

https://dspace.org/

Investigating the benefits of a mature e-government to business (G2B) system in South Africa

Dhlamini, Ntokozo

2020
https://hdl.handle.net/10539/31483

Downloaded from a DSpace repository. https://dspace.org/



Research Report

Investigating the benefits of a mature e-government to business (G2B) system in South Africa

Submitted by:

Ntokozo Dhlamini

[1888718]

Supervisor:

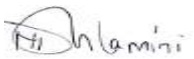
Mitchell Hughes

DECLARATION OF ORIGINALITY

I declare that this is my own unaided work and is, to the best of my knowledge and belief, original, except as acknowledged in the text.

I have read and understood the Senate policy on plagiarism and I am aware that plagiarism is the intentional or unintentional "failure to acknowledge the ideas or writing of another" or "presentation of the ideas or writing of another as one's own". In this context "other" means any other person including a student, academic, professional, published author or other resource such as the Internet. Failing to acknowledge the use of ideas of others constitutes an important breach of the values and conventions of the academic enterprise.

I am aware that plagiarism will be dealt with in terms of the Senate policy and may be subject to disciplinary action.



Signed: _____

Date: 08/07/2020

TABLE OF CONTENTS

CONTENTS			PAGE
DECLARATION			i
LIST OF TABLES			iv
LIST OF FIGURES			iv
ABSTRACT			v
CHAPTER 1 – INTRODUCTION			
1.1	Background and Context		1
1.2	Problem Statement		7
1.3	Purpose of the study and Research Objectives		8
1.4	Intended contribution of the study		8
1.5	Delimitations of the study		10
CHAPTER 2 – LITERATURE REVIEW			
2.1	Literature Review Methodology		11
2.2	Benefits and Challenges of mature e-government systems in Africa		13
2.3	Theories, models and frameworks in e-government research		15
2.4	E-government Systems Evaluation		18
2.5	Theoretical Background and Research Model		20
	2.5.1	Theoretical Background	20
	2.5.2	Research Model and Hypotheses	22
CHAPTER 3 – RESEARCH METHODOLOGY			
3.1	Research Paradigm and Approach		29
3.2	Research Design and Methodology		30
3.3	Data Collection Methods		31
	3.3.1	Pre and Pilot Testing	33
	3.3.2	Sampling and Respondents	35
	3.3.3	Survey Administration	37
3.4	Data Analysis Methods		37
3.5	Ethical Considerations		38
3.6	Limitations, Internal and External Validity		39

CHAPTER 4 - DATA ANALYSIS

4.1 Data Screening 41
4.2 Missing Values and Outliers 41
4.3 Respondent's Profile Analysis 42
4.4 Validity and Reliability 43
4.4.1 Inter-Item Correlations 43
4.4.2 Principal Component Analysis 43
4.4.3 Cronbach's Alpha 46
4.5 Hypotheses Testing 47
4.5.1 Correlations Analysis 48
4.5.2 Regression Analysis 51

CHAPTER 5 - DISCUSSION AND INTERPRETATION OF RESULTS

5.1 Recapping Objectives and their Outcomes 53
5.2 Supported Hypotheses 54

CHAPTER 6 - CONCLUSION

6.1 Summary of Results 59
6.2 Implications for Academia 60
6.3 Implications for Practice 60
6.4 Limitations of the study 61
6.5 Recommendations for Future Research 61
6.6 Conclusion 61

REFERENCES 63

APPENDIX A Research Instrument 80

APPENDIX B Models and Frameworks used in E-government studies 87

APPENDIX C Participation Information Sheet 89

APPENDIX D Pre- and Pilot Testing Amendments 90

APPENDIX E Multiple Regression Results and Assumptions 93

APPENDIX F Ethical Clearance Certificate 96

APPENDIX G Correlations between Net Benefits Elements and Independent Variables 97

APPENDIX H Inter-Item Correlations 99

APPENDIX I Turn-It-In Report 107

LIST OF TABLES

Table 1: Challenges of e-government systems in Africa 13

Table 2: Benefits of e-government systems in Africa 15

Table 3: Net Benefits Measure 27

Table 4: Summary of hypotheses 27

Table 5: E-Government Success Measures and Questionnaire Items 34

Table 6: Number of Employees 42

Table 7: KMO and Bartlett's Test 44

Table 8: Independent Variables Rotated Component Matrix 45

Table 9: Dependent Variable Component Matrix 45

Table 10: Reliability analysis 46

Table 11: Hypotheses of the revised model 47

Table 12: Composite scores and Distribution for whole scale 48

Table 13: Correlations Matrix 48

Table 14: Composite scores and Distribution for Net Benefits Measure 49

LIST OF FIGURES

Figure 1: Research Model 22

Figure 2: Revised Research Model 47

ABSTRACT

Purpose – The purpose of this study was to test the relationships between the dimensions that are predicted to contribute to the success of mature e-government systems. The measurement of e-government success is still not well understood by both practitioners and researchers, and this study therefore aimed to provide empirical validation for the success of mature e-government systems, with particular focus on private companies in South Africa. Mature e-government systems are predicted to contribute to effective and efficient governments that enable the sharing of information, and the delivery of seamless, integrated e-government services. This has the potential to reduce the administrative burden on companies, and improve the transparency and accountability in e-government systems and government officials.

Design/methodology/approach – A quantitative survey design was used and an online survey questionnaire was sent to companies that were registered and using the Central Supplier Database (CSD) system, focusing on small and medium enterprises (SMEs) in South Africa.

Findings – All the predicted relationships between all the constructs were supported by the results of this study, except for "service quality" which had to be dropped from the research model after failing validity scrutiny. The findings also revealed that SME companies perceive public value from all of the dimensions of the "net benefits" measure, for all the elements that were derived from the Public Value theory, namely, efficiency, effectiveness and improved democracy.

Originality/value – The study attempted to add to the body of knowledge in the Information Systems discipline by validating the extended DeLone and McLean IS Success model within the less explored aspects of the e-government discipline, involving the evaluation of a mature e-government system utilized by private companies in a developing country such as South Africa, with particular emphasis on reducing administrative burden on these companies. This study integrated constructs mainly from the DeLone and McLean IS Success model with elements from the Public Value theory, namely efficiency, effectiveness and improved democracy, to cater for the unique aspects of e-government systems.

Practical implications – This research may assist government officials, IS practitioners and academics understand the potential success of e-governments within the South African context and also to understand the factors that might influence the success of mature e-government systems. It may also help guide policy makers towards making the most appropriate decisions when implementing such systems and initiating other e-government projects.

Key words: e-government, government-to-business (G2B), administrative burden, integration, IS Success Model, Public Value Theory, Small and Medium Enterprises (SMEs)

CHAPTER 1. INTRODUCTION

This chapter deals with the background and general context of this study. It also includes the problem statement, purpose of the study, intended contributions and delimitations of the study.

1.1 Background and Context

1.1.1. E-government overview

Over the past two decades there has been rapid progress in information and communication (ICT) technology innovations that have encouraged many governments to gradually incorporate the new technology in the provision of goods and services to their citizens (Davison, Wagner and Ma, 2005; Morales, 2018; Palaco, Park, Kim, and Rho, 2019). Governments with such high levels of ICT use are defined in various terms, and one of the most common is "e-government". E-government is a broad term that defines the use by governments and other state entities of ICT, and in particular the Internet and related technologies, as the means for state organizations to provide better services its inhabitants, firms and other organizations that interact with the government (Drew, 2011). This is the definition that was adopted in this study. Some researchers believe e-government involves much more than just technological developments and innovations. They view e-government as a reengineering, socio-economic process that affects citizens, organization, companies, the economy and politics (Abdalla, 2012; Abu-Shanab and Shehabat, 2018; Morales, 2018). Similarly, others describe e-government as fostering an e-society through which relationships are developed between the state, enterprises, and societies, and thus improving service delivery and the communication between the state, businesses and civil society (Bwalya, 2012; Palaco *et al.*, 2019; Twizeyimana and Andersson, 2019). Therefore, there is an inherent need for the development of e-government systems that will enable the state and other public entities to deliver excellent services to their citizens.

