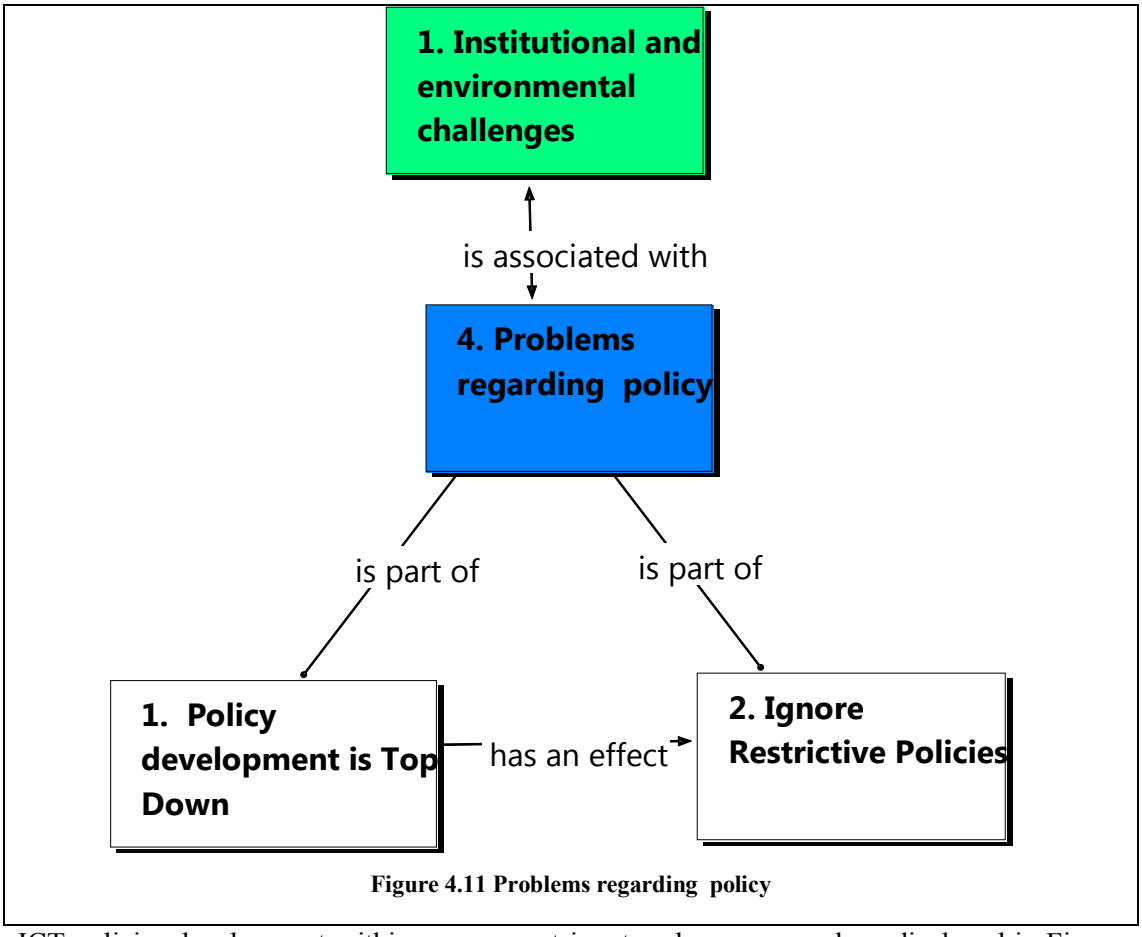


Figure 4.11 Problems regarding policy

ICT policies development within government is a top down approach as displayed in Figure 4.11. This is demonstrated by the following comment from an informant:

- *in every policy process, you have to go to -- you know once it's been to top management [director general] and to the minister and then it has to go to the cluster.*

However, there are those managers that ignore the restrictive policies, as demonstrated by the following comment from an informant:

- *.... they [directors] just say don't worry about the policy but you know, you can be held liable for it.*

Policies are only effective if there are well co-ordinated strategies that support the policy.

4.4.3.5 Problems regarding clarity of ICT strategy

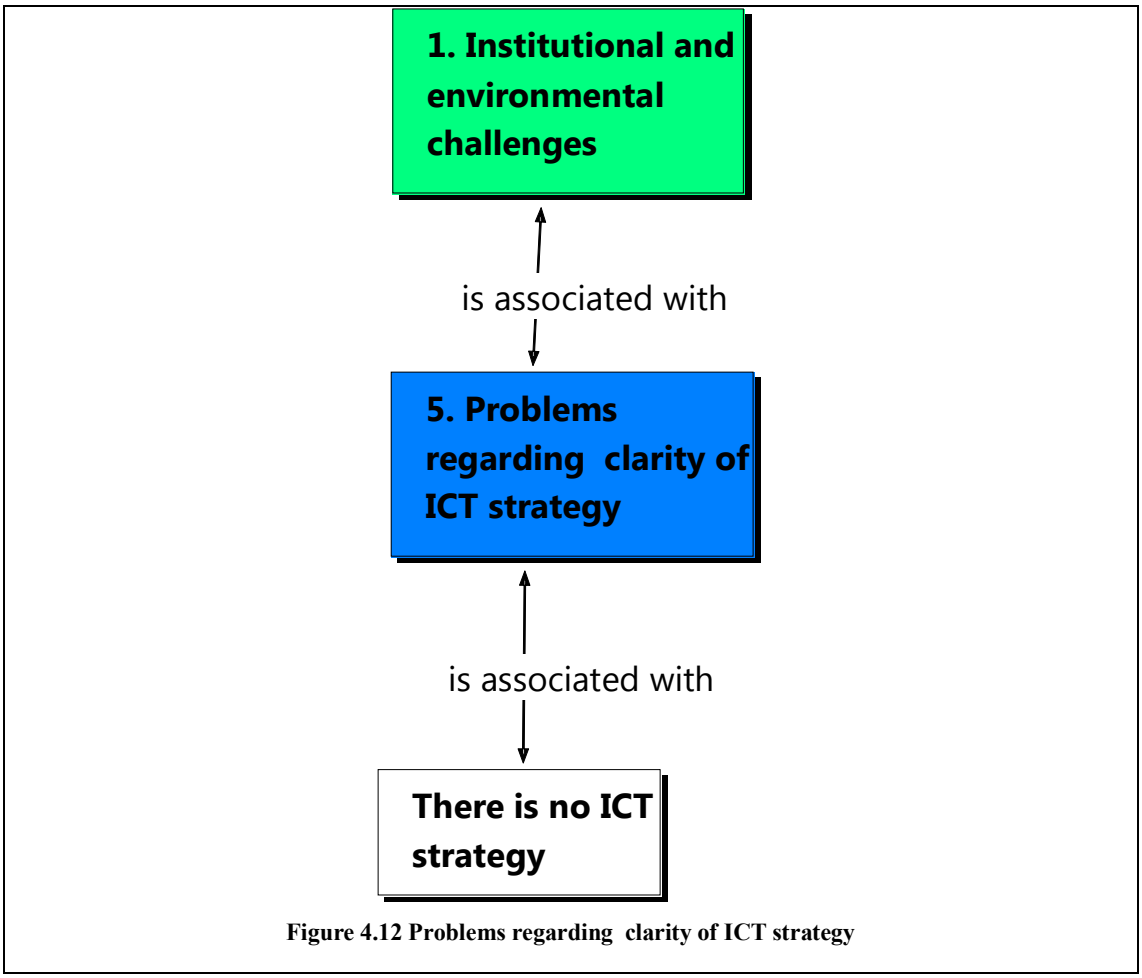


Figure 4.12 Problems regarding clarity of ICT strategy

In the case of the South African government there is no official ICT strategy, as displayed in Figure 4.12. Though there is an ICT policy, the following comment from an informant demonstrated this point:

- *There is not an ICT strategy for government, okay*

Informants did not want to openly discuss government's ICT strategy claiming that ICT strategy has to come from senior government officials. This lack of a clear ICT strategy will have an effect on the modernisation of government.

4.5 The theme relating to drivers for change: modernisation challenge

4.5.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to drivers for change, modernisation challenges were generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.5.2 What does this theme mean?

The modernisation challenge refers to the drivers of change within the government and the primary means to achieve change is to use ICT. The modernisation challenge has a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. One of the objectives of modernisation is to make government more effective and efficient in its day-to-day tasks. However, modernisation is complex because of the different competing mandates within government. The implications are that e-Government applications should be seen as a bridge to connecting the different competing mandates.

4.5.3 What are the elements of this theme?

The modernisation challenge is characterised by problems regarding recommendations from external entities; problems regarding the maintenance of ICT systems; problems regarding the development methods for applications; and problems regarding clarity in the development process. These will now be discussed.

4.5.3.1 Problems regarding recommendations from external entities

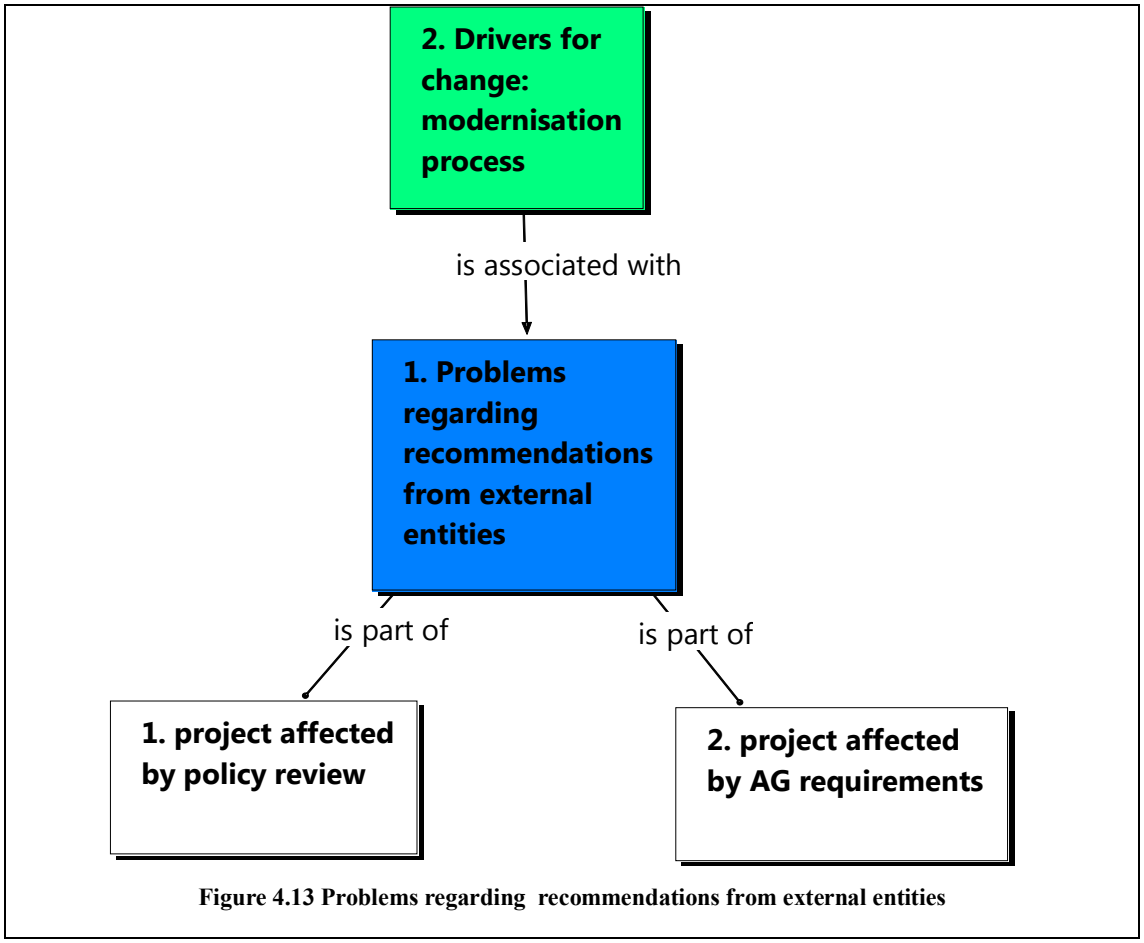


Figure 4.13 Problems regarding recommendations from external entities

There are two issues that affect e-Government applications, as displayed in Figure 4.13. These are reviews to policy which happen on a yearly basis and requirements from external bodies such as the Auditor General. The following comments from informants demonstrated this point:

- *AG's [Auditor General] requirements, and when these requirements have come about, we've had to respond to the AG's requirements*
- *...some of the policies are up for review on an annual basis, some of the projects are up for review on a two year, a two-year basis.*

Apart from requirements from external bodies there are ICT maintenance issues that affect e-Government applications.

4.5.3.2 Problems regarding the maintenance of ICT systems

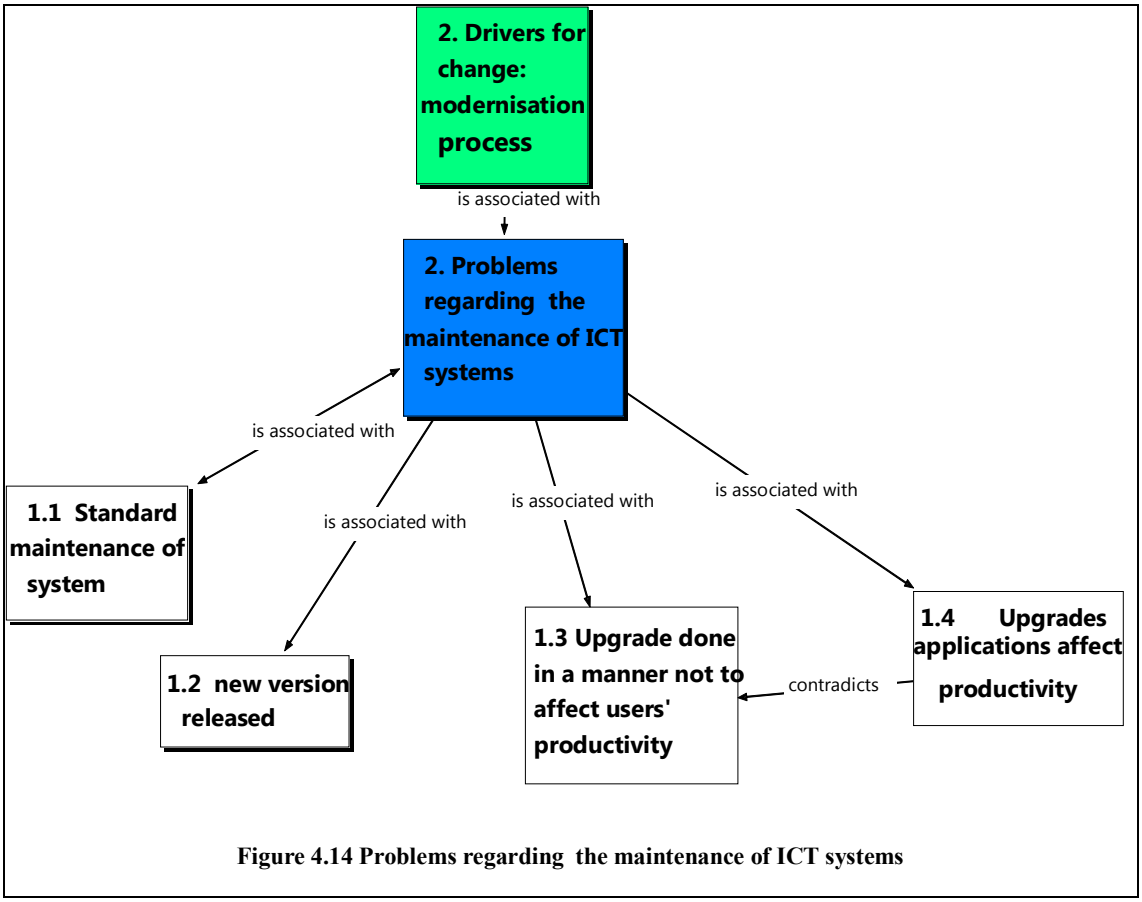


Figure 4.14 Problems regarding the maintenance of ICT systems

Maintenance of e-Government applications happens as a result of standard maintenance to systems, as displayed in Figure 4.14. This standard maintenance would relate to software patches and licensing requirements. Then there is the new version release of proprietary software[47] such as MS Office 2013, or upgrades to proprietary software for removing bugs from the software. These ICT maintenance issues affect productivity and is a drive of change. The following comments from informants demonstrated this point:

- *We had big issues with the Office 2007 roll out from the 2003 to the 2007 the interface changed and they [ICT department] rolled it out overnight and suddenly people [users] couldn't work because now where's my bold and where's my highlight...*
- *...in a very outdated version [software] and the platform had become very unstable.*
- *The crux of it is that you had to migrate data from the current version [application] to the new version. And the migration of the data is a very, very complex process because there are billions and billions of characters involved...*

In addition to ICT maintenance, development methods affect e-Government applications.

[47] Proprietary software here refers to software that is purchased off the shelf such as MS Office Suite.

4.5.3.3 Problems regarding the development methods for applications

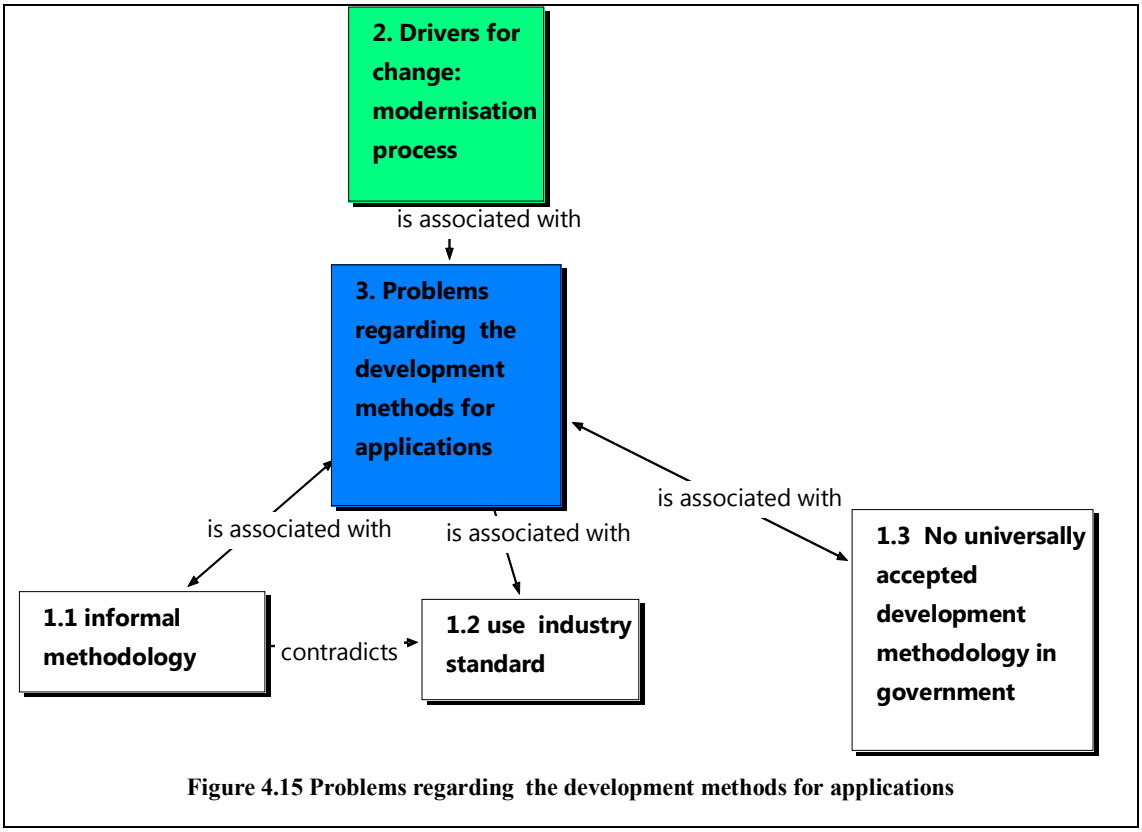


Figure 4.15 Problems regarding the development methods for applications

- *Government departments have fluid ICT methodologies, as displayed in Figure 4.15. This means that there are no accepted standard development methodologies, as demonstrated by the following comments from informants:*
- *...in the first place there must be a proper methodology [systems methodology] that must be followed*
- *I did not follow any specific methodology [systems], to be honest with you.*
- *In terms of standardized methodology [systems], in terms of systems development and project management there isn't one, so there is no standardized development methodology or project management methodology within government. Every department does its own thing there.*

Further, within government there does not exist a formal development architecture, as demonstrated by the following comment from an informant:

- *But I think within government I think the biggest issue that we have is that we don't -- well, we haven't formalized first of all architecture [development architecture]. And second, we have not formalized our old one, our architectures through our strategic objectives within the organizations.*

Besides ICT methodologies, the development process that is employed has an effect on the e-Government application.

4.5.3.4 Problems regarding clarity in the development process

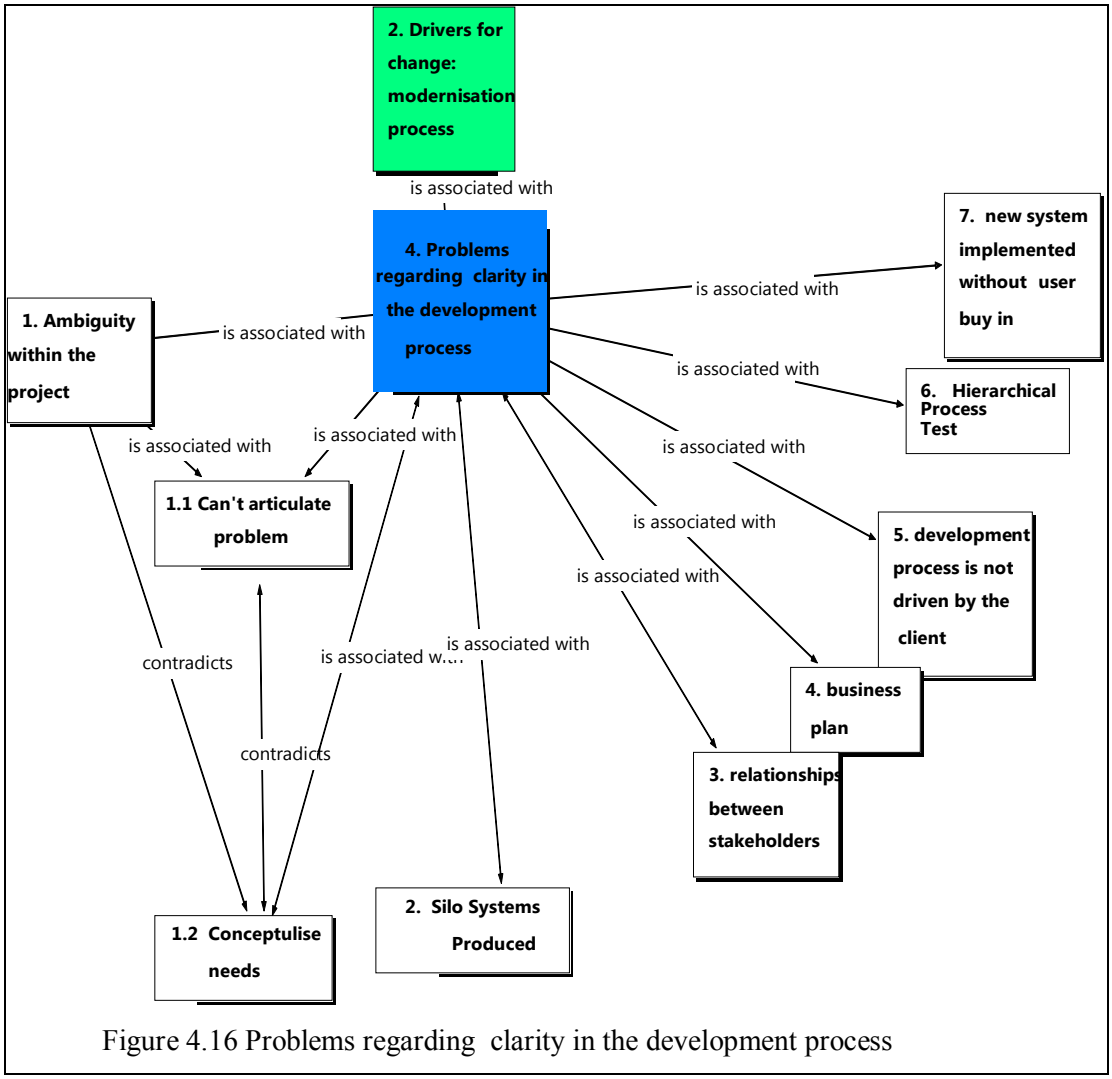


Figure 4.16 Problems regarding clarity in the development process

The development process of e-Government applications is affected by the following issues: ambiguities within the project which are associated with the inability to articulate the problem and conceptualise users' needs; silo system production; relationships between stakeholders; business planning; the development process is not driven by the client but by the service provider; hierarchical testing process; and systems being implemented without user buy-in, as displayed in Figure 4.16. Ambiguities within the project, silo system production, and relationships between stakeholders are three important issues, which will be briefly reported upon. Ambiguities within the project refer to projects that are poorly defined, as demonstrated by the following informant responses:

- *But the proposal [ICT proposal] is a strong proposal. It has a very clear set of terms of reference. Maybe not that clear, I guess, it's vague.*
- *There was not that much clarity of exactly [in the project proposal], for instance, what kind of accuracy you would get off your speech recognition system or what levels of intelligibility you would get off your speech synthesis systems and so on.*
- *... understanding the ambiguity [within the project] of what we were doing was very poorly defined...*

Ambiguities within the project lead to the problem of being unable to articulate the problems, as demonstrated by the following comments from informants:

- *...they knew [users and manager] that they didn't know what was going on with the implementation across ...*
- *they [managers] knew that there was a problem. I don't know if they had gone so far as articulating it into problem set therefore we need something.*

Being unable to articulate the problem, this leads to challenges with conceptualising needs, as demonstrated by the following comments from informants:

- *Well, there is a proposal that indicates what they would like to see and the proposal is really, the focus of government is about sharing impact of whatever they invest in, but also then in the case of technologies now showing what impact technologies can have on social development, on livelihoods, sustainable livelihoods, et cetera.*
- *They [users] actually initially had in mind something like almost like a telephone questionnaire but we developed their ideas into more of an interactive voice response system where learners call in and follow voice prompts and then leave information on the system which is transcribed and can then be used by the department to improve their service delivery, to identify problem areas, to get an idea of what is really happening with implementation at grassroots level.*

The next challenge that is associated with the development process is the development of silo systems. Silo systems are most often stand alone application or applications that have limited interaction with other applications, as demonstrated by the following comments from informants:

- *...at the moment all of the systems that we've developed, they just run in isolation. So there is implication, there is separate interface for each one of those...*
- *So they [other departments] tend not to share data very easily. So as a result there were many silos that developed...*
- *Many departments have their own small systems actually running around which is not at all conditional environment.*

Another challenge relates to the gaps in relationships management between stakeholders. These gaps relate to poor communication between different levels of stakeholders, as demonstrated by the following comments from informants:

- *I mean he is on the executive level [director], so he is drinking tea with the DG [director general] twice a week at meetings and I can't understand why one cannot at the coffee pot just say listen, by the way this submission is on the way or this thing is happening or can you please attend to it.*
- *the senior guy at IT who's been working here for seven years but we have never spoken to him before.*

The gaps in relationships management between stakeholders have an effect on the management of resources.

4.6 The theme relating to the management of scarce resources

4.6.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to management of scarce resources was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.6.2 What does this theme mean?

Government has begun to recognise the need to effectively and efficiently manage their limited resources in the form of money and scarce resources in the form of appropriately skilled staff. Management of scarce resources has a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. The success of e-Government applications is affected by the challenge that is created by the different departments that are competing for these limited resources. The implications are that the department that knows how to appropriately market its proposal is the department that will be allocated resources.

4.6.3 What are the elements of this theme?

The items that affect the management of these resources are: problems regarding budget restrictions; problems regarding resources constraints; and problems regarding the role of research and development. These issues are briefly reported upon.

4.6.3.1 Problems regarding budget restrictions

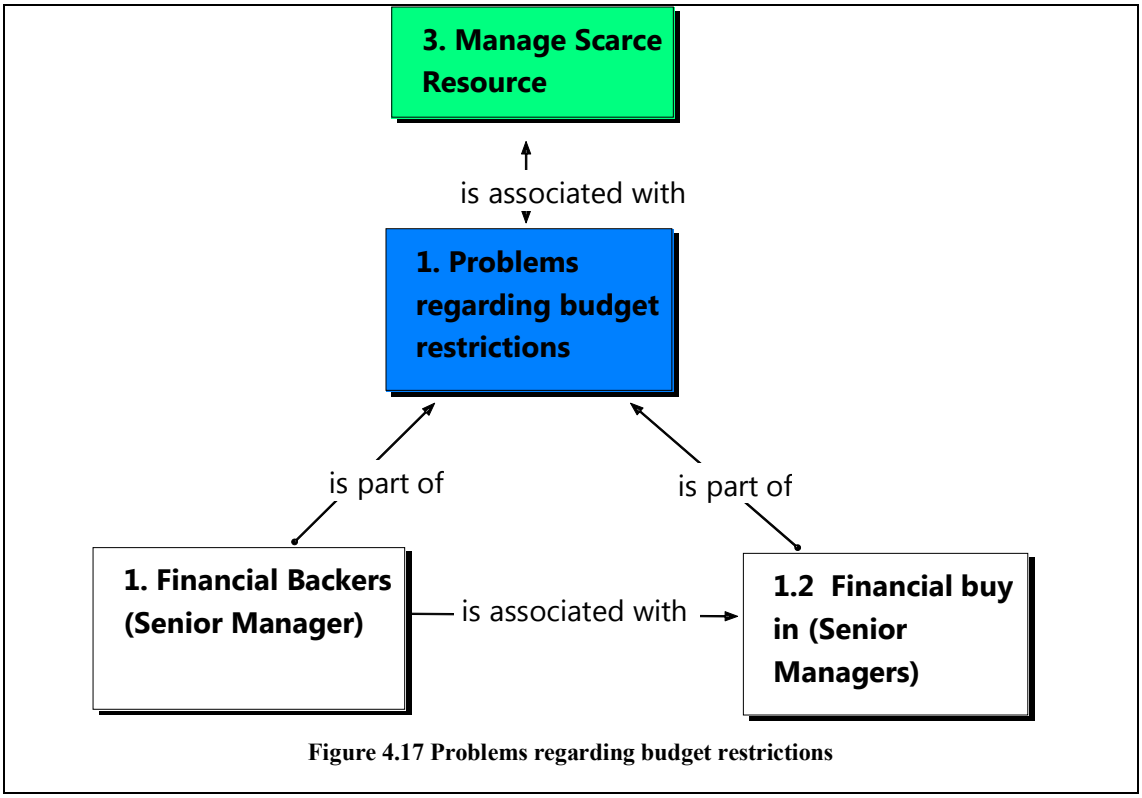


Figure 4.17 Problems regarding budget restrictions

From a budget and finance perspective it is important to have buy-in from senior managers who influence financial decisions, as displayed in Figure 4.17. Buy-in from senior managers refers to the manager being able to understand the financial implications of the request. This is demonstrated by the following comments from informants:

- *...every [ICT] project, that's run here, budget proposal bas to be made, and it has to be endorsed by senior management. So that's the first level, to provide the budget, they [senior management] made the money available for us to proceed...*
- *...buy-in from senior managers in terms of budget...*
- *..., that we paid for the readiness study which was about R30,000 - 40,000. Our Director General at that time supported things like that...*

Budget and finance issues also affect resources in government.

4.6.3.2 Problems regarding resources constraints

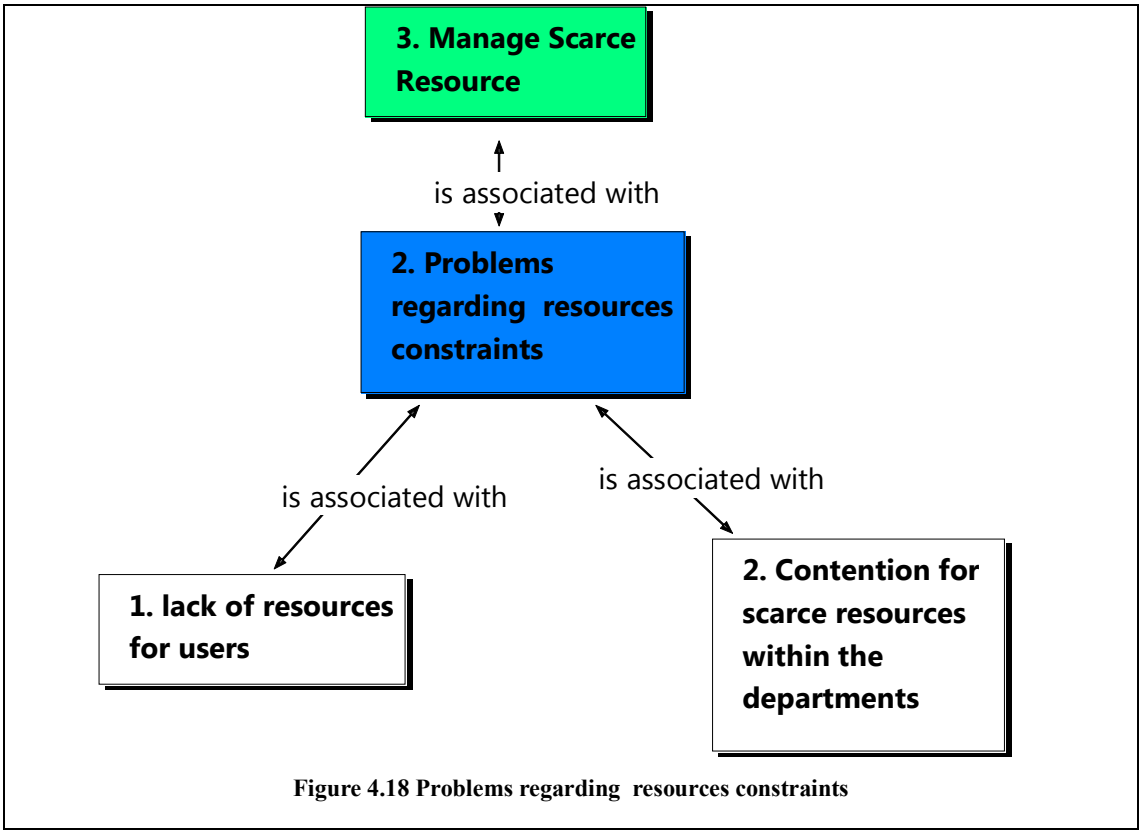


Figure 4.18 Problems regarding resources constraints

The issues that affect resources are a lack of resources that results in users having to use their own personal resources to maintain a level of productivity and there is also contention within departments for scarce resources, as displayed in Figure 4.18. This lack of resources is demonstrated by the following comments from informants:

- *...the facility became less and less available because it was coupled with cost-cutting strategies that were taking place...*
- *...as a department, we are also under resourced...*
- *But not everyone has email and, and even those who have email not everyone knows how to do it...*

This lack of resource results in some civil servants having to use their own personal resources, as demonstrated by the following comments from informants:

- *So from the 25, you could say about 20 of them [users] are actually using their own personal laptops which they've purchased from their own money...*
- *we have our own SMS [Short Messaging Services] system, but this SMS system is paid for by the advisors concerned...*

And then contention for resources is a challenge, as demonstrated by the following comments from informants:

- *... whilst the demands of the department gets bigger with different systems that need to become operationalised, the resources don't seem to be expanding*
- *...some of these divisions get by with no money.*

To gain maximum potential of the available resources, research and development issues are important considerations.