1.1.2 *Types of E-government*

E-government systems are generally classified into three broad categories, namely, government-to-government (G2G), government-to-citizen (G2C) and government-to-business (G2B) (Al Salmi, Mohtar and Hasnan, 2017; Iyer, Singh, Salam and Aubeterre, 2006; Kumar, 2017), although some researchers have added another category referred to as "government-to-employee" G2E (Fang, 2002; Mapanoo and Caballero, 2018). G2G is the sharing of ICT infrastructure, processes, data or integration of information systems that

involve two or more state entities, departments or other government agencies, with the goal of enhancing service delivery or to support state initiatives and improve communication between the state entities (Kumar, 2017). G2C is the use of ICT by governments to provide goods and services, and to communicate with their citizens (Pappa and Stergioulas, 2006). G2E refers to the use of ICT to enable government employees to provide efficient services (Mapanoo and Caballero, 2018). G2B is when governments utilize ICT innovations to communicate with businesses and facilitate the provision of goods and services (Kumar, 2017). This is done in an attempt to reduce red tape and other operational barriers, and to save costs and time. This study focused on the G2B aspect of e-government, through the assessment of the CSD system, which was introduced by the National Treasury in South Africa in attempts to enable businesses to provide goods and services to government entities more efficiently.

1.1.3 *Stages of e-government maturity*

E-government researchers typically use maturity models to describe the attributes and rank the quality of e-government systems, including technological and organizational capabilities (Fath-Allah, Cheikhi, Al-Qutaish and Idri, 2014; Pardo, Nam and Burke, 2012). An e-government maturity models comparative study by Fath-Allah *et al.* (2014) reveals that there is a wide variety of e-government maturity models, ranging from three stage models to six stage models. The study reviewed 25 articles and showed that while there are many similarities and differences within the models, there is a main common theme that exists in all these models. Stage one defines e-government systems at the most basic level, such as websites displaying static information to citizens. The transitional stages vary from model to model, however, most of these stages have elements of interaction between governments and the capability to search for information and enabling data transfer, including email communication. The next phase shows systems that are nearing full maturity. These systems have the capability to process full transactions online, including being able to perform financial transactions such as payments.

The highest stage in most of these models involves systems that are not only able to process complex transactions online, but systems with sufficient levels of integration between state entities to enable them to seamlessly share information and provide better services to their citizens. One of the main purposes of this study was to evaluate the effect e-government systems on companies. In particular, how the success of an e-government system can contribute to the reduction of administrative burden on companies. According to Arendsen, Peters, Ter Hedde and Van Dijk (2014), e-government systems are usually presented as having the potential to reduce the administrative burden on companies in many countries. The authors state, however, that the successful implementation of such systems and underlying assumptions are hardly evaluated in empirical studies. This study focused on a mature e-government system with sufficient levels

of integration because stage one systems have less potential to contribute to the reduction in administration burden on companies since they are mainly for displaying static information. Whereas highly mature e-government systems have attributes that can potentially connect state entities across boundaries to share information and integrate services, thereby potentially contributing to improved government service delivery to businesses (Pardo, Nam and Burke, 2012). The quality and transformational aspects of an e-government system, rather than just quantity, are more vital in the improvement of public administration and provision of services through information and communication technology (Kwok, 2014).

1.1.3 *System integration overview*

Systems integration, within the context of this study, is the creation of a larger unit and merging the systems of government entities for the purpose of sharing information and the alignment of processes (Scholl and Klischewski, 2007). The need for systems integration was conceptualized early within the information technology sector when organizations realized that they needed better organizational coordination when preparing responses to business situations and making better decisions (Goodhue, Wybo and Kirsch, L.J., 1992). Within the public sector in particular, integration is seen as means to share knowledge and resources necessary for efficient service delivery by coordinating government programs and services, and sharing information, government networks and other infrastructure (Alshehri and Drew, 2011; Manda, 2017). Integration has potential to lead to government services that are more inclusive, effective, efficient, and faster than before for both citizens and businesses, and can also lead to the internal effectiveness and efficiency within individual government departments (Scholl and Klischewski, 2007). Some academics have argued that systems with high levels of integration also show the highest levels of e-government maturity (Manda, 2016; Pardo, Nam and Burke, 2012; Thi, Lim, and Al-Zoubi, 2014). For example, a study by the United Nations Division for Public Economics and Public Administration identified five stages of the e-government model, with the highest stage described as seamless if it had comprehensive integration of e-government services across organisational boundaries (Alshehri and Drew, 2011).

Although many researchers have studied the success or the evaluation of key aspects of e-government systems, few studies focus specifically on evaluating the success of e-government systems and its effect on businesses. Most e-government research usually focuses on the adoption or the diffusion of e-government systems (Baharon, Yap, Ashar, Hanafi and Hazmi, 2017; Belanche, Casaló and Flavián, 2012; Veeramootoo, Nunkoo and Dwivedi, 2018) or the evaluation of the quality of e-government systems in general (Al Athmay, Fantazy and Kumar, 2016; Bhattacharya, Gulla and Gupta, 2011; Lee and Levy, 2014). It is this gap in understanding the benefits brought by the success of an e-government system to businesses that this research will attempt to answer, especially for small and medium enterprises (SMEs) within the South African

context, which is a country in a region where this phenomenon is even less understood. This can be shown by a review of 97 articles identified for this study, with only 14.43% of the papers coming from this region, with an even smaller percentage of the papers focusing on private companies. The summary of these articles is listed in Appendix B.

1.1.5 *Administrative burden on businesses*

The reduction of administrative burden on companies has been a focus of governments and academics across the world (Di Mascio, Natalini and Stolfi, 2017). A number of researchers in Africa have listed bureaucratic red tape, lack of trust in government and lack of flexibility as significant barriers to business and citizens in general in many countries in this region (Abdalla, 2012; Amegavi *et al.,* 2017; Ouma, 2014; Robert, 2013; Ruhode, 2013). Minimizing bottlenecks and queues in the delivery of services and improving the quality of processes and services contribute to improving the administrative efficiency of governments (Castelnovo, 2013). The administrative burden can be described as the financial and other costs incurred by businesses in compliance with regulations and other obligations imposed by governments (Arendsen *et al.*, 2014). These include information and compliance obligations such as registration, reporting, monitoring, and all other assessment activities needed to comply with government directives.

In South Africa, some of the documents required for businesses to comply with government bids include company registration documents, a valid tax clearance certificate and a valid B-BBEE certificate and several other documents (Department of Planning, Monitoring and Evaluation, 2015). Complying with these can be a significant burden, especially to businesses that conduct business with multiple government departments and other state entities. Reducing the administrative burden involves the efficiency, effectiveness, improved quality, and reduced costs for administration processes, procedures and systems (Twizeyimana and Andersson, 2019). It also means minimizing bottlenecks and queues in the delivery of services. This means reducing the administrative burden can also include non-financial costs. For example, in 2006 the United Kingdom government initiated the implementation of e-government solutions and services that were aimed to reduce the amount of time that it takes businesses to perform certain activities by reducing search, communication and transaction times (UK Cabinet Office, 2006).