4.6.3.3 Problems regarding the role of research and development

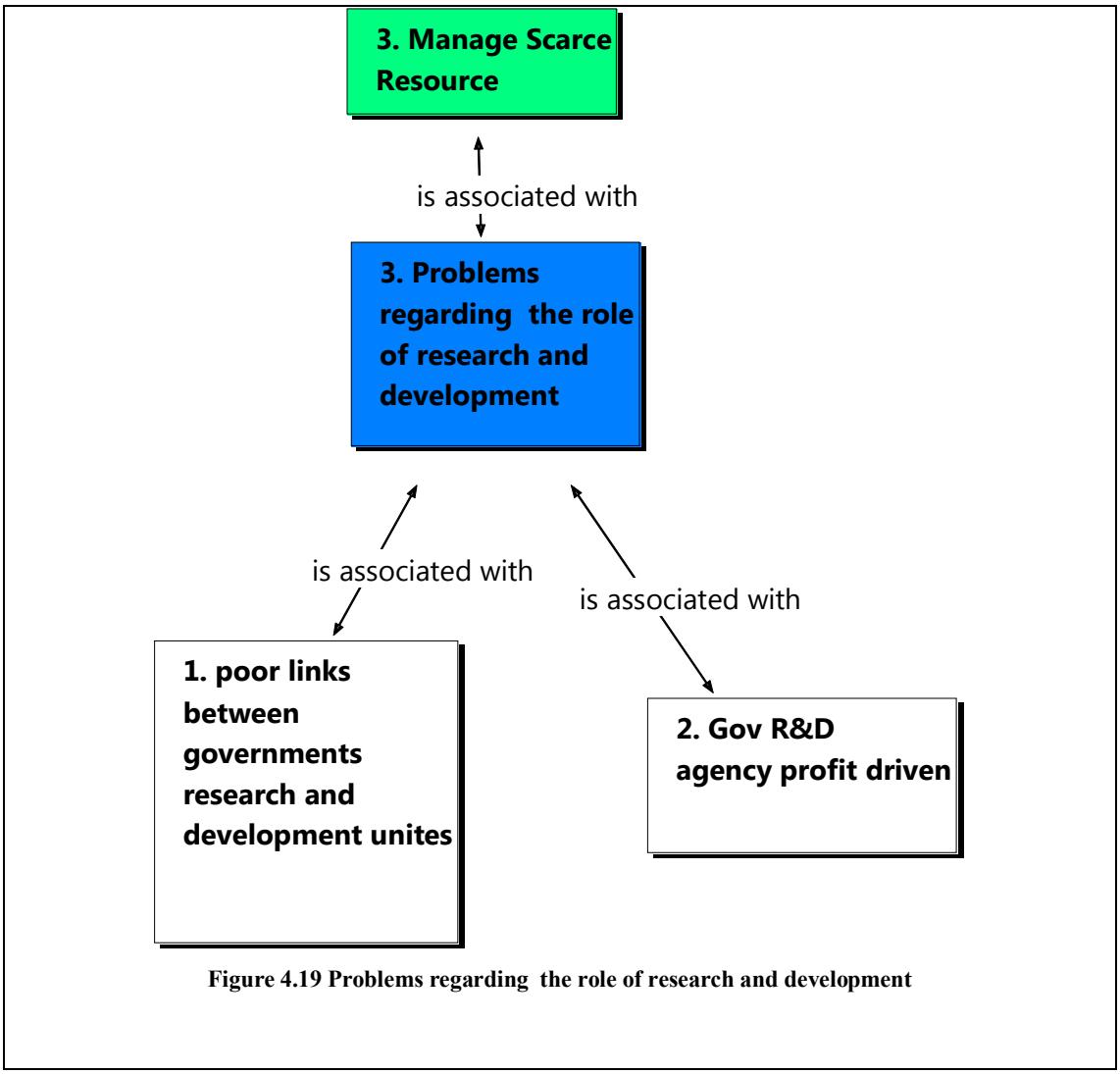


Figure 4.19 Problems regarding the role of research and development

From a research and development perspective the challenges relates to there being poor links between government's research and development units as well as the perception that the government research and developments units are profit driven, as displayed in Figure 4.19. This is demonstrated by the following comment from an informant:

- *our biggest challenges is there aren't enough links between research and development and government.*

The research and development units are seen as profit driven units and the relationships are short lived, as demonstrated by the following comment from an informant:

- *Now CSIR although we see as a government organisation and they must provide service to government, the problem is CSIR, they are not 100% funded. So, the research they do, they try to make it robust, so they have to tender for work, so that's why other government departments are reluctant to appoint them. They say, the CSIR has worked for us before and then if you work with private sector*

organisations, problem is, you're stuck for three years and after three years you're back to square one and you must reappoint a new company afresh...

The next theme that affects e-Government applications is related to systemic obstacles.

4.7 The theme relating to systemic obstacles

4.7.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to systemic obstacles was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.7.2 What does this theme mean?

Systemic obstacles refer to the challenge that relates to how government agencies are unable to meet their obligations to deliver the desired level of ICT services required by the departments that use their services. Systemic obstacles have a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. Departments that are unable to get the desired services from government agencies seek these services from outside service providers. One implication of this is that the solution proposed by the outside service provider may not be compatible with other e-Government systems and the solution may be designed and developed using different standards and methodologies.

4.7.3 What are the elements of this theme?

Systems obstacles are characterised by the following two issues: challenges regarding the structure of ICT and challenges associated with the status of ICT enablers.

4.7.4 Challenges regarding the structure of ICT in government

Government ICT structure is associated with government's in-house IT service provider. Challenges are associated with problems regarding the government IT agency and problems regarding the ineffective government IT management structure.

4.7.4.1 Problems regarding the government IT agency

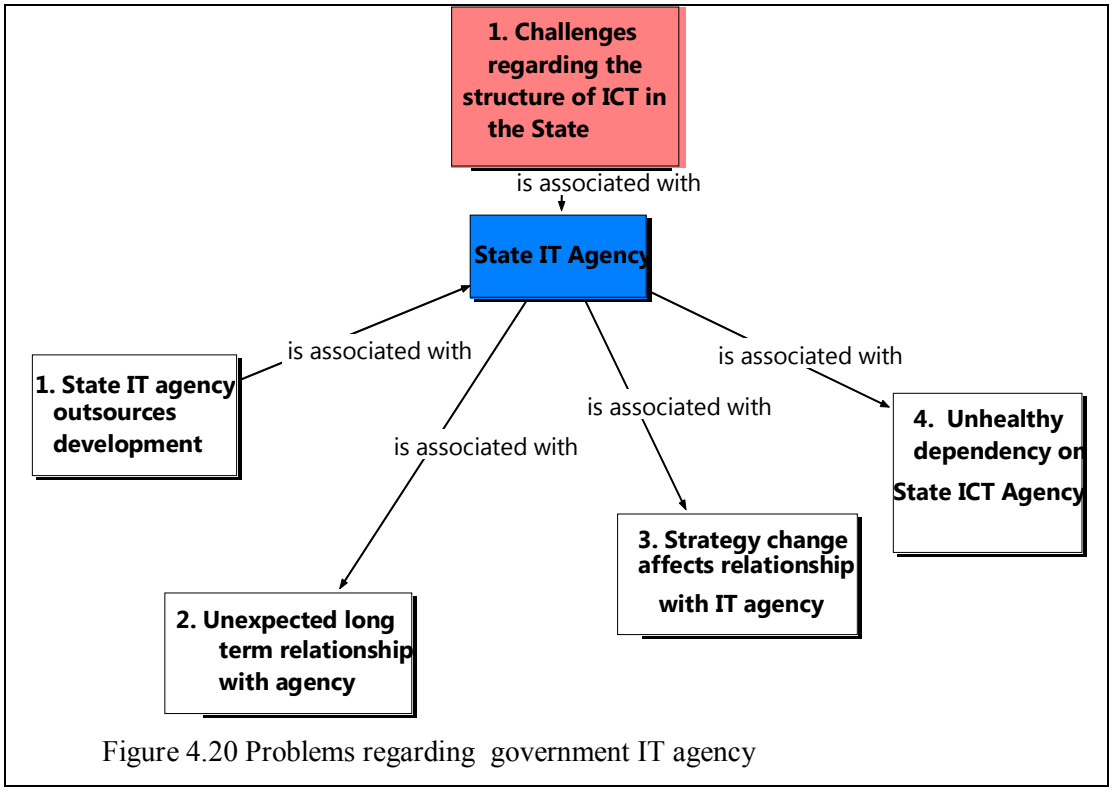


Figure 4.20 Problems regarding government IT agency

There are challenges associated with working with the government IT agency, as displayed in Figure 4.20. The government IT agency outsources systems development; there are unexpected long term relationships with the agency, strategy changes that affect the relationship with the IT agency, and an unhealthy dependency on the agency.

The government IT agency outsources the development of systems[48]. This leads to the problem that the government IT agency becomes the middle man in the outsourcing process. This middle man approach has an effect on communication between the commissioning department, the government IT agency and the outsoursee, as demonstrated by the following comments from informants:

- *...so the government has outsourced to SITA [State IT agency] and SITA has outsourced to someone else.*
- *So that private provider must deliver for SITA, SITA must deliver for government.*

Further, there are challenges to work with the government IT agency, as demonstrated by the following comments from informants:

- *If I look at the entire SITA and its relationship with government departments now, the reason is not so much if you are forced to use SITA because they have taken away many of the areas where people are forced to use SITA, it is because of poor service delivery.*

[48] The outsourcing of systems refers to the design, development and implementation of e-Government applications as well as physical infrastructure such as networks.

- *On the whole the relationship between SITA and departments is very bad because of poor service delivery.*

In addition to the challenges associated with working with the government IT agencies, there are additional challenges related to ineffective government IT management structures.

4.7.4.2 Problems regarding the ineffective government IT management structure

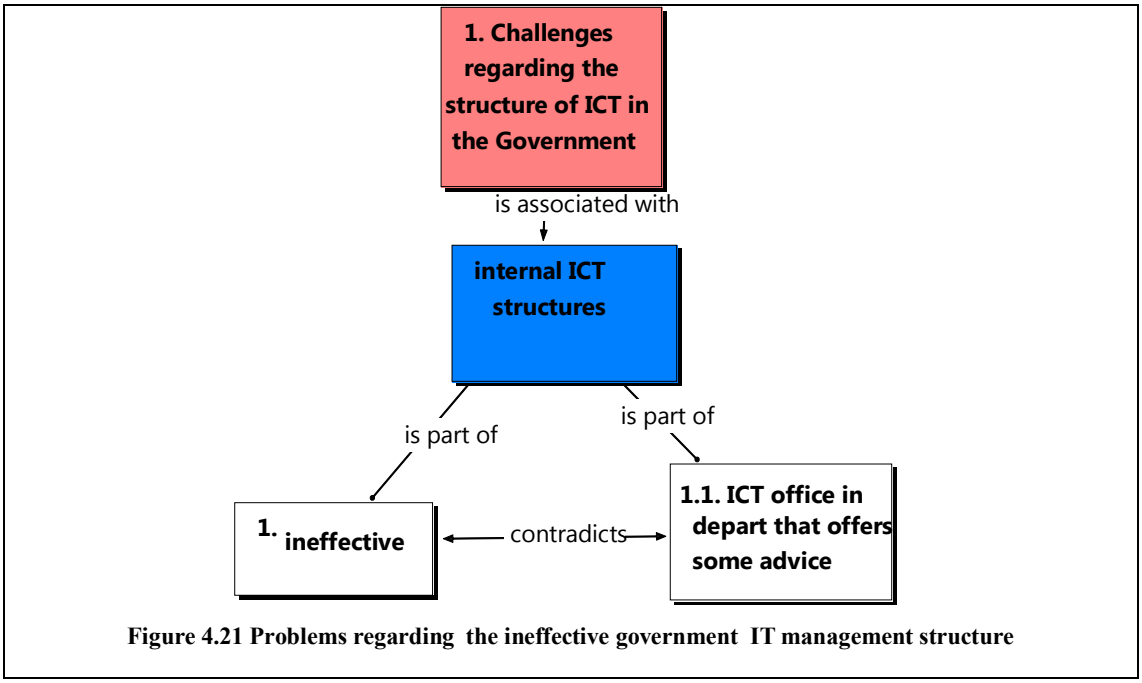


Figure 4.21 Problems regarding the ineffective government IT management structure

There are challenges associated with internal ICT management structures because of the additional layer of management that has to communicate with the state IT agency, as displayed in Figure 4.21. These management structures are not geared to deal with the creative application of ICT, as demonstrated by the following comments from informants:

- *They [SITA] have not come forward in terms of being the leaders within how basically to neutralize the acetic effect of administration.*
- *I don't think that they [SITA] have been very effective*

Then there are challenges associated with ICT enablers.

4.7.5 Challenges associated with the status of ICT enablers

The status of ICT enablers relates to how ICT is perceived within government. The status of ICT enablers is associated with problems regarding the in-house ICT department, problems regarding the status of ICT in government, problems regarding the hierarchical ICT delivery process and problems regarding legal and regulatory requirements. It is important to note that in-house ICT department are meant to maintain a working relationship with the State IT agency, because the State IT agency is see as the preferred service provider for government.

4.7.5.1 Problems regarding the in-house ICT department

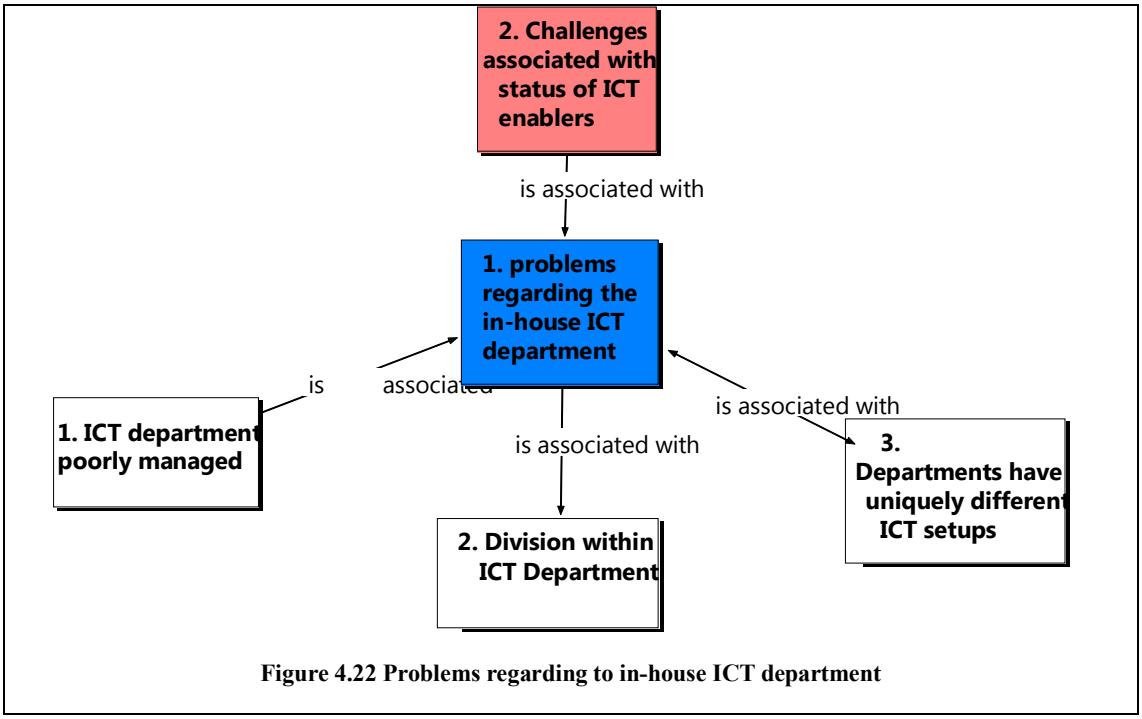


Figure 4.22 Problems regarding to in-house ICT department

The in-house ICT department is affected by slow poor management, divisions within the ICT department, and different departments have uniquely different ICT setups, as displayed in Figure 4.22. The in-house ICT systems are perceived as not being user friendly and are not seen as mission critical. Further ICT is driven by legal requirements, requirements from the Auditor General or the department has money that needs to be spent.

Some of the challenges that affect ICT department are divisions within the department. These can be described as a type of turf war, as demonstrated by the following comment from an informant:

- *There are camps in there. Operations, IT operations, this is a group which looks after hardware operations system level, just the basic foundation, their agenda is simple, they have been sitting in this organization, these are the longest standing members in ICT, they have been in the organization most of them 20 plus years alright, they have been sitting in back in the days when the acceleration technology was quite slow so things didn't move as rapidly as they did, so they did not sort of keep the whole up-skilling and moving with the times.*

There are also challenges that the in-house ICT systems are not user friendly, as demonstrated by the following comment from an informant:

- *I suppose it can be because that's why I am using all these spread sheets and all to get things done*

The ICT department also has a poor reputation, as demonstrated by the following comment from an informant:

- *...in the end most of the ICT guys were not stepping up.*

Despite the poor reputation of the in-house ICT department, ICT is mission critical to government activities.

4.7.5.2 Problems regarding the status of ICT in government

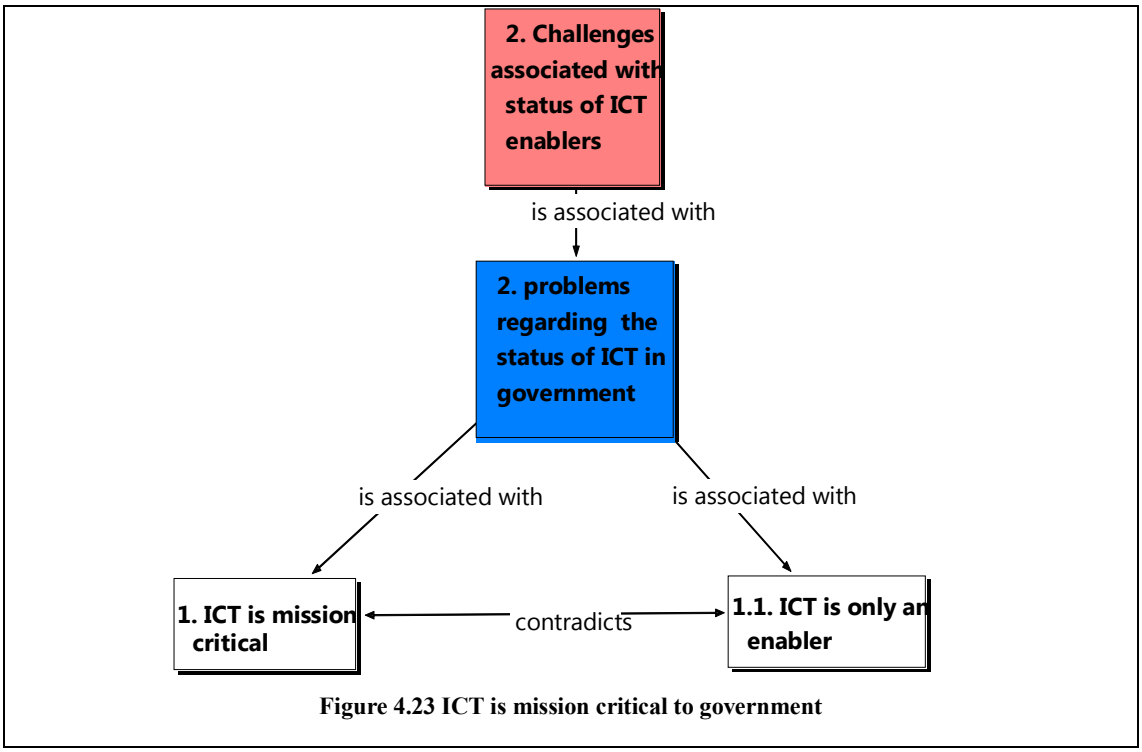


Figure 4.23 ICT is mission critical to government

ICT is sometimes seen as mission critical to government activities, as displayed Figure 4.23. This is demonstrated by the following comments from informants:

- *There is a huge, huge dependency on ICT for its functioning. So for example, our core business, which is auditing of governmental organisations, our entire audit processes are computerised.*
- *...the biggest risk is on the IT dependencies.*
- *...we couldn't have survived without that IT strong support.*

Further, ICT is seen as an enabler for modernisation, as demonstrated by the following comment from informants:

- *...you are the technology enabler but we don't have the power to, for example, to change things in the communities...*
- *...IT as a strategic enabler for most of the projects that we do...*

Besides ICT being mission critical, ICT delivery strategies influence e-Government applications.

4.7.5.3 Problems regarding the hierarchical ICT delivery process

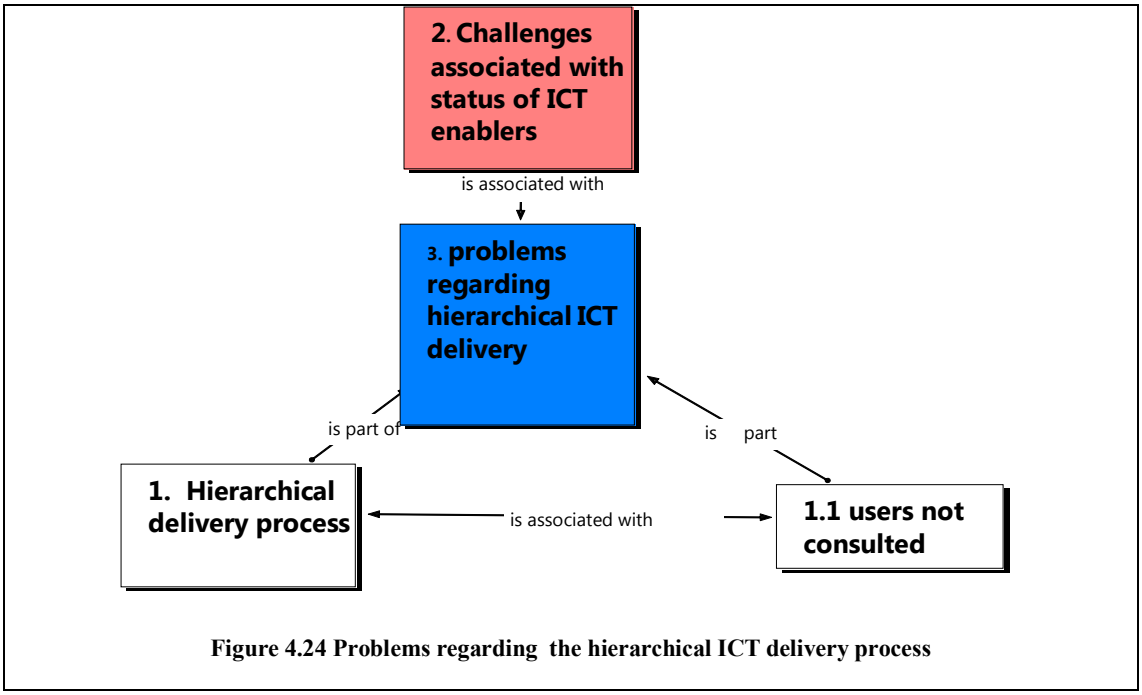


Figure 4.24 Problems regarding the hierarchical ICT delivery process

ICT delivery is based on a hierarchical delivery process, as displayed in Figure 4.24. This hierarchical delivery process is top down driven with little input from users at the grass roots level. This is demonstrated by the following comment from an informant:

- *...there is a system administrator and that system administrator then gets access to the functions that we have released into production to manage the system.*

The next issues that affect e-Government applications are problems regarding legal and regulatory requirements.

4.7.5.4 Problems regarding legal and regulatory requirements

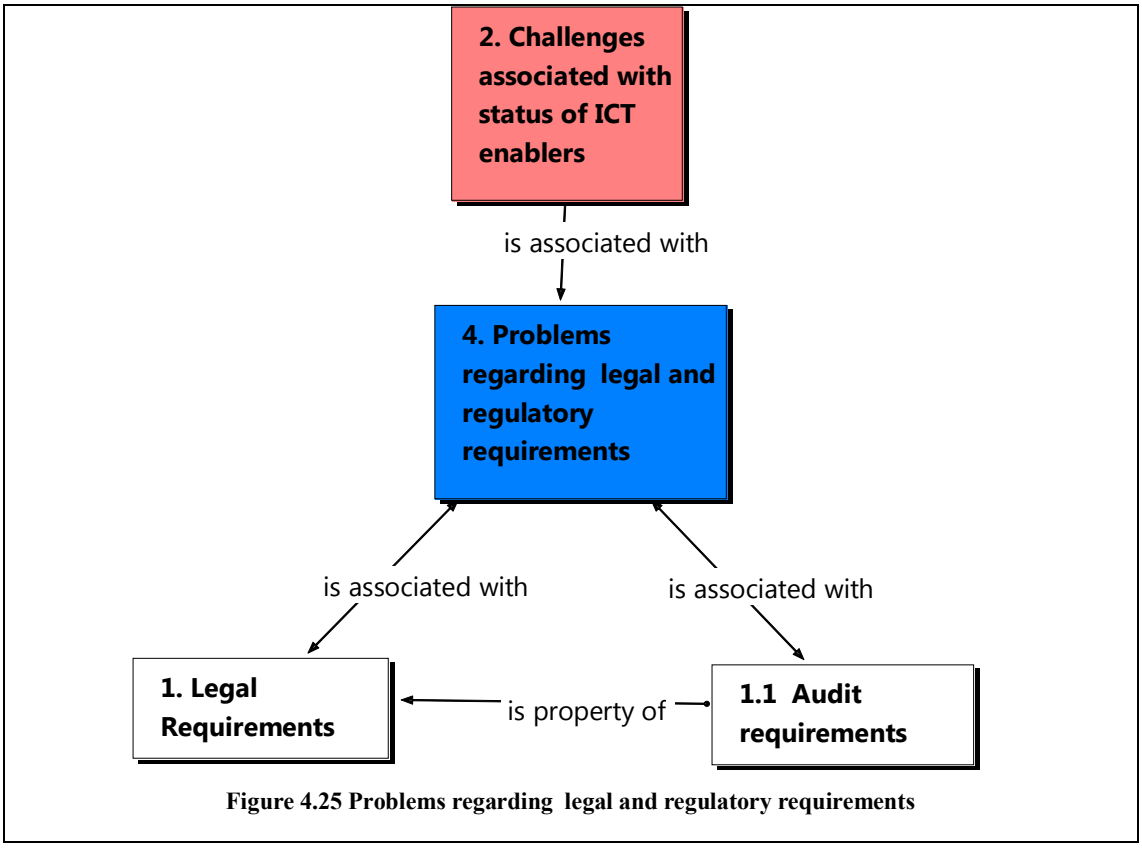


Figure 4.25 Problems regarding legal and regulatory requirements

Some drivers of ICT are related to legal requirements, as displayed in Figure 4.25. This is demonstrated by the following comments from informants:

- *...these are laws, for example, the ECT Act [Electronic Communications and Transactions Act] defines the legal situation of electronic transactions and the e-commerce...*
- *Municipal Finance Management Act that requires the organization to follow the procurement process which is basically divided into three steps...*
- *...a lot of regulations that end in laws and acts...*

The next theme to consider is the strategies used to promote the modernisation program in government.

4.8 The theme relating to strategies employed in government

4.8.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to strategies employed in government was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.8.2 What does this theme mean?

Strategies employed in government refer to the different approaches that are used to promote the modernisation goals. These strategies have a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. The strategies that are used are not always aligned with the department goals, stakeholder requirements or management objectives. The implications are that the stakeholder may feel disenfranchised or may be under-prepared to realise the benefits of the e-Government application.

4.8.3 What are the elements of this theme?

There are four elements to this theme which are challenges regarding skilled personnel, challenges relating to motivating staff, challenges related to leadership dynamics and challenges related to outsourcing dynamics.

4.8.4 Challenges regarding skilled personnel

The challenge relating to skilled personnel refers to civil servants that are not suitably skilled for the tasks that they are assigned to do. This challenge is associated with problems regarding ineffective training, problems regarding key stakeholders, problems regarding appropriate skilled personnel, problems regarding appropriate staff appointments and problems regarding interdepartmental cooperation.

4.8.4.1 Problems regarding ineffective training

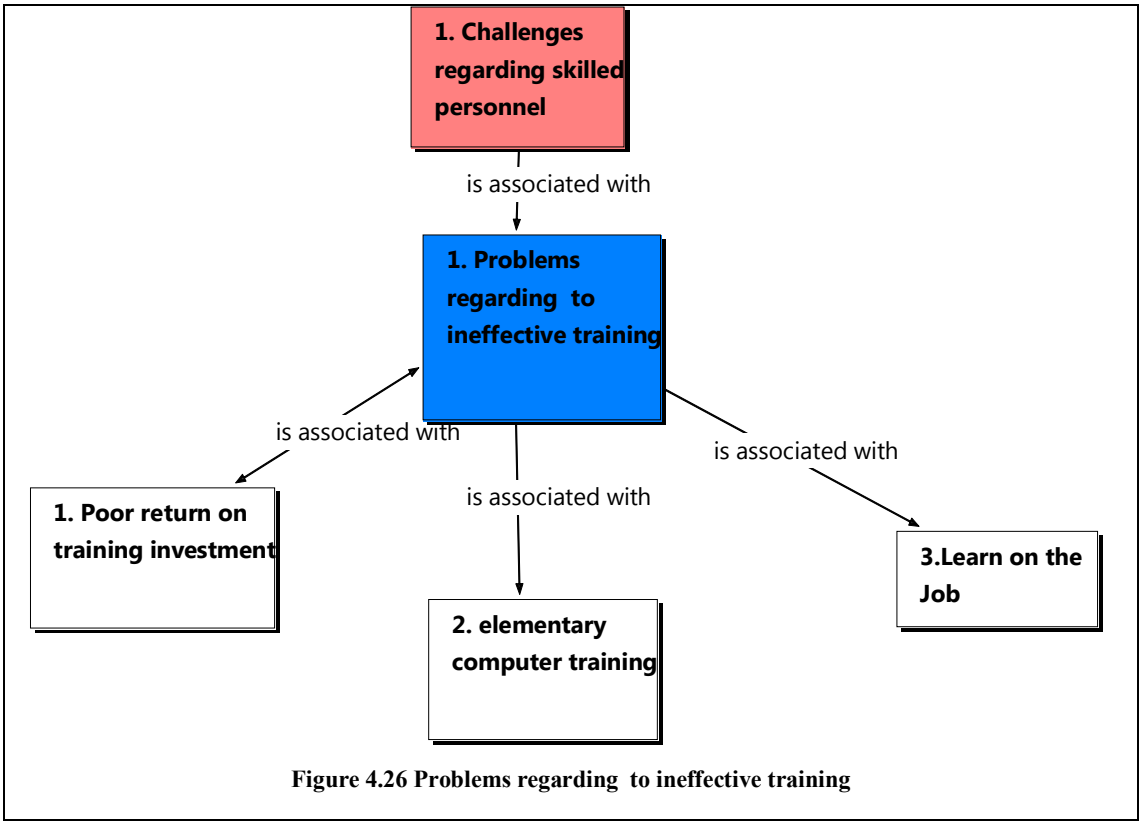


Figure 4.26 Problems regarding to ineffective training

Government is getting poor return on their training investment, as displayed in Figure 4.26. Civil servants are not fully utilising training opportunities. This is demonstrated by the following comment:

- *So we got 11 people from this department to do that course. I mean, it was expensive, it was about $25,000 [the service provided was not a South African base company therefore the department paid in dollars]. And so about 11 people from this department did that course. I was the only one that passed the exams, I was the first certified knowledge manager in South Africa and in Africa.*

There are elementary computer training skills that government offers to civil servants, as demonstrated by this comment:

- *There's the beginner, there's the intermediate and then there's the advanced. So, people [civil servants] put their names down, as depending on what they require and then they go for this training programmes. They use the facility down at the College, a computer facility, and they do the training and it's over a week for each of the courses and then you get certified thereafter.*

However, there are situations where civil servants are forced to get on-the-job training, as demonstrated by this comment:

- *There's really no time for, how should I say, sending someone on a course to become proficient with these kinds of thing, they kind of learn on the job.*

Then, there are other types of stakeholder challenges.

4.8.4.2 Problems regarding key stakeholders

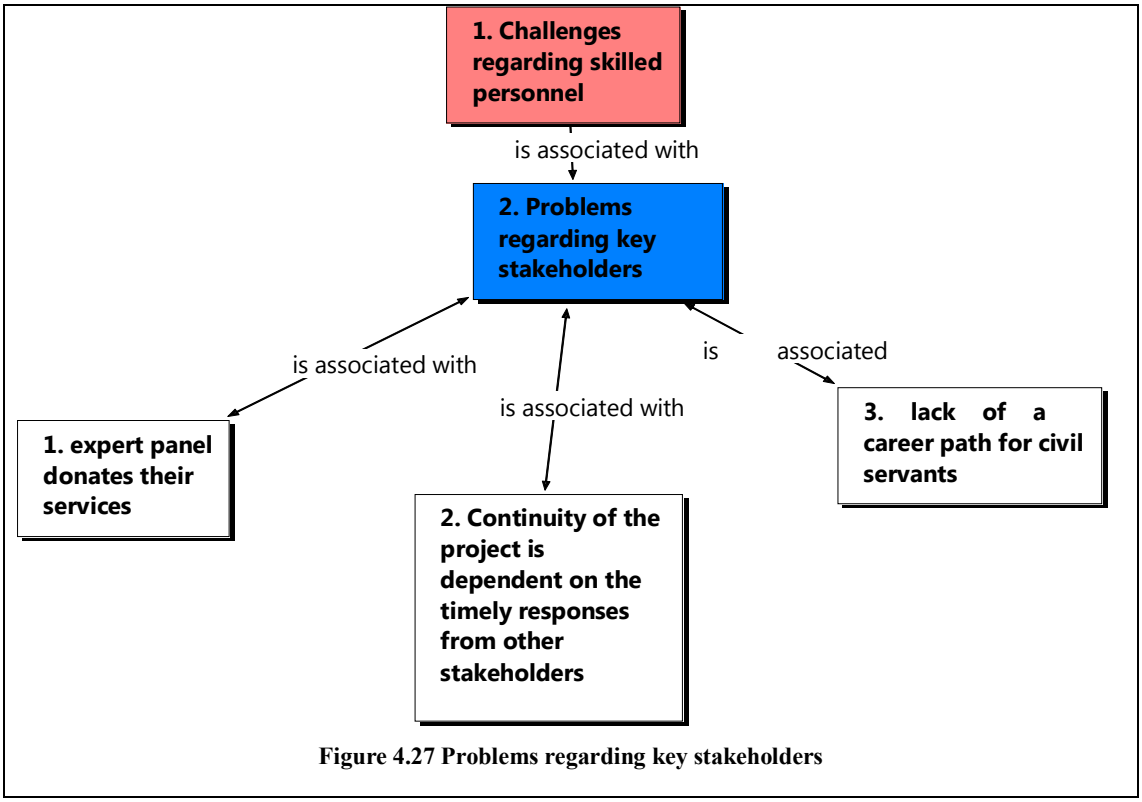


Figure 4.27 Problems regarding key stakeholders

Stakeholder challenges are associated with expert panels that donate their services, as displayed in Figure 4.27. Expert panels are groups of subject matter experts that government seeks advice from; these experts are usually academics or researchers. This is demonstrated by this comment:

- *...most of them [expert panels] they get no remuneration at all, they donate the time and some of them have been doing so since 2000...*

Then, there are those stakeholders that affect the continuity of the project by delaying the process, as demonstrated by this comment:

- *There's delay in meeting the timeframes of the project charter and plan, at each phase, there's a requirement for provinces and schools to respond. And you know, if we don't make a certain timeframe and schools close for vacation, then you know, the project is immediately suspended until schools open. And that is a major setback for us.*

Further there are concerns about the lack of a clear career path for civil servants, as demonstrated by these comments:

- *Many government officials see it as a job and not as a profession or not as a service that they are delivering.*
- *...how many of you guys [civil servants] if you leave here you are going to survive, you won't because your basics are not aligned...*

A lack of a clear career path for civil servants affects civil servants' skills.

4.8.4.3 Problems regarding appropriate skilled personnel

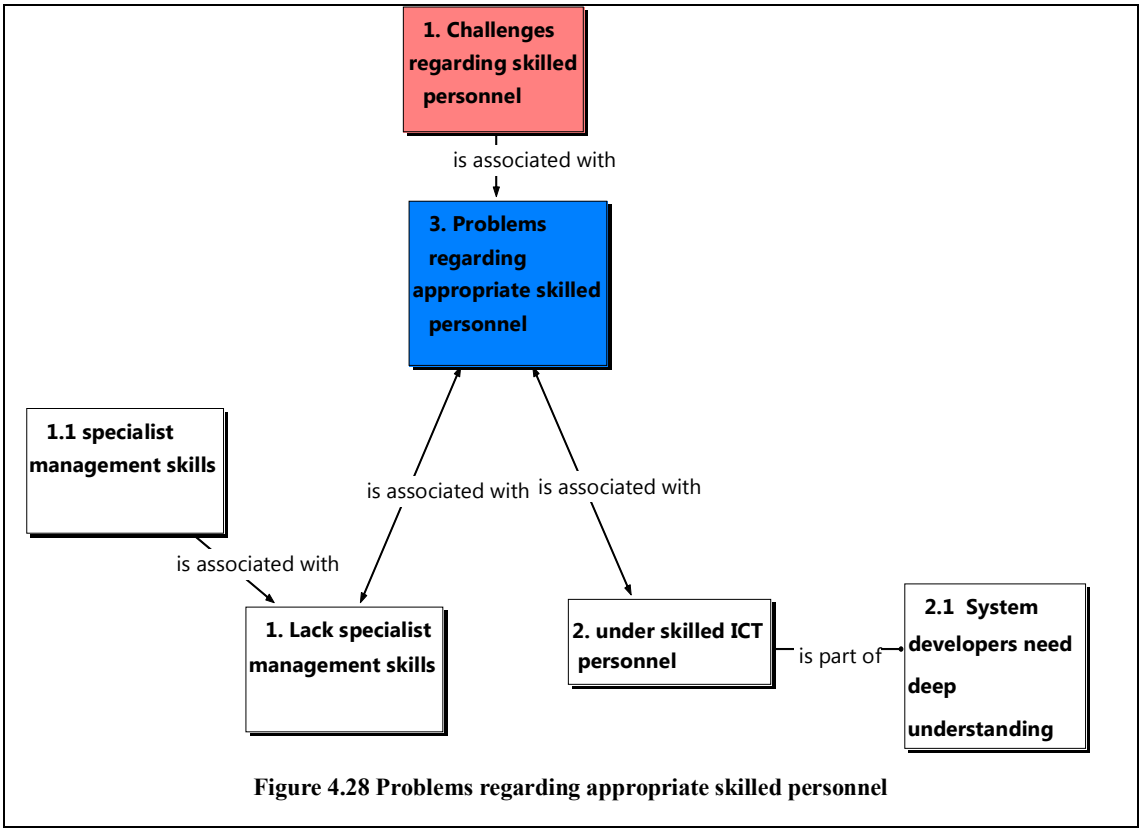


Figure 4.28 Problems regarding appropriate skilled personnel

From a skills perspective there are challenges regarding specialist management skills, as displayed in Figure 4.28. An acute lack of specialist skills such as project management skills affects the success of e-Government applications. This is demonstrated by the following comments:

- *There have been a number of projects that even our developers were not quite sure of how, how to tackle from the start so it's sort of these projects we really found ourselves in unknown territory*
- *...you need to have a project office, mostly in government it's a term that's misunderstood and in some cases they don't understand that it is a discipline to have a project management office with project managers running all the projects and if you've got projects and you don't have a centralized project management office, who is going to run that?*

Then there are challenges of under-skilled ICT personnel, as demonstrated by these comments:

- *We have to have a separate team, right. The way Java beans works for instance are totally different from where Microsoft DLLs are. So these deep skills take a while to master. The same with the Apple environment, if you had to write an Apple app there is a lot of deep skills that go.*
- *I went and asked the security [ICT] guys did you resolve the issue and their resolution was we've just disabled encryption at login levels so it's no more sitting in the machine it encrypts.*

- *For instance in the Microsoft world if you have to develop an app for SharePoint you need to understand how SharePoint works to use a developer jargon with how object model works.*

Further to the skills challenge, there are staff challenges.