1.1.6 *Small and Medium Enterprises (SMEs)*

Small and Medium Enterprises are generally regarded as engines for economic growth in many countries. This is recognized by academics and business practitioners, as well as by many governments (Aristovnik

and Obadić, 2015; Engineering News, 2019; Forbes, 2019; Mencinger, Aristovnik and Verbič, 2014). SMEs are frequently viewed as the most important catalyst for economic growth, with the percentage of companies that are classified as SMEs making up 99% of the total number of companies in some regions, such as the United States of America and the European Union (Bhaird, 2010; Virglerová, Dobeš and Vojtovič, 2016). The South African government established the SA SME Fund after a joint initiative with major businesses to address some of the major challenges affecting the country's economic growth (Forbes, 2019). These types of initiatives were also supported by the Business Unity South Africa (BUSA), which formed the Small Business Working Group to seek solutions to the challenges that are facing the economy (Engineering News, 2019). According to BUSA president, Sipho Pityana, the SME sector can play an essential role to the growth of the South African economy. To work towards accomplishing some of those goals, they worked with other entities such as the Small Business Institute (SBI) and the South African Chamber of Commerce and Industry (Sacci) in attempts to address the legislative, regulatory and policy changes needed to grow the SME sector. According to Aristovnik and Obadić (2015), policy makers play a critical role in developing a suitable and healthy business environment by establishing property rights, reducing the costs of resolving disputes, increasing the predictability of doing business, and minimizing the hindrances experienced by business start-ups when they try to establish new businesses.

Red tape and bureaucracy create a disproportionate administrative burden on SMEs compared to larger companies (Aristovnik and Obadić, 2015; Ntaliani and Costopoulou, 2017). As a result, countries with the lowest costs for SMEs and those with shortest time that is spent on tax administration and enforcing contracts procedures are found to have the best SME growth. According to Ntaliani and Costopoulou (2017), one of the main objectives of e-government is to enable state policies to be efficient and providing improved access to public administration, and reducing the administrative burden on companies in a cost effective manner. This is done through initiatives that, among other things, simplify the process of conducting transactions with state entities, and enable the sharing information and experiences, and eases the process of information retrieval, access, usage, and utilisation of e-government services. Mature e-government systems are also viewed by other academics as having the quality and transformational aspects with greater potential to provide better public administration through different value perspectives, including better administration, improved service delivery, productivity and cost savings (Kwok, 2014). Other studies have also found that state entities can attain significant benefits by implementing e-government initiatives to minimize the administrative burden on corporations, particularly SMEs (Ebenezer, 2018). These initiatives include e-registration, e-procurement systems such as the Central Supplier Database (CSD) and e-taxation portals such South African Revenue Services e-filing that enable companies to carry out their various business processes

and transactions that are necessary for the enterprises to be established and continue to conduct their business.

1.1.7 *CSD System Overview*

The Central Supplier Database (CSD) was introduced by the National Treasury in South Africa in April 2016. The National Treasury describes the system as "The Central Supplier Database maintains a database of organizations, institutions and individuals who can provide goods and services to government. The CSD system serves as the single source of key supplier information for organs of state from 01 April 2016, providing consolidated, accurate, up-to-date, complete and verified supplier information to procuring organs of state" (Central Supplier Database, 2019). The CSD system is therefore suitable for the purposes of this study since it has the attributes of a system that this study aims to evaluate. It is a system in which information systems from different government organizations will be integrated and also be potentially interoperable to seamlessly and effectively utilize the same database and share key information, including tax and company registration information.

These types of systems are frequently described as having characteristics of highly mature systems in most maturity models described above. The system meets the requirements for an integrated system because when a supplier registers within the system, critical information can be verified directly from the system without the supplier having to provide the details from another state agency. For example, a supplier previously was required to register and provide tax clearance details to each state organization it wanted to provide goods and services to, which may even be a dozen or even more entities depending on the goods and services provided. In the new process, a supplier would only need to ensure that their details are up to date with the South African Revenue Services (SARS), and the CSD system will be able to verify the details through integration with the SARS systems both during the registration period and also through constant updates. The updates are provided daily to state organizations through bulk files or real time services. In addition to potential reduction of both financial and administration costs to suppliers, this also ensures that each state organization always have up to data verified information at all times, thus potentially reducing regulations compliance costs.

Although there are other e-government systems in South Africa with high levels of maturity such as the SARS e-filing, the CSD system was selected for this study because it has most attributes required for the purposes of this study. It is one of the few e-government systems that were designed specifically for companies or business people. And its mandatory nature means all companies, including SMEs, must register and use the system to bid for government business, unlike in other systems where participation is completely

voluntary, or in some cases, where SMEs are not required to use the system. For example, a supplier may choose to visit SARS offices directly, and in any case most SMEs are not required to register as VAT (Value Added Tax) vendors if they do not meet a certain income threshold. Companies are only required to register for VAT if their income exceeds R 1 million per year, and are only allowed to register on a voluntary basis if their income exceeds R50,000 per annum (SARS, 2019). The CSD system also meets the criteria of a highly mature system as described above, because in addition to allowing companies to perform complete transactions, the system also has elements of integration between government departments as described above, thereby having the potential to reduce administrative burden on companies.

1.2 Problem statement

The review of 97 studies mentioned above revealed that only 14% of the papers that were reviewed were from Africa, and most of those studies focused on e-government adoption or success in general, and a few focused on the effect of e-government systems on companies, in particular SMEs. According to some researchers, few studies have focused on the effects of e-government initiatives on SMEs (Kwok, 2014). Additionally, few of those studies from Africa focused particularly on the evaluation of mature e-government systems. Out of the 97 articles that were reviewed for this paper, only six focused on the impact of e-government initiatives on companies. Most of the studies focused on e-government adoption by citizens (67.01%). Despite the numerous e-government studies, the measurement of e-government success is arguably still not well understood by both practitioners and researchers (Heeks, 2008; Scott, DeLone, and Golden, 2016; Stefanovic, Marjanovic, Delić, Culibrk and Lalic, 2016).

Therefore, there is lack of empirical studies that validate the benefits mature e-government systems, which makes it very difficult for governments to understand the influence and success of such systems and to properly plan for their e-government initiatives.

The need to understand the net benefits of e-government systems is especially important when considering the high costs usually associated with implementing mature e-government systems. Governments also need to be able to justify the public value derived from investing in e-government systems. Therefore, there is gap in understanding the public value of mature e-government systems, which provides an opportunity to study the success of mature e-government systems, particularly on companies within the South African context. In addition to a loss of significant financial resources that usually occurs when e-government projects fail, administrative burden on businesses, especially small ones, can have a big impact on their success. According to Arendsen *et al.* (2014) compliance costs not only hamper economic growth in general, but present a particularly significant burden on small companies. Red tape and bureaucracy may impose a more

disproportionate administrative burden on SMEs than on larger companies with bigger budgets (Aristovnik and Obadić, 2015; Ntaliani and Costopoulou, 2017). This could have a devastating impact on a developing country with low economic growth rates and high unemployment rates such as South Africa.

1.3 Purpose of the study and Research Objectives

The purpose of this study was to use the DeLone and McLean IS Success model with elements of the Public Value theory to test benefits of a mature e-government system, the South African National Treasury's Central Supplier Database (CSD).

The CSD database is used to register companies who want to conduct business with any government department and state owned entities. This system has attributes of a mature e-government system that will enable this study to focus on investigating the effects of an e-government systems on companies (G2B) in South Africa, and thus potentially understanding the benefits of such systems. The IS Success model was adopted to account for the nature of complex e-government systems. To accomplish this goal, this study aimed to achieve the following research objectives:

1. Conduct a literature review of e-government systems.
2. Expand on the DeLone and McLean IS Success model with the inclusion elements from the Public Value theory as a theoretical lens underpinning this study.
3. Test the relationships between the constructs of the model that are predicted to contribute to the success of mature e-government systems.
4. Discuss the findings.
5. Offer recommendations on future work.

1.4 Intended contribution of the study

1.4.1 *Contribution to theory*

This study aimed to produce useful knowledge through the evaluation of the success of mature e-government systems, which is a topic attempted by few studies, especially in the Sub Saharan African region. The study also attempted to add to the body of knowledge in the Information Systems discipline by validating the updated DeLone and McLean IS Success model and integrating some aspects of the public value theory in order to understand less explored aspects of the e-government discipline, both in terms of the complexity of

the system, through the evaluation of a system with high maturity, and also in terms of the demographics involved. As already discussed above, very few studies in developing countries evaluate the effect of complex e-government systems on companies. Additionally, as shown in the reviewed literature described below, there are few studies that validate the IS success complete model, especially in the Sub-Saharan Africa region, thus the study potentially added to the body of knowledge by validating the complete IS Success model.

1.4.2 *Contribution to practice*

This study will potentially assist government officials, IS practitioners and researchers understand the e-government phenomenon within the Sub Saharan Africa context and also to understand the various factors that influence the success of mature e-government systems. It may also help guide policy makers towards making the most appropriate decisions. Since implementing and sustaining mature e-government systems is usually complex and expensive, governments need to understand the net benefits that can be attained from such systems, and learn to anticipate the factors that may impede successful implementation of such systems. The Sub-Saharan Africa region suffers from a lack of funds, lack of infrastructure, lack of ICT skills and high levels of inequality, and as a result, governments in this regions usually have to prioritize scarce resources to a greater extent than other regions (Abdalla, 2012; Bwalya and Mutula, 2016; Matavire *et al.,* 2010). Therefore, if the benefits of such systems are not clear enough, state entities may decide not to pursue the more complex e-government systems. Additionally, the e-government concept has been proposed by some industry leaders as a means to enable economic development in the fourth industrial revolution. For example, Alibaba's Jack Ma made the following remarks during the recent South Africa Investment Conference, held from the 25th to the 27th October 2018: "It is important for government to be 'e-government', we have to make sure that the sure government is digitalized. If government is digitized, it serves people better" (SABC News, 2018). This shows that both governments and business leaders acknowledge the important role that e-governments can play in uplifting countries and their inhabitants, and this research paper aims to aid in the efforts to understand the concept better. The CSD system offers a unique opportunity to understand the potential economic benefits, organizational efficiencies, improved public administration and public value that may be brought by e-government initiatives to companies in South Africa.

1.5 Delimitations of the study

This study encompassed the following:

- Companies using the system the CSD system to register their businesses, and for conducting business with government entities.
- Only small and medium enterprises (SMEs) were sampled for this study.

The following were regarded as out of scope for the research:

- The individual citizens and employees' interaction with the CSD system.
- The challenges or successes concerning the actual implementation of the system by government entities.

CHAPTER 2. LITERATURE REVIEW

This chapter presents the literature review methodology and results of a literature review on e-government, and also discusses e-government evaluation, benefits and challenges and as well as models, theories and frameworks most commonly used in in e-government studies. The first section describes how the literature review was carried out and presents the results of that review. Next, the benefits and challenges of e-government, and e-government evaluation and theories are discussed. The chapter concludes by discussing and presenting the theoretical underpinnings, research model and the associated hypotheses that were developed for this study.

2.1 Literature Review Methodology

A literature review was conducted in order to provide a clear view of the studies that evaluate the success of e-government systems, including the models, theories or conceptual frameworks that that were used in each of the studies. This section discusses the protocol that was followed to conduct the literature review, and the next section discusses the results of the review.

2.1.1 *Data sources*

The databases selected for this study were ACM Digital Library, EBSCO Host, Springer LINK, Emerald Insight, ScienceDirect, IEEE Xplore, ProQuest-ABI/INFORM Complete, Taylor and Francis, and Google Scholar. These databases were identified from similar, peer reviewed studies that were addressing similar topics and concepts.

2.1.2 *Search criteria*

The phrases and words used in the in the data search were guided by the topic and objectives of this paper, therefore main terms used for searching were “e-government” and “success”. Other alternative terms for ‘success” such “benefits”, were not used because the results were not significantly different that those already obtained. Similarly, other alternative terms for e-government, such as “Public Sector”, “Smart Government” and “Government to Government (G2) “, “Government to Business” and “Government to Citizens”, were not used because the results were also not significantly different from the results which were already returned. Only studies from 2008 and 2018 were included in the search criteria.

2.1.3 *Inclusion and exclusion criteria*

This process was carried out in several iterations. After a search in each of the mentioned databases, the first phase included selecting all peer reviewed journal and conference articles based on the title, abstract, and introduction (where necessary) of the paper to first verify if the studies were relevant to the topic and that they addressed the research objectives. The next phase of this process involved examining the initially selected papers in detail to determine if they were empirical studies that evaluated success the success of e-government systems. A key criterion that was used to select papers for review was that the research must measure at least one of the dimensions that are usually used to determine the success of e-government systems. If the purpose of the study was carried out to only list critical success factors but not evaluate them, the paper was excluded. However, if the purpose of a study was to list the success factors, then also evaluate the success of the system using at least one criteria, the paper was included. A paper was included if it evaluated any of the aspects used to measure system success in the information systems (IS) field, such as system quality, user adoption, user satisfaction, system use and quality of information. If the same study was published in different versions, only the latest version was included because it may provide the latest and most comprehensive analysis. Only articles written in English were included to ease the analysis process without concerns about interpretations.

2.1.4 *Data retrieval and synthesis*

The data retrieval and synthesis process resulted in 97 papers being selected for final review. The process started by first searching through the aforementioned databases, using the search criteria already mentioned in the section above. The descriptive synthesis approach was used for this study. This approach, also referred to as the narrative/qualitative or thematic analysis, is used to collate and summarize the results derived from multiple studies using a qualitative process (Cruzes and Dyba, 2011; Snilstveit, Oliver and Vojtkova, 2012). According to Cruzes and Dyba (2011), this approach relies heavily on words and text to summarize and explain the findings. The 97 included papers were determined to have met the final inclusion criteria after a qualitative analysis of the 159 papers that passed the initial search and inclusion process.

To enhance the enhance the transparency of the data retrieval and synthesis process as per the recommendations of Snilstveit, Oliver and Vojtkova (2012), the results of the process were captured in a summary evidence table, and the following information was recorded: Reference, Purpose of the study, Year, Methods Used, Demographics / Population, Sample Sizes, Model/Framework used/ Theory, Country, Key Findings, Limitations and Type of paper. This evidence table was adopted from a working paper by Bancilhon and Cohen (2012) and amended to meet the objectives of this paper. The approach involved an

in-depth analysis of the introduction, methodology and findings/conclusion sections to determine if the paper met all of the conditions for inclusion in this paper.

2.2 Benefits and challenges of mature e-government systems in Africa

An analysis was also performed to identify benefits and challenges of mature e-government systems in Africa, in particular those factors that are associated with government administration. Table 1 shows some of the factors most commonly listed as challenges of mature e-government systems in Africa. These factors reflect how certain external environment and organizational factors affect the administration and management of government initiatives that are meant to provide goods and services to their citizens and companies. According to Welch, Hinnant and Moon (2004), these ICT innovations were meant to provide governments with the means to share more information about service delivery and government administration. However, the provision of these technologies are usually not sufficient to cater concerns of the users of these systems, including security and bureaucratic issues, which may affect the level of citizens' trust in government. According to Bennet (2015), there a positive link between the levels of trustworthiness in government and the intentions to use e-government systems. This analysis also shows how overly complicated administrative procedures can negatively affect the administration of e-government systems, regardless how well developed and matured the systems are. Other factors particularly relevant within this region and for SMEs include the digital divide, social exclusion and inequality, inadequate ICT infrastructure and poor internet penetration.