4.8.4.4 Problems regarding appropriate staff appointment

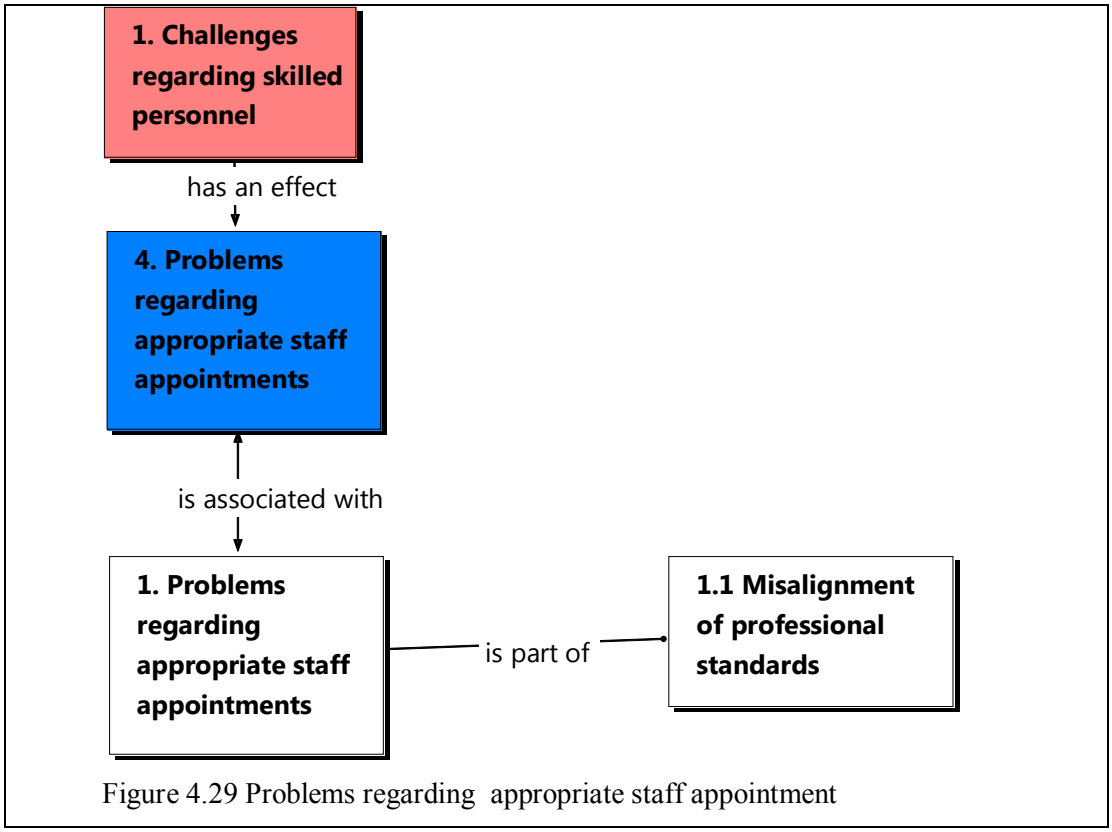


Figure 4.29 Problems regarding appropriate staff appointment

There are challenges relating to staff and their appropriate placement, as displayed in Figure 4.29. Civil servants with unrelated skills are appointed to manage ICT, as demonstrated by these comments:

- *So that's where the challenges I see in the government environment because if you want to use technology then you must have experts driving the process, there is a mismatch of employees, you got the IT person in HR, you got the HR person in freight and you got the freight person in communication, you got the communications person in engineering.*
- *I think the big challenge is that not many people are natural collaborators*

In addition to staff challenges, there are challenges with interdepartmental cooperation.

4.8.4.5 Problems regarding interdepartmental cooperation

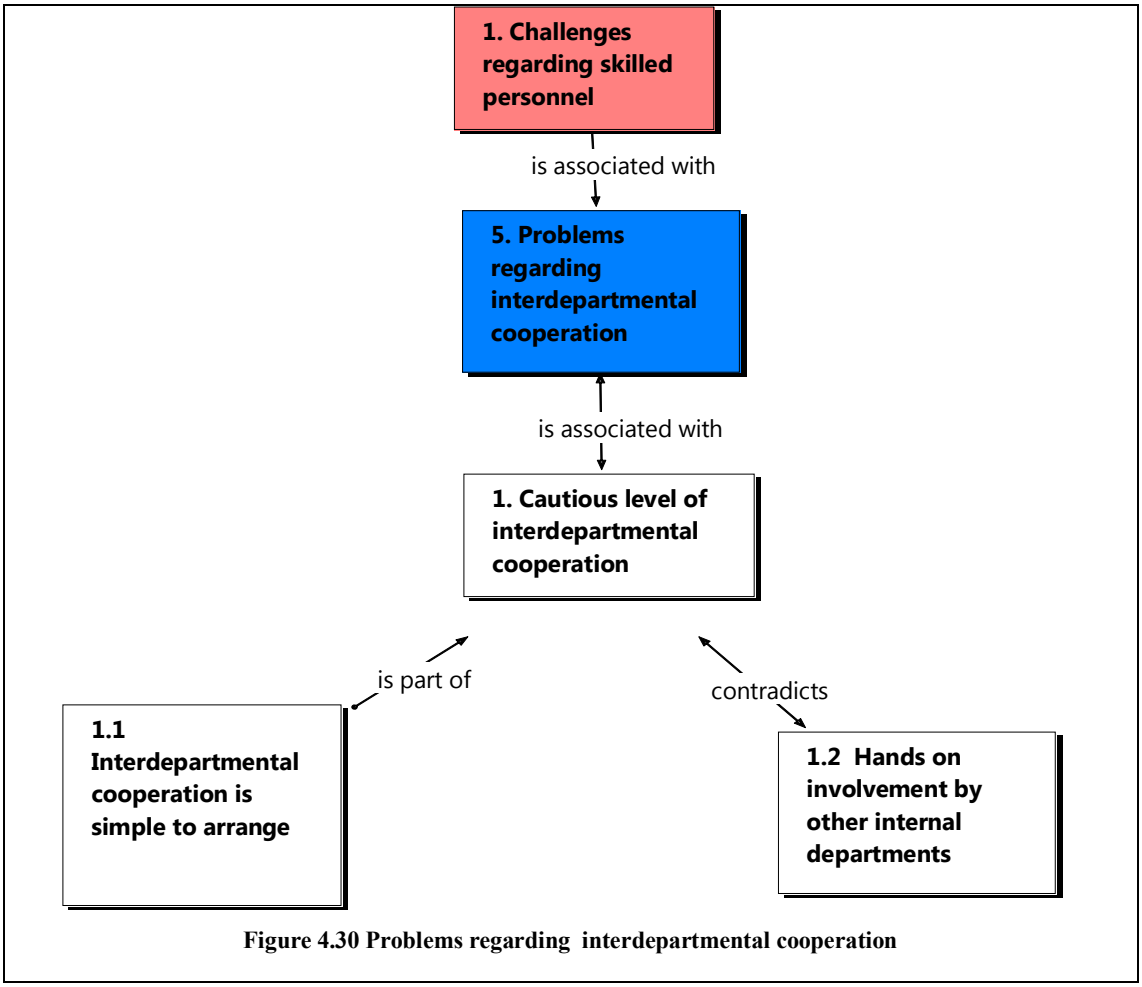


Figure 4.30 Problems regarding interdepartmental cooperation

Interdepartmental cooperation with regard to ICT initiatives is conducted cautiously, as displayed in Figure 4.30. This is demonstrated by the following comments:

- *So there was an arm's length kind of business relationship.*
- *So SARS [South African Revenue Services] is one of our suppliers within and our relationship with them is mainly as a supplier of data. Now, what that means is as a supplier of data is that we don't have any legal enforcement on them.*
- *... at one level, there was a huge interdependency, for example, between finance and human capital, and yet at another level, it was a relationship between the business unit and a client.*

The next consideration is challenges relating to motivating staff.

4.8.5 Challenges relating to motivating staff

The challenge of motivating staff is related to how civil servants are encouraged to participate in ICT initiatives. This is associated with problems regarding the will to participate in ICT initiatives, problems regarding effective communication, problems regarding the encouragement of staff, and problems regarding the lack of enthusiasm of civil servants.

4.8.5.1 Problems regarding the will to participate in ICT initiatives

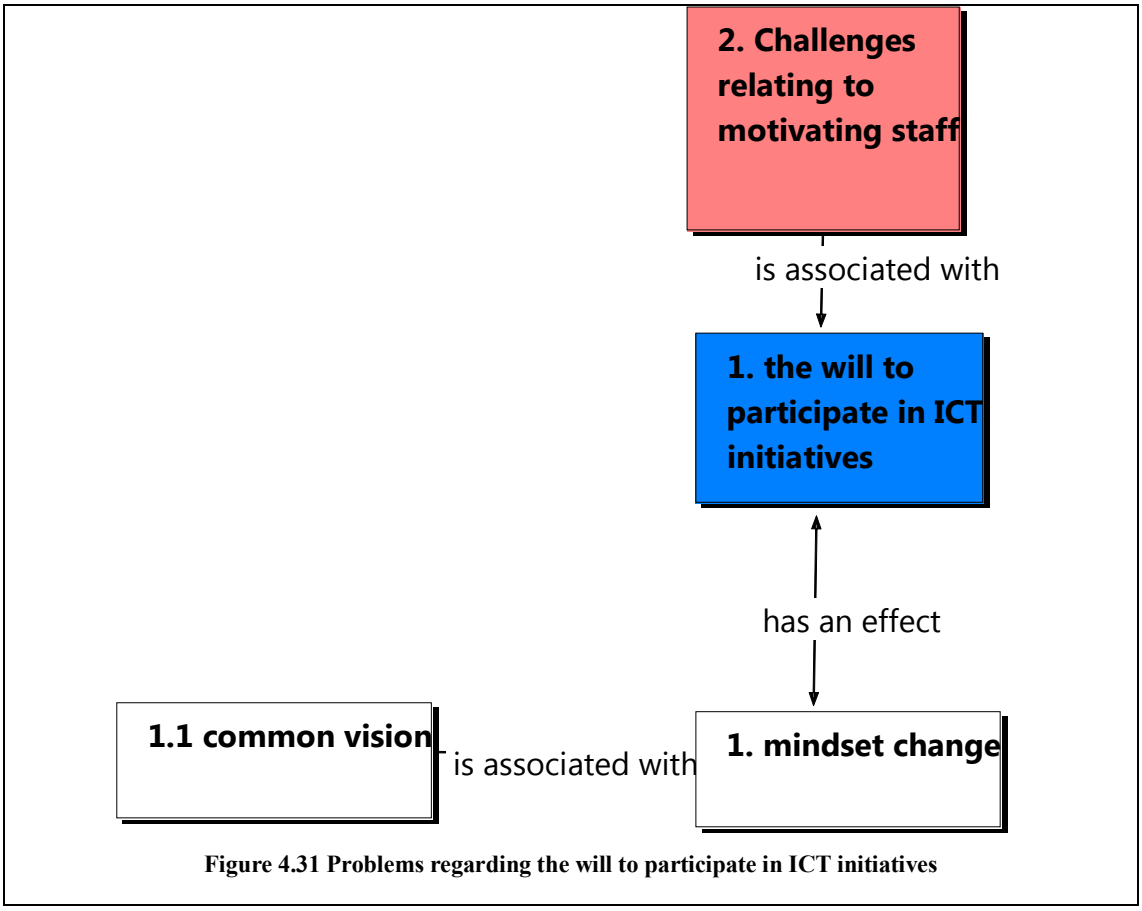


Figure 4.31 Problems regarding the will to participate in ICT initiatives

The will to participate in an ICT initiative is displayed in Figure 4.31. The will to participate by civil servants in an ICT initiative affects the initiative. This is demonstrated by the following comments:

- *The minister wanted it done, and he wanted it done yesterday.*
- *Once you get buy-in from your political head, your supervisor, once they buy the idea then basically you go out to supply chain for something called RFI Request for Information or Request for Proposal just to see what's out there in the industry.*
- *So there has been political will and support for this.*

The will to participate is also affected by the mindset of civil servants, as demonstrated by the following comments:

- *...you know, it requires a mindset change and it's you know, very difficult...*
- *...and it is slower than private. There is no motivation of profit. And so it is slow.*
- *You know, a lot of this has to do with one's own commitment, one's own conviction, one's own work ethic, one's own personality and one's own self-interest in something.*

Furthermore there are communication considerations.

4.8.5.2 Problems regarding effective communication

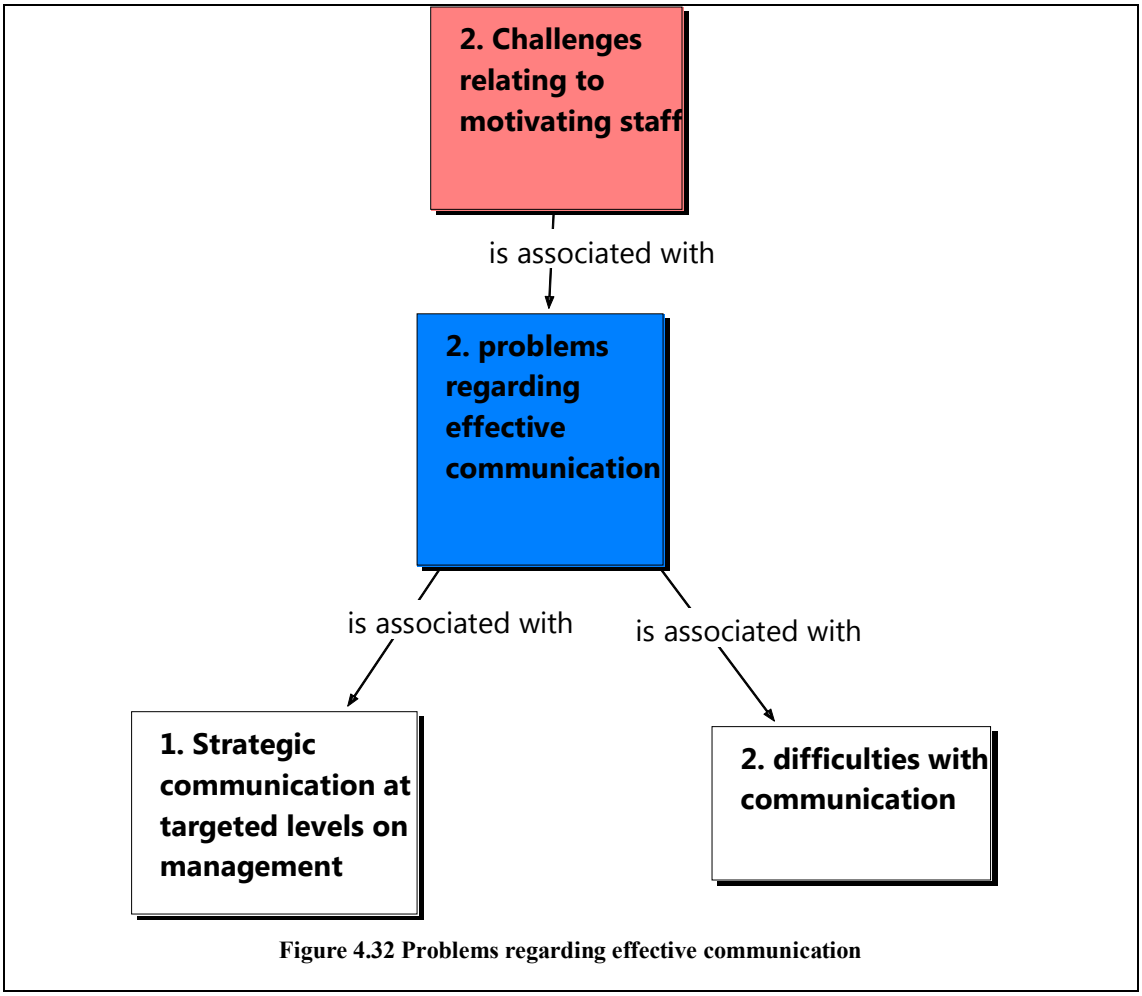


Figure 4.32 Problems regarding effective communication

Communication has to be strategic, at targeted levels of management, as displayed in Figure 4.32. Strategic communication increases the likelihood that the proposal will be successful. This is demonstrated by the following comments:

- *...if you cannot articulate that to people, and people buy in, then you would be on your own and often with government thinking it's first you, your personality then relate, build relationship, before you say anything you need to build relationship*
- *you need experts in the organization who can communicate to the service provider.*
- *If it is clearly articulated and defined as to what's expected of them...*

There are also difficulties with communication, as demonstrated by the following comments:

- *...if we had to communicate with them firstly [users], we actually send notices, you know, by post.*
- *We have a registry at the bottom, they take all their mail to three different circuit offices in our district and principals physically go and collect their mail from the circuit office and that is how they are informed of activities and events that we are holding.*

Communication affects how civil servants are encouraged to participate in ICT initiatives.

4.8.5.3 Problems regarding the encouragement of staff

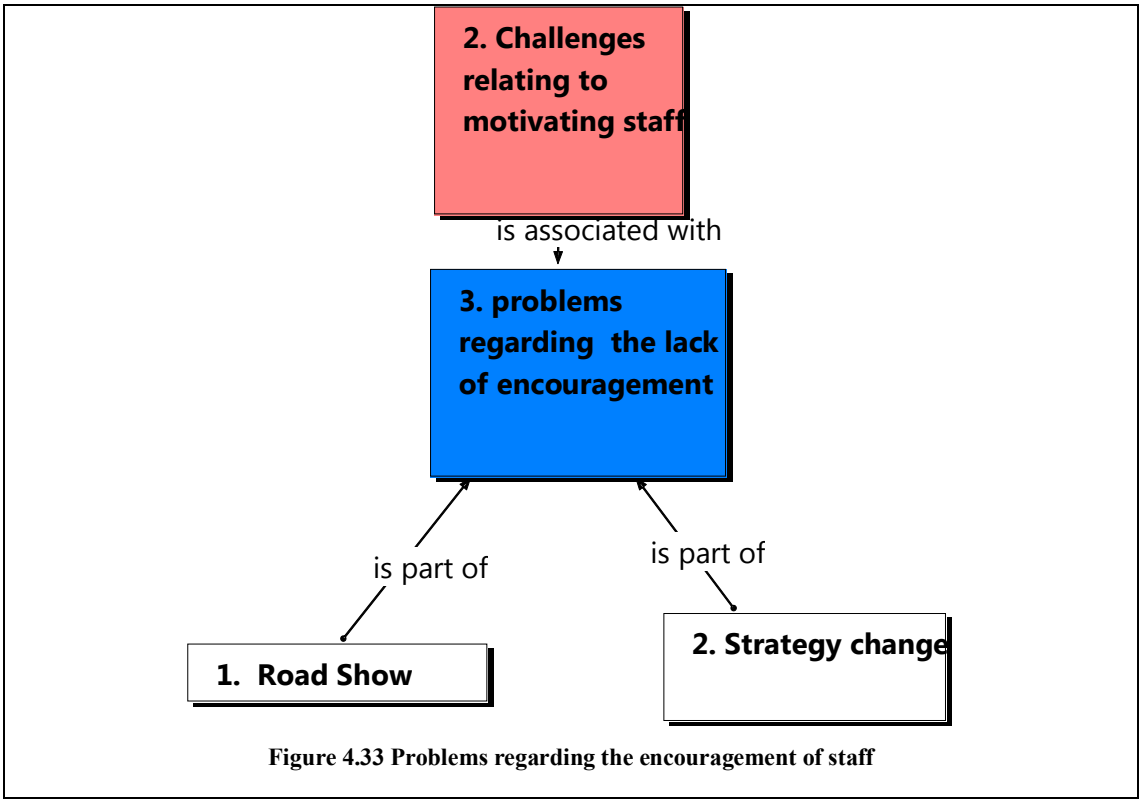


Figure 4.33 Problems regarding the encouragement of staff

From an encouragement perspective, departments require a road show or demonstration of the application of ICT and their related benefits for their department, as displayed in Figure 4.33. These types of demonstration encourage the uptake of ICT initiatives. This is demonstrated by the following comments:

- *...and then secondly to demonstrate to others, look, what we developed here; why don't you get a developer and customize it for yourself*
- *...five of the main projects we were doing at the time and that awareness campaign was one of them. And I mean, we went into communications strategy that included a brand, you know, brochure, frequently asked questions in all 11 languages, you know, and lots of blueprints.*
- *We demonstrate, give live demonstrations to them on our systems and so on.*

Encouragement is also affected by changes to strategy, as demonstrated by the following comments:

- *At some point, managers in the department, and these are your heads of departments and the ministers, council of ministers. They are the decision-makers, and often they would change strategies in the course of the development of the system.*
- *...look at the departmental strategy, you look at what is going to be covered and you look at the major thrust of the strategy...*

Encouragement has an effect on the enthusiasm of civil servants.

4.8.5.4 Problems regarding lack of enthusiasm of civil servants

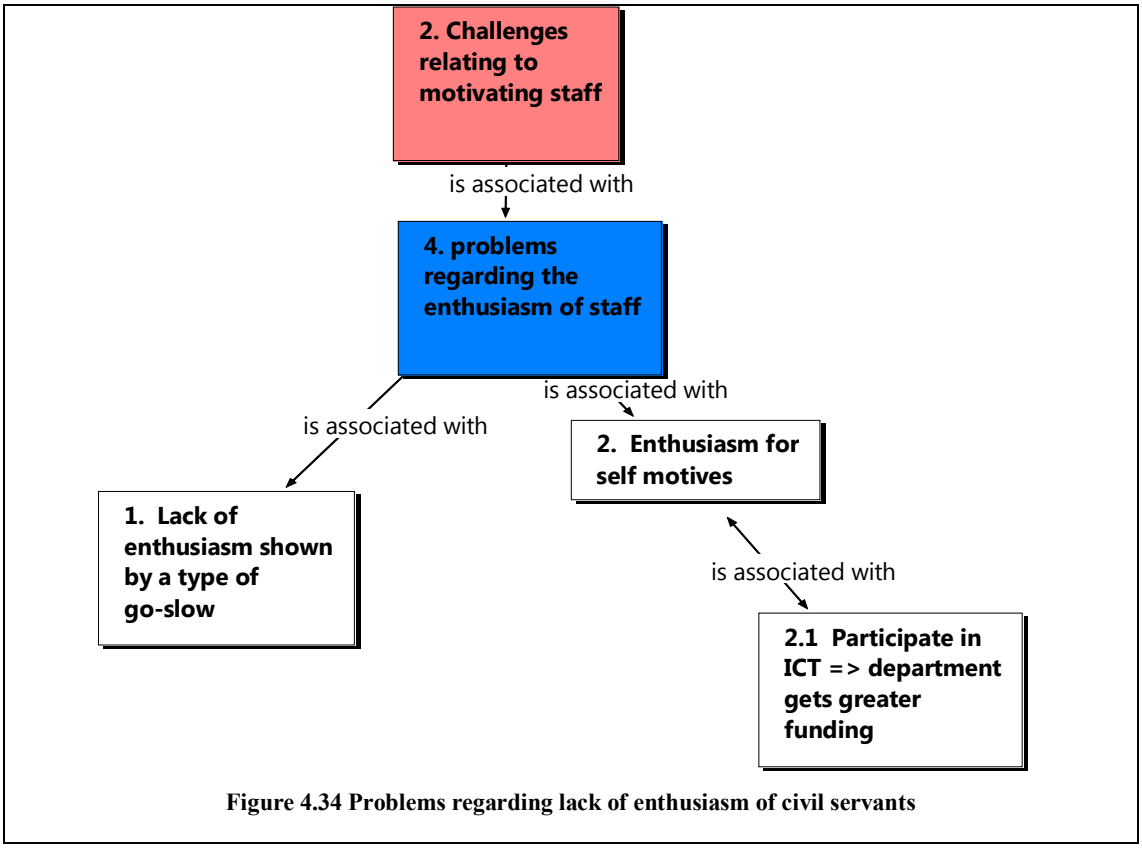


Figure 4.34 Problems regarding lack of enthusiasm of civil servants

In addition when it comes to enthusiasm, civil servants demonstrate a lack of enthusiasm to participate in ICT initiatives by embarking on a type of go-slow, as displayed in Figure 4.34. A go-slow is a deliberate action on the part of a civil servant not to complete a task in the minimum amount of time. This is demonstrated by the following comment:

- *Well, you would find that they won't work with the same sense of urgency. They [civil servants] won't work as late as the other people. When the testing was done, it was not done to the level of accuracy needed, et cetera.*

Then there is enthusiasm to participate in projects for other reasons, such as, the department would get more funding, and personal motives, as demonstrated by the following comments:

- *...it was not an issue with participating, particularly if there was specific funding then everyone would be there to try and get a cut of that funding.*
- *Some people [civil servants] were honest. They said, I want it for my CV. I want to be able to say that I did a, b and c.*

Civil servants' enthusiasm is affected by the leadership in their environment.

4.8.6 Challenges related to leadership dynamics

Leadership dynamics relates to management within government. Leadership dynamics is associated with problems that affect senior managers and effectively using the skill of the middle managers.

4.8.6.1 Problems that affect senior managers

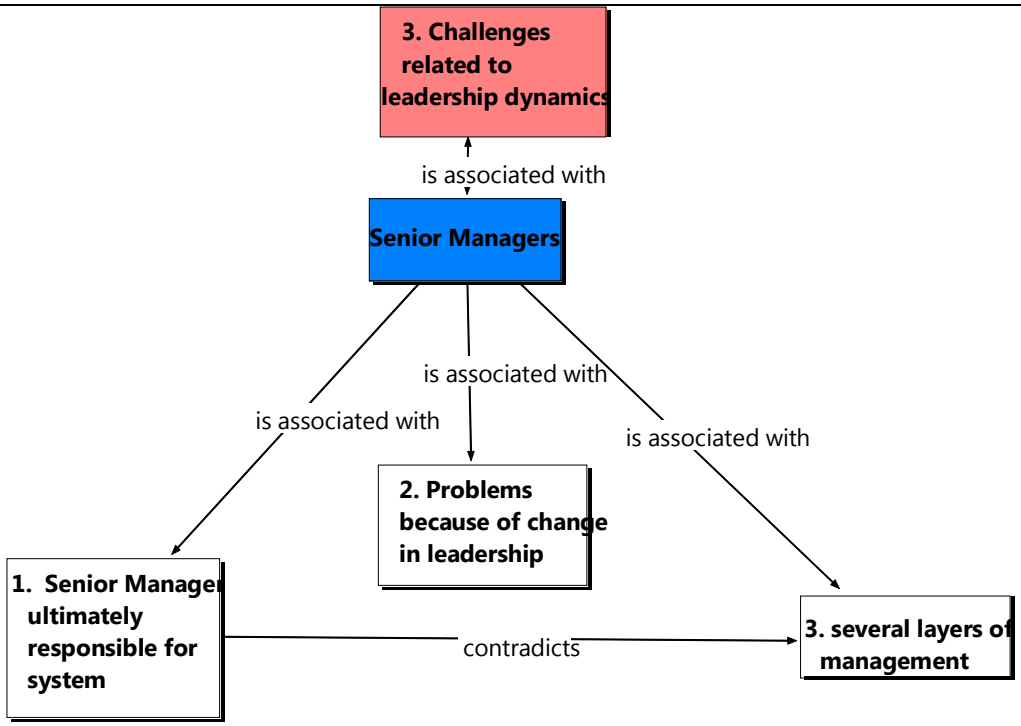


Figure 4.35 Problems that affect senior managers

Senior managers are ultimately responsible for the success of e-Government initiatives, as displayed in Figure 4.35. This is demonstrated by the following comments:

- *...the person that's ultimately responsible and has to explain where are we in the case of business continuity, it is the senior manager [director and deputy director].*
- *...the person responsible for managing all this process is our manager, the deputy director, who is the system owner.*

However, when there is change in the leadership, this change in leadership affects the continuity of the project, as demonstrated by the following comments:

- *...there was a change in top management, not even the top, on chief director level, the thing just was scrapped.*
- *...and to now try and get that support from the top [director and deputy director] to say all right, that is difficult because the new top manager doesn't know what I'm doing, doesn't have the background or anything, so, and it is a very difficult topic to describe to anyone and to know how to quickly describe it to and at the end of it say give me money is quite a difficult thing...*

Furthermore, due to several layers of management, senior managers are abdicating responsibility and downward delegating responsibilities, as demonstrated by the following comments:

- *They [senior managers] avoid any hint of permanently fixing these issues alright, because it means then certainly half the workforce or consultants have no job.*

- *You know, in government what you'd observe is that people [senior managers] fear to make decisions.*
- *It is because they have seen their executives don't take decisions and their executive's executives don't take decision and this goes back to government.*
- *When he stopped, the next DG [director general] did not know as much about IT and so he delegated*

Senior managers should be downwardly delegating responsibilities to middle managers.

4.8.6.2 Effectively using the skill of the middle managers

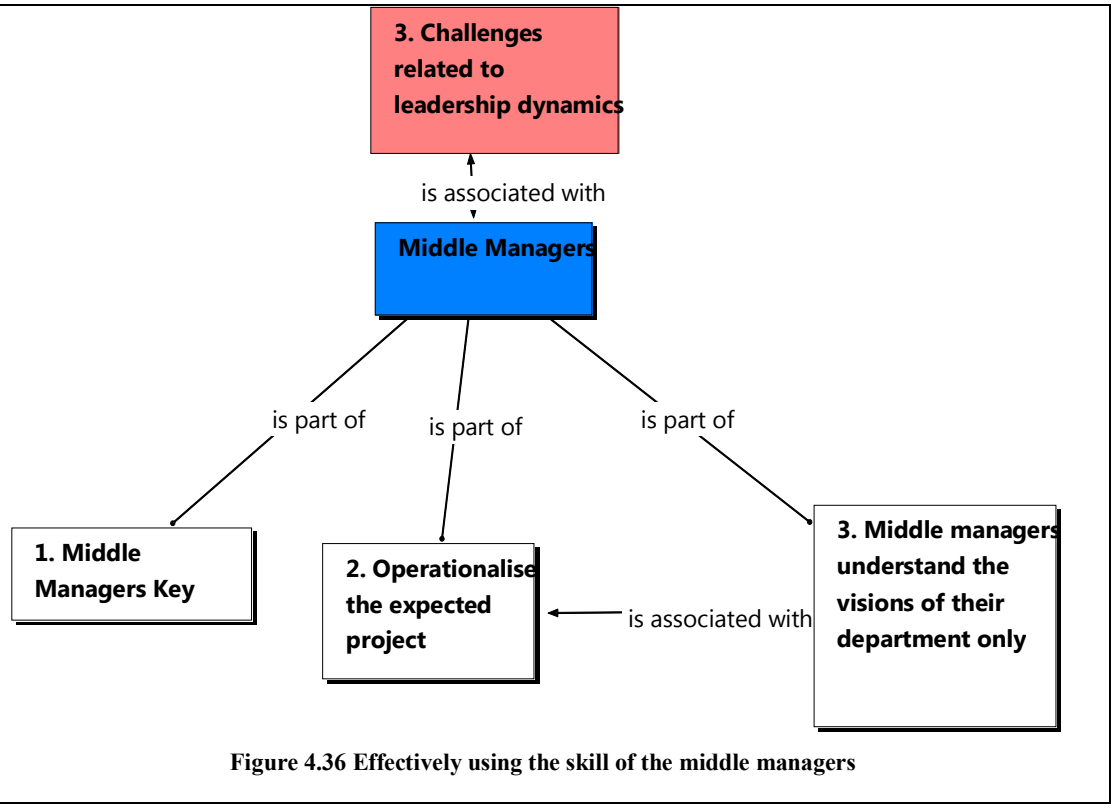


Figure 4.36 Effectively using the skill of the middle managers

Senior managers are administratively burdened, so middle managers are the buffer to reduce the pressure on senior managers, as displayed in Figure 4.36. For example middle managers act as intermediaries in communication with the government IT provider, as demonstrated by the following comment:

- *...there's a project manager that's assigned by SITA where we have weekly management meetings to see that what's included in the project charter and plan now starts becoming operationalised...*

Further, middle managers have become key stakeholders in the operationalisation of projects, as demonstrated by the following comments:

- *It was done at a middle management level, which was very interesting considering the complexity of the challenge and depth of it...*
- *...program management in that particular environment was called middle management. Portfolios managers were actually regarded as the middle*

management, which amazed me because the senior project managers reported into middle management.

Middle managers also have a clearer understanding of the vision of the department, as demonstrated by the following comment:

- *...I think if you get support from middle management, if you working with a particular department you are able to get buy in, and you know, they have that vision because they are dealing with on the ground stuff ...*

Management dynamics is just as important as outsourcing dynamics.

4.8.7 Challenges related to outsourcing dynamics

Outsourcing refers to the use of outside ICT service providers. Outsourcing dynamics is associated with problems regarding outsourcing and problems regarding ICT contracts.

4.8.7.1 Problems regarding outsourcing

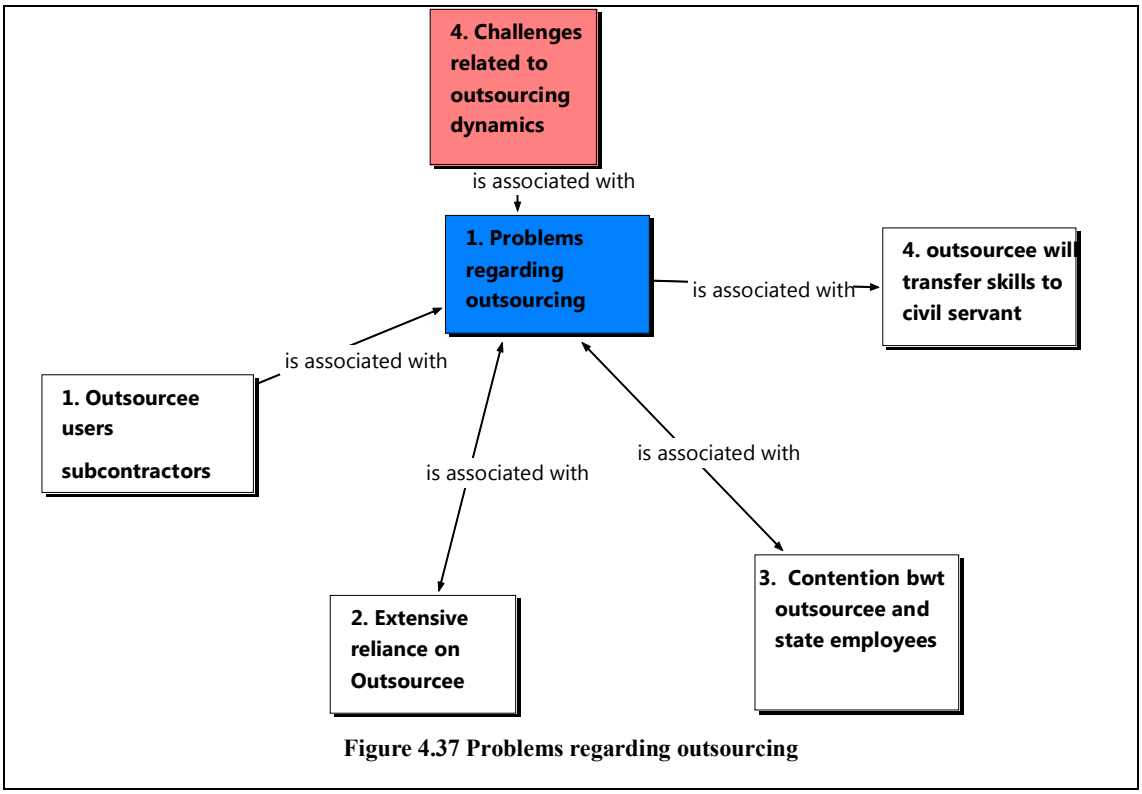


Figure 4.37 Problems regarding outsourcing

There are several challenges facing outsourcing, as displayed in Figure 4.37. For example, the outsouree further subcontracts the project, as demonstrated by the following comments:

- *What happened was it went out on tender. A local company won the tender. The software itself was sourced from an Indian company*
- *...it's been re-subcontracted to actually support the product...*
- *...but the subcontractors to the company supplied it...*

There is also the challenge of extensive reliance on the services of outsourcees, as demonstrated by the following comments:

- *...bearing in mind that we have many [department] consultants over here...*

- *...when you look at how long we have had the consultants working here. I came here last year, and this company, before them they were consulted, like the consultants have been here for a long time...*

In addition, there is contention between the outsourcee and civil servants, as demonstrated by the following comments:

- *I think it is because we look at how much these people [outsourcee] get paid. You look at how much I [civil servants] get paid. And the job that I do is not different from them.*
- *I said to him [outsourcee], what I think we should do is we should actually document the process that we followed so that we can have what we call as shared learning, and he was dead against that and said I don't want to do that because that's my intellectual property.*

There is also the expectation that the outsourcee will transfer skills to civil servants, as demonstrated by the following comments:

- *I struggle [civil servant], and they [outsourcee] should show me those kind of things.*
- *It is partially, it is partially. But again, you must also understand that when you say there should be a skills transfer, you must define that. You don't just say skills transfer. I mean, when you say I should transfer a certain skill to you, you must define how that process should be done because the guy I worked with will also certainly discuss this immediately at that time and I'm not here to teach you; I'm here to show you.*

The expectation that the outsourcee will transfer skills to civil servants must be captured in a contract.