Table 1 - Challenges of e-government systems in Africa

Factors hindering e-government	References
Lack of comprehensive e-government and ICT strategies	Bwalya and Mutula (2016); Onyancha (2008)
Lack trust in government	Bennett (2015); Mutula and Mostert (2010); Olumoye and Govender; (2018); Onyancha (2008)
Bureaucratic red tapes and lack of flexibility	Abdalla (2012); Amegavi *et al.* (2017); Ouma (2014); Robert (2013); Ruhode (2013)
Digital divide, social exclusion and inequality	Abdalla (2012); Matavire *et al.* (2010); Nkwe (2012); Olumoye and Govender (2018); Pillay (2013)
Inadequate ICT infrastructure and poor internet penetration	Abdalla (2012); Bwalya (2009); Heather (2015); Manda (2017); Mutula and Mostert (2010); Mutula (2008); Nkwe (2012); Olumoye and Govender (2018); Onyancha (2008); Pillay (2013); Robert (2013); Ruhode (2013); Schuppan (2009); Wilkins (2016)

Lack of security, confidentiality and privacy	Abdalla (2012); Amegavi *et al.* (2017); Ashaye and Irani (2014); Gathungu and Mungai (2012); Heather (2015); Mutula (2008); Nkwe (2012); Olumoye and Govender (2018); Onyancha (2008); Ouma (2014); Pillay (2013)
Lack of clear polices, rules, regulations and legal framework	Abdalla (2012); Ashaye and Irani (2014); Gathungu and Mungai (2012); Heather (2015); Manda (2017); Mutula and Mostert (2010); Mutula (2008); Olumoye and Govender (2018); Onyancha (2008); Ouma (2014); Ruhode (2013)

Table 2 shows the benefits that are expected from well-developed e-government systems, when implemented and used properly. The most significant factors that were identified include the increased efficiency, decision making and faster responsiveness of governments departments that have fully implemented matured e-government systems and processes, and the improved quality of service delivery. The study by Gathungu and Mungai (2012) shows that e-government integration and interoperability can improve the connection to government through easily accessible electronic means, which in turn increases efficiency through the faster dissemination of state information to a wider audience. The article by Nkwe (2012) describes how the introduction of the Integrated Patient Management System and Health Workers System was used by the government in Botswana as a way to improve the quality, safety, timeliness and efficiency in the provision of health services. The findings from the study of five public sector organizations in Nigeria by Olumoye and Govender (2018) reveals that matured e-government systems provide a reliable medium for delivering dependable services and enhancing the quality of services. These conclusions are supported by the findings from a case study by Robert (2013), who interviewed workers from President's Office-Public Service Management in Tanzania. The respondents of the study identified faster services, up-to-date information, increased communication, greater access to important information and increased transparency as playing a critical role in improving the quality of service delivery. However, there is a relatively smaller number of sources that empirically identify and support the evidence related to the benefits of matured e-government systems, especially when compared to those sources that identified and listed the challenges. Therefore, more research needs to be carried out to empirically confirm the veracity of these benefits within the African context. A number of the factors that were identified during this analysis were incorporated in the research model of this study, as described in Section 2.5 below.

Table 2: Benefits of e-government systems in Africa

Benefits e-government	References
Improved exchange of information, reduction of duplication, and reduced data collection, process, and storage	Abdalla (2012); Olumoye and Govender (2018)
Reduction of the overall administrative costs	Ashaye and Irani (2014); Gathungu and Mungai (2012); Robert (2013); Schuppan (2009)
Improve productivity	Ashaye and Irani (2014); Olumoye and Govender (2018)
Transparency and accountability	Bennett (2015); Gathungu and Mungai (2012); Robert (2013)
Quick and prompt information sharing	Ashaye and Irani (2014); Bwalya (2009)
Improve quality of service delivery	Ashaye and Irani (2014); Bennett (2015); Hassan, Mike and Guyo (2017); Nkwe (2012); Olumoye and Govender (2018); Robert (2013)
Increased efficiency , faster responsiveness and decision-making	Ashaye and Irani (2014); Gathungu and Mungai (2012); Nkwe (2012); Robert (2013); Robert (2013); Schuppan (2009)

2.3 Theories, models and frameworks in e-government research

Governments have experienced varying degrees of successes and failures in their efforts to establish themselves as e-governments. As a result, there have been numerous studies over the years that have been conducted to empirically assess the success of e-government systems (Abdalla, 2012; Kassim and Hussin, 2013; Napitupulu, Syafrullah, Rahim, Amar and Sucahyo, 2018; Pillay, 2013; Toots, 2019). Most of the studies seem to support the predictive capacity of the models used to evaluate the success of e-government systems to varying degrees of effectiveness. Most of the key factors that were evaluated were determined to have a significant positive impact on the dimensions that were being measured, such as “system quality”, “user adoption”, “user satisfaction”, “system use” and “information quality”. Nevertheless, three models in particular were found to reveal particularly significant results in assessing the success of e-government systems: UTAUT, TAM, and the IS Success Model. As shown in Appendix B, these models were also the three most widely used models. These results support findings by other literature reviews, such the one by Rana, Williams, Dwivedi and Williams (2012), which found that TAM, the IS Success Model and UTAUT were the first, second, and fourth most widely used models in e-government research, respectively. TAM is also one of the earliest technology acceptance models in the IS field (Davis, 1989). All of the studies under review that used TAM showed that the main constructs of the TAM have a strong influence on the intention to use e-government systems. The findings of the study by Shyu and Huang (2011) revealed that “perceived learning value” influenced “perceived usefulness” and that “perceived enjoyment” affected the “perceived

ease of use". The findings also showed that "perceived ease of use" had a significant effect on "perceived usefulness", which also influenced both "attitude" and "behavioral intention". Finally, the results showed that "behavioral intention" had a significant impact on the actual use of the system in turn. Taken together, these findings substantiate the predictive capacity of the TAM model.

The findings were supported by Hamid *et al.* (2016), who found that "perceived usefulness" and "perceived ease" of use were positively linked to continued "intention to use" the e-government system. The other papers that used TAM reached similar conclusions. However, a meta-analysis by Rana *et al.* (2012) seems to suggest that there very little evidence exists to support the direct relationship between some of the constructs, such as between "perceived ease of use" and "behavioral intention". Nevertheless, the same study did find enough evidence to support the direct relationship between "perceived usefulness" and "behavioral intention". Moreover, an analysis of the reviewed papers also revealed that TAM on its own is a not sufficient theoretical tool for a more complete analysis and understanding of most factors used within the e-government context to measure the success of systems. For instance, Al-Hujran *et al.* (2015) suggested using TAM constructs together with social-economic, cultural and political factors to reflect the unique nature of e-government initiatives.

UTAUT was conceptualized to address some of the shortcomings of individual models such as TAM. An integrated model, it was formulated by Venkatesh, Morris, Davis and Davis (2003) to address some of the limitations of the models they compared. These limitations include the complexity (or lack of) of technology studied, the type of subjects who participated in the studies, the timing of measurement, the nature of measurement and the lack of studies examining mandatory usage of systems. The authors reviewed eight different models to design their unified model. The models that were reviewed were the "social cognitive theory", the "theory of reasoned action", "innovation diffusion", the "model of PC utilization", TAM, the "motivation model", the "theory of planned behavior", and a combination of TAM and the "theory of planned behavior".

The reviewed studies also show that UTAUT generally performs well when used to predict the usage of e-government services. For example, the findings of a study by Gupta, Dasgupta and Gupta (2008) indicated "social influence", "performance and effort expectancy" and "facilitating conditions" had a significant positive effect on the use of e-government services. Kurfalı, Arifoğlu, Tokdemir and Paçin (2017) also revealed that "performance expectancy", "social influence", "facilitating conditions" and with the addition of the "trust of internet" variable had a strong effect on "behavioral intention" to use e-government services. This support the results of a meta-analysis by Rana, Dwivedi and Williams (2013) that showed that of all the constructs' relationships of the UTAUT model are significant. Although the authors also add that more

e-government adoption research is still needed to substantiate the model because of the model's unified nature and in order to examine the constructs of the model using other important and relevant moderating variables.