4.8.7.2 Problems regarding ICT contracts

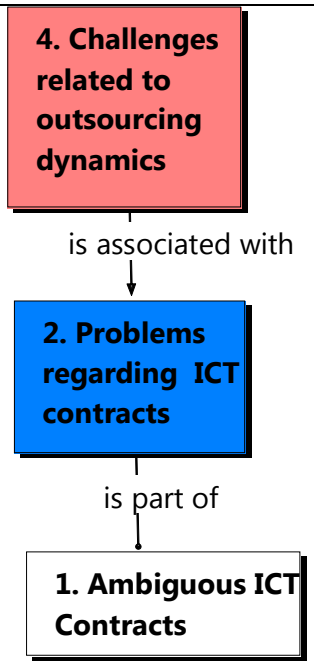


Figure 4.38 Problems regarding ICT contracts

There are ambiguous ICT contracts that lead to litigation, as displayed in Figure 4.38. These ambiguous ICT contracts delay the design, development and implementation of e-Government applications. This is demonstrated by the following comment:

- *...is really a case between the department and the suppliers at the moment. So it's ended up in the lower courts.*

This leads to the next theme which is automate systems development.

4.9 The theme relating to automate systems development

4.9.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to automate systems development was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.9.2 What does this theme mean?

The automate systems development challenge refers to automating a traditional process without improving on the effectiveness of the department and inappropriate use or reuse of hardware and software. Automate systems development has a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. The development of these types of e-Government systems improves the traditional efficiency of departments but may not improve the effectiveness of the department. The implication is that the traditional inflexible natures of government departments are reinforced by these automate systems.

4.9.3 What are the elements of this theme?

The automate systems development challenge is associated with the following issues; automating traditional processes, problems regarding technology, problems regarding hardware and software and problems regarding proprietary solutions.

4.9.3.1 Automating traditional processes

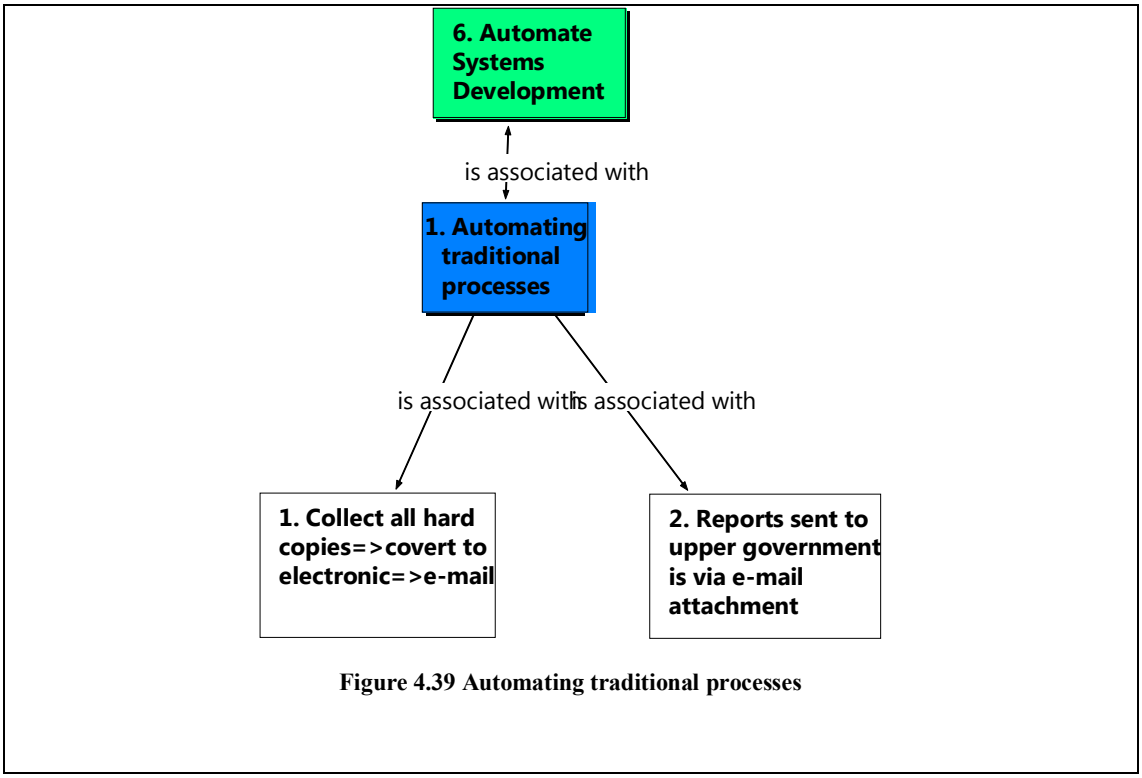


Figure 4.39 Automating traditional processes

With the automate process the traditional inflexible procedures in government are converted into electronic procedures, as displayed in Figure 4.39. This does not improve the effectiveness of the department. This is demonstrated by the following comments from informants:

- *Sometimes, it's just hard copies that are provided to our supervisor; our supervisor then collates it and emails it to the next level.*
- *these reports are actually sent via email*

The next consideration is problems regarding technology.

4.9.3.2 Problems regarding technology

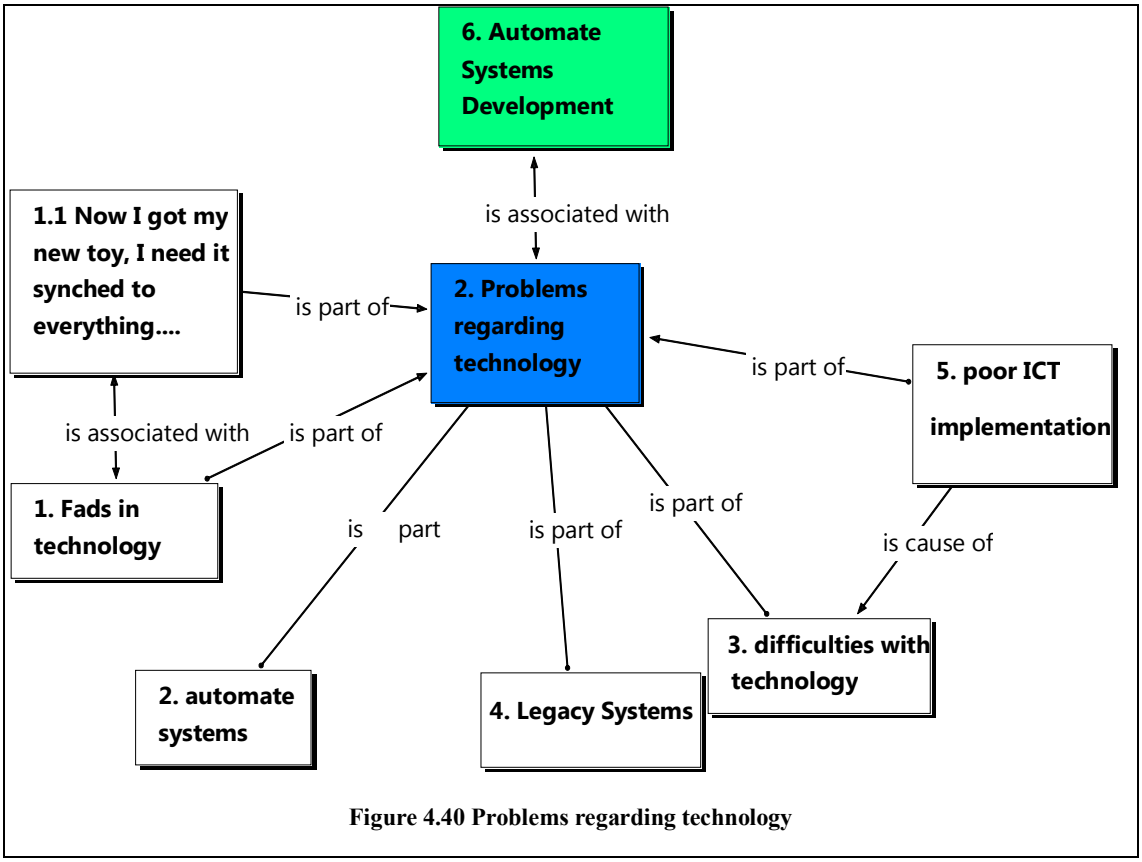


Figure 4.40 Problems regarding technology

The technology aspect is associated with fads in technology; automate systems, difficulties with technology, legacy systems and poor ICT implementation, as displayed in Figure 4.40. Only Fads in technology, which were highlighted as an important issue, will be discussed. Fads in technology are associated with the uses of newly introduced hardware to the market place, as demonstrated by the following comments from informants:

- *The DG [director general] liked the idea of the iPads, because it meant that the people had instant access to the emails wherever they were.*
- *I have got the Samsung phone S-III. It can do funny things like if I shake it, it can refresh itself with our mail server, you know, refresh it.*
- *Oh, a good example is the Apple stuff that the senior managers [directors] wanted us to create applications on mobile devices like Apple and iPad which is very understandable because the whole world is using Apple devices and Samsungs and a lot of mobile devices and so they want an app that runs on an Apple for instance. One of the requirements is for board meetings for instance.*

Additionally, there are challenges with hardware and software.

4.9.3.3 Problems regarding hardware and software

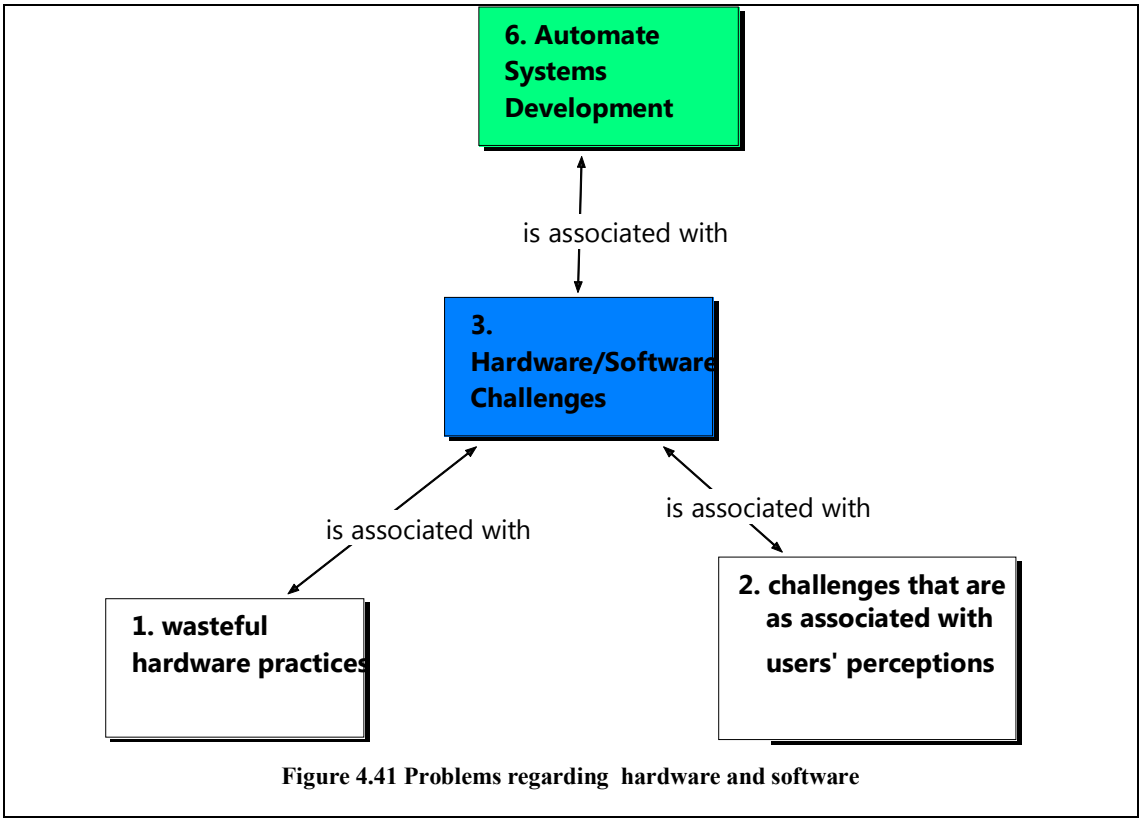


Figure 4.41 Problems regarding hardware and software

The hardware and software challenge is associated with wasteful practices, as displayed in Figure 4.41. Hardware and software are not appropriately managed. This is demonstrated by the following comment from an informant:

- *...they had issued me [senior manager] with a laptop computer and a desktop computer...*

Software challenges that are associated with users' perceptions of computer security are demonstrated by the following comments from informants:

- *We had to make many customizations for these guys [users] and many of them, many of their customizations are very emotional. It's like, in certain cases and in not all cases. In certain cases, they really have a valid point when it comes to the sensitivity of the data.*
- *...our financial division and our financial division guys they really - their security needs are relatively higher than the rest because you are dealing with people, salaries, very sensitive data. You wouldn't want for instance the government salary to be let out or known to whole lot of, so security needs to be really tight.*

There are further challenges associated with proprietary solutions.

4.9.3.4 Problems regarding proprietary solutions

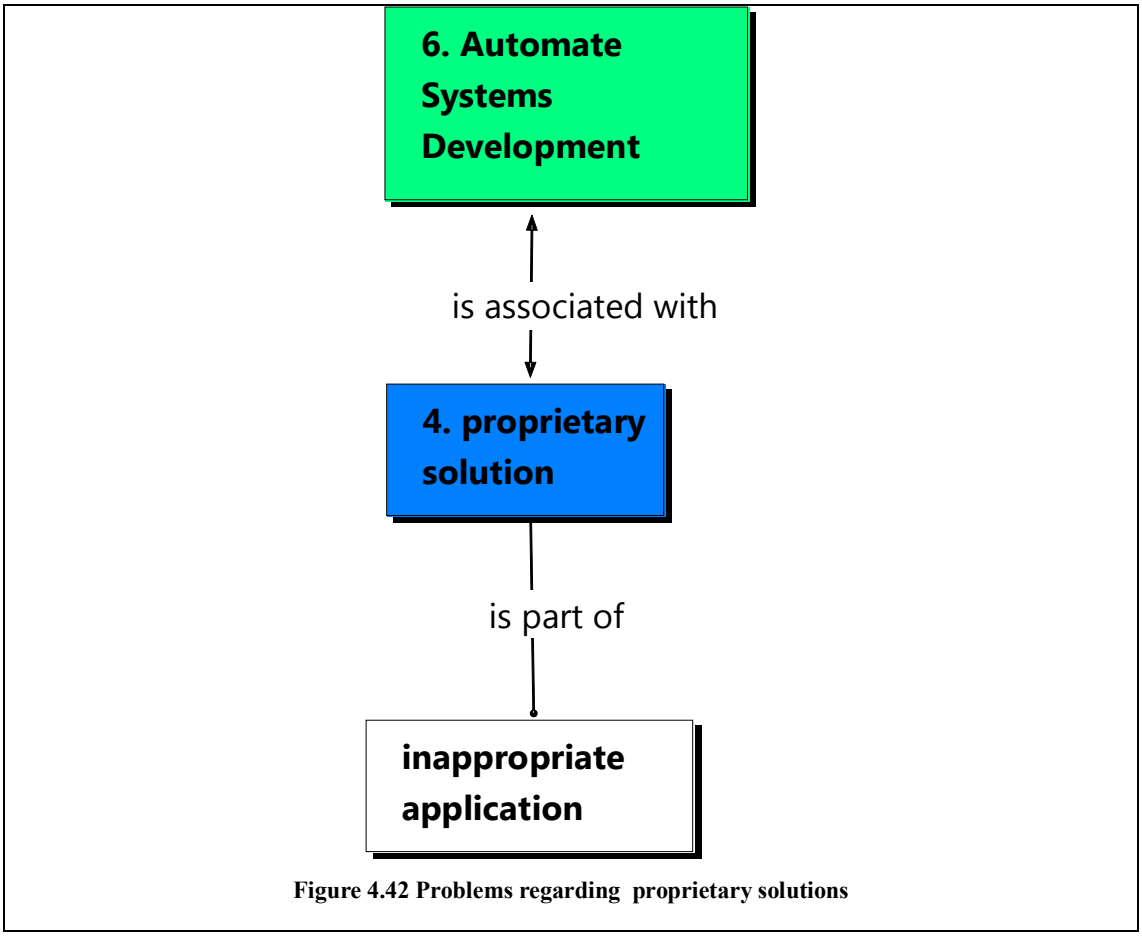


Figure 4.42 Problems regarding proprietary solutions

Proprietary solutions are associated with the inappropriate application of proprietary software to an existing problem, as displayed in Figure 4.42. Without having a detailed understanding of the problem, proprietary software is sometimes proposed as a possible solution to a problem. This is demonstrated by the following comment from an informant:

- *...they [directors] have the tendency to look at a business problem and automatically think about those licences they pay as a solution to the problems that we are dealing with...*

The next theme is the evaluation process that is employed by government.

4.10 The theme relating to continuous evaluation to measure perceived productivity

4.10.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to continuous evaluation to measure perceived productivity was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.10.2 What does this theme mean?

The continuous evaluation to measure perceived productivity refers to how government is evaluating e-Government applications and the civil servants that are involved in the commission, design and development of these applications. The continuous evaluation to measure perceived productivity has a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. There are no standards set for the evaluation of e-Government applications which result in conflicts relating to their evaluation. Similar types of conflicts arise in the evaluation of civil servants. The implications are that the civil servants, who are involved in the commissioning, design and development of e-Government applications, may not produce estimates that will resemble what is likely to happen and there may be a tendency to under-estimate in the belief that a full costing will kill the project or affect their individual performance evaluation. This deliberate inadequate estimation has a direct impact on limited resources.

4.10.3 What are the elements of this theme?

The elements of this theme are conflicts relating to evaluating the performance of systems and conflicts relating to evaluating the performance of civil servants.

4.10.3.1 Conflicts relating to evaluating the performance of systems

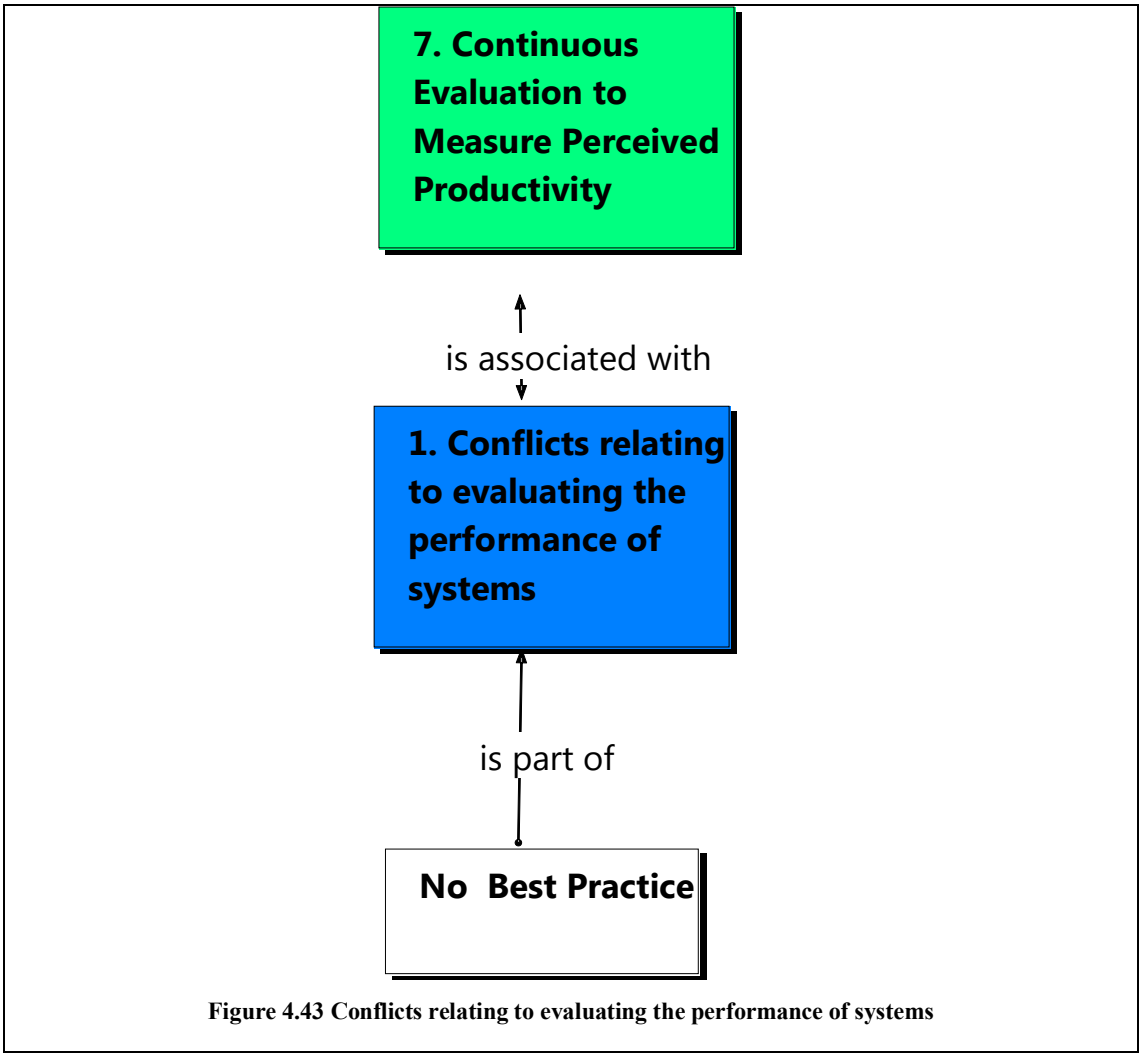


Figure 4.43 Conflicts relating to evaluating the performance of systems

From the perspective of evaluating the performance of systems there does not exist a set of accepted benchmarks in government, as displayed in Figure 4.43. There are no benchmarks to measure success of systems, acceptance of systems or quality of systems, as demonstrated by the following comments from informants:

- *So you measure the success by saying, was I able to continue with the business operations with as little impact as possible. So business continuity was the criteria we would use.*
- *Success is relative.*
- *...it's very difficult to calculate return on investment right, but that is one of the major things that is lacking here and it's all over [within government].*

In addition to evaluating the performance of systems, civil servants' performance is also evaluated.

4.10.3.2 Conflicts relating to evaluating the performance of civil servant

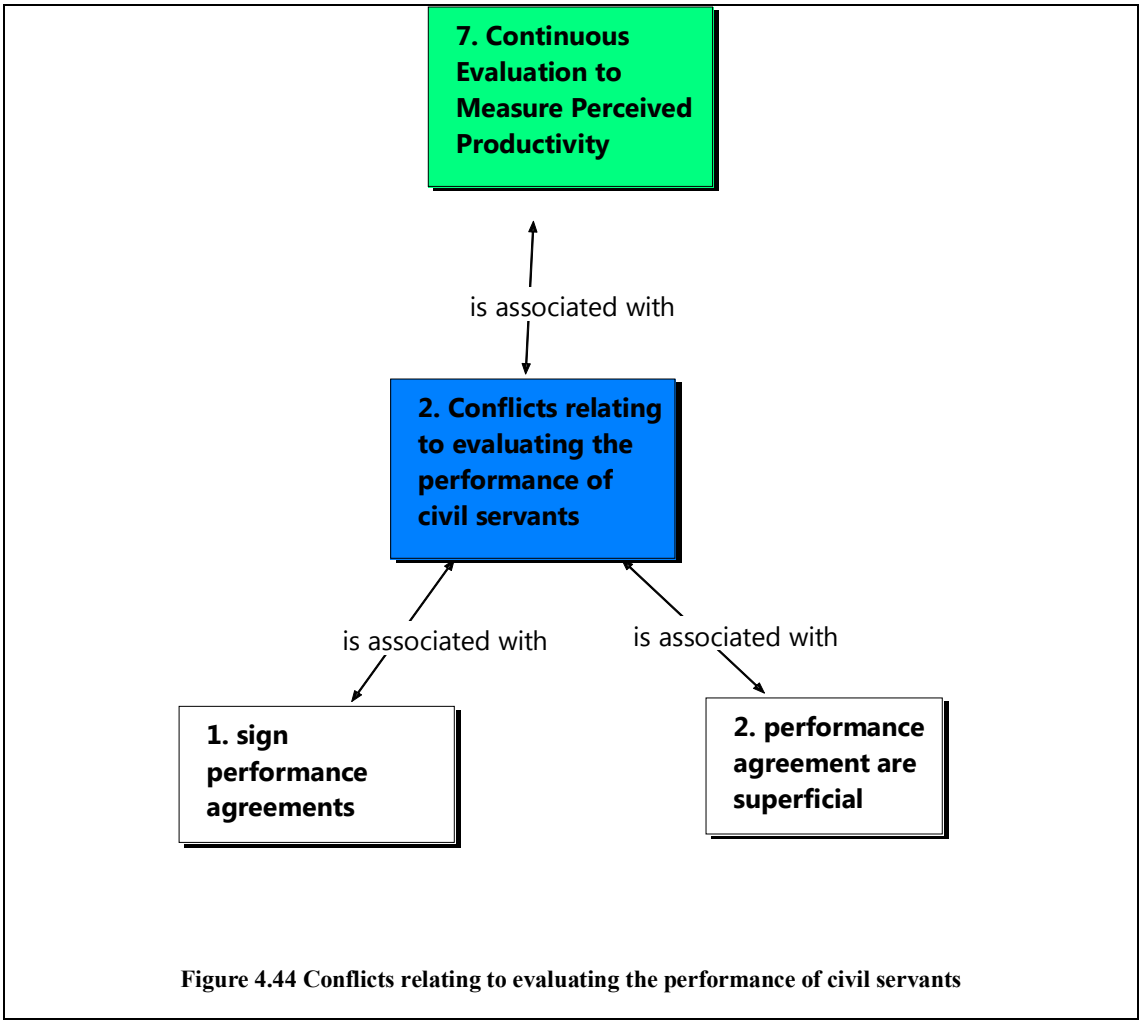


Figure 4.44 Conflicts relating to evaluating the performance of civil servants

Civil servants sign performance agreements that have a financial reward. These performance agreements affect the manner in which ICT projects are conducted, as displayed in Figure 4.44. This is demonstrated by the following comment from an informant:

- *at the end of the day it all affects our bonuses and pay cheques whether you get the project done or not, you run against the system, the more you get stakeholders involved the more you risk your project being derailed.*

There is a perception amongst civil servants that performance agreements are superficial and ineffective, as demonstrated by the following comments from informants:

- *KPA's [key performance areas] and performance pretty much isolate people, reduce creativity and box people.*
- *... they [directors] are very much worried about the guys above them and not whether the project is running well or not, so again it's based on bonuses, you know, if my superior feels I am doing a good job it's got nothing to do with the actual quality of the product, it's very subjective.*
- *...what happens is if they [directors] stall on the project it runs to the end of the year and they say, did you deliver, no you didn't, and you going to get deductions in your performance scores and that affects your bonuses, so what happens is now people actually compromise - you rather chop the project down into multiple phases and*

therefore it takes longer overall because you are just going to say getting the platform in place this year. Next year I look at specific requirements from department A, third year department B, so it becomes a very long, you know, you take the little mole hill and you stretch it out, you know, and make it look like a mountain to justify, why you are taking so long.

This now leads to the consequences associated with these issues.

4.11 The theme relating to the unintended consequences of ICT

4.11.1 How was this theme arrived at?

After a process of reflection and grouping of the second cycle concepts, the theme relating to the unintended consequences of ICT was generated as a result of grouping similar concepts and possible interrelationships found between them. This allowed the researcher to present a higher order concept of the ideas in a more meaningful way.

4.11.2 What does this theme mean?

The unintended consequences of ICT refer to new problems that were not considered before the implementation of the e-Government application and to procedural anomalies that are discovered in the department. The unintended consequences of ICT have a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits. These unintended consequences of ICT cause additional problems for departments. The implications are that to avoid embarrassment because of anomalies in the department, departments are reluctant to participate in ICT initiatives.

4.11.3 What are the elements of this theme?

The elements of this theme are the unintended consequences of ICT applications as well as anomalies that are uncovered because of the new system.

4.11.3.1 The unintended consequences of ICT applications

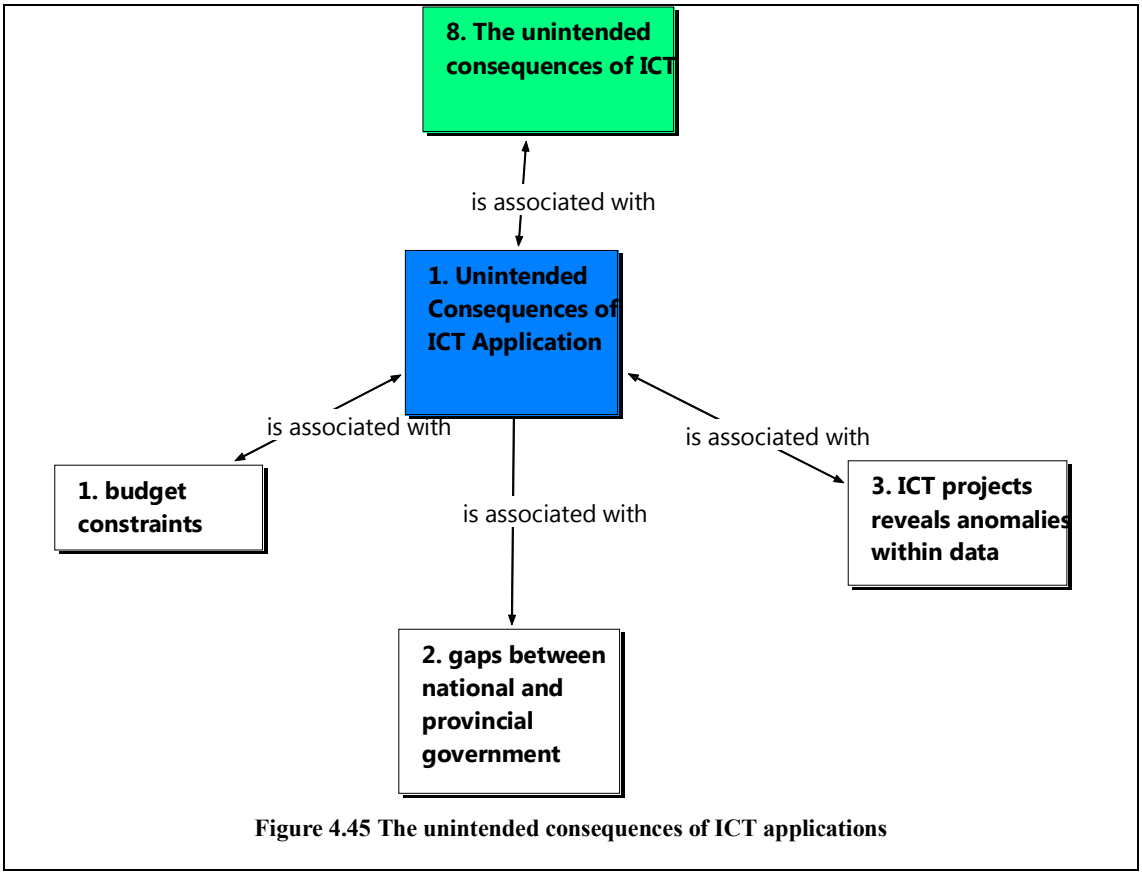


Figure 4.45 The unintended consequences of ICT applications

The unintended consequences of ICT applications associated with budget constraints, gaps between national and provincial government and ICT projects reveal anomalies within data, as displayed in Figure 4.45. The unintended consequences of ICT applications reveal new sets of previously unknown problems. This is demonstrated by the following comments from informants:

- *[a school nutrition monitoring systems was implemented], the children want meat every day or they want bread every day, the department is not able to afford that.*
- *... right now they [the department] don't have enough money to give a stove to the school, but that is what the teacher is reporting, that is what the principal is reporting, they want to see a change, I reported something, something must happen. But the hands of the government are also tied, this is our budget, we can only do it next year.*
- *Children are reporting that they are not getting food at school or the teacher reporting that the food was not delivered by the supplier, who has been contracted by the government by tender that they are supposed to deliver a certain amount of raw material to the schools and it didn't get delivered and there's nothing to cook for the children.*

In addition, government is finding it difficult to deal with the newly generated data, as demonstrated by the following comments from informants:

- *We committed [department] to this project two years ago but we haven't appointed extra people to deal with the information that's coming in. We haven't put in place extra processes or new processes.*
- *... is government ready to, if you get steams of information like; we [ICT system] are providing streams of data of what is happening with school meals but can departments actually deal with them and action things based on that data, do they have the capacity to do that, do they have the ability to do that?*

There are other problems such as gaps between national and provincial government, as demonstrated by the following comment from an informant:

- *We [department that sponsored an ICT system] have found that the national departments, for example, usually sit in Pretoria, they have challenges in getting information back through from the provincial departments.*

There are further challenges such as anomalies in the systems.

4.11.3.2 **Anomalies that are uncovered because of the new system**

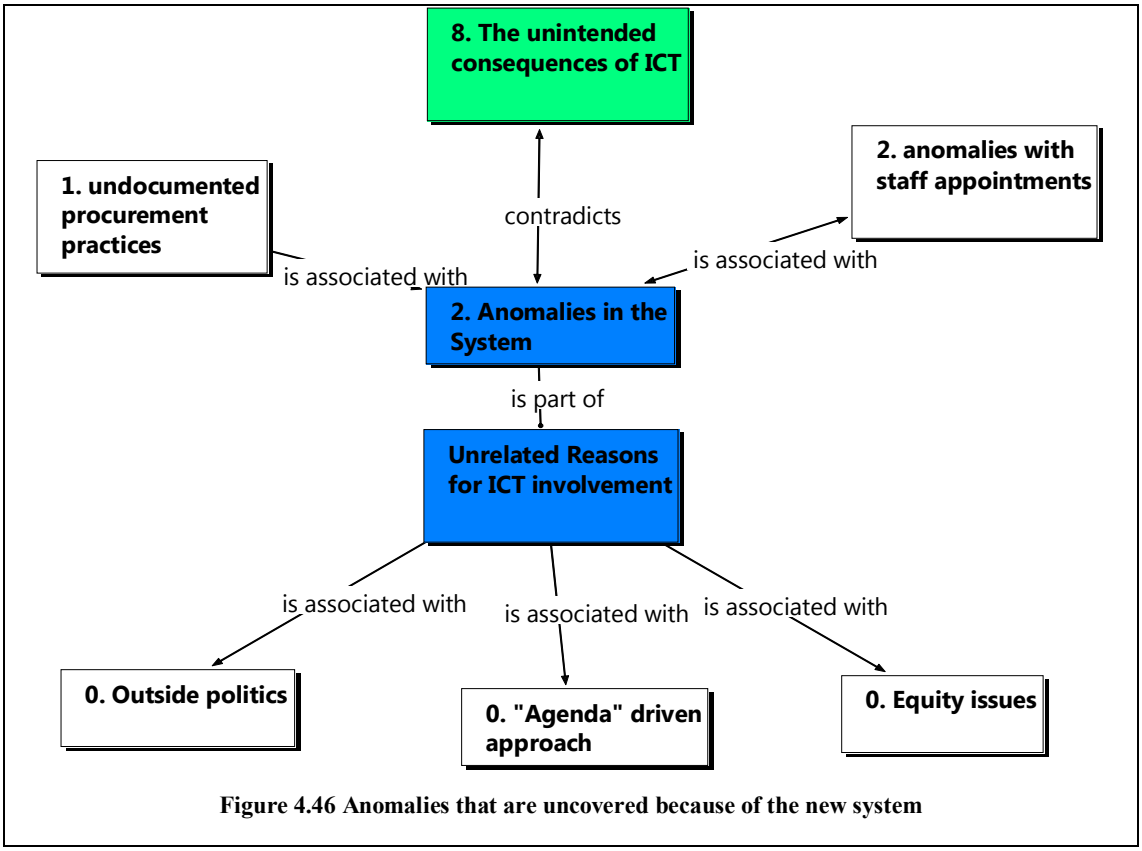


Figure 4.46 Anomalies that are uncovered because of the new system

Then there are anomalies that are revealed by the e-Government application, as displayed in Figure 4.46. These anomalies relate to challenges in undocumented procurement practices and anomalies with staff appointments. These are demonstrated by the following comments from informants:

- *...the anomalies in activities was from what I understand, huge.*
- *...there were tender anomalies...*

- *...people are being employed to work on a system, but they don't even have basic computer skills...*

The findings that have been presented, have been used to develop the theoretical conjecture.

4.12 The Narrative

e-Government development processes can be hindered by a series of problems related to lack of clarity regarding appropriate systems objects. There are a number of positive change drivers available for e-Government applications. There can also be challenges when systems are proposed without adequate understanding of the technology. Resource management has been seen as an important driver in the sense that e-Government applications can make those resources available more effectively and efficiently. However systemic obstacles related to bureaucracy, including evaluation, as well as the status of ICT within Government can reduce the impact of e-Government. Faced with challenges to modernisation, government has adopted the following strategies:

1. Assigning to senior leadership the responsibility of managing e-Government applications development.
2. Investing in the training of civil servants.
3. Selecting either in-house government ICT provider or outsourcing certain ICT functions to reduce the pressure on the in-house provider.

These strategies alone do not lead to optimal e-Government applications. These strategies need to be supplemented by:

1. Senior managers drawing on the skills and understanding of experienced middle managers.
2. Recruiting talented in-house technologists to reduce the reliance on outsourcing.
3. Overseeing outsourced contractors for technical quality and ensuring that the contractor delivers on the requirements' specifications.
4. Using suitable approaches to evaluate e-Government applications as well as civil servants to maximize optimal outcomes.
5. Adopting feedback processes to ensure the effectiveness of these strategies.

It is further important to focus on interdepartmental collaboration and motivate civil servants. Due to these issues e-Government has not progressed adequately towards facilitating modernization in government and therefore has not delivered required benefits.

4.13 Development of the Theoretical Conjecture

The reported finding has been consolidated and refined to produce the following theoretical conjecture:

e-Government applications are driven by a need to modernise government processes in the expectation of using scarce resources with improved efficiency. These applications are implemented in an environment that is not conducive to changes in processes and practices. The pressure to modernise can lead to non-optimal systems development decisions being made and practices implemented. The decision to modernise is made with little attention to the appropriate strategies to employ, key stakeholders who are able to deal with and manage the process, and how the process will be evaluated. The resulting application automates the department tasks but does not improve their effectiveness. These automate systems expose gaps in the department processes.

Figure 4.47 is a graphical representation of the theoretical conjecture. e-Government applications are conceived, designed and developed in an environment that is not conducive to change (systemic obstacles). One factor that is associated with the design and development of e-Government applications is a drive to modernise government processes. The catalyst that drives the modernisation process is associated with managing scarce resources. Using inadequate strategies, the e-Government applications that are designed and developed are characterised as automate in nature. There is an ongoing process of evaluating these automate systems as well as the strategies applied in their design and development. These automate systems expose gaps in department processes.

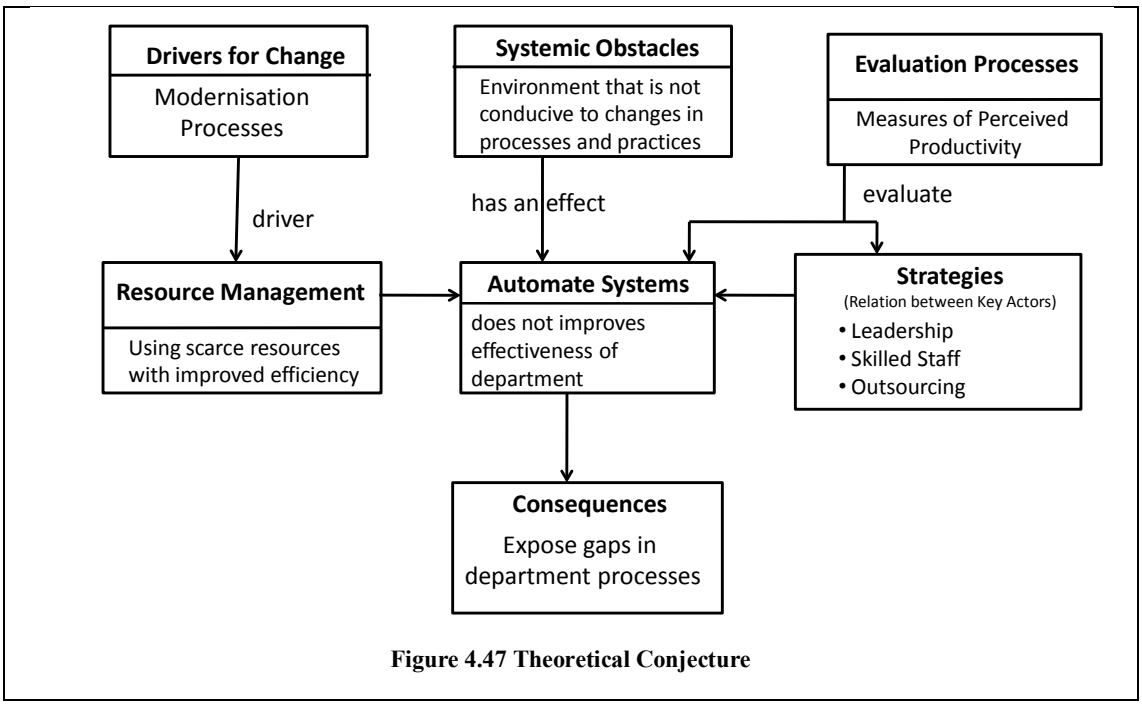


Figure 4.47 Theoretical Conjecture

4.14 Answer to the research question

The traditional inflexible and bureaucratic nature of government is not geared to the use of hi-tech e-Government solutions. There is an inherent 'conflict' between the tendency of technology to be most effectively used as an instrument of integration although the structure

and philosophy of the organisation is profoundly based on attitudes of strict departmental boundaries. To deliver the required benefits, e-Government application performance can be improved by proactive change which recognises the limits of the current situation and the potential of the new system. It is important for the department that is proposing an e-Government application to go further than just automating existing traditional processes which may make the department more efficient but the overall effectiveness of the department may not be improved. Using appropriately trained civil servants and drawing on the skills of middle management are critical to the success of e-Government applications. There is an acute shortage of ICT skilled civil servants, which forces the current administratively overburdened and ICT under-prepared civil servants to use committees for decision-making. Committee driven decision-making does not allow critical decisions to be made quickly, which then prolongs the design, development and implementations of e-Government applications. To reduce the pressure on in-house ICT providers, outsourcing aspects of e-Government application design, development and implementation can be helpful but it has to be overseen by appropriately skilled civil servants. Meaningful evaluation of e-Government applications and the civil servants that are involved in these processes is a central issue. These types of evaluations need to be pre-negotiated so that all parties are aware of the criteria that will be used during the evaluation.

4.15 Summary

In this chapter, eight themes were reported on. These themes are institutional and environmental challenges, the drivers for change, the catalyst that causes the change which is resource management, systemic obstacles that affect e-Government applications, the strategies that are employed by government, the e-Government systems developed, the evaluation process and the results of the e-Government systems that are developed. Using these themes a theoretical conjecture was developed. The importance of the theoretical contributions, the study's limitations, and possible avenues of further research are considered in the following chapter.

Chapter 5
End Notes, Limitations and Further Research

5.1 Introduction and Overview

This chapter reflects on the journey undertaken to answer the research question and presents comments on the voyage of discovery. It offers thoughts on the theoretical contribution, practical implications, methodological contributions, the research audit trail, the originality of the contribution and reflects on the rigour of the research. In addition to this, some limitations are discussed and possible avenues of further research are identified.

5.2 The Voyage of Discovery

Personal experience in dealing with government and my use of e-Government systems led me to believe that it was an important area to research. When I read the literature on e-Government, it echoed my personal experiences, while giving me an understanding of some of the important issues which underpin this topic. To develop a further understanding of the issues affecting e-Government, a Delphi study which called on a panel of experienced and knowledgeable informants was conducted. The results produced gave me a deeper insight into the issues that affect e-Government. The literature review and the new insights gained from the Delphi study were used to develop research questions and the interview schedule. The data collected for the main body of the empirical research, primarily in the form of interviews, was analysed and a theory was proposed. After conducting the literature review, Delphi study and field work, new insights were gained and these are presented in Table 5. 1 which is one aspect of my intellectual audit trail.

What I thought about e-Government after the literature review	How these thoughts developed as a result of the Delphi study	What I came to realise as the most important issues in e-Government after the field work was analysed

• In the context of this research, e-Government refers to how web/internet based ICT is used to facilitate the delivery of government services.
• When e-Government systems do not achieve their objectives, the results are:
  • loss of limited capital,
  • inability to achieve proposed organisational objectives,
  • negative publicity,
  • high turnover of staff,
  • dissatisfied staff and citizens,
  • embarrassed senior civil servants and politicians,
  • economic setbacks in the form of reduced productivity, and
  • sometimes even obstacles to the country's economy objectives.
• e-Government has different meanings to different stakeholders such as:
  o politicians
  o civil servants
  o ICT designers and developers
  o citizens and
  o business
	• Drivers for change – ICT is perceived simultaneouslyas a driver of change as well as a facilitor to modernise.
	• Systemic obstacles to success are also associated with:
	  • problematic relationships between key actors, and
	  • gaps in understanding amongst the key players.
	• Managment of stakeholders - senior civil servants who are administratively burderned and who do not have the required ICT skills or understanding are required to manage the complex web of relations between stakeholders.
	
	Insights gained
	
	The following 5 statements scored the highest rankings indicating that they are the most important:
	• The scarcity of in-house ICT expertise and resources.
	• The tendency towards 'turf wars' within government departments.
	• Complicated internal bureaucratic policy requirements by governmental departments.
	• Civil servants are generally not sufficiently technologically savvy to understand the consequences of their decisions on the project.
	• Civil servants' decision-making processes are complex and bureaucratic.
		• There is a complex environment with multiple agendas that have relatively little alignment.
		• Government is traditionally not oriented towards the use of Hi-tech solutions.
		• The nature of government is that ministers change and there is a change in direction specified at ministerial level
		• There is an inherent 'conflict' between the tendency of technology to be most effectively used as an instrument of integration and the structure and philosophy of the organisation, which is rigidly based on attitudes of strict departmental boundaries.
		• Conflicts which arise due to performance agreements targets
		• The bureaucracy tends to reduce the effectiveness of senior management by imposing the need for authorisation from a number of different entities.
		• The process of introducing any ICT into an organisation requires a careful and detailed study of the process within the organisation and the thinking involved in the analysis for the incoming new system often reveals new dimensions which had not been highlighted before. It was reported that e-Government systems had the effect of discovering inadequacies in the current operation procedures.
		• e-Government

What I thought about e-Government after the literature review	How these thoughts developed as a result of the Delphi study	What I came to realise as the most important issues in e-Government after the field work was analysed
	Some new ideas from the open ended question: • e-Government applications are developed and deployed in individual departments while citizens' needs cross departments. • Institutional logic of bureaucrats is to implement policies, not to serve citizens. • Timelines are too long which changes the goal posts each time the technology changes. • Many of the decision makers are not computer literate or knowledgeable enough to understand the technologies and capabilities in the market. • e-Government applications are being built to suit the needs of government rather than citizens (i.e. not citizen-centric).	applications are conceived, designed and developed in an environment that is not conducive to IT and organisational change. • A factor that is associated with the design and development of e-Government applications is a drive to modernise government's internal processes. • A catalyst that drives the modernisation process is associated with managing limited resources. • Using incomplete strategies and dealing with systemic obstacles, the e-Government applications that are designed and developed are characterised as automating in nature and do not substantially improve the efficiency of the department. • There are ongoing processes of evaluating these automate systems, as well as the civil servants that are involved in the design and development of these applications, which add another layer of bureaucracy. • These automate systems expose gaps in government processes leading to more e-Government projects with associated problems that could benefit from greater research in this under-researched subject.

Table 5. 1 The Evolution of the Thinking Process

5.3 Importance of the Theoretical Contribution

The theoretical contribution resulting from this research is important because e-Government is not a subject that is pursued by many South African institutions (Burke, 2012), and also has implications for developing countries and BRICS countries. This theoretical contribution has added to the body of e-Government knowledge by increasing the understanding of the challenges associated with the design and development of e-Government applications, the drivers of e-Government, the strategies used for e-Government, the types of evaluations that are used and the types of e-Government applications that are developed. The findings can also benefit the e-Government research community by providing some insight into the factors that affect e-Government applications design and development. One of the key factors that affect e-Government applications is systemic obstacles; these types of obstacles are interwoven into the daily tasks and processes of departments. Thirdly, the findings offer researchers the opportunity to conduct future research around the identified issues that affect e-Government applications, these issues can be considered unique to government. Finally the insights gained from the senior managers provide a window into their thinking about e-Government applications; this is important because senior managers are the persons who have a strong influence on the success or failure of these systems.

5.4 Practical Implications of the Research

Senior managers who are administratively burdened can use the talent and expertise of the middle manager as a resource to oversee the design, development and implementation of e-Government application.

There is an acute shortage of ICT skilled civil servants. This requires a more focused investment in training civil servants to have a deeper understanding of ICT and there is also a need to recruit talented ICT skilled persons.

To reduce the pressure on in-house ICT providers, outsourcing aspects of e-Government application design, development and implementation can be helpful but it has to be overseen by appropriately skilled civil servants.

There are conflicts which arise due to ambiguities in performance agreements for civil servants. Performance agreements need to be continually reviewed in order to accommodate change and realistically measure performance. There are also ongoing evaluations of e-Government applications. The criteria for these evaluations also need to be negotiated in advance with relevant stakeholders.

The use of traditional Information Systems approaches to the design and development e-Government applications is not appropriate in all circumstances because of the nature of government and the complexity associated with e-Government applications.

5.5 Methodological Contribution

The methodological contribution in this work can be regarded as the creative use of standard methodological tools. The Delphi study was used to support understanding of the literature in order to come up with a better research question and to develop a better interview schedule, and Atlas.ti was used in order to manage, back up, secure and code the data in a more efficient and effective way.

5.6 The Research Audit Trail

A research audit trail was incorporated into the research design. The research audit trail consisted of an intellectual audit trail and an event audit trail. The intellectual audit trail indicates how the research unfolded. This audit trail assisted me in reflecting on how my thinking evolved throughout the research. The evolution of my thinking is presented in Table 5. 1.

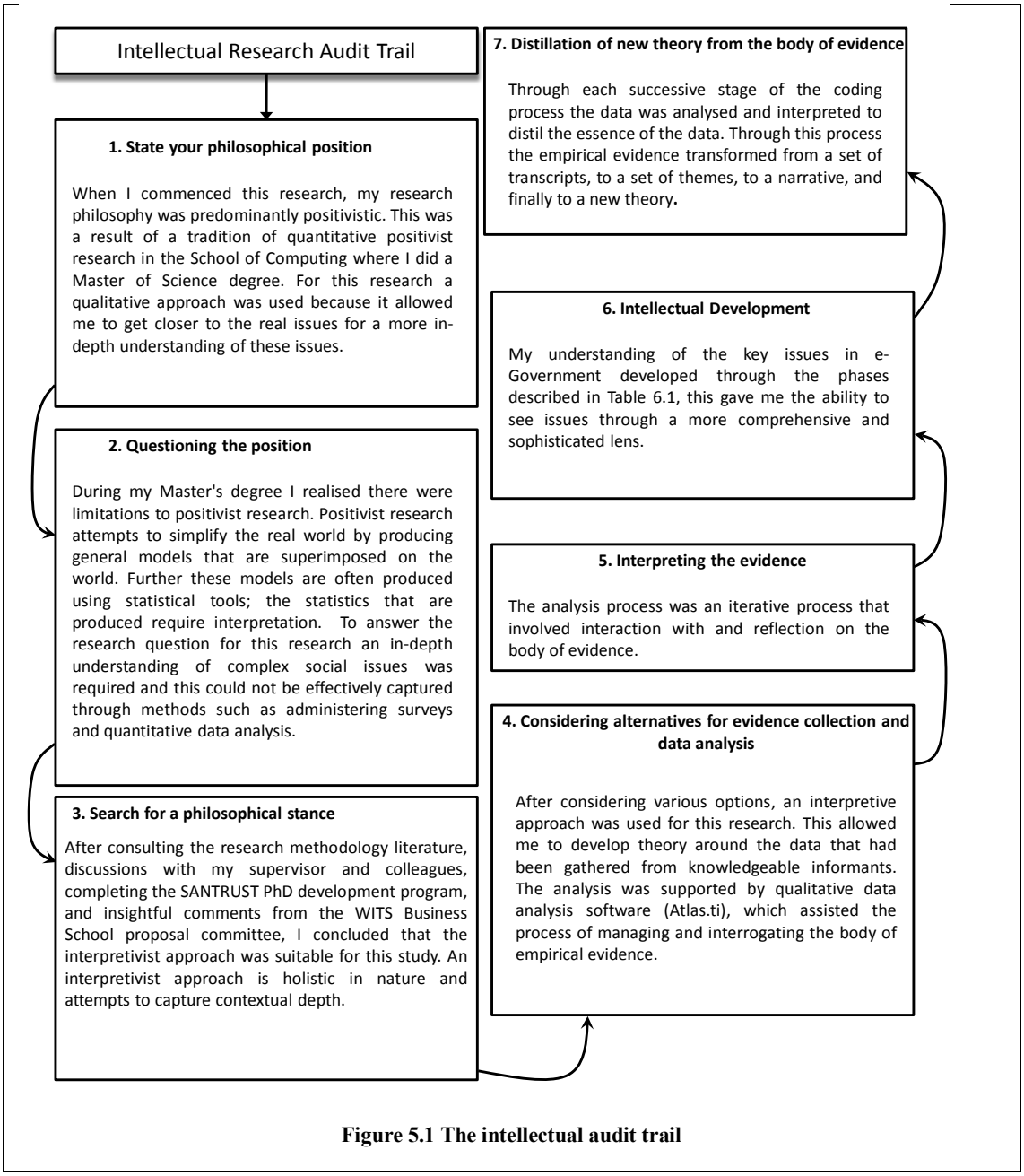


Figure 5.1 The intellectual audit trail

The event audit trail documented the stages of a research study, from identification of the research problem to development of the theory, and reflects the key research methodology decisions. This audit trail is presented in Figure 5.2.

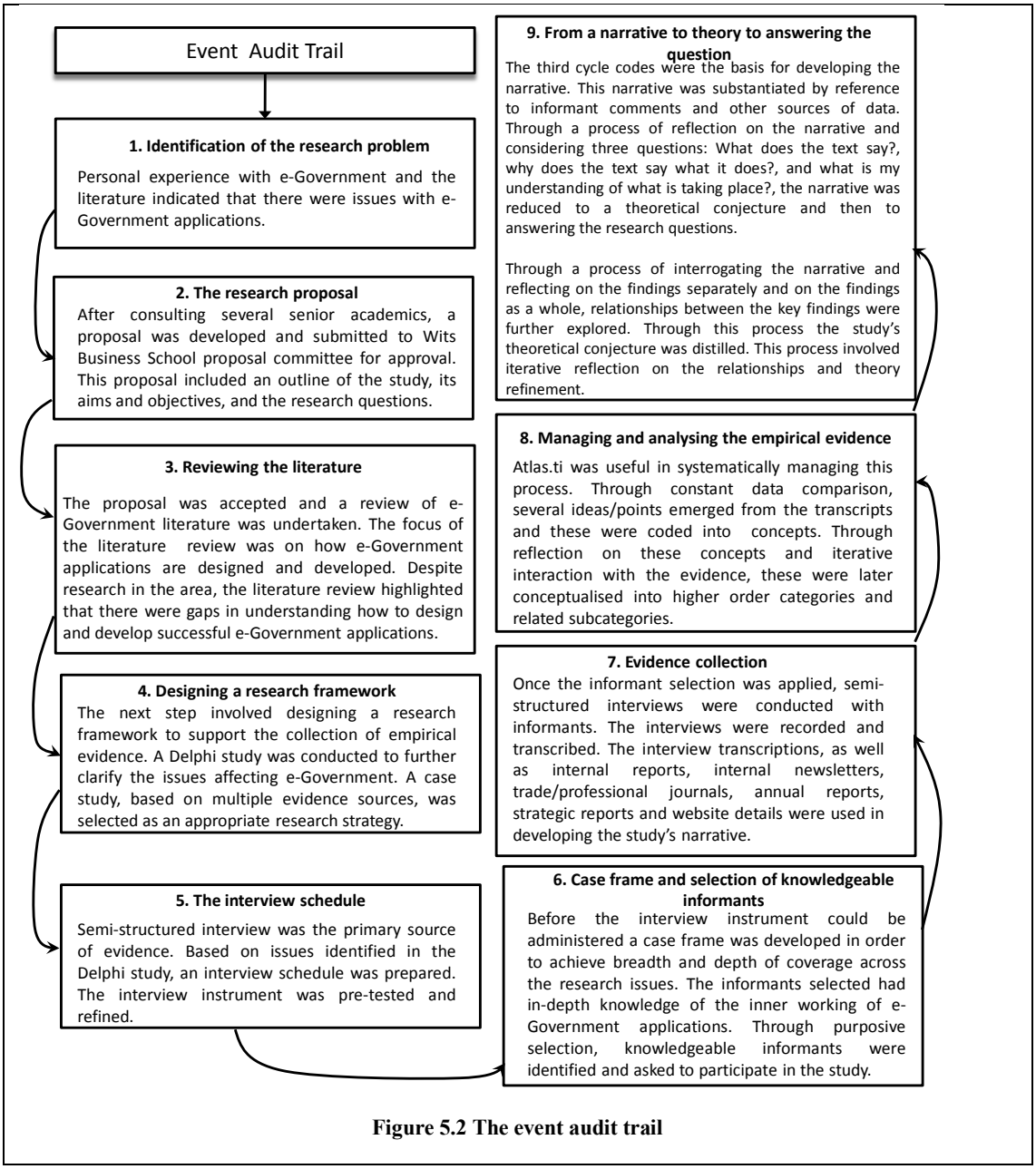


Figure 5.2 The event audit trail

5.7 The Originality of Contribution

There are gaps in the body of literature in the field of study. These issues have not been addressed previously in South Africa. The government space is complex with multiple agendas that have relatively little alignment. In this space key stakeholders change. Government is traditionally not oriented towards the use of Hi-tech solutions. e-Government applications are conceived, designed and developed in an environment that is not conducive to ICT and organisational change. There is an inherent 'conflict' between the tendency of technology to be most effectively used as an instrument of integration and the structure and philosophy of the organisation, which is rigidly based on attitudes of strict departmental boundaries. The process of introducing any ICT into an organisation requires a careful and detailed study of the process within the organisation; and the thinking involved in the analysis for the incoming new system often reveals new dimensions which had not been highlighted before. It was reported that e-Government applications had the effect of discovering inadequacies within departments' current operating processes. A factor that is associated with the design and development of e-Government applications is a drive to modernise government's internal processes. One reason for this is linked to the management of limited resources. Senior managers deal with systemic obstacles such as complex bureaucracy which reduces their effectiveness by enforcing the need for authorisation from a number of different entities. This could lead to e-Government applications that are characterised as automating in nature and do not substantially improve the effectiveness of the department. There are ongoing processes of evaluating these automate systems, as well as the persons involved in their design, development and implementation. Conflicts arise due to these evaluations. These automate applications expose gaps in department processes leading to more e-Government applications with associated problems.

5.8 Reflection on the Rigour of the Research

The rules for the analysis of the data acquired have been strictly followed and all the required steps in the interpretation of the analysis have been followed. Having developed the theory, it is important to reflect on the rigour of this research. The Lincoln and Guba (1985; 2000) framework has been applied as follows:

1. Dependability
    - Know where the data comes from. This is addressed in Chapter 3, Section 3.4.2 Expert Sample, Section 3.6 the Research Informants and other evidence and Section 3.10 the Informant Selection.
    - How was the data collected? This is addressed in Chapter 3, Section 3.4.3 the Three Round Delphi Study, Section 3.11 Data Collection and Section 3.14 the Instrument.
    - How was the data used? This is addressed in Chapter 3, Section 3.4.3 the Three Round Delphi Study and section 3.18 Qualitative Data Analysis.

- Community validation. This has been addressed as follows:
    - the research proposal was defended and accepted by a panel of 6 senior academics at the University of the Witwatersrand.
    - a paper has been published that addressed the research strategy (Singh & Remenyi, 2011). The paper was awarded a certificate of merit.
    - a poster presentation at the 4th Cross-Faculty Postgraduate Symposium, Showcasing Postgraduate Research at University of the Witwatersrand, 2011. The poster was awarded a second prize.
    - a second paper was published that was used to refine the research question (Singh, 2013).

2. Credibility
    - Are the research findings credible? This has been addressed by the publication of aspects of the research, see Singh (2013) and Singh and Remenyi (2011).
    - Is the data consistent and cohesive? This is addressed in Chapter 3, Section 3.19 A Strategy for Developing the Theory.
    - Triangulation. This is addressed in the form of data and informant triangulation.
3. Transferability
    - The degree to which the results of the research can be transferred to a different setting. The purpose of this research is to understand how the development processes of South African e-Government applications be improved to deliver required benefits. Purposive sampling was used to select informants. The type of sampling can impact on the transferability of the findings. The samples must therefore be such that they are chosen to provide adequate data to build creditable theory. This research follows the approach of Stake (2005) that "the purpose of a case study is not to represent the world", the purpose is to "dig into meanings, working to relate them to contexts and experience". This concern has been addressed by the publication of aspects of the research, see Naidoo, Singh, & Levine (2011) and Thakur and Singh (2012).
    - Is there an adequate and detailed description in laying out all the relevant details of the research? This was addressed the Chapter 3.
4. Confimability
    - Confirmability is concerned with providing evidence that the researcher's interpretations of informants' constructions are rooted in the informants' constructions. The data analysis, findings and conclusions can be verified as being grounded in the informants' perceptions (Jensen, 2008).
    - Confirmability is expressed through the audit trail use in this research.

The requirements for rigour have been adequately met for this research.

5.9 Limitations

Having met the requirements for rigour, it is prudent to reflect on the research journey as a whole with a view to understanding how the process could be improved knowing what I currently know. There are three limitations that have been identified.

5.9.1 Resources and Time Constraints

As a part-time post graduate researcher, I was constrained by the fact that I needed to adhere to the research schedule and complete this study within a specific timeframe. Further, I had limited funding.

5.9.2 The Information Filter

Informants filtered the information that they provided during the interview. Once the voice recorder was switched off, informants were more forthcoming with some of their responses. The after-interview conversation provided a rich source of data; unfortunately I could only capture the essence of these conversations in my field notes.

5.10 Future Research

This research makes a contribution towards developing an understanding of how e-Government applications are designed and developed. There are several opportunities for further research.

It would be interesting to explore the following issues: gaps in understanding and managing stakeholders. A gap in understanding ICT design, development and implementation is the difference between senior management's understanding and/or potential citizens' understanding and the way in which these understandings are received and acted upon by ICT professionals. Managing stakeholders refers to the internal inefficiencies in dealing with the competing expectations of the different stakeholders.

This research focused on South Africa. There is an opportunity to expand this research to include other countries, then to compare the findings for common patterns in the approaches used by different countries.

Finally, there is an opportunity to conduct longitudinal studies on how e-Government applications are designed and developed.

5.11 Concluding Remarks

During the course of this research, I had the opportunity to interact with leading e-Government researches, senior academics, government officials and citizens affected by e-Government applications. My interaction with these individuals shaped my understanding of how e-Government applications are designed and developed. The theory that is developed in

the research is an understanding of how e-Government applications are designed and developed.

e-Government can make government more efficient. However, citizens, for example, want resolutions to problems. No matter how good the technology that is in place, if the government of the day cannot harness the data produced by e-Government applications to develop effective policies, in the eyes of the citizens government has not meet their expectations.

Further, there is the notion that e-Government applications will reduce anomalies in the behaviour of misdirected individuals within government. e-Government applications cannot be used as a tool to replace dependable officials. However, e-Government can be used as a tool to increase the dependability of officials.

This research study may be understood as a platform for ongoing research. The findings from this research offer opportunities for others to follow on and further improve on these understandings. In the words of Checkland (1999) writing about systems thinking and practice:

> *"Obviously the work is not finished, and can never be finished. There are no absolute positions to be reached in the attempt by men to understand the world in which they find themselves: new experience may in the future refute present conjectures. So the work itself must be regarded as an on-going system of a particular kind: A learning system which will continue to develop ideas, to test them out in practice, and to learn from the experience gained."*

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Appendix A: A Bibliometric Analysis of e-Government Research

Dwivedi (2009b) in Table 1, analysed 1037 articles on e-Government research, published in 19 peer reviewed journals between 1998 to 2008. There are 68 countries that are actively involved in e-Government research. African is under-represented in e-Government research.

Country/Territory	Count	% of 1037	Country/Territory	Count	% of 1037
Peoples R China	172	16.59%	South Africa	4	0.39%
USA	171	16.49%	U Arab Emirates	4	0.39%
Germany	67	6.46%	Wales	4	0.39%
Italy	65	6.27%	Argentina	3	0.29%
England	63	6.08%	Hungary	3	0.29%
Greece	52	5.01%	Jordan	3	0.29%
Spain	42	4.05%	Morocco	3	0.29%
Austria	41	3.95%	Philippines	3	0.29%
Netherlands	35	3.38%	Poland	3	0.29%
Australia	28	2.70%	Tunisia	3	0.29%
Switzerland	21	2.03%	Chile	2	0.19%
Brazil	20	1.93%	Croatia	2	0.19%
Canada	18	1.74%	Cyprus	2	0.19%
South Korea	18	1.74%	Indonesia	2	0.19%
France	15	1.45%	Israel	2	0.19%
Singapore	15	1.45%	Lebanon	2	0.19%
Sweden	15	1.45%	North Ireland	2	0.19%
Belgium	14	1.35%	Azerbaijan	1	0.10%
Scotland	11	1.06%	Barbados	1	0.10%
Taiwan	11	1.06%	Botswana	1	0.10%
Denmark	10	0.96%	Egypt	1	0.10%
Japan	10	0.96%	Iran	1	0.10%
Ireland	9	0.87%	Jamaica	1	0.10%
Norway	9	0.87%	Lithuania	1	0.10%
India	8	0.77%	Luxembourg	1	0.10%
Slovenia	7	0.68%	Macedonia	1	0.10%
Thailand	7	0.68%	Malaysia	1	0.10%
Czech Republic	5	0.48%	Mauritius	1	0.10%
Finland	5	0.48%	Mexico	1	0.10%
Romania	5	0.48%	Nigeria	1	0.10%
Turkey	5	0.48%	Oman	1	0.10%
Estonia	4	0.39%	Russia	1	0.10%
Portugal	4	0.39%	Sudan	1	0.10%
Slovakia	4	0.39%	Uzbekistan	1	0.10%

Table 1. Electronic government studies according to country (Dwivedi, 2009b)

Khan and Park (2013) further point out that developed countries account for the majority of published academic articles, as displayed in Figure 1. The US, UK, Canada, Germany and Singapore are key hubs in e-Government research.

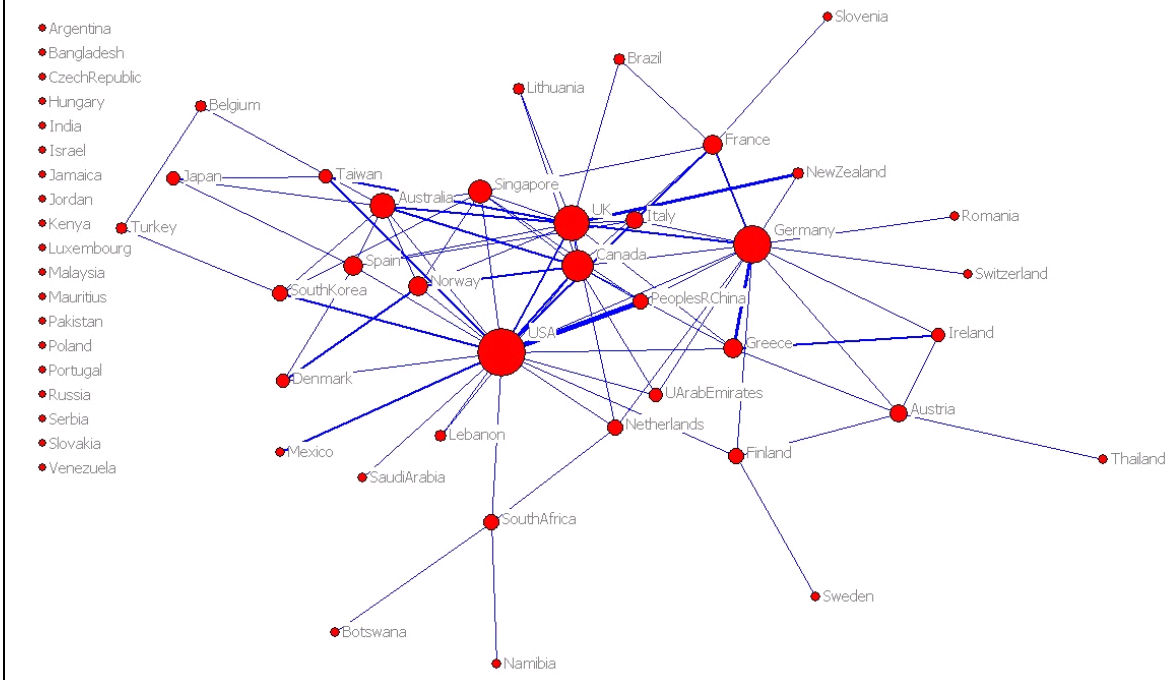


Figure 1.The co-authorship network of countries in the EG research domain (source (Khan & Park, 2013))

Figure 2 shows some of the key institutions in the e-Government research domain. For example, the University of Maryland, the University of Arizona, and Georgia University are key institutions in the U.S. cluster. Korea University is a key in the Korean cluster, and the University of Manchester is significant in the U.K. cluster. There is no African cluster.