It is also important to consider that "system use", "user acceptance", "adoption" and "user satisfaction" alone do not necessarily mean that a system can always be considered successful or that end users have realized net benefits from the system (Hasan *et al.,* 2018). When system use is mandatory, system use usually cannot be considered a useful measure of system success on its own (DeLone and McLean, 1992; Seddon and Kiew, 1996; Seddon, 1997). Other researchers also suggest that "intention to use" is not always the most reliable predictor of actual usage in post-adoption of a system and therefore, may not be enough to explain the success of a system in the long run (Floropoulos, Spathis, Halvatzis and Tsipouridou, 2010). Additionally, past research has revealed that multidimensional aspects should also be considered when measuring complex government information systems in order to realize the desired success (Hasan *et al*., 2018).

This was particularly relevant for this study since the main purpose of this study was to measure the success of mature e-government systems, therefore, measuring only factors such as "system use" and "user acceptance" would not reveal much about other the aspects of such systems. These type of systems are considered by some researchers as more complex and with the highest levels of e-government maturity because they include elements such as integration (Andersen and Henriksen, 2006). Researchers Hasan *et al.* (2018) also agree with arguments advanced by DeLone and McLean (1992) that, because the success of information systems is a multidimensional concept, researchers also need to consider the multidimensional factors when measuring complex information systems, as it is the case with highly mature e-government systems. The authors suggest that the DeLone and McLean IS success model is one of the most appropriate models that can be used to measure the multiple dimensions involved in information systems, including the technical aspects, accuracy, effectiveness and efficiency of the system, how users perceive the system and the quality of the information produced by the system.

In addition to the multidimensional factors associated with information systems success, there other factors to consider within the e-government context. For example, several studies identified trust as a significant factor that may affect e-government success. Teo, Srivastava and Jiang (2008) showed that "trust in government", but not "trust in technology", was positively linked to trust in the e-government system they were evaluating. Trust seems to be a significant factor linked with e-government studies. The findings by Chen *et al.* (2015) revealed that "trust in technology", "trust in government", and "previous experience" had a direct influence on all three IS quality measures affected the trust in e-government websites. This in turn also had a direct effect on all three IS quality dimensions. Lean *et al.* (2009) used the trust concept in

conjunction with the TAM and the diffusion of innovation (DOI) theory and found that variables such as "trust", "perceived usefulness", "perceived relative advantage" and "perceived image" had a direct significant association with the "intention to use" the e-government system under examination. Trust was also one of the significant factors identified by Scott, DeLone and Golden (2016) when they used the Public Value theory to realign the IS Success Model and formulate the three key success or value dimensions in their study: efficiency, effectiveness and social value.

Some researchers have argued that an although association exists between the key constructs of the IS Success model such as "system quality" with "intention to use", the relationship between "system quality" and "user satisfaction" is either insignificant or inconclusive within the e-government context (Rana *et al.,* 2012; Wirtz and Kurtz, 2017). Nevertheless, the same authors also suggested that this may be because users of e-government systems themselves may not completely understand the net benefits of the systems, and may also not be aware of the advantages of using the e-government services. They also argue for more such examinations of the relationships between these variables to show the extent of significance between them more accurately. Rana *et al.* (2013) also reached similar conclusions, and suggested that the reason there may be inconclusive findings reached by studies using this model may be because of the limited number of studies analyzing the complete model empirically in e-government adoption research.

An analysis of the ten studies identified in this paper that solely used the DeLone and McLean Success Model as a theoretical lens revealed that most hypothesized associations between the success variables are significantly supported by the findings. Furthermore, some of the empirical studies directly contradict the findings of the meta-analysis by Rana *et al.* (2012) and Rana *et al.* (2013), while others support the findings. For instance, while the findings of the study Abdelsalam *et al.* (2012) showed that "system quality" has a significant influence on both "use" and "user satisfaction", the study by Chen *et al.* (2015) suggests that "system quality" does not affect "perceived usefulness" and "user satisfaction". The overall conclusions reached by this study also support the argument that the predictive capacity of the IS Success Model is inconclusive in e-government studies because the relatively low number studies that employ the complete model in this field and that more empirical research is needed to validate the model within the e-government context. This study attempted to address this gap by using the complete DeLone and McLean IS Success model and including some other elements that are discussed in Section 2.5.

2.4 E-government Systems Evaluation

Of the 97 articles selected for this study, only six focused on the effect of e-government systems on companies. Of these six, only one studied the role e-government system on administrative burden on

companies. However, the study by Arendsen *et al.*, (2014) was more focused on the organizational characteristics that are perceived as influencing factors of burden reduction, and not on the success of such mature e-government system from the perspective of companies. The study by Kwok (2014) did evaluate the benefits of an e-government system from the perspective of companies, but the focus was more on the role of service providers in facilitating the provision of e-government services than on the value of mature e-government systems.

Some e-government research that focused on the benefits of complex e-government systems was done from the perspective of citizens. Scott *et al.* (2016) proposed incorporating the Public Value theory to the IS Success model to understand the benefits of using an e-government system. Three elements in particular were added to the Net Benefits construct, namely, efficiency, effectiveness and improved democracy. The authors came up with these three broad categories after conducting a systematic literature review. Under the "Efficiency" dimension; cost, time, ease of information retrieval and communication were listed. The "Effectiveness" dimension included convenience, avoidance of personal interactions and control. "Improved democracy" was the other category, which included elements such as "trust" and "transparency". According to Twizeyimana and Andersson (2019), in addition to effectiveness, efficiency, improved quality and reduced costs, administrative efficiency also means enabling government operations to be more responsive through participation, inclusiveness and transparency. Other researchers such as Hellang and Flak (2012) also support the notion that the value derived from state entities is structured differently from private companies. They state that state entities should not only focus on profitability, but must also be concerned with other factors such as transparency, accountability, fairness and increasing democratic participation. Other Measures under "improved democracy" include "well informedness" and "participation in decision making" (Scott *et al.,* 2016).

Although a lot of theoretical research has been conducted on these public value concepts, some researchers have expressed the view that little empirical research has been done to validate these concepts. According to Ha (2016), most of the research that has been done it this area has been mainly focused on developing public value-based conceptual frameworks, with little empirical evidence provided to verify the validity of those frameworks. However, there has been studies that have attempted to perform empirical validation, such as the study by Scott *et al*. (2016) who carried out survey of 347 users of United States government websites that largely confirmed that the proposed success measure discussed above is reliable and valid. The findings of the study indicated that users found all the three elements of the Public value theory that were incorporated in to the IS Success Models were useful, although they viewed the social and democratic benefits were more useful than efficiency and effectiveness. Ha (2016) also carried out empirical validation of the conceptual model through field surveys. The findings confirmed that effectiveness, public service delivery, and trust

and transparency were the dimensions that create public value through the success of an e-government system.

A qualitative study by Rose, Persson and Heeager (2015) also attempted to understand the value of e-government systems from the perspective of employees. They wanted to understand the value traditions of e-government systems from three different positions. Firstly, through "administration efficiency" which focused on cost-effectiveness, secondly through "service improvement" which is mainly concerned with providing better services for citizens, and lastly through "citizen engagement" which emphasizes democracy, promotes responsiveness, cooperation, consultation and participation. In contrast to the findings from Scott *et al.* (2016), the results of this study showed that there was a strong preference for "administration efficiency", with a lack of concern for "citizen engagement". The differences in views may be because the study by Scott *et al.* (2016) was from a citizen's perspective, while the one from Rose *et al.* (2015*)* was from an employee's perspective. Therefore, more research still needs to be done to understand these concepts better. Additionally, as already mentioned at the beginning of this section, few studies have focused on the public value of e-government systems on companies, more empirical evidence is still needed in this area. This study attempted to evaluate these concepts from this perspective using the IS Success model in conjunction with the Public Value theory, mainly as proposed by Scott *et al.* (2016), while also incorporating concepts from the studies cited in this section and other studies. The next section discusses the conceptual model for this study and also discusses how the concepts introduced in this section were operationalized.