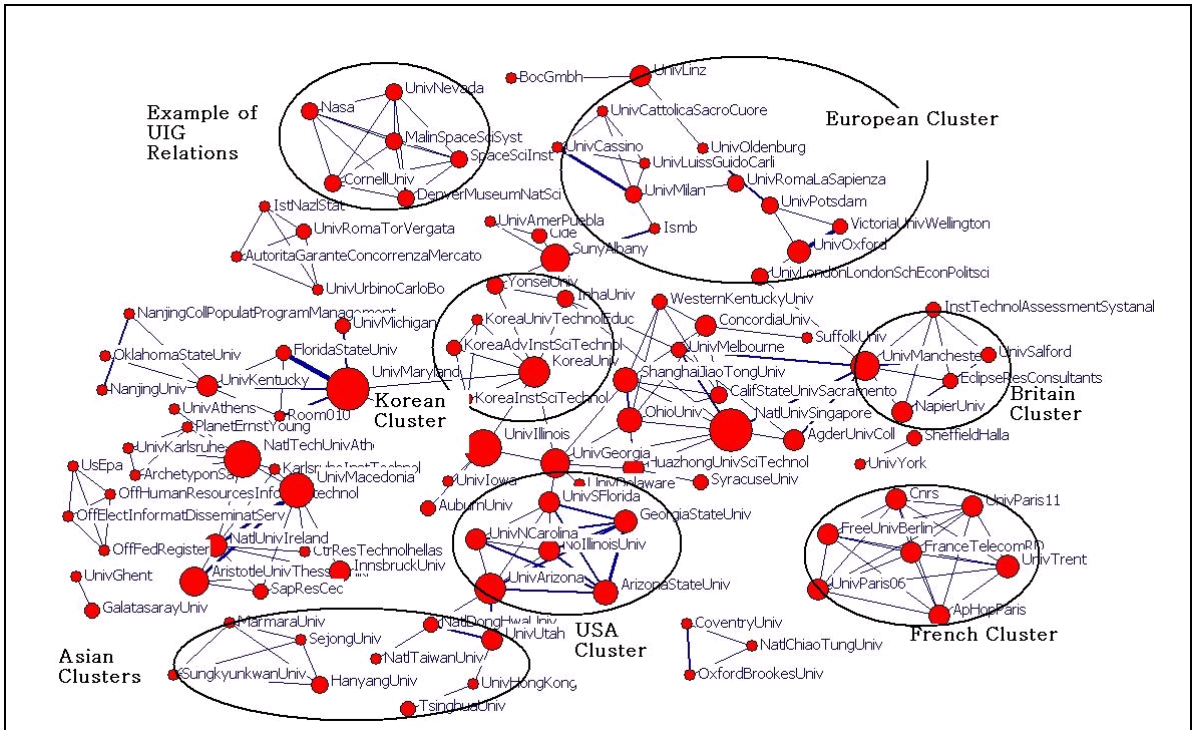


Figure 2. The institution-level network in the EG research domain (source (Khan & Park, 2013))

Further, a search of BookData Online[49], for books published about e-Government, returned a result of 944 books. The countries that these books are published from are: US; UK, India, Germany, France, Canada and Australia. A further search for books about e-Government case studies returned a result of 24 books:

- 6 books published in 2004
- 3 books published in 2006
- 10 books published in 2007
- 1 book published in 2008
- 1 book published in 2009
- 1 book published in 2011
- 1 book published in 2012
- 1 book published for 2014

A review of the academic literature on e-Government research indicates that research articles are published mostly in non-IS government-related journals such as Government Information Quarterly and Public Administration Review (Bélanger & Carter, 2012). As displayed in Table 2, e-Government research themes are as follows (Hernández et al., 2010, 2012b):

[49] A Nielsen Holdings information and measurement company who collect book information from over 70 countries, see http://www.nielsenbookdataonline.com

- Technological innovation and modernisation in public administration management: These articles focus on the different changes in public administrations that allow greater transparency in the activities of government and public services. Modernisation of public administrations is a result of the efforts of public managers to use ICT more effectively and efficiently in management.
- e-Government program/project evaluation and policy analysis: This item includes articles that discuss the results of an evaluation of public programs related with initiatives of e-Government.
- Citizen participation / Deliberative Democracy: Includes articles that are about emergent changes in the relationship between government and the citizen as result of e-government.
- E-services: These articles are about the transformation in the delivering of services.
- Accountability, transparency and dissemination of information: This theme includes research about government websites for communication with citizens and disclosure of information to promote accountability of public managers online.
- Behaviour of citizens in relation to the applications of e-Government: This research theme is about the usability of e-Government applications.
- e-Government and personnel / human resources: These articles focus on the experiences of designers of government applications; the acceptance of ICT by public officials; and the efforts made by public administrations to manage ICT.
- Legislative architecture: This area focuses on administrative proceedings or any type of law that enables and encourages the adoption and implementation of e-Government initiatives in public administrations.
- Intergovernmental relations: This research theme includes focus on the political or institutional aspects of interagency relations between government units at the local, state, or national level.
- Digital divide and resistance barriers to e-Government: This item includes articles about obstacles to citizens using e-Government applications.
- Organizational theory and behaviour: These articles are about the effect of e-Government applications on the organisation.

Research Themes / Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Technological innovation and modernization in public administration management	3	3	6	3	3	11	11	9	3	3	8	63
e-Government programme/project evaluation and policy analysis	4	5	11	3	7	10	5	6	11	10	6	80
Citizen participation / Deliberative Democracy	3	4	1	13	8	14	9	9	10	10	11	92
e-Services	3	4	1	13	8	14	9	9	10	10	11	42
Accountability, transparency and dissemination of information	2	9	5	3	6	5	5	7	8	8	2	60
Behaviour of citizens in relation to the applications of e-Government	1	0	1	4	2	6	7	3	5	9	4	42
e-Government and Personnel / Human Resources	0	1	1	0	1	3	1	4	3	6	0	20
Legislative architecture	3	0	3	2	2	4	0	0	1	4	0	19
Intergovernmental Relations	0	1	1	0	0	1	0	4	3	6	2	18
Digital divide and resistance barriers to e-Government	0	1	2	2	4	1	3	2	1	3	3	21
Organizational theory and behaviour	3	1	1	1	2	1	1	4	4	4	3	25
Total	21	30	33	33	39	63	46	54	53	69	42	482

Table 2. Chronological distribution of different themes within e-Government research (Hernández et al., 2010, 2012b)

For the period 2000 to 2010 there were 20 papers published about e-Government design.

Focusing on Information Systems, Bélanger and Carter (2012) examined e-Government articles published in the following journals: Information Systems Journal, European Journal of Information Systems, Journal of Strategic Information Systems, Journal of the Association for Information Systems, Journal of Information Technology, Information Systems Research and Journal of Management Information Systems.

Before 2006 there were only seven e-Government articles published in the above IS journals. However, between 2006 and 2010 there was 23 paper publications in these journals. A summary of the finding are presented in Table 3. For the period 2003 to 2010 there were:

- 15 qualitative studies, 9 quantitative studies, 4 conceptual studies, 1 applied study and 1 mixed methods study
- 6 studies in Singapore, 9 studies in the UK, 6 studies in the US, 1 study in from Austria, 1 study in from Hong Kong, 1 study in from Sri Lanka, 1 study in from

Turkey, 1 study in from a Mediterranean country, 1 study in from India, 1 study in from Ireland and 1 study in from a European country.

- 13 case studies, 10 surveys, 1 survey and case study, 3 content analysis and 1 benchmarking study

Again, there were no African studies.

The objective of this systematic literature review (Dogan et al., 2014) is to assess the how many peer reviewed scholarly articles were published about e-Government in Africa. A review of the material published between 2013 to 22 July 2014, consulting the following databases: EbscoHost, Science Direct, SpringerLink, Proquest and Sabinet, was conducted. A search strategy was developed for each database using a combination of the following terms: e-government, information systems and Africa. Applying the search strategy to each database and eliminating duplications the following results obtained:

- EbscoHost - there are 2 papers,
- Science Direct - there are 7 papers,
- SpringerLink - there are 4 papers,
- Proquest, - there are 18 papers, and
- Sabinet - there are 10 papers

These results indicate that e-Government is not being adequately researched in Africa.

Authors	Year	Journal	Methodology				Sample		
			Approach	Method	Time	Unit of Analysis	Sample	Origin	Government Type
Tan & Pan	2003	*EJIS*	Qualitative	Case study	Cross sectional	Individual	taxpayers, managers, developers (number unknown)	Singapore	National
Beynon-Davies & Williams	2003	*JIT*	Conceptual	n/a	n/a	Government	22 government agencies	UK	Local
Tung & Rieck	2005	*JSIS*	Quantitative	Survey	Cross sectional	Organization	128 firms	Singapore	Generic
Carter & Bélanger	2005	*ISJ*	Quantitative	Survey	Cross sectional	Individual	105 citizens	USA	State/ Province
Irani et al.	2005	*ISJ*	Qualitative	Case study	Cross sectional	Government	2 cases of citizens (number unknown)	UK	Local
Mahrer & Krimmer	2005	*ISJ*	Qualitative	Case study	Cross sectional	Individual	201 members of parliament	Austria	National
Moon & Norris	2005	*ISJ*	Quantitative	Survey	Cross sectional	Individual	1471 administration	USA	Local
Wastell	2006	*JSIS*	Conceptual	Case	n/a	Organization	2 cases	UK	Local
Hong & Tam	2006	*ISR*	Quantitative	Survey	Cross sectional	Individual	808 citizens	Hong Kong	National
Pan et al.	2006	*ISJ*	Qualitative	Case study	Cross sectional	Individual	17 project stakeholders	UK	Local
Gil-Garcia et al.	2007	*EJIS*	Quantitative	Survey	Cross sectional	Individual	478 project managers and users	USA	State/ Province
Grimsley & Meehan	2007	*EJIS*	Qualitative	Case study	Cross sectional	Individual	2 org with developers and users (number unknown)	UK	Local
Hackney et al.	2007	*EJIS*	Quantitative Qualitative	Survey & Case study	Cross sectional	Individual	56 public sector buyers (survey); interviews (number unknown)	UK	Local
Heeks & Stanforth	2007	*EJIS*	Qualitative	Case study	Longitudinal – 5 years	Individual	project stakeholders (number unknown)	Sri Lanka	National
Huang	2007	*EJIS*	Qualitative	Content Analysis	Cross sectional	Websites	3099 websites examined; 1744 portals	USA	Local

Table 3. Summary of e-Government research in IS journals (source Bélanger and Carter (2012))

Table 3. Summary of e-Government research in IS journals (cont.)

Authors	Year	Journal	Methodology				Sample		
			Approach	Method	Time	Unit of Analysis	Sample	Origin	Government Type
Irani et al.	2007	*EJIS*	Qualitative	Content analysis	Cross Sectional	Comments	5 groups ; 115 comments from e-gov practitioners	UK	National
Kahrama et al.	2007	*EJIS*	Conceptual (SWOT analysis)	n/a	n/a	SWOT elements	n/a	Turkey	National
Yao & Murphy	2007	*EJIS*	Quantitative	Survey	Cross sectional	Individual	453 citizens	USA	Generic - remote
Olphert & Damodara	2007	*JAIS*	Conceptual	Content analysis	n/a	Government	20 case studies	n/a	n/a
Azad & Faraj	2008	*JSIS*	Qualitative	Case study	Longitudinal – 2 years	Individual	29 interviews - 16 stakeholders	Mediterranean country	Local
Bélanger & Carter	2008	*JSIS*	Quantitative	Survey	Cross sectional	Individual	214 citizens	USA	State/ Province
Chan & Pan	2008	*JSIS*	Qualitative	Case study	Cross sectional	Individual	2 cases; 24 developers, operations, users	Singapore	National
Gupta et al.	2008	*JSIS*	Quantitative	Survey	Cross sectional	Individual	102 employees	India	National
Irani et al.	2008	*JSIS*	Qualitative	Case study	Cross sectional	Individual	3 cases; users (number unknown)	UK	Local
Phang et al.	2008	*JSIS*	Qualitative	Case study	Cross sectional	Individual	10 stakeholders	Singapore	National
Mosse & Whitley	2009	*ISJ*	Applied	Benchmark	Cross sectional	Website	2 government websites	UK	State/ Province
Sutanto et al.	2008-9	*JMIS*	Qualitative	Case study	Cross sectional	Individual	296 commuters	Singapore	National
Teo et al.	2008-9	*JMIS*	Quantitative	Survey	Cross sectional	Individual	214 students	Singapore	National
Connoly et al.	2010	*EJIS*	Quantitative	Survey	Cross sectional	Individual	6661 citizens	Ireland	National
Cordella & Iannacci	2010	*JSIS*	Qualitative	Case study	Longitudinal – 15 months	System	2 focus groups, 20 practitioners	Europe	National

Focusing on Africa, the number of academic articles published about e-Government is low (Burke, 2012). For the period 2003 to 2010 there were 30 journal articles published and 20 conference proceeding, as displayed in Table 4.

Year	Total	Journal articles	Conference proceedings
2003-2004	2	1	1
2005-2006	9	8	1
2007-2008	19	10	9
2009-2010	20	11	9
Total	50	30	20

Table 4 African e-Government published research papers (Burke, 2012)

The design and development of e-Government applications is not an extensively researched area for either the developed or the developing worlds.

Appendix B: Evaluation of e-Government applications

No.	Location	Type of e-Government Project	Evaluation	Estimated cost of Project	Classification
1.	Eastern Europe	A Web portal and Web-enabled communication platform for local governments in Turkey	* uncertain		automative
2.	South Asia	The creation of Pakistan's National Database and Registration Authority.	* uncertain		automative
3.	South Asia	Web-enabled citizen services.	* uncertain	+- US$3,000	automative
4.	South Asia	Web-enabled portal for information and services relating to the government-citizen interface.	* uncertain	US$100,000	automative
5.	Central Africa	A Web-based mechanism for publishing to, and interacting with, Cameroon citizens and businesses.	* uncertain		automative
6.	South Asia	A participatory information system.	largely successful	US$171,000	informative
7.	Southern Africa	Use of information and communication technologies (ICTs) to manage the electoral process	largely successful		automative
8.	South America	Web-based e-procurement system.	largely successful	US$7m	informative
9.	Central America	Web-based e-procurement system.	largely successful		automative
10.	South Asia	Electronic Birth Registration Information System	largely successful	US$20,000	automative
11.	South Asia	FRIENDS (Fast, Reliable, Instant, Efficient Network for Disbursement of Services) centres offer a one-stop, front-end, IT-enabled payment counter facility to citizens to make all kinds of government payments.	largely successful	US$80,000-worth of capital investment (including software).	automative
12.	Eastern Europe	A pension payment and contribution collecting system,.	largely successful		automative
13.	East Africa	The Fisheries Scientific Information System is part of its home Ministry's overall management information system.	largely unsuccessful		informative

14.	Southern Africa	Community Information Link was a project initiated by Durban Metropolitan Unicity Council.	largely unsuccessful	Hardware and licence costs were US$170,000; software costs under US$5,000; telecom line rental costs were about US$90 per month per library	automative
15.	West Africa	Computerising all of Ministry of Foreign Affairs internal services, creating an intranet, and creating Web-enabled citizen services.	largely unsuccessful	excessive	automative
16.	West Africa	A management information system (MIS) to assist with management of the university sector in Nigeria.	largely unsuccessful	US$1.4million	informative
17.	Caribbean	Decision support system - budget preparation system, Ministry of Finance	partial failure		informative
18.	Caribbean	Management information system - student performance reporting system; state high school	partial failure		informative
19.	Caribbean	Basic data system - planning application tracking system; Planning Department	partial failure		automative
20.	Caribbean	Functional information system - health accounting and budget; Ministry of Health	partial failure		automative
21.	Caribbean	Document management system - file tracking system; Registry, Ministry of Finance	partial failure		automative
22.	Caribbean	Management information system - human resource management; Ministry of Planning	partial failure		informative
23.	Caribbean	Decision support system - debt management system; Ministry of Finance	partial failure		informative
24.	Caribbean	Management information system - expenditure monitoring and control; Ministry of Finance	partial failure		informative
25.	Caribbean	Decision support system - budget preparation system, Ministry of Finance	partial failure		informative
26.	Central America	Functional information system - budgeting and accounting; municipal government	partial failure		automative
27.	East Africa	Decision support system - budget; Ministry of Finance	partial failure		informative
28.	East Africa	Decision support system - child-related data; government parastatal	partial failure		informative
29.	East Africa	Decision support system - IS for managing aid budget; Ministry of Finance	partial failure		informative
30.	East Africa	Project management information system - Ministry of Environment	partial failure		informative
31.	East Asia	Functional information system - human resource management; Ministry of Finance	partial failure		automative
32.	East Asia	Intranet - Law Department	partial failure		automative
33.	Eastern	Intranet - Department of Statistics	partial failure		automative

	Europe				
34.	Eastern Europe	Management information system - aid funds management; Ministry of Trade and Cooperation	partial failure		informative
35.	Eastern Europe	Management information system - computerised property register, Housing Ministry	partial failure		informative
36.	South America	Decision support system - for ministerial council decisions; Office of the President	partial failure		informative
37.	South-East Asia	Management information system - budget, Provincial Department of Health	partial failure		informative
38.	South-East Asia	Management information system - management of schools, Ministry of Education	partial failure		informative
39.	Southern Africa	Functional information system - inventory; Government Computer Centre	partial failure		automative
40.	Southern Africa	Functional information system - human resource management; Department of Public Administration	partial failure		automative
41.	Southern Africa	Management information system - Ministry of Trade and Industry	partial failure		informative
42.	Southern Africa	Management information system - health data; Ministry of Health	partial failure		informative
43.	Southern Africa	Decision support system - project budget and planning; Ministry of Planning	partial failure		informative
44.	Southern Africa	Management information system - monitoring departmental performance; Government Performance Unit	partial failure		informative
45.	West Africa	Database management system - drug information; health parastatal	partial failure		automative
46.	South Asia	A combination of MIS and delivery of services to citizens, via the Internet.	partial success	US$600,000	automative
47.	South America	Social investment funds (SIF) are new institutions that conceive, finance and manage large numbers of small-scale community projects.	partial success	US$75,000	automative
48.	Central	The Cameroon Department of Tax's Web-based mechanism for publishing to, and	partial success		automative

	Africa	interacting with, Cameroon citizens and businesses.			
49.	Central Africa	An automated transaction processing system that links together key activities in the operations of the port.	partial success	US$1.5m	automative
50.	South Asia	Citizen Facilitation Centre is a one-stop service centre for citizens who have to visit government offices for various official documents.	partial success	US$41,000	automative
51.	Caribbean	Operational support system - automated radio play and billing system; state radio station	success		automative
52.	Caribbean	Basic data system - handling customs data; Customs department	success		automative
53.	Caribbean	Basic data system - planning application tracking system, Planning Department	success		automative
54.	Central America	Management information system - community investment project management system, Central Fund Organisation	success		informative
55.	Central Asia	Functional information system - health data; Department of Epidemiology	success		automative
56.	East Africa	Management information system - debt management; Ministry of Finance	success		informative
57.	Eastern Europe	Basic data system - refugee camp data; government committee	success		automative
58.	Southern Africa	A decision support system, with a simple geographic information system interface.	total failure	US$60,000	automative
59.	South Asia	The National Data Bank project was planned to provide a broad range of data and information support to many levels of stakeholders both inside and outside Bangladesh.	total failure	US$440,000	automative
60.	Southern Africa	To provide public service employees with an affordable computer bundle.	total failure		automative
61.	Caribbean	Basic data system - online national register; Registrars Department	total failure		automative
62.	East Africa	Decision support system - natural resource strategic planning; Ministry of Natural Resources	total failure		informative
63.	East Asia	Decision support system - regulatory control; Office of Regulation	total failure		informative
64.	East Asia	Decision support system - city twinning projects; municipal government	total failure		informative
65.	Southern	Management information system - budget; Ministry of Finance	total failure		informative

	Africa				
66.	Southern Africa	Management information system - land licensing system, City Council	total failure		informative
67.	East Africa	A citizen service to take photographs of all citizens of voting age using digital cameras.	total failure	US$22m	automative
68.	West Africa	A computerised transaction processing and management information system for the Social Security and National Insurance Trust.	* uncertain		automative

Table 1. Summary of e-Government Applications

Appendix C: Letter of Consent

Delphi Study

Challenges to e-Government Applications

Letter of Consent

I, ..., voluntarily agree to take part in the research project being conducted by Shawren Singh. I have read the Research Participants' Information Document and I understand the contents thereof. Any questions which I have asked have been answered to my satisfaction.

I understand that the information which I will supply is confidential and that it will be anonymised and will only be used in the finding of this research. No direct reference will be made to my views.

I understand that I do not have to answer all the questions put to me during this study. The information which I provide will be held securely until the research has been completed (published) after which it will be destroyed.

The information which you provide will not be used for any other purpose other than academic research.

I understand that I will be sent an e-copy of the research at the end of the project, upon my request.

I have been informed that I may withdraw from this study at any time and that any information which I have supplied will not be used and any records held relating to my contribution will be destroyed.

Yours sincerely

Dated

Appendix D: Research Participants' Information Document

Delphi Study

Challenges to e-Government Applications

Research Participants' Information Document

	Issue	Detail
1.	Name of Researchers Contact Details	Shawren Singh singhs@unisa.ac.za
2.	Title of Research Project	A Delphi Study exploring issues which may affect e-Government projects.
3.	Purpose of the Study	To acquire a fuller understanding of the environment/context in which e-Government applications are designed and developed in.
4.	Description of the Study	The research will take the form of a 3 round Delphi Study in which a set of questions will be presented 3 times.
5.	Duration of the Study	4 to 6 weeks
6.	What is involved and how long will it take?	Contributors will be asked to complete a short questionnaire. The times required to complete the questionnaire will be approximately 15 minutes.
7.	Why you have been asked to participate?	You have been asked to partake in this study due to your knowledge and experience of the subject being studied.
8.	What will happen to the information which will be given for the study?	The information will be held in a confidential manner while the work is being collated. Following the successful completion of the research the completed questionnaires will be deleted. Anonymity will be assured at all times.
9.	What will be done with the Results of the Study?	The results of the questionnaires will be reported as findings in a summary manner with no reference to the names of the participants in the study. This will be done in a completely anonymous manner.
10.	What are the possible disadvantages ?	There are no costs associated with your involvement with this study. No negative consequences are envisaged for any contributors in this research or anyone else for that matter.
11.	In what way will the study be beneficial and to whom?	The study will provide useful insights into how e-Government applications are designed and developed.
12.	Can permission be withdrawn having previously being granted?	Yes, all contributors shall retain the right to have their contributions to the research withdrawn at any time prior to the completion of the research report.
13.	Can you refuse to answer any question?	Yes. The contributor has the right to refuse to answer any question on the questionnaire.
14.	Will I received a copy of the results of this study?	Yes. If you request a copy, an electronic copy of the final results of this study will be e-mailed to you when the work has been completed.

Appendix E: Letter of Consent for the Interview

I, _____,agree voluntarily to take part in the research project being conducted by Shawren Singh as part of the requirements for his Doctorate Degree at Wits Business School. I have read the Participant Information Sheet and I understand the contents thereof. Any questions which I have asked have been answered to my satisfaction.

I understand that the information which I will supply is confidential and that it will be anonymised and will only be used in the findings of the research.

I understand that I do not have to answer all the questions which may be put to me. The information. The information which I provide will be held securely until the research has been completed after which it will be destroyed.

The information which I provide will not be used for any other purpose.

I understand that I am entitled to ask for a de-briefing session or a copy of the research at the end of the project.

I have been informed that I may withdraw from this study at any time and that any information which I have supplied will be used for be used for this research and any records relating to my contribution will be destroyed.

Signed.....

Date.....

Appendix F: Interview - Participants Information Sheet

	Issue	Response
1.	Name of Researcher Contract details	Shawren Singh e-mail: singhs@unisa.ac.za Tel: 011 4712721
2.	Title of Research Project	Towards Understanding the processes of e-Government Application Development
3.	Purpose of the Study	The purpose of this research is to understand how e-Government applications are developed.
4.	Description of the Study	Academic research for a degree which requires primary data from individuals involved in e-Government.
5.	Duration of the Study	36 months
6.	What will be your involvement and how long will it take	Contributors will be interviewed. The time required is estimated to be approximately 60 minutes.
7.	Why you have been asked to participate?	You have been asked to partake in this study due to your experience with e-Government applications.
8.	What will happen to the information which will be given for the study?	The information will be held in a confidential manner (secured cupboard) while the interviews transcripts are being processed. Following the successful completion of the research the interviews transcripts will be shredded.
9.	What will be done with the Results of the study?	The results of the interviews will be reported in the findings section of the research. This will be done in a completely anonymous manner.
10.	What are the possible disadvantages?	There are no costs to you associated with your involvement with this study. It is not envisaged that any negative consequences will accrue to you from your contributions in this research.
11.	In what way will the study be beneficial and	It is hoped that this study will provide a

	to whom?	useful framework to understand e-Government application development.
12.	Who has reviewed this study to ensure that it complies with all the requirements and ethical standards of the university?	The Ethics Committee of the University of the Witwatersrand has approved this research proposal and granted permission for the research to commence.
13.	Can permission be withdrawn having previously been granted?	Yes, all contributors shall retain the right to have their contributions to the research withdrawn at any time.
14.	Can you refuse to answer any question?	Yes. The contributor has the right to refuse to answer any question during the interview.

Appendix G: Ethics Clearance

University of the Witwatersrand

Singh, Shawren

Subject: FW: Status of ethics application

From: Sushiela Naidoo [mailto:Sushiela.Naidoo@wits.ac.za]
Sent: 16 April 2012 12:15
To: Singh, Shawren
Subject: RE: Status of ethics application

Hi Shawren

Here we go...

Your ethics number is **H12/03/08**.

Warm Regards
Sushi

1

UNISA college of science, engineering and technology

Mr. S Singh
School of Computing
UNISA
Florida

2012-05-04

Permission to conduct research project

028/SS/2012

The request for ethical approval for your PhD research project entitled "Towards Understanding the processes of e-Government Application Development" refers.

Given the fact that you are a registered student with the University of the Witwatersrand (Wits) and that you have successfully applied for ethical clearance through the appropriate channels at Wits, the College of Science, Engineering and Technology's (CSET) Research and Ethics Committee (CREC) has no objection to the envisaged research that you wish to conduct on the condition that you fulfil your ethical obligations under the clearance granted to you by Wits.

We trust that the research will be undertaken in a manner that is respectful of the rights and integrity of those who volunteer to participate, and that your behaviour as an ethical researcher in the employment of UNISA will be in aligned with the stipulations of the UNISA Research Ethics policy. The policy can be found at the following URL:
http://cm.unisa.ac.za/contents/departments/res_policies/docs/ResearchEthicsPolicy_apprvCounc_21Sept07.pdf

Yours sincerely

Chair: School of Computing Ethics Sub-Committee

University of South Africa
College of Science, Engineering and Technology
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone + 27 12 429 6122 Facsimile + 27 12 429 6848
www.unisa.ac.za/cset

Appendix H: Interview Schedule

Interview schedule for e-Government respondents

Research question

How can the development processes of South African e-Government applications be improved to deliver required benefits**?**

Sub questions:

- How can system obstacles affect the success of -Government applications?
- How do the relationships between key actors affect the success of e-Government applications?
- How do drivers of change affect the success of e-Government applications?

Target informants

This interview schedule will be used to interview persons involved in the commission, design and development of e-Government applications.

Duration

It is expected that the required evidence will be collected within 60 minutes.

Descriptive questions

a) Name of department/sub-division:_____

b) Name of respondent: _____

c) Title: _____

Questions

3. What was the last ICT project with which you were involved either as a developer or as a user?

Systems Obstacles to Success

4. Can you please explain the decision making process, if any, that was used in the commissioning of that ICT system.
    a. If the decision making process was atypical, then can you describe the usual decision making processes involved.
    b. If the decision making process was not atypical (unusual), then can you describe the decision making processes for that system?
5. Can you please describe the management approach that is used in the design and development of that ICT systems?
    a. Please describe the management approach.
    b. If there is no management approach, who would take charge and ownership? How does this happen?

Relationship Between Key Actors

6. Can you tell in which ICT project development more than 1 department was involved?
    a. Describe the working relationship with that department(s).
7. Can you describe how departments are encouraged to participate in the development of ICT systems?

a. If departments are not encouraged, do you think it would be a good thing if they were encouraged to participate in the development of ICT systems?

b. What types of encouragement would you propose?

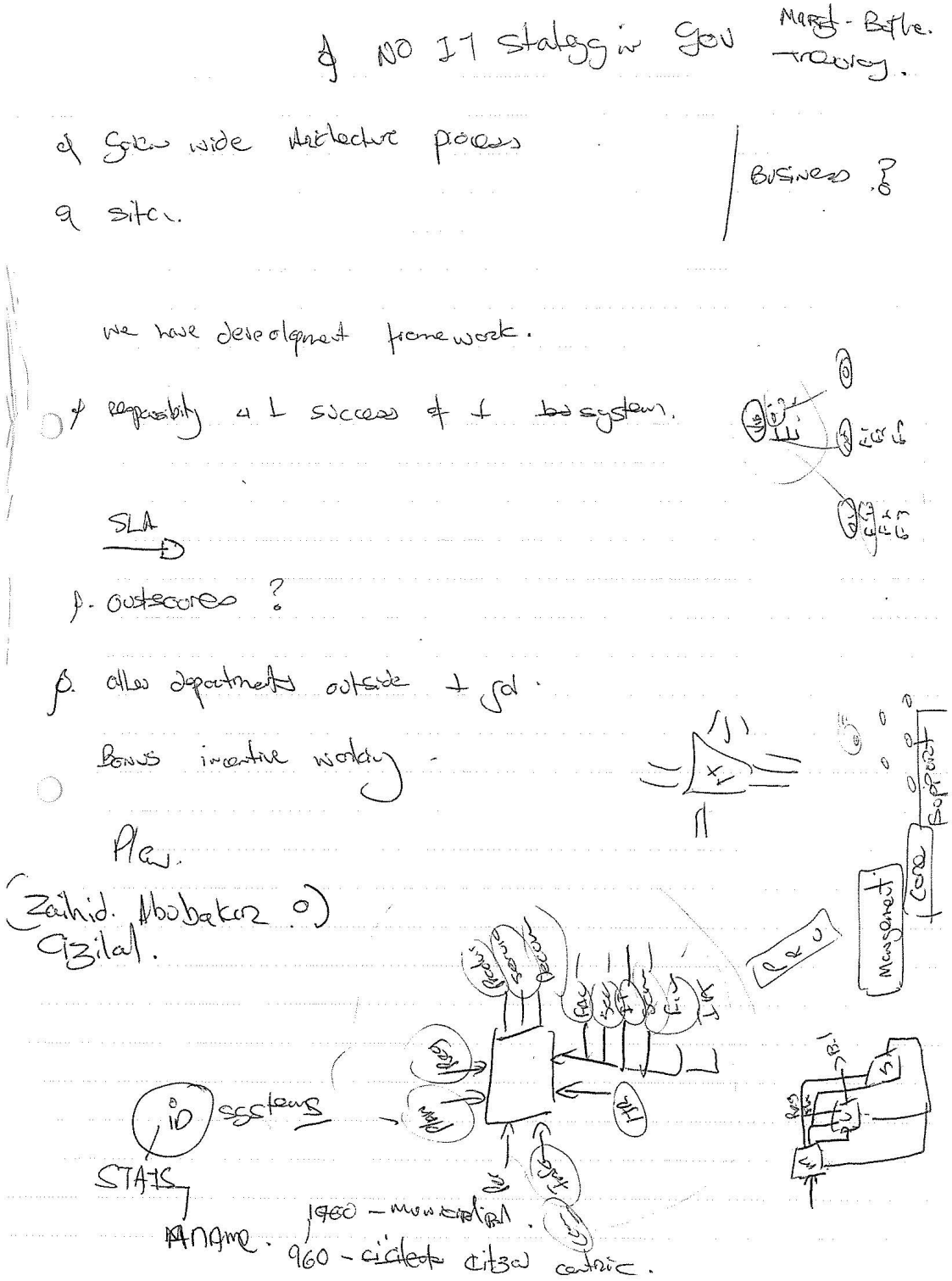
Drivers of Change

8. Can you describe how senior managers give support to proposed ICT systems?
    a. Describe the type of support that senior managers give?
    b. If they do not give support, how does this affect (the success of) the ICT systems?
9. Have you encountered colleagues who have not been enthusiastic about ICT initiatives (systems)?
    a. In what ways did they demonstrate their lack of enthusiasm?
    b. In what ways is resistance to change an issue in your department?
    c. How do enthusiastic colleagues demonstrate their willingness to participate in the design and development of ICT systems?

General

10. Are there any other issues which I have not raised but which may be important in understanding how ICT systems are commissioned, developed and assessed?

Appendix I: Interview Notes



Appendix J: Digital picture of documents

Annexure A: Accelerated Development Programme Nomination Form

Each participant should identify and state a unique departmental challenge within his/her department that requires distinct strategic solutions. Once approved, this particular challenge will form the central theme around which the individual will develop all portfolios of evidence supportive of the Executive Development Programme modules.

Synopsis of the unique, strategic departmental challenge:

The National Disaster management Centre (NDMC) is an information rich goverment centre. The strategic challenge emanates from information being fragmented, diverse and often contained in a very specialised form, held separately by the many individuals, business units and even various other external goverment departments and organizations, all of which contribute towards the NDMC meeting its mandate. The foremost challenge is to create an enabling environment with the necessary tools that enables the centre to tap into this dispersed information and process the output that individuals and organizations can use to achieve their ends mutually. By addressing this challenge, the NDMC would then have the opportunity and potential to better facilitate centralized planning and decision making to ensure more effective utilization of resources.

PLEASE CHECK THAT THE FOLLOWING DOCUMENTATION IS ATTACHED:

- Completed nomination form with all the required signatures ☑
- Certified copy of highest qualification ☑
- Certified copy of identity document ☑
- Copy of certificate for AMDP / Middle Management Programme ☐


directorate for client training services and a central
cing unit. Sixteen major national and 24 minor communication
rategy campaigns were managed last year.
formation on the GCIS Website
BuaNews ONLINE
www.buanews.gov.za
News, the gateway to quick and fresh government news and information
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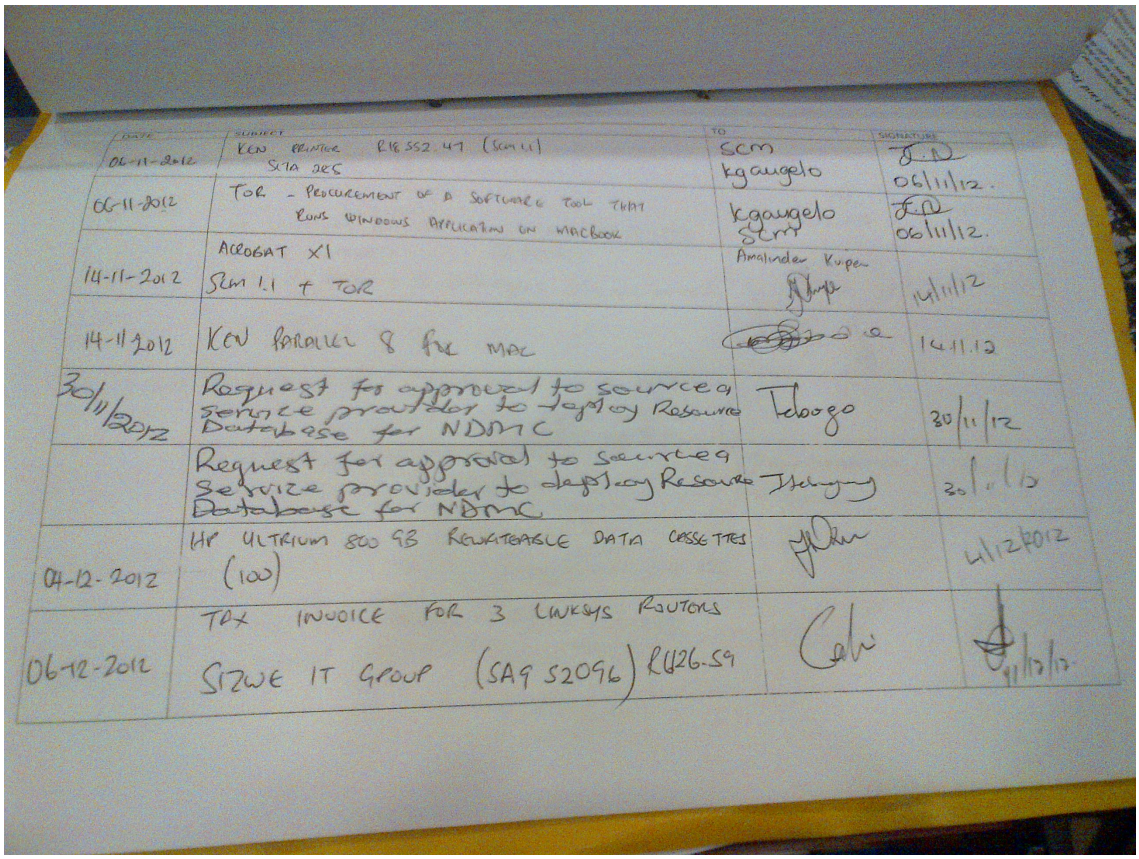
stories | Other Features | International News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SCM 1.1 + TOR
Amalinda Kuper
14/11/12
14-11-2012
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30/11/2012
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30/11/12
Request for approval to source a Service provider to deploy Resource Database for NDMC
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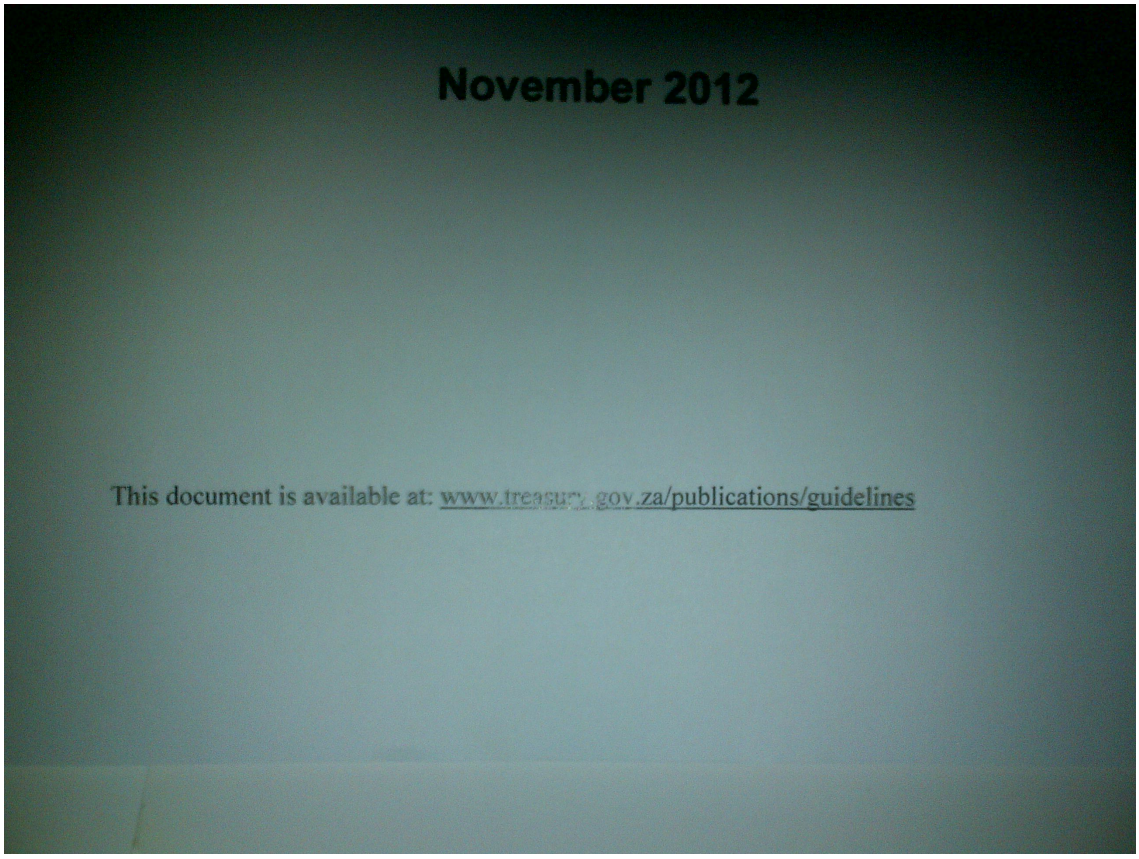

November 2012
This document is available at: www.treasury.gov.za/publications/guidelines

Appendix K: Interview Transcript

Interviewer: Interview with Interviewee from the Treasury Department.

Could you please tell me, what was the last ICT project in which you were involved in, either as a developer or as a user?

Interviewee: I'm the manager of the development within our environments, so there are various projects.

Interviewer: In the context of the project, can you please explain to me the decision making processes, if any that are used in the commissioning of ICT systems?

Interviewee: Well, I think one of the big issues for us within government is obviously trying to understand the business requirement, identifying that through a form of process. So identifying our business process models, just start off with me, backing business requirements, backing to those models and understanding what the technology requirement is.

Obviously, there is a procedure to be followed. You couldn't architecture process, we define the formal requirements through enterprise architecture, correct, which is based on the government wide enterprise architecture and framework as well as the GWEA, our TOGAF, which is the adopted one that we've got. GWEA as you know is just a water-down version of TOGAF. Yeah, so we got through the process of identifying the business processes, identifying the impact of that through an information data, location and resource perspective.

Take that down to a logical design, where we basically look at what the logical requirement is and what information needs to be transposed into data, what processes needs to transposed into functions, what resources needs to be transposed into system typically, and then what location it's really linking to is where the technologies that we have within organization system. And based on that we develop a logical design, which is typically reactive as a function specification. Then we go down and take it to the technical level where we get involved with the developers and system architects, and they basically run both a technical specification, [2:00] based on that maybe draw out the technical design and they then we start building it.

Interviewer: Now, the government run architecture process, would you like to expand on that.

Interviewee: Yeah. I don't think the Department of Public Service and Administration as in conjunction with SITA, which is our technology service provider developed an architecture framework that was based on the TOGAF. At this stage, the first declaration was on TOGAF, I think we've successfully upgraded it to TOGAF plan framework. But it's basically a framework to develop information system planned for a department, which we have to comply to. There is DPSA Regulation that stipulates that a department must provide strategic information systems plan and operational plan and the technology roadmap to the department to actually do enterprise planning for government.

So service provide which is SITA can accommodate the backend structure. So the concept of this whole process engagement to relevant departments especially the key department, which is sets the things, just this obviously, the DPSA themselves and then their partner which is SITA. And then there was a couple of other non-core departments, like treasury, like industry and presidency and so forth that also project into developing this architecture framework.

Interviewer: Is this architecture framework working for you?

Interviewee: I think it's still very -- for us it works. But we haven't adopted GWEA. We have adopted TOGAF, which is the all encompassed architecture program. GWEA is just a water-down version to accommodate the compliance with the regulations that is out there.[4:00] So the outcomes are in the process of reviewing it and hopefully to expand it

certainly to its older architecture elements, so that we can actually get better decision making. But I must say, I mean, there is a couple things in regulations, so it's not just GWEA -- I mean there is e-governance policy that has been implemented in 2001, but that hasn't actually being implemented in IT sectors.

Then there is MISS, which is the Minimum Information Security Standards which we have to comply to. There is MIOS, the Minimum Interoperability Standards. There is the # [00:04:32]. So there is various parameters and policies that's out there that we have to comply to. But I think within government I think the biggest issue that we have is that we don't -- well, we haven't formalized first of all architecture. And second, we have not formalized our old line, our architectures through our strategic objectives within the organizations. So I think that's where the gap currently sits within government. Government does not see IT as enabler necessarily they see them as a service provider to provide specific services based on as on # [00:05:04].

Interviewer: Now, with all of different standards, how do you manage your projects keeping in mind that there is so many different standards that you need to comply to?

Interviewee: No, look, I think what we've done from architecture perspective is obviously defined a set of organization standards for us. So we stick within the technology standards that we've defined. We stick within the application development standards that we've defined. We've developed our own development framework to implement that and we will stick within those parameters. So whenever we develop any systems, it aligned straight to principals and architecture principals, which includes obviously as I said, business principals, data principals and indication principals and technology principals.

So we stick within that and we meet standards. So that's whenever we make a decision we try and stick [6:00]within the suites that we support to reduce cost first of all, to ensure interoperability, to ensure that we got platform independency, so we can ensure that we reduce duplication, so all of those fall within the e-governance framework we're trying to accommodate as best as possible.

Interviewer: So for me to understand what you've said, I'll summarize that. You'll have your own internal department process that you'll follow, and that fits in to the rest of the standards that government has.

Interviewee: Yes. We're just using -- the SITA -- the government doesn't have standards on that level, I think. What they do those is that -- if you take the pillars it has to be interoperable, meaning that any platform should be able to talk to any other platform, and that it should be the non-specific, it should be obviously secured by someone that's in the MIOS and it should obviously try and able the organization MIOS business outputs. I know just there are things for the sake of drafting because I think there is contingency, which we do in government, somebody has got a requirement, we build the requirements, but it has to met in someway.

So it's a process which we go through where we're trying to understand business more effectively. And I think maybe if I can just take you out a bit from an architecture perspective, let's just go to the beginning I think one of the biggest concerns of that within government is all -- is that the strategic planning processes, which we relate to later on to an operational planning process, which utilizing into a resource and financial and deliverable plans.

So when you have a strategic plan for an organization it needs to be linked to the # [00:07:55] outcomes. [8:00]And we think that that is visible on that label and than we put down that strategic plan into the lower strategic plans, I don't think there is alignment always as well. So I think that's where the gap is.

And because there is a gap and misunderstanding of what the requirements are or miscommunication of the requirements, and systems more or less always developed or mostly

developed on an adequate basis. They come in unplanned and then you have to plan the request, engineer the whole development of that cycle.

Interviewer: How do you manage this whole process development?

Interviewee: We've got a, what we call a # [00:08:34]. We've got an approach where a request to assistance comes in to our department, on a weekly basis we basically sit down and actually we let all the requests that comes in and I'm not talking about operational stuff like changing parts, and creating accounts and stuff like that. We're really talking about whether there is an infrastructure requirement or whether it is the system requirement or if it's an office requirement. So there is the infrequent process. We basically take it through this management forum. We then evaluate it based on available resources, funds, cost, time and all those type of things. And then once we've obviously developed all those -- before we evaluated all those things, we allocated it to somebody.

So if it's a small change, we will allocate typically to the development people. If it is a big interchange, obviously, it has to go through the architecture first, where we physically go and identify all these detailed requirements from business strategy technology, and based on that we come up with the proposed solution and then see really whether we can implement it. So that's how we do it. We do have a detailed strategic information system plan that has developed for three year period forward which includes the technology development as well.

And then obviously based on that we actually develop an annual performance plan, which is the -- you want to call it in normal words, an operational plan. So what are we going to do for the next year? [10:00]And then all these request that comes in obviously gets evaluated, begins what we said we're going to do and how does that fit into that picture and whether we do have available capacity of people. And then if so, then we head it to the annual performance plans from a reporting, so they can control it.

Interviewer: You mentioned the word business units. Would you like to expand on what you mean by that?

Interviewee: Business units are basically all divisions within an organization. So if you take National Treasury, so we've got 12 business divisions. And in each one them has got a strategic objective, obviously, aligned to the treasuries objectives. And then in each one of them there is various business units. Business unit is typically a subset of the business division. So it's just a structural breakdown of it. And so if you take corporate services bond and corporate services in business division and within corporate services the business units that you typically get, your ITs, your, security facility, internal and those types of things. So it's just the way that we're talking, yeah.

Interviewer: So how do these business units measure the success of their IT projects? What metrics do they use if any?

Interviewee: I think they may measure it basically on the discussion of the end of the day. It's whether they have a clear understanding of what they were suppose to do and then measure against whether they got what they wanted. And as I said one of our biggest stumbling boxes because there is no certain enterprise -- we've got an enterprise approach, but it's in the infant stage. So we've developed framework, we're trying to develop a first round of business last year which basically only covered the corporate environment, corporate services environment. So we did not go to the full length of the organization and we're currently trying to do that.

Interviewer: I'd like to take you a little back. You mentioned SITA, what are the working relationship do you have with SITA?

Interviewee: That's a good question. [12:00]Look, SITA is our research provider, # by government, DPSA budgetary regulates them from a technical and process perspective and National Treasury regulates them from a financial perspective. But they are supposed to

doing certain things and I think that you know what they're supposed to do and listen what they supposed to do. So it makes really sense.

I think the objective of SITA was to actually get into the interoperability and enterprises between various departments so they can communicate complete effectively, nut then sometimes more creative time to provide the service rather than proving the infrastructure that they were supposed to. They were also supposed to actually fit some standards made for technology within government. And I don't think that they basically do effectively because if you look at the procurement process in the way that value for money is generated out of the transverse of contracts.

And I don't think that's also frequently managed because I think -- take desktop volumes, like we can buy desktops outside and if also possible we can get it from a SITA contract. So I think there is a clear model issue. And I don't think this is from a product perspective I think it's more trying to accommodate the requirement because then it's obviously has to do get cover for three to six months period. So like then # [00:13:24] and obviously everything comes from overseas, so the end dollar most probably grows. So they could get covers on top of that, it exposes this thing to inflate quite a bit. So I'm working at logistic for SITA, we've got a business agreement with him, we've got service agreement with him, we've got quarterly meetings with them to discuss our concerns and things and we get along within the parameters that we have to.

Interviewer: So when it comes to the SMEs, how do you implement the SMEs with SITA?

Interviewee: Okay, obviously that goes to -- it's normally driven from the business agreement, business agreement. [14:00] with SITA is basically only putting the framework compliances in what we're going to engage with. And then we get down to the service agreement, that's basically something that is actually on the detail services that we get from them. And that obviously changes from year to year and is reviewed on the yearly basis as well.

How we control it? We basically have review meetings on a quarterly basis and we obviously go to account manager and facility managers as well. So in case if anything that goes wrong in anyway during the process between the three months there is an escalation process for it. Yeah, it's basically running almost as a sale agreement. Its engagement, negotiation and honestly I think one of our concerns there is that the penalty closes from this is quite an issue because we can't put penalty closes in. So if we don't have servicing, it actually -- there is no way for us to rectify that in the time of duration.

Interviewer: Can you please describe the management process that is used in designing development of ICT systems in the department? How is it managed?

Interviewee: Well as I said, we've got a SDRC that we've developed which talks about the three layers which is obviously your architecture phase first, then you design phase and then obviously your development phase and then good implementation authorization phase. Okay. So yeah, we go through the process of funding the architecture, defining the basic requirement and do the high level step of work. We then give an architecture contract through the analyst and they basically drew out the functional and technical specification which is follow the design and then based on initial system and the end cost, obviously it gets allocated to a team. [16:00]

And then it obviously gets developed by both implement and integral solution, operationalize it through training and then interpretation, so. And then obviously it goes into the maintenance phase where we physically maintain the system as follow the service that we provide in the organization. So service driven management or actually operational driven management is one of the key things that we really do. We see service driven of management from outside and operationally driven management to the people that we provide services into.

Interviewer: So you don't have an internal IT department that does all of this?

Interviewee: Yeah, looking # [00:16:36] we've got a slight different approach to this. There is currently actually five IT components within the organization that's due to legacy structuring if you want to call it that. And so there is certain division that's got the capability of developing on their side and then obviously is an overarching support, which is us, the IT business unit. We're the only IT business unit, the rest of is just sub units of divisions. But what we've done and we've actually in the implementation process of it, we've try to consolidate all of those specifically from a governments perspective.

So what we've done is we've released the new government wide -- government's framework that has been drawn up and has been submitted, if I'm not mistaken. But it's based on TOGAF, # [01:17:33], so those are the two different frameworks that we use. And then based on those frameworks, we developed a governance framework, the business framework first of all then with the governance framework in it. And obviously based on that, then obviously follow certain procedures to support it.

We've also gone to the DGN to ask for permission to the delegation of authority specific here on governance to a specific forum. [18:00]So we've developed an ICT cycle which is headed by the head of this division, but consist of all the other IT subs within Treasury. So for us to control IT and set standards for IT in the organization, that was the easiest way of doing. So yeah, the stake has been established, the government's framework has been developed, the policy procedures are currently being developed and then obviously the compliance will be checked against those.

Interviewer: Okay. And can you tell me in which ICT project there was more than one department involved in its development?

Interviewee: I can tell you, we've got a division called Asset Liability Management forum and typically they've got interfaces into other systems. They've got obviously infrastructure requirements, so we typically supported them from an infrastructure design perspective. They developed an insight of the application. The household project managed the development of it in-house and outsourced the developments just to company outside.

And then obviously the interfaces may was written in conjunction with these various service providers that required -- are depended on. So it's a typical one, obviously couple actually, a lot of them actually happens like that. I mean, we don't do the development, we are responsible for infrastructure. So we are the core infrastructure that supports divisions, so that's where we get on top. And then obviously the maintenance and the research and those of type of things we do for that. So, yeah.

Interviewer: So what is the working relationship with these departments?

Interviewee: I know, we've got a very -- with department we've got a good working relationship. I mean, we engage on the constant basis, seek the stakeholders which consist of all these people. We settle these once a month and discuss viable government issues. We sit at least once a week with policy and procedures developments [20:00]and then we have open book policy with regards to queries and concerns. So yes, I think we've got a pretty good working relationship. I don't think we've got any resistance, that's the question.

Interviewer: Okay. What about the department outside this -- outside treasury?

Interviewee: Yeah, I must tell you I think one of our -- # [00:20:22]one call it a team effort, but we not suggest the same thing. We are internal government centric organization, meaning that we provide services to the recent government and obviously to a citizen outside. And this is an eccentric application that we do have is one that we know about, the # [00:20:40] and that is something that has been developed by analyst where we actually sell bonds outside to the public for investment. The rest of the systems have been actually developed as a research programming. So actually it's a systems where local municipalities and provincial

departments have to comply with reporting and feedback by some financial and it's been in just within their departments.

Interviewer: So what type of working relationships do those municipalities have with the Treasury?

Interviewee: Well, I think with Treasury they've got a good one, with ITs I don't think we have got that good one because we don't engage with them. I mean our client is obviously, business. So at this stage what we do is we actually accumulate the business requirements. So if there is a policy or a legislation that is made for compliance, and then I'll use a simple thing and if things are allocated over million it has to be reported to Treasury, so will typically go in to find the parameters and rules around those types of things and then we will put the system in place with these people to comply for that. So that's the way we interface.

I think from a municipal perspective, they deal with a huge amount of divisions within treasury. So CFO for argument sake might not just speak to public filings, they also speak to the budget officer, they will also speak to asset liability management, they will speak to communications, they will speak to the specialist functions divisions within that. [22:00]So there is various interfaces from the departments based on the type of financial consults to develop.

Interviewer: So is there some kind of an ICT system that helps people in municipalities to manage this communication with treasury.

Interviewee: Look, at the moment all of the systems that we've developed outside, they just run in isolation. So there is implication, there is separate interface for each one of those. And I think one of the key objectives of what we have is trying to stop integrating that. So typically what we've done, and I mean even within divisions there is, different interfaces. So what we typically could have is that either a division might sit with, for example, with training monitoring. So they need to monitor where the people are trained enough and skilled enough to do their work. That's the one side of thing.

And other the component of that division might actually do evaluations assessments on the governance maturity on an organizations, do they do strategic planning, operational planning, resource planning and so forth. And they will measure that risk analysis, those type of things. And then with their division they might engage within all financial aspects. So all of that just within one division and there is three interfaces So what we're trying to do is now compartment those divisions and try putting single interfaces in place, so we can actually start getting people to have the single same environment where they physically go in and all the stuff that they need to do with Treasury, sits in once place, so that's a strategy obviously that goes forward and sits within that three to five years.

Interviewer: Okay. And have you engaged with municipalities and not just typical initiative.

Interviewee: Well, we specifically from IT perspective, our # [00:23:43] government has started to doing that. All the divisions have started to build. So I'm just trying to understand what is all the interfaces need that is required and actually trying to standardised in that, but as part of their architecture obviously that's something that will pickup as we get along.

Interviewer: Okay. Can you describe [24:00] how departments are encouraged to participate in ICT projects?

Interviewee: How departments are encouraged?

Interviewer: Yes, within your different business units.

Interviewee: I mean, -- yeah.

Interviewer: Lets us look at different business units, first.

Interviewee: Yeah. Look as I think the need for IT is always have been there and I think that is something we haven't talked about long time. I think the objective from the engagement with the IT upfront when they do strategic planning operation that is what selecting at the moment. So what we've done is obviously we've started creating our business forum that process the all of the division within the organization and that business forum basically talks on what IT is doing but also gives business opportunity of planning of what they do. So we could start engaging in research, at least follow the community practice and the knowledge gathering session. And that basically just gives us an idea of where the business is going. So that's one mechanism that we use.

The other mechanism is placing each drive currently in trying to create a knowledge management framework or a information sharing strategy within the organization, so there is lot of communication around within the organization that are trying to show people how they can use technology to effectively communicate, to effectively store information, to make sure that intellectual property within the organization is captured and secured. And so those type of initiates that we have within the organization. But then obviously the key one for us is actually getting all those architectures solved as a business solution and an IT solution.

Because if you take enterprise architecture, you take actual elements within the architecture space, you can actually extract research requirements, you can extract facility requirement, you can extract process requirements, so it's much bigger than just IT and I think that's what we're trying to sell at the moment. [26:00]So those are the things that we are focusing on, trying to get business to understand. But we better understand what they do it's difficult for people to build systems and # [00:26:11].

Interviewer: So is business buying into the interface architecture?

Interviewee: Yes, I think, definitely specifically around system's that is bigger than just a small division. And so if I understand what the process is and how they do it and then we have to take it and then translate it to a system perspective, they start seeing gaps. And I think that's where they are starting to understand. So with all the analysis, the business analyses phase, within the architecture space, is in the IT business.

And I think formalizing business process is because you can say that the IT department does lead management the same, I don't think it's a reality, they don't. So if you start blocking it down and you put it on paper and you show it to them and then they can see where the gaps then things are starting to get change for them as well, so you don't build systems based on the first engagement, we build systems only once we have an understanding of the process. And they've agreed if that's the process that they've actually implemented and that they want to automate it. And then it enables it, yes, but not withholding, because otherwise the stability starts changes and so forth.

Interviewer: I'd like to know how do other departments like municipalities engaged with your -- when it comes to participating in ICT projects?

Interviewee: They -- they don't. Basically what they do -- that all they do, I think business normally -- and also they've got a requirement that has been plotted out through the process that they developed. And obviously then they engage within to say, how and when and what they need them to fill in and then we normally have these type of technical review sessions where business goes up and also if there is any functional issue, so it's more of a survey type of scenario or a feedback of the system functionality. [28:00] But from a design perspective and from a requirements perspective, there is not a huge amount.

Interviewer: So I'll summarize what you say, so if I can just, the system is build and then you taught to use it. All that happens is they survey on the --

Interviewee: On the experience.

Interviewer: Yeah.

Interviewee: On the experience of it. Most of the systems that we actually developed that is based on legislation. So what we're saying is we're putting our compliance mechanism, which is a system.

Interviewer: Yes.

Interviewee: Okay. And make it easy for people to comply by actually completing the information all through the system. And that's basically the mechanism. So I think we have to look it from a government perspective and not from a departmental perspective, at least from our approach but for the lack for # [00:28:50] into process approach within government, you will never get away from those types of things.

I think one of the other biggest issues that we have is the fact that government is segmenting in the city. And the first it's easy to control, I mean, national and provincial, national governance provincial and that's the way it is. So national can be prescriptive to provincial and then provincial have to comply. And when you get to municipal levels and then it becomes slightly different, because on a municipal level.

There is legislation that has to be implemented and enforced and all of national and provincial can do is ask for proof, because they have implemented what they've said there is. So it's just a simple thing, if you take financial systems in the organization, on local municipal level, they've had special or those type of things. They use systems. And that I think provincial governments, they could all set implementation and they run in potential services on their own backend infrastructure.

[30:00] What treasury do require from them was obviously the financial reporting made by some specific standards and if they do an instructional stuff and they give it to us then we comply to. So that's where the issue is. I mean on a muni perspective, it's difficult. Provincial national is easy. I think there is a good synergy and good engagement, but local is a problem because, first of all very, very weak. Secondly, very, very stubborn, and it was everything they want to way do things. So I think that's where we still have slight issue within government in general.

So it is difficult to engage within one on technology because a lot of the municipalities don't have technology. You go to Western Cape and then you speak to some of those people, you don't know look at the intervention side of things, but the only thing they # [00:30:49] is of falls so there is all those type of things. So they store information on local machines, they use open platforms for mouth liberation and Google and those type of things, G-mails and those kind of things. So that's where it becomes issue, the integration and interface is not there because they do what they want to do. So that's something is our biggest concern.

Interviewer: So how are you're all encouraging those types of departments to participate in your ICT projects?

Interviewee: How are we just --

Interviewer: How are you 'll encouraging them to participate in the ICT projects that you'll implement?

Interviewee: Look I think within government there is a big drive, for obviously with regards to IT spend in general. If any project is allocated -- any IT project is allocated within their budgets that they have to actually to obviously prove that what they're doing with that money, because it's easy to do things under the umbrella of technology. So I think from a compliance perspective, from a reporting perspective, and from a monitoring perspective, [32:00] various divisions within our department actually engage on a constant basis every time, how they're are doing it, why they're doing it giving proof that they've done it.

But we have financial organization, we're not a monitoring organization to that extent, but we did put in place is a government component which is a technical assistance unit that basically goes out and actually assist national local intervention departments in developing framework, developing owned up frameworks, standards of purchasing, planning, and making sure that the execution is done in line with government objectives. So that's one of our mechanisms we basically go out with the ICT project.

Interviewer: # [00:32:50] each program working?

Interviewee: I think very effectively, yes. The amount of projects that is going through and the amount of success that we have I mean obviously it's just proven. One of those divisions basically monitors national and provincial and local history divisions, all from a governance perspective. And so they look at things as a system, how do they manage projects. How do they develop strategic plans, how do they mange their risk profiles, how do they mange their and comply to audit filings and those type of things. And what we've seen over the last two-to-three years is that there has definitely been an improvement thing within the output I think, maturity of the organizations.

But there is also improvement in the skill level, because we're even monitoring training so whether people are adequately trained and equipped in to do what they're suppose to do. So there is definitely an approach from our sides to try and encourage people to uplift skill and insure that they can do the performance, they need to make sure that they do the things right. So that's I think one of our objectives. And it's not a financial, if you think of this it's not a financial objective, it's supposed to be[34:00] But finance is one of the key enablers to achieve governance and government effectiveness. So that's all we're trying to do I think that way.

Interviewer: Okay. Can you describe how senior managers give support to ICT systems?

Interviewee: That's a good idea.

Interviewer: Please elaborate on # [00:34:31]?

Interviewee: A little example that somebody once told me. Senior Manager of technical devices said, I want a bomb. And when they ask him what you want to do with a bomb. He said I'll blow up things. And they said, what you want blow up? He said all smart people, okay. And then he goes down. So from a senior management perspective I think we get the high-level requirement, the bomb. But when you want to get to the action, that's implosive, what the actual system should do and it goes to down to the lower levels.

And I think because of a lack of understanding of process some times in the lower levels in the distribution doesn't always gets through. So there is a frustration from that, because he doesn't get what he wants and neither there is also communication, because he didn't communicate what he wants. He expect with other people to do. So just I think that's the gap that we have most of the times.

Interviewer: How do you manage that gap?

Interviewee: Well, we have chat sessions. We try and engage as far as possible with the other people that can. We try and bounce back what the people at the bottom gives us may within for well grow up with it, it's called implication and where it's possible then we get it done obviously those projects are more successful than the once we get done. And so it's more of an engagement or reactive engagement of it, just bouncing it back to redefine what we're trying to understand with their perception is, based on the people perception.

And most of the time that's obviously the benefit or that's the gap, [36:00] because if there is an alignment between any of these department, then obviously they're running the same race, but when they see the gap then there is no interventions and that's where typically we'll start with the detailed business process I think for them. Just trying to understand what they do and

how they do it and what the specific enterprise requirement and what they think of investment business process.

Interviewer: So how do these departments react when this gap appears?

Interviewee: Well, in two ways. Either they embrace it and fix it or they just start and install the projects. So it's a question of if you if can't enable something there because its dispute on the process, obviously then they've to either fix or to keep on doing what they're doing the way they're doing. And I think that's maturity they need in organizations. So we're trying harder more to try and fix it. I think the 100% of the time we trying to fix it.

The other issue that we also have within our department specifically is that another question that we have constantly. I mean, we sit with # [00:37:00] questions on a day to day basis. So the amount of senior management's involvement in those types of things now are fully odd. So we constantly sit with, we prioritize that in all the lead operational stuff.

Interviewer: So ultimately who takes ownership of ICT project?

Interviewee: Oh, okay. We obviously once we formulated our projects charts and the responses and stakeholders and all of those type of things that's allocated, and if the senior managers allocated those responses obviously we will take ownership of it, but we've got a program of project manager that they should come through and install process for us and that we have been certainly.

Interviewer: Now, if the project fails what are repercussions to the sponsor?

Interviewee: If the project fails to the sponsor, well, obviously within government it's slightly different then in private sector. I think private sector it's normally linked to finance, in the governments it's more linked to the performance. [38:00]So people's performance are measured against it. And when you got a sponsor and allocated to a specific project and the project fails then obviously that will be linked to his performance and his achievement or what his deliverables were across through the year. So it's more about a reactive performance measure.

Interviewer: Would you suggest something different?

Interviewee: Well, I think if that the opportunity of doing out some planning at successfully for financial year. We should able to actually realign our over performance agreements, and they do that on deliverables. And then control it. So from a performance management perspective I don't think they will change, because that's there the only way that you can basically do it and that's how you get incentivized as well, your performance is done as you incentive with regards to your performance. But I think one of our concerns is that currently because of the amount of unplanned projects that gets granted.

Interviewer: Yes.

Interviewee: I mean your project -- your annual performance plan changes on a weekly basis, I mean ours changes on a weekly basis. You move things up, you move things down, you move up. So it's difficult to actually put tangible deliverables in the business performance agreement upfront and out to but you can imagine at the end of the year, so we normally sit the, let's say, 40-60 reality. 40% was plan, 60% was # [00:39:45]. And then sometimes the situation is like, the 40% plan and # [00:39:59] because it was actually 80% add of that was moved through people. So that's how it sometimes planned out within this government.

Interviewer: Yes.

Interviewer: [40:00]So do you think the performance bonus actually encourages people into department to meet the objectives. Is it the right incentive?

Interviewee: # [00:40:17] who believes that, as you get the performance bonus and if you do what you're supposed to do. So if you strategy over the deliverables for the year and you actually achieve what you set to achieve from that, that should be your bonus, it should be that you've still got a job. So from my perspective I was saying that specifically within government performance should be measured against the deliverables and if not stern action should be taken, it should not be financially motivated; if it's archived then disciplinary motivation goes up. That's not what always we are looking in government, I think. That it mustn't get in the report.

Interviewer: Have you uncounted colleagues who have not been enthusiastic about ICT initiative?

Interviewee: Yes, we get a lot of them.

Interviewer: How do they show this lack of enthusiasm?

Interviewee: Well, I think you get people that actually -- I won't say lack of enthusiasm, I think the lack of understanding is more that right word. One of our biggest problems is that we sit with quite an experienced type of the user. So our people make and do with extra performance what very few deliverable can do in reality. So a lot of the times when you actually try and implement new systems, I mean get people away from, start integrating the stuff and getting the value add of processing and centralization and data utilizing and those type of things, they are really the negative to change, they don't want to change.[42:00]
So those type of people basically all come into meeting and everything and anything that said they will be hit down, # [00:42:10] priorities will be changing.

So there is always these, stoppages that blocks you. And the approach that we take to try and fix it, we try and prove them wrong, so the process is typically one thing that we do on our side, we physically go and get the physical data, structure things, show them the response, show them the value of centralizing, show them the value of not duplicating. And so those of the types things, interventions we take and then once we've kind of convinced them and then we start working on engagement of that system. I think people of the systems all those solutions for the remaining still accommodating. And when we're starting the small ones, I mean, as people get fine, obviously we get out in the market.

Interviewer: Is there a success story that you'd have to share with us.

Interviewee: I think there is lot of success stories. I mean, we had the G-20 about four years ago, five years ago, okay. And we were running into the low end of the thing. I mean, two months prior to the G-20, they told us that we got an # [00:43:15] for them and what happens with the G-20s, it's a group of 20 governments that basically sits and talks together about financial methods and stuff. And what happens, it's the continuous through from country to country.

And then what is involved, there is obviously they're sitting up a face gear, and with all the people, hosting and huge amount of conferences, we're sort out pretty deliberative platforms. We've got two months to do this. And we successfully pulled that off, maybe five days prior to the actual invitation, fully operational, migrated all of that just from the other side[44:00] and gave access to every single person [44:00] within the G-20, which was over a 300 people, so all these type of success stories that we have from housing perspective.

From system perspective, developing because I think at this stage we're not looking at an integrated system, but I think one of the things that adds value for us for the first time is the architecture part. So that's one of our big wins we had the last year and we could actually get a # [00:44:34], aligned that to system annual performance plan, aligned that to the budget and aligned that to resource plan, aligned that to the total restructuring of an IT organization. So I think that's a huge one for us, because for the first time we actually know what people have

to do, how they do it, when they do it and how often they do it and what's the cost involves in doing it.

So taking that method, we're developing all these and installing in such a way that we can start costing for it. And although it's funding money it's a work, but actually you're monitoring and controlling yourself effectively. So if you can add value to an organization by proving that you're delivering what you suppose to do within the time and constraints that you have. I think that's the objective, so those are the ones that we're trying to get to. And I think we've been successful to some of that.

Interviewer: Now how do enthusiastic colleague show the enthusiasm to participating in ICT project.

Interviewee: There aren't to # [00:45:26] but some of these technical guys that actually sits in account they proactively develop things. They doesn't do things, they start writing things on the side. So that's the way -- I mean it takes these all of I because they don't like to do things over and over so. They like to do new things and some times that's also a problem. The huge benefit that can be a huge problem as well because the focus is always on doing the nice things then some of the right thing is doing other nice things.

So it's basically the way that they approach projects. The way that they deliver, the targets they deliver, trying to see if they can put accretive thoughts there, I'll know that enthusiasm is based on payments and meetings, participation in meetings. Initiatives outside of the box, those are the [46:00]48:0otype of things that I measure those type things. And then we have people like that that actually sits in day and formulize for new solution, don't dream about this, and coming up to the next morning and can't wait to tell people what they thought of those. So it's just the approach of communicating. I think that's maybe one of the biggest gaps that we have in IT in general, is that they can tell us they're not communicating, like the # [00:46:43] and because it's a communication understandings is for sometimes maybe initiate, but yeah, its participation and engagement.

Interviewer: What about departments outside the Treasury like various people of the ITC, have you encountered people who do not want to participate in ICT projects.

Interviewee: Yeah, look I think specifically from the local municipality perspective, a lot of them don't like who are at the facilities to interact with these systems. Training is a huge issue. And so people then try and they can't use the systems. And they have special issues, obviously where they are situated, main access to them sometimes is an issue, bandwidth is a huge issue.

But I don't know, I want to say they don't want it, they are limited by the circumstances but they have technical issues. So these mechanisms that we put in place, and if they can't put in something assistance we will actually do the # [00:47:40] those type of things. So there is way we could we deal with it. That's not a lot, it's the poor, poor municipality that sometimes and the issue for us.

Interviewer: In what ways is the resistance you've change an issue in the department?

Interviewee: [48:00] I think, government is # silo mentality. So as long as things changed within the damages of control, and I think there is a huge resistance for that change. Because when you start integrating and looking at enterprising between that is a resistance because they're seeing that people are trying to relinquish responsibility and lose power. So I think there is a change issue, change within the actual sphere of responsibility.

I don't think its # [00:48:42], on a daily basis, I thinks that's what we do as treasury in general, the way that we ended up budget, I mean it's obviously based on economic change on a constant basis. So that seems to change required through this as long as the stages and the stage and the parameters of our controls. But people tend to do not accommodate change in the moment that there is a possibility of power that goes away.

Interviewer: How do you manage that if at all?

Interviewee: Well, I don't think from an IT perspective we do. I mean, unfortunately that's something that we can't control. But it is typically highlighted and out comes out from the processes, those processes gaps, and from our either perspective what we can do is through our strategic information system, we will give the opportunity to the solutions. And this is typically off the margin of business process, it could be an opportunity in the solution and defining and developing and re-interfacing, those are the topics that we will take.

But from an IT perspective, no that's not something that we can do. We basically nearly can show what we see. I mean business obviously have to agree on prioritize and execute. But as I said in the beginning, IT is not seen as -- enterprise architecture is not seen as strategic tool for an organization, it seem as IT tool.[50:00]

Interviewer: And I'd like to take a step back, you had mentioned all outsourcing on your own, how do you manage that relationship with the outsource company.

Interviewee: As I said we've got -- similar to that what we've done with SITA. We've got a contract management strategy in place. We will basically setup a contract for a specific service organization. Our service level agreement gets formulated between us and that service provider that provides a service, quarterly reviews that out, and then obviously escalation procedures are implemented in this service agreement, so if anything goes wrong we go basically # [00:50:35] that.

Interviewer: Is SITA involved in that relationship in anyway whatsoever?

Interviewee: In certain yes, and certain no. And obviously, there is transversal contract. And so whenever we procure, we procure off the transversal contracts. We have a SITA does not have very transversal contract in place for a service that we require, then we go out on the normal financial supply processes, then we mostly get this system through the process appoint set up service agreement, master systems, master service agreements and then control it through the quarterly meetings.

Interviewer: How long does that process take?

Interviewee: Within the process, well, I think the -- in the organization it's between 42 and 56 days, from # [00:51:25] which I think it's pretty all right compared to some of the other departments that they talk to you. So yeah, we're roughly about 42% guys.

Interviewer: And, Interviewee, are there any other issues which I have not raised, but would you think is important in understanding how ICT system are commissioned, developed and assessed in government.

Interviewee: Yeah, I think I said it earlier and I think I will say it again, maybe, one of my biggest concerns within government, and I'm talking about government resolve, if you think of the ICT standards #[52:00] we implemented. We don't initiate deployment. So that's not a big issue. There is not an ICT strategy for government, okay. And the one they've dropped still does not accommodate what they actually need to accommodate. So planning is essential planning is an issue from us. Monitoring evaluation, that's also an issue from here, because if you don't plan you can't monitor, so that's my estimate, and then obviously the regulations process is also an issue because there is no -- I mean there is investment deals and those type of things.

But there is not a formal approach around governance in general. I mean, there is a nice governance framework that has been written out, that you have to use to go with. But necessarily how do you implement, one of the controls within the framework that you want to implement, so control is an issue as well, governments issue. So the three tiers of planning within government, IT, has to be centralized. So central planning, central control, central

regulation because you control against planning regulation for compliance and performance, and if you don't do it then you can't, so if you want to have an integrated ICT e-governance strategy, you want to call it that then you have to plan for an integrated ICT e-governance strategy.

You have to make sure, the relevant regulation and policies is in place to control it and you have to set your summary that sits in, actually monitor whether it's actually effective or not. So if I could take just one step back inside, from a citizens perspective, we could define all those services that we are currently giving to the citizen, okay. And we look at all the mechanism that we're currently having in place to get it, start seeing whether duplication isn't seeing out; we can effectively integrate those systems with each other. Then I think we might actually start[54:00] moving to the right direction from an e-governance perspective.