2.5 Theoretical Background and Research Model

2.5.1 Theoretical Background

DeLone and Mclean IS Success Model

This is one of the most commonly used models in the IS field to evaluate the success of systems. It was first developed in 1992 as a more comprehensive model that could cater for the multiple measures of information systems success, as well as the multi-dimensional nature of those measures (DeLone and McLean, 1992). These measures include "System Quality", "Information Quality", "Use", "User Satisfaction", "Individual Impact" and "Organizational Impact". The model was updated in 2003, and the main outcome of that review was the construction of a single dependent variable which they referred to as "Net Benefits", by combining "Individual Impact" and "Organizational Impact" that were previously used to measure IS success (DeLone

and McLean, 2003). The other significant update was the addition of "Service Quality" as one of the main dimensions of IS success.

This model is popular within e-government studies, with ten of the reviewed articles employing it to evaluate systems within the public sector context. It was also one of the most used models to develop the integrated models. For example, Al Athmay *et al.* (2016) used the IS Success Model in conjunction with the UTAUT to examine the relationships in e-government aspects related to "perceived effectiveness", "system quality", "information quality", "user satisfaction", "intention to use" the e-government system and "social influence". Similarly, Fan and Yang (2015), Prybutok, Zhang and Ryan (2008), and Scott *et al.* (2016) used the IS Success Model with other models to evaluate key success factors and other attributes of e-government systems. According to Abdelsalam, Reddick and El Kadi (2012), the IS Success Model has been successfully utilized to evaluate information systems in both the private sector and public sector systems. About half of the papers that employed the model within this literature review examined all six elements of the updated IS Success model.

Most of the studies also reveal strong links between the IS Success constructs, and almost all of the hypothesized relationships are supported by the findings to a varying degree. The usefulness of the IS Success Model has been enhanced in recent years by researchers such as Scott *et al*. (2016) to ensure that the model is capable of measuring the effect of information systems beyond its practical usefulness. In addition to measuring productivity, efficiency and task improvement of systems, the theory has evolved to measure wider range of value attitudes, including social and environmental factors. Therefore, the updated and evolved IS Success Model is suitable for measuring a technically complex e-government system, which also has socio-economic dimensions, such as the one that was identified for this study.

Public Value Theory

According to Scott *et al.,* (2016), the public value theory is leading theory used in the evaluation of government policies, including e-government initiatives. The theory seeks to explain the approaches that are used achieve better public administration and also used to implement government policies (Turkel and Turkel, 2016). Most e-government studies that apply the public value theory focus on the outcomes of government policies and initiatives, and their effect on public services from the perspectives of general citizens (Kamau *et al.*, 2016; Patola and Kurniawan, 2016; Scott *et al.,* 2016). This is supported by the trend observed during the analysis of the reviewed papers which found that 65 (67%) of the 97 articles were citizen centric (G2C) and only six of them focused directly on businesses (G2B). However, since e-government

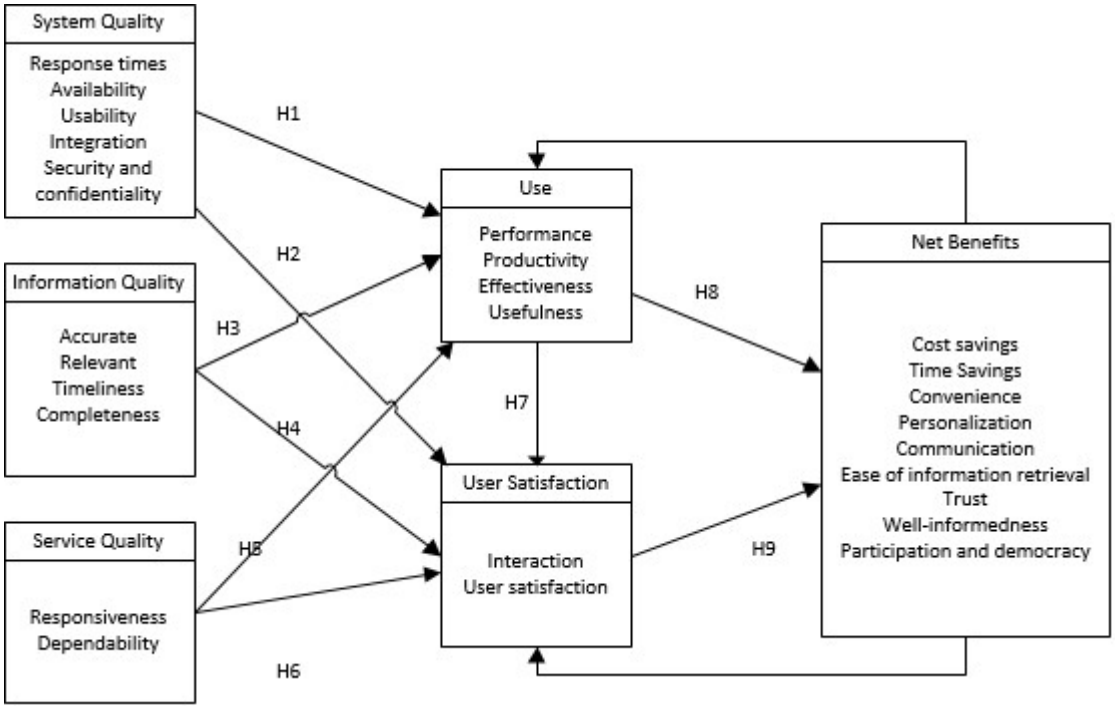
initiatives can affect both individual citizens and companies, a fresh perspective can be attained by using the theory to understand the value of public ICT services that are aimed at companies.

This study adopted a similar approach to that proposed by Scott *et al.* (2016), that is to use the Updated DeLone and Mclean Success Model as a theoretical lens to evaluate the multidimensional nature of IS success, including the technical aspects, accuracy, effectiveness and efficiency, user satisfaction and system use, in conjunction with the Public Value theory to provide a more balanced model and account for the e-government specific factors, including trust and social value. This conceptual model was used to accomplish one of the main objectives of this research project, to evaluate effect of mature e-government systems on companies, in particular the potential to reduce the administrative burden on companies. Additional items from literature in the Sub-Saharan region were then incorporated into the model in order to cater for contextual factors that affect e-government systems within this region.

2.5.2 Research Model

This study used the Updated DeLone and Mclean Success Model to evaluate the multidimensional nature of IS success, while also incorporating Public Value theory to provide a more balanced model and account for the e-government specific factors, including trust and social value (Scott et al., 2016).

Figure 1: Research Model – Adopted from the "Updated DeLone and McLean IS Success Model" (2003)



Hypotheses

All the hypotheses that were derived for the conceptual model of this study, as depicted in Figure 1, were adopted from the updated DeLone and McLean Success Model (2003), Al Athmay, Fantazy and Kumar (2016) and Scott *et al.* (2016), with minor adjustments and a few items added from literature from Sub Saharan Africa, where the study was carried out. The main dependent variable was "Net Benefits", which was deemed to indicate system success if the net effect was positive and failure if the net effect was negative. The updated IS Success model considers all the other variables interdependent rather than independent, however, for the purposes of this study all the other variables were treated as independent except for the "net benefits" measure in order to simplify data analysis. Multiple regression analysis was still used to gain even further insights on the combined effects of the interdependent variables that do not interact directly with the "nets benefits" dependent variable.