This organization has a series of opportunity, a government service provider, a citizens service providers, and I think that's the challenge, the challenge is for us to central planning and I thin the ownership of IT within government is also an issue because if you think about it where does the responsibility of ICT planning sit. It sits within the OGCI, that sits within DPSA, which is a non-technical organization. They actually have more an HR organization, if you call it that. If you ask with infrastructure set, well, I would say, it's publicly accessory, the clear, the bottom that you can actually allocate. I normally # [00:54:53] and normally go and say you take only closest in this square and get inputs, you get outputs.

How many outputs that you can actually or the inputs that you can actually have paraphrase things that you buy to do something, like, information. Any three things that you can get out of any business process, it is either a product, a service or commissions, just throw something away, dispose off something, okay. Things that actually regulate or control a process are two things, there is either plan that directs, okay, or there is a regulation which is your governance that controls how you do it. There is two things that sits at the bottom here and are actually this one I also interpret in couple of things; it is the HR component, which is the resources, the people, right. That's the mechanism that you used to actually handle this process.

[56:00] And then you've got other mechanisms which is facilities, which is security, which is IT, which is ECM, which is finance, which is internal audit, all right. And if I take that process that I wrote through and I put it in the highest place I have to ask you then who is responsible for planning within in government. Well, I would think the planning commissions that is under the most, # [00:56:35], agree. If I had to ask questions of who is responsible for regulating, managing in regulation, I would think the, # [00:56:40] people, okay. So that's strictly once again comes out of the ministry's space.

If I ask you then who is responsible for procurement, all I would say is Treasury people, we actually give the finances and the authorization for payments. If I were to ask you who is responsible for projects, I would say the department of services, the departments name, and the commissioning, obviously the departments. If I ask for facilities, you can say probably # [00:57:00]. If I say, ECM, I could say, Treasury, finance, Treasury, internal audit, AIG, so I can name everything, HR, BPO, so I can only give the department on a government process.

But one thing I can link is information and IT, because the information and of the process could be anybody. So there is always a problem, ownership issue, but IT in currently government, you cant link to anything, because you can't link IT to DPSA, you can't link IT to SITA because SITA is merely a service provider, you cant link IT to Treasury, you cant link IT to science and technology and you cant link IT to communication.

So information we could link to communications if you want to. But the point that I'm saying is that that IT currently [58:00] is the only department that you can't actually interface or IT is the only component you can't link to other department and for that I think that's why they choose. and you can't bring me into that, I mean, how do you know grant like that, an IT process and say what are these things that you're giving, what are the things you didn't, what are the legislation and translate and what is all the mechanism that we have to do IT.

So that's the issue for me. So if you want to have a change within IT, having a central view of IT, I think one of the key things that I would change in the government is to create a # [00:58:36] of honour for IT within government. And not necessarily the GCR, because basically the GCR is -- I don't have to know the structure of the GCR. It's a government -- it's a OGCR, office of the government CR.

Then there is a GCR, which is the government CR, which has been now vacant for about two years in IT division. So they are supposed to have the strategy of ITC government employees. But they sit within the GCR side. And they don't have I don't think the backing, what they call it, they actually this do a lot. So what happens is there has been a GITOC, Government Information Technology Offices Council.

Every single department has got a GITOC and that's typically your IT hubs within all the departments, but as certain this GITOC. So the GITOC is then used to advice the minister of DPSA as well as OGCIO of what they're doing in the department, so that these house can actually strategy out some development, but as I said, I mean, first of all, the payment is poor, secondly, their synergy is poor, thirdly, the central is poor and no control. So those are the issues.

[60:00]There are certain committees on the GITOC that recommend architecture, the governance committee, there is security committee and I can go on until I'm blue in the face, we've got all those committees and they're all sit but actually nothing comes out of it. So in any region-wise because every department's wants to make their voice heard but nobody collides and actually pull it together, because that's how they do it.

And I think that's the challenge. So that is just my explain on where the issues are currently within e-governance perspective specifically, is we don't see the big picture. I think there was # [01:00:36] but you can actually go and speak to somebody; I'll give you a name. There was 960; I think national and provisional citizen centric applications. And there is other 1,700 remaining local municipality systems.

So roughly we're talking about 2,500 or 3,000 citizen centric systems which all the users wanted ID and not all of those systems in it are controlling the # [01:01:18] ID in the intervention. So there is no central depositary of it. And those are things that we haven't put rest. So if you start looking it at on that level. How do you enable all those? I mean if you think what other governments done, there is a centre portal to all the services available in that portal, you click where you are, you only have to log in once with the name of the list of # [01:01:41] profile and those are the type of systems that you should enable services. But ownership of data is an issue, sharing of information across department is an issue, so those are things that we get pass, we can pass those things and I think we can start building these things.

Interviewer: [62:00]Do you know why the ownership of data is an issue amongst departments?

Interviewee: Look, I think if every single department, they want to stream things. Remember I said the largest state within your boundaries of responsibility in # [01:02:17] it's the moment that you got out of it, it becomes an issue. Yes, I mean this is once again, talking about this but years ago there was a very interesting statement made my somebody, where it was said that if you take a person that comes into the committee, you know, when they got to check your passports as you're coming, that they actually verify that name in the docket, all right.

I think it was seven departments. You have to go through social development, you have to go through # [01:02:51], you have to go through the police, you have to go through the army, the defence forces, you have to go through # [01:03:07] as well, you have to go through the # [01:03:12] services, you have to go accounting with all of them, but there was a huge amount of departments that sits in the decking, the moment that thing kept on the system there, all of this systems on each side, gets a # [01:03:24], coming to the country, all right. And then they

process it on the docket, all of their systems. So the argument goes there, if you had to say that, for argument sake, coming into the country and falsified name, okay, there is no way that they would have been able to pick it up, there is also no way that they can tell how many people comes because you have to query seven systems to try and get the right information.

And how many is South African and how many is foreign and how many is -- it becomes an issue. So the point is that people are sitting next to each other doing the work and they refuse to pull the system. [64:00]And this is just because they don't want to relinquish the responsibility of docking. And I think that's probably the biggest issue in IT, data -- ownership of data. If you had to ask the question, who is the owner of IT, they will just call it they are into the IT, who is the owner of it? # [01:04:20], all right. The other thing, is the owner of IT, who am I? Okay, then that is the interface that should be given out to government across the both of servicing. Whenever you query any person in any of the system, you query as referring them as IT. If you are the owner of IT then there is other things that you also could be the owner of, name, surname, date of birth, I mean, those are the processes that sits within that.

So when we talk about a citizen, the data of the citizen, as who am I, the person, okay, sits within the internal phase of all of this okay. But now let's go to another one. If we talk about the entity of security, okay, who comes for security, well, hopefully it sits within police. So if that's the case, then entity ID that related to police call that, and only on certain levels, we don't have to go into the detail levels, but you can do that, if I ask you the same question, enter the ID this, its linked to social development services, XYZ, pension grants whatever the thing is, I mean that's the concept we should be able to.

So if they sit with the protocol of services linked to a person then you're able for an e-governance process, where you can say listen, via cell phone and via internet via whatever mechanism. You can access your services there and actually see what the strategies over central. And now currently you have to go to # [01:06:00], you check your status there, you have to go to the # [01:06:07] you have to your check status there. [66:00]So you have to understand 70,000 things, al right, to understand these services. Yes, you have turned it around you can have one portal and you can see all of these things you get. # [01:06:16] for something, that you should be able to go and say, listen I am entity Interviewee, okay, and this is my rights and my rights is classified based on these tariffs and these tariffs are because of a agricultural area, the new standards # [01:06:30] should open, but been under that way because agriculture # [01:06:37] and so yeah, I will fix it.

Interviewer: One other question. Now, you were speaking about who get particular IT belongs to? What about the process that goes to that is attached to that, does it -- do you think it should belong to the department or it should belong to IT.

Interviewee: Well, I think the thing about that I said earlier, I mean if you think of a business model, if you build a enterprise business model, so you go and say, what are all the process that we execute in an organization and you actually go and structure and you building integrated in, so you understand what goes in what comes out typically what I showed you. And you understand what the different issues, the governance regulations all those types of things.

Then you start allocating the responsibility based on that process. So you get to a point where we're saying, listen, if I'm responsible for leave management, then the leave management process and I'm responsible for planning and I'm supposed to regulate it, so that's my job to make sure that they're planning and the regulations is formulated and governed and implemented. So that's how you will fix it.

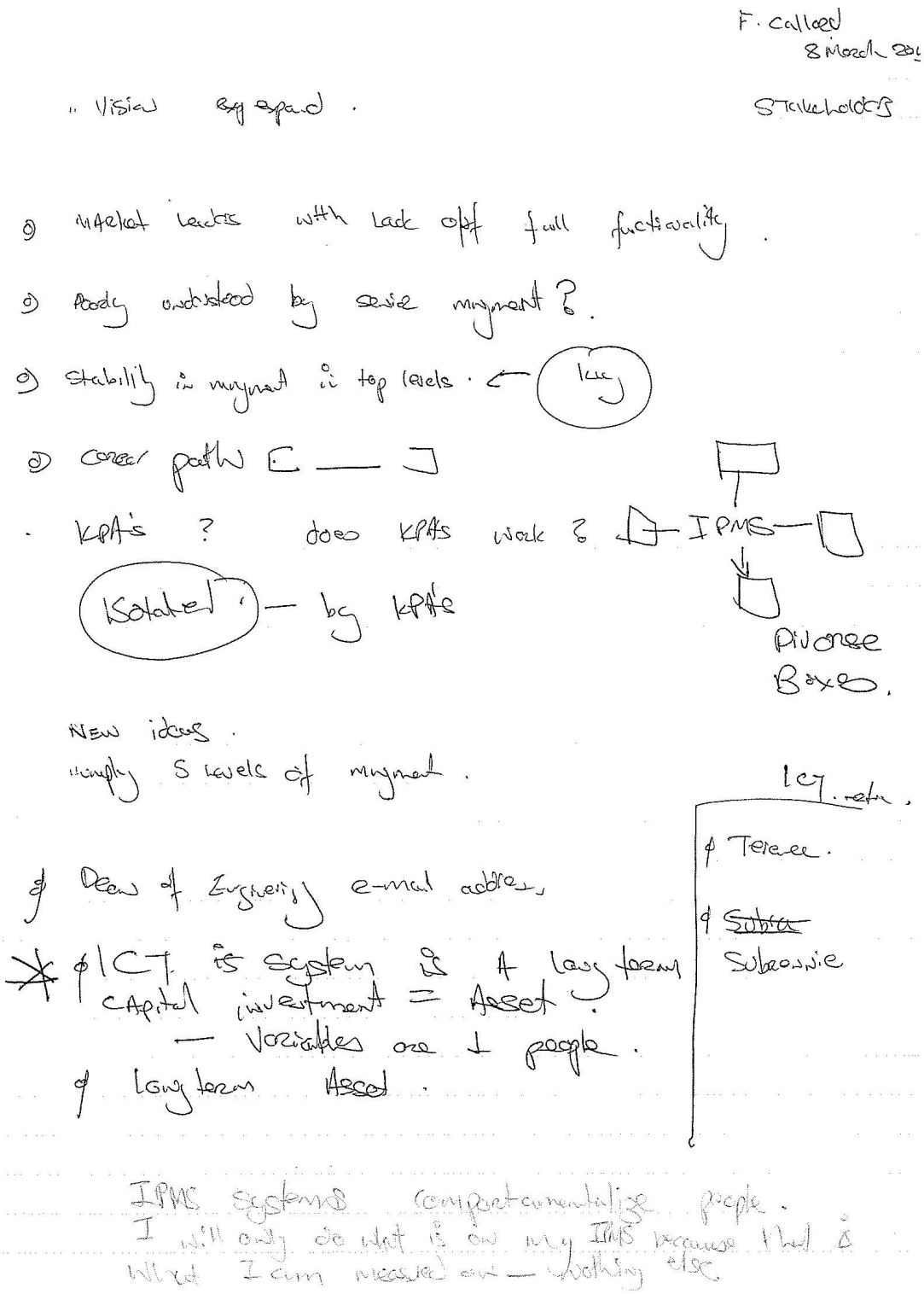
If we're saying that IT or citizen, the entity citizen is owned by DPSA, all they managed that is someone they have to put in place. [68:00]So any system that's sits on the outside, then there is a change. I mean, lets use a simple example, I'm getting married, obviously I have to go Home Affairs, my system # [01:08:13] and every single system that maintains that name

list needs to know that, listen, this guy is now married, he is not unmarried, so when he dies we don't have to deal with the same issues. So that's the type of culture.

Interviewer: Okay, thank you so much.

Interviewee: I hope it helps.

Appendix L: Field Notes



Site
Prof. Daniel
Mashe

- CMMI
- Client facing.

62TQC.

- NO owner. Public-admi of service.
- inefficient + complications.
- siloed — ownership.
- Testing

Ask 2 speak 2 session of E-gov projects.

recommend breaking of silo systems

of. do not have team.

- success of + project.
- IT ministry.

ICT research + development.

NISIS — DSD www.dsd.gov.za

*) (Present register [illegible]

20 March
[illegible]

① Too much formalities

② SITA XX vs HP

Supervisor.

COKTA.
COKTA

③ Revised process Affect the project.

NDMC.gov.za
Frame work.
↓
download.

* electronic process.

You identified a need, you changed it.

Urgency 2 do the work.

SITA

Smith motives.

Register. As 4il —

Business card —

Appendix M: Excel Templates Supplied by Informants

QUARTERLY PERFORMANCE REPORTS: 2011-12
Sector: Sport, Arts and Culture

Programme / Subprogramme / Performance Measures	Estimated Annual Targets		
QUARTERLY OUTPUTS	2011-12	2012-13	2013-14
Programme 2: Cultural Affairs			
2.2 Arts and Culture			
• Number of structures supported			
• Number of Service Level Agreements concluded			
• Number of sponsorships/bursaries awarded			
• Number of events organised			
• Number of participants attracted			
• Number of significant days hosted in the cultural calendar			
• Number of Artists trained			
• Number of cultural administrators trained			
• Number of learnership programmes initiated			
• Number of performance programmes offered to develop and upcoming artists			
• Number of programmes per facility			
• Number of cultural activities hosted			
2.3 Museums and Heritage			
• Number of people visiting the facilities			
• Number of outreach programme implemented			
• Number of brochures and publications distributed			
• Number of exhibition staged			
• Number of programmes promoting cultural tourism			
• Number of heritage sites promoted			
• Number of geographical place names reviewed			
2.3 Language Services			
• Number of language coordinating structures supported			
• Number of literary exhibitions conducted			
• Number of documents translated			
• Number of interpreting services conducted			
• Number of persons empowered to deliver translations			
Programme 3: Library and Archive Services			
3.2 Library Services			
• Number of New library facilities built			
• Number of Library buildings upgraded			
• Number of community libraries provided with ICT infrastructure			
• Number of Library materials procured			
• Number of promotional projects conducted			
• Number of staff trained			
• Number of monitoring visits done			

Luthuli Museum

	Outcome				Medium-term estimate		
	Audited	Audited	Audited	Estimated outcome			
R Thousand	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Revenue							
Tax revenue	–	–	–	–	–	–	–
Non-tax revenue	–	–	–	–	–	–	–
Sale of goods and services other than capital assets	–	–	–	–	–	–	–
Of which:							
Admin fees	–	–	–	–	–	–	–
Sales by market establishments	–	–	–	–	–	–	–
Other sales	–	–	–	–	–	–	–
Other non-tax revenue	–	–	–	–	–	–	–
Transfers received	–	–	–	–	–	–	–
Total revenue	–	–	–	–	–	–	–
Expenses							
Current expense	–	–	–	–	–	–	–
Compensation of employees	–	–	–	–	–	–	–
Goods and services	–	–	–	–	–	–	–
Depreciation	–	–	–	–	–	–	–
Interest, dividends and rent on land	–	–	–	–	–	–	–
Transfers and subsidies	–	–	–	–	–	–	–
Total expenses	–	–	–	–	–	–	–
Surplus / (Deficit)	–	–	–	–	–	–	–
Movement in capital assets							
Adjustment to fair value	–	–	–	–	–	–	–
Acquisition of assets	–	–	–	–	–	–	–
Disposal of assets	–	–	–	–	–	–	–
Balance sheet data							
Carrying value of assets	–	–	–	–	–	–	–
Investments	–	–	–	–	–	–	–
Inventory	–	–	–	–	–	–	–
Loans	–	–	–	–	–	–	–
Receivables and prepayments	–	–	–	–	–	–	–
Cash and cash equivalents	–	–	–	–	–	–	–
Total assets	–	–	–	–	–	–	–
Capital and reserves	–	–	–	–	–	–	–
Borrowings	–	–	–	–	–	–	–
Post retirement benefits	–	–	–	–	–	–	–
Trade and other payables	–	–	–	–	–	–	–
Provisions	–	–	–	–	–	–	–
Managed funds	–	–	–	–	–	–	–
Total equity and liabilities	–	–	–	–	–	–	–
Contingent liabilities	–	–	–	–	–	–	–

Appendix N: Word Templates Supplied by Informants

Vote

Name of department

Accountability information

R thousand	2008/09 Total to be appropriated	Current payments	Transfers and subsidies	Payments for capital assets	2009/10 Total	2010/11 Total
Programme 1	–	–	–	–	–	–
Programme 2	–	–	–	–	–	–
Programme 3	–	–	–	–	–	–
Programme 4	–	–	–	–	–	–
Programme 5	–	–	–	–	–	–
Programme 6	–	–	–	–	–	–
Programme 7	–	–	–	–	–	–
Programme 8	–	–	–	–	–	–
Programme 9	–	–	–	–	–	–
Programme 10	–	–	–	–	–	–
Total	**–**	**–**	**–**	**–**	**–**	**–**
Direct charges against the National Revenue Fund	–	–	–	–	–	–
Total expenditure estimates	**–**	**–**	**–**	**–**	**–**	**–**

Executive authority	
Accounting officer	

Aim

Detail

Programme purposes and objectives

Programme 1: Administration

Purpose: Detail (Purpose Bold)

Programme 2: Name

Purpose: Detail

Measurable objectives: Detail

Programme 3: Name

Purpose: Detail

Measurable objectives: Detail

Programme 4: Name

Purpose: Detail

Measurable objectives: Detail

Strategic overview and key policy developments: 2004/05 – 2010/11

Introduction (Paragraph)

Paragraph on the department's direction and expected results to be achieved.

Key policy developments

Paragraph on policy developments and legislative changes.

Recent achievements

Paragraphs on achievements in 2006/07 and 2007/08.

Key performance indicators

Indicators	**Performance**						
	Past			**Current**	**Projected**		
	2004/05	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
…… ……	… …	… …	… …	… …	… …	… …	… …
…… ……	… …	… …	… …	… …	… …	… …	… …
…… ……	… …	… …	… …	… …	… …	… …	… …
…… ……	… …	… …	… …	… …	… …	… …	… …

Expenditure estimates

Table x.1: Name

	Audited outcome				Medium-term expenditure estimate		
Programme				Adjusted appropriation	Revised estimate		
R thousand	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
. . 2 .							
Subtotal							
Direct charge on National Revenue Fund							
Total							
Change to 2007 Budget estimate							
Economic classification							
Current payments							
Transfers and subsidies							
Payments for							

capital assets		
Total		

Expenditure trends

Detail

Efficiency savings

Infrastructure spending

Customised text box per vote

Include table and text

Departmental receipts

Brief description of all departmental receipts for 2006/07 and anticipated revenue for the new MTEF period.

Table 1.2: Departmental receipts

	Audited outcome			**Adjusted appropriation**	**Medium-term receipts estimate**		
R thousand	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
Departmental receipts							
Total							

Programme 1: Administration

Description of *programme* and *subprogramme*

Expenditure estimates

Table 1.3: Administration

Subprogramme	**Audited outcome**			**Adjusted appropriation**	**Medium-term expenditure estimate**		
R thousand	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**

	04/05	05/06	06/07	8	08/09	09/10	10/11
Total							
Change to 2007 Budget estimate							

Economic classification

Current payments							
Compensation of employees							
Goods and services							
of which:							
Transfers and subsidies							
Payments for capital assets							
Total							

Details of major transfers and subsidies:

Provinces and municipalities							
Municipalities							
Municipal bank accounts							
Current							
Capital							
Public corporations and private enterprises							
Public corporations							
Other transfers							
Current							
Capital							
Households							

Social benefits			
Current			
Capital			
Total			

Expenditure trends

Detail

Trading entities

Public entities and agencies

Name

Paragraph

Key performance indicators

Indicators	**Performance**						
	Past			**Current**	**Projected**		
	2004/05	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
…… ……	… …	… …	… …	… …	… …	… …	… …
…… ……	… …	… …	… …	… …	… …	… …	… …
…… ……	… …	… …	… …	… …	… …	… …	… …

Annexure

Vote 1: The Presidency

Table 1A: Summary of expenditure trends and estimates per programme and economic classification

Table 1B: Summary of personnel numbers and compensation of employees per programme

Table 1C: Summary of expenditure on training per programme

Table 1D: Summary of conditional grants to provinces and municipalities

Table 1E: Summary of official development assistance expenditure

Table 1F: Summary of expenditure on infrastructure

Table 1G: Summary of departmental public-private partnership projects

Appendix O: Internal Electronic Documents Supplied by Informants

Annexure A

Summary

Uniform Budget Programme Structures for the 2013/14 Budget are applicable to: Basic Education; Health; Social Development; Provincial Treasuries; Provincial Legislatures; Department of the Premier; Agriculture and Rural Development; Human Settlements; Safety and Liaison; Economic Development and Tourism; Cooperative Governance and Traditional Affairs; Sport, Arts and Culture; Public Works; Transport; and Environmental Affairs.

Please note that the Budget Programme Structures for the above mentioned sectors remain unchanged, except for Basic Education and Agriculture and Rural Development. The structure for Basic Education has been reviewed by the sector but has not been formally signed off yet and is hence subject to minor adjustments.

All provincial departments will fully implement the collectively agreed Uniform Budget Programme Structure in 2013/14 financial year.

Provincial Legislatures will implement the newly revised Budget Programme Structure for the 2013/14 financial year.

A new Uniform Budget Programme Structure has been developed for the Tourism function and has been added to the Economic Development structure as 'Programme 6'. The prompt completion of the structure is as a direct result of the active participation of the national Department of Tourism in the process.

Human Settlements

	Programme/ Sub-programme	*Objective of Programme/ Sub-Programme*	*Goods, services and payments included and excluded*
1	**Administration**	To provide overall management in the Department in accordance with all applicable Acts and policies.	
1.1	Office of the MEC	To provide for the functioning of the office of the MEC.	This sub programme renders a: secretarial support, administrative, public relations/communication; and parliamentary support.
1.2	Corporate Services	To provide corporate support that is non-core for the department.	Providing operational support in terms of financial management, transport, procurement, human resource, legal, information systems, communication and auxiliary services in the department.
2	**Housing Needs, Research and Planning**	To facilitate and undertake housing delivery planning.	
2.1	Administration	To provide administrative and/or transversal project management services.	
2.2	Needs	To identify Housing Needs	
2.3	Policy	To provide a regulatory framework for Housing delivery; To develop policy guidelines, Proclamation of Acts and Amendments	To develop policy guidelines, proclamation of Acts and amendments
2.3	Planning	To develop provincial multi-year housing delivery plans; To properly plan provincial multi-year strategic housing plans by October each year	To determine Housing needs, strategy, aligning housing plans with IDP'S and environmental impact
2.4	Research	To conduct research on demand for housing	
3	**Housing Development**	To provide individual subsidies and housing opportunities to beneficiaries in accordance with the housing policy	
3.1	Administration	Administration support funded from equitable share	
3.2	Financial interventions	Facilitating immediate access to Housing Goods and Services creating enabling environments and providing implementation support	
3.3	Incremental interventions	Facilitating access to housing opportunities through a phased process	

Appendix P: Internal Reports

1. Background

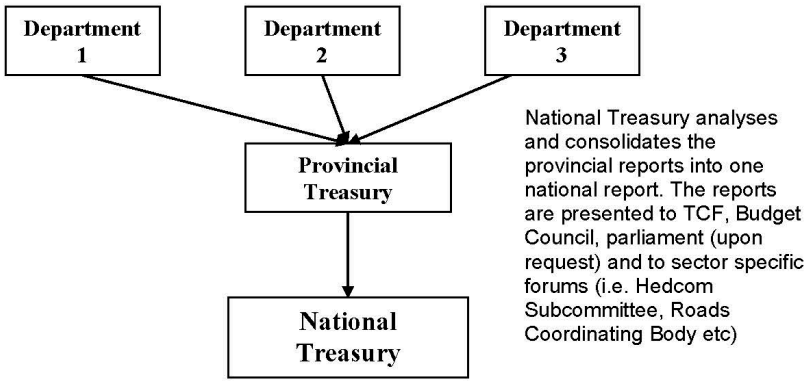
The Infrastructure Reporting Model (IRM) is a project level monitoring and reporting (M&R) tool, developed in MS Excel and Visual basic (VBA). The model is used by provincial departments to report expenditure and performance progress on infrastructure projects.

2. Reporting Responsibility

The Infrastructure Grant to Provinces (IGP) framework, contained in the Division of Revenue Act, requires provinces to provide reports on aggregate spending on infrastructure based on the prescribed reporting format. The Infrastructure Reporting Model (IRM) has been designed and prescribed for reporting by provinces.

Each provincial department has the responsibility to report progress on infrastructure projects to its relevant Provincial Treasury. The Provincial Treasury will then analyse, monitor progress on reported projects, check data quality and approve the IRM datafile. If the quality of the submitted IRM datafile is poor, the relevant Provincial Treasury must send it back to the respective provincial department to make the necessary corrections. National Treasury has developed the Provincial Infrastructure Reporting Model (PIRM) and Infrastructure Trends Analysis Tool (iTAT) to assist Provincial Treasuries in analysing the infrastructure data submitted by provincial departments. The IRM datafiles (from provincial departments) and consolidated reports (from the Provincial Treasuries) are then submitted to National Treasury (NT) on a quarterly basis.

The data flows as follows:



Buttons:

- The ***Budget*** button is used to manage the departmental budget;
- The Project button is used to capture infrastructure projects and to report on their performance;
- The ***Information*** button provides key information to the user;
- The ***Import Data File*** button imports data from a datafile into the IRM;
- The ***Export Data File*** button exports and back-up the data into an IRM datafile;
- The ***Zoom*** button can be used to increase the font size and visibility of the IRM;
- The ***Full screen*** tick removes the MS Excel bars and gives the user maximum screen usage.

4. Budgeting

Each department's infrastructure budget is captured and consolidated under the budget sheet. . The budget sheet is configured according to the relevant sector's sources of funding. The only information that is to be captured here is the department's main and adjusted infrastructure budgets (in the yellow cells) according to sources of funding and funding classification (i.e. capital or current).

The **total budget** is a sum of the Main and Adjusted budget:

GT - Dept of Public Transport, Roads and Works Budget			
Financial Year: 2010/11	**(R'000)**	**(R'000)**	**(R'000)**
Month: PLANNING	**TOTAL**	**Capital**	**Current**
TOTAL 2010/11 budget:	**R -**	**R -**	**R -**
Infrastructure Grant to Provinces (IGP)	R -	R -	R -
Equitable Share	R -	R -	R -
Infrastructure	R -	R -	R -
Other	R -	R -	R -

Main 2010/11 budget:	**R -**	**R -**	**R -**
Infrastructure Grant to Provinces (IGP)	R -		
Equitable Share	R -		
Infrastructure	R -		
Other	R -		

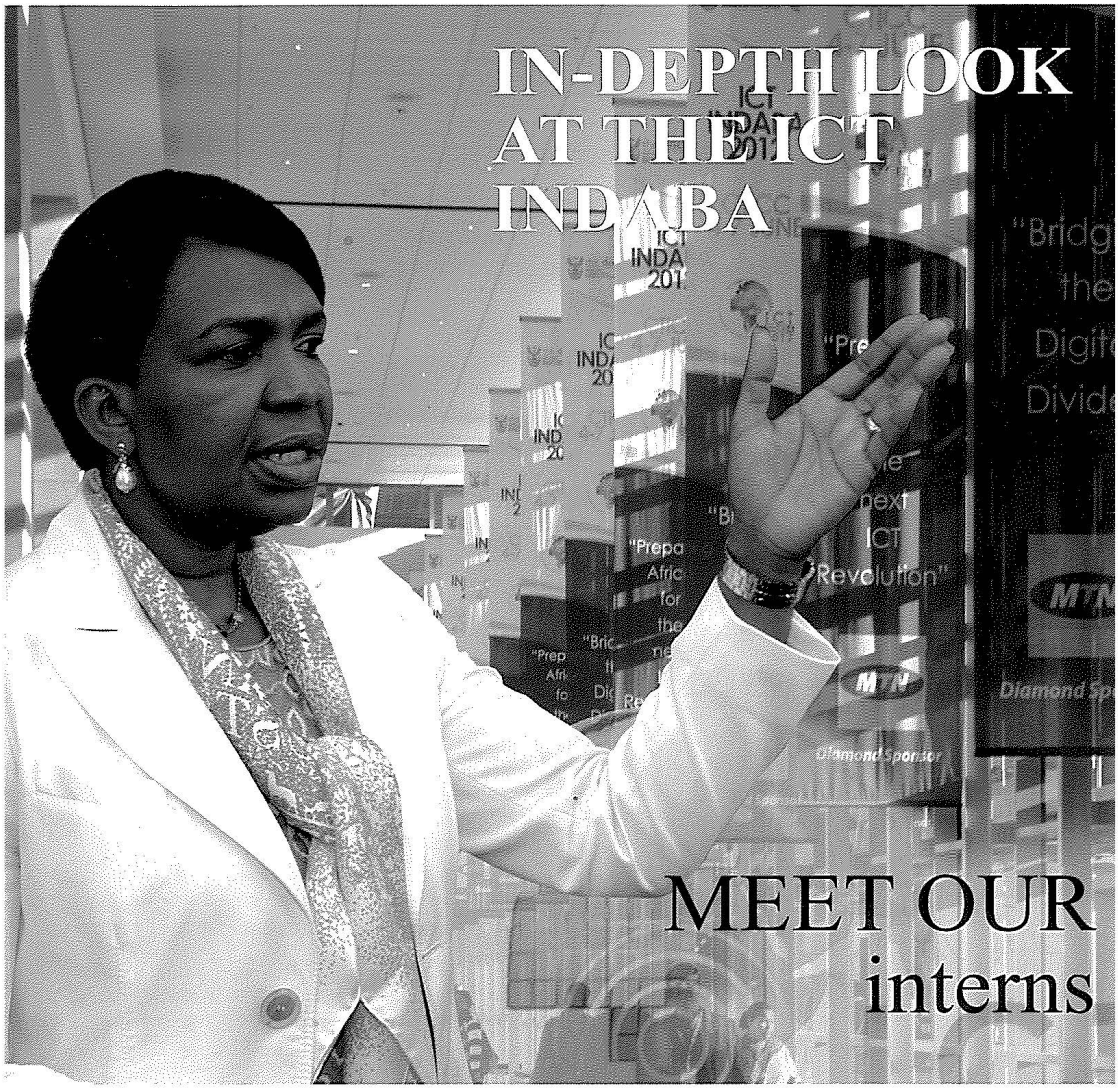
The adjustment budget is normally captured during the adjustment period (in Quarter 3). If the budget was revised downwards, a negative figure must be captured. All figures are to be rounded to the closest thousand (R'000).

Adjustments to 2010/11 budget:	**R -**	**R -**	**R -**

Appendix Q: Internal Newsletters from Departments

e-Ndaba

Fourth Quarter 2012



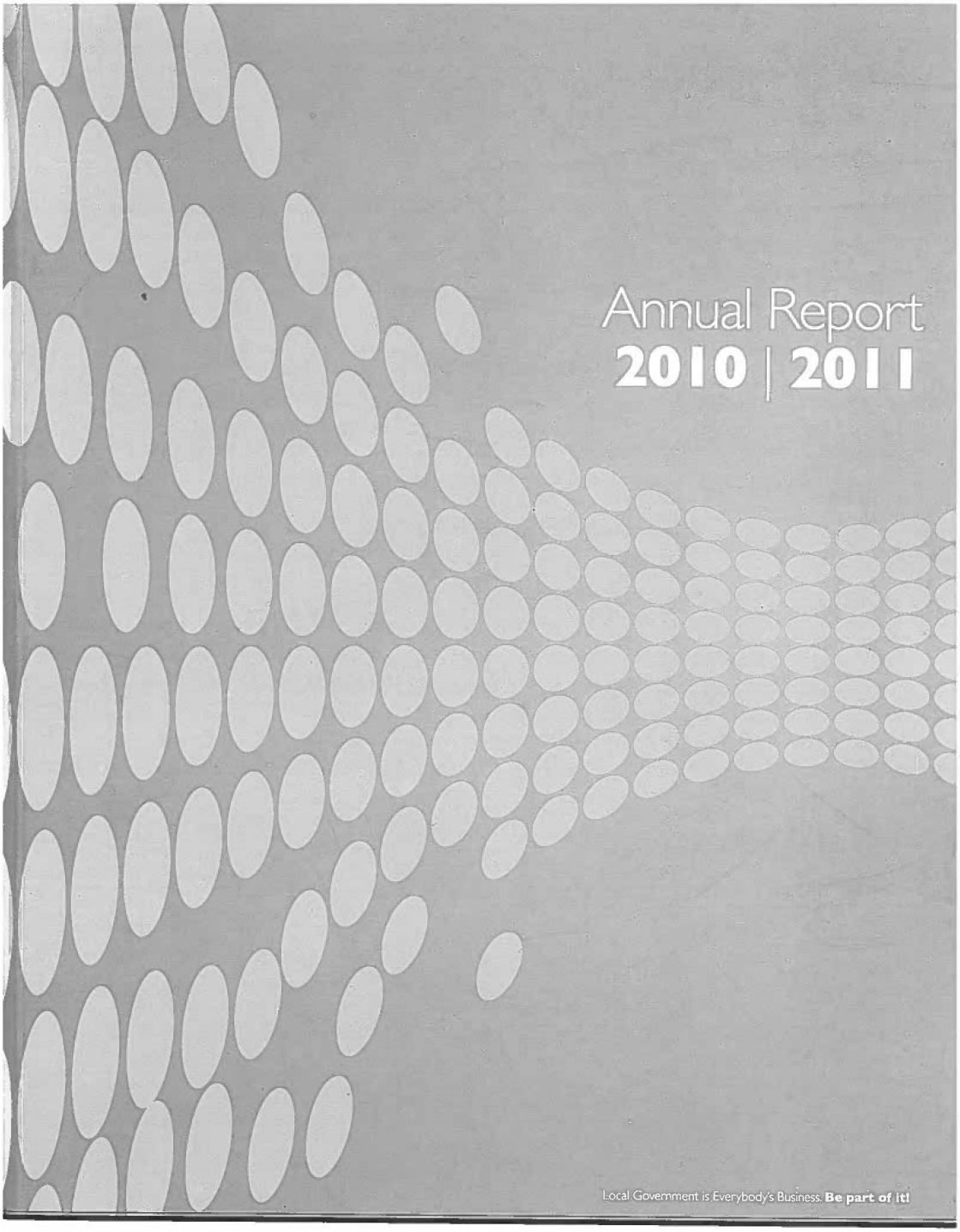
A Department of Communications Internal Publication

the doc
Department:
Communications
REPUBLIC OF SOUTH AFRICA

Appendix R: List of government websites that were inspected

Department of Art & Culture	https://www.dac.gov.za/
Department of Basic Education	http://www.education.gov.za/
Department of Cooperative Governance	http://www.cogta.gov.za/
Department of Health	http://www.westerncape.gov.za/dept/health
Department of Home Affairs	http://www.home-affairs.gov.za/
Department of Justice and Constitutional Development	http://www.justice.gov.za/
Department of Public Works	http://www.publicworks.gov.za/
Department of Service and Administration	http://www.dpsa.gov.za/
Department of Transport	http://www.transport.gov.za/
Department of Water Affairs	http://www.dwaf.gov.za/
Department: Government Communication and Information System	http://www.gcis.gov.za/content/resourcecentre/contactdirectory
Dept of Economic Dev. and Finance, KZN	http://kzntopbusiness.co.za/site/economic-development
Ethekwini Municipality	http://www.durban.gov.za/Pages/default.aspx
Gauteng Online	http://www.gautengonline.gov.za/Pages/default.aspx
KZNOnline	http://www.kznonline.gov.za/
National Treasury	http://www.treasury.gov.za/
South Africa Government Online	http://www.gov.za/
South Africa Government Services	http://www.services.gov.za/services/content/Home
South African Reserve Bank	https://www.resbank.co.za/Pages/default.aspx
State Information Technology Agency	http://www.sita.co.za/
Statistics South Africa	http://beta2.statssa.gov.za/
The Auditor-General of South Africa	http://www.agsa.co.za/
The Council for Scientific and Industrial Research	http://www.csir.co.za/
The Presidency	http://www.thepresidency.gov.za/
The South African Revenue Service	http://www.sars.gov.za

Appendix S: Annual Reports that were inspected




Railway Safety
REGULATOR
Annual Report
2011/12

Appendix T: Strategic planning reports