A. Independent Variables

Quality Dimensions

All three quality dimensions of the model were measured in this study, namely: "information quality", "system quality" and "service quality" and they were all be based on the updated DeLone and McLean Success Model (2003). Most of the key items in the operationalization of the constructs were adopted from the updated model and complemented by other studies such as Scott *et al.* (2016), with some items from additional studies, as indicated below.

A. System Quality

System quality was used to measure the supplier's perceptions of the technical performance of CSD website, starting from the registration process, the updating and retrieval of information, and using the website to conduct business with different state entities in all nine provinces of South Africa. This quality measure was included in both the original (1992) and the updated model (2003). All measurement items within this construct were adopted as per the updated model because they are all relevant for the context of this research. The nature of the relationships between the variables from the original and updated models were left by the authors for other researchers to hypothesize for themselves, taking into account the context of each particular study. Therefore, the Central Supplier Database is intended to be a highly sophisticated system and of presumably of high quality because of the way it was designed, in this study it hypothesized that the use of the CSD system will lead to increased "system use", which in turn will lead to increased "user satisfaction".

This was supported by the conclusions from a study by Al Athmay *et al.* (2016) and Scott *et al.* (2016), which found a positive association between "system quality" and "user satisfaction" and the "intention to use", which eventually leads to users attaining net benefits.

As discussed above, prior studies predicted and validated that system quality has a positive contribution to "system use" and "user satisfaction" (Al Athmay et *al.,* 2016; and Scott *et al.*, 2016). Hence the first two hypotheses of this study were derived as follows:

H1. "System quality has a positive influence on the Use of the CSD system"

H2. "System quality has a positive influence on User Satisfaction in the CSD system"

Information Quality and Service Quality

According to the updated IS Success Model "service quality" was added to the original quality measures because of the importance of IS support, given the crucial nature of customer service in ICT systems, especially e-commerce. Service quality was used within the context of this study to measure the quality of the service provided by the main service provider of the system, the National Treasury, and the individual state entities that the suppliers deal with. It is necessary, for example, to ask if the service is more convenient, quicker and more responsive now when suppliers register and respond to purchase orders in the new integrated CSD database than it was when they had to register separately with multiple state entities.

"Information quality" is used to measure the accuracy, relevance, understandability, completeness, dynamism, personalization, amongst other elements, of information provided by ICT systems (DeLone and McLean, 2003). The CSD system is expected to provide more up- to-date information of the suppliers through its integration with other state institutions such as South African Revenue Service's systems, therefore information quality can be assumed to be of high and contribute to companies attaining net benefits. Similar to "Systems Quality", both "Information Quality" and "Service Quality" were also found by Scott *et al.* (2016) to participate in a combined significant positive relationship with Net Benefits through "system use" and "user satisfaction". Therefore, the next four hypotheses were derived as follows:

H3. "Information quality will have a positive influence on the Use of the CSD system"

H4. "Information quality will have a positive influence on User Satisfaction in the CSD system"

H5. "Service quality will have a positive influence on the Use of the CSD system"

H6. "Service quality will have a positive influence on User Satisfaction in the CSD system"

Generally, additional measures were incorporated into these quality dimensions, as well as the Net Benefits dependent variable. For example, security, which was also in the updated model, was also identified, together with confidentiality, as one of the most significant barriers to highly mature e-government systems by many researchers in Sub-Saharan Africa (Abdalla, 2012; Amegavi et al., 2017; Ashaye and Irani, 2014; Gathungu and Mungai, 2012; Heather, 2015; Mutula, 2008; Nkwe, 2012; Olumoye and Govender, 2018; Onyancha, 2008; Ouma, 2014; Pillay, 2013). Jiang and Ji (2014) included security and privacy in their model as a variable that was hypothesized to be positively linked to a user's perceived usefulness. Therefore, confidentiality was added next to security as an item in the system quality measure of the conceptual model. Security and confidentiality are a particularly significant factor in the CSD system because, with the capacity brought by information sharing, the personal and some sensitive data of the suppliers is now potentially available to a significantly greater number of government entities and their employees.

Similarly, transparency and accountability were also identified as integral aspects of mature e-government systems by several authors in Sub-Saharan Africa (Bennett, 2015; Gathungu and Mungai, 2012; Robert, 2013). Therefore, these factors were added to the net benefits measure to test whether introduction of the CSD system improves accountability and transparency from state entities in relation to procurement matters, and if it will lead to suppliers preferring to use and being more satisfied with the system.

Use and User Satisfaction

This study also adopted "use" and not 'intention to use" because even though the use of the CSD system is mainly mandatory for suppliers who want to do business with any government entity, the suppliers are still offered the option registering at each individual government entity or even at the offices of the National Treasury, and they can continue to do business individual state entities as long as they are still validly registered on the system. This is to cater for those companies who might not have access to the system or are otherwise unable to use the system for other reasons. Therefore, suppliers can still choose to use or not to use the CSD system and, therefore, "system use" was a useful measure even in this study.

The items that are listed to assess "user satisfaction" were derived from both the updated DeLone and McLean (2003) and Scott *et al.* (2016) and adopted for the purposes of this study. Scott *et al.* (2016) identified the measures from previous studies and specifically adapted them for the e-government context. Both "Use" and "User Satisfaction" were shown to have the associations between "system quality", "information quality", and "service quality" by both Al Athmay *et al.* (2016) and Scott *et al.* (2016). Additionally, both the original and the updated model postulated "Use" and "User Satisfaction" are closely interrelated. Although the use of a system should precede the user's satisfaction, a user's satisfaction will a system will lead to more system use, hence the feedback loop between these two variables. The results from

Al Athmay *et al.* (2016) supported this conclusion that the "User Satisfaction" and “User” variables have a direct effect on each other. Nevertheless, since both the original and updated model theorises that system “use” must precede “user satisfaction”, only the effect of system use on user satisfaction was measured in this study. Therefore, the following hypothesis was derived:

H7. “Use will have a positive influence on User Satisfaction in the CSD system”

B. Dependent Variable

Net Benefits

Scott et al. (2016) carried out a systematic literature review of e-government success studies, and formulated a list of benefits that they included in the net benefits measure. The dependent variable “Net Benefits”, as evaluated by Scott *et al*. (2016), includes “cost savings”, “time savings” and “ease and convenience of information retrieval”, which are amongst the most frequently cited benefits of e-government systems. Abdalla (2012) and Olumoye and Govender (2018) listed “improved exchange of information” as one of the main benefits mature e-government systems with adequate levels of integration, and this factor can be measured with the “ease and convenience of information retrieval” items included with the net benefits measure by Scott *et al.* (2016). Similarly, a number of researchers (Ashaye and Irani, 2014; Gathungu and Mungai, 2012; Robert, 2013; Schuppan, 2009), listed reduced administration costs as one of the main benefits. The other items included within this measure include “communication”, “avoid personal interaction”, “control”, “personalization”, “trust” and “trust” are amongst the benefits derived from the public value perspective to represent “efficiency”, “effectiveness” and “improved democracy”. The “effectiveness” and “efficiency” elements were used to measure “administrative efficiency”. According to Twizeyimana and Andersson (2019), in addition to effectiveness, efficiency, improved quality and reduced costs, administrative efficiency enables governments to provide effective, efficient, better and better quality services at reduced costs, while also enabling governments to be more responsive through participation, inclusiveness and transparency. “Improved democracy” also represents the improved social value that may be obtained from such systems, and can also improve the transparency, accountability, fairness during government interactions with its citizens (Hellang and Flak, 2012).

Table 3 represents how the “net benefits” measure, in addition to testing its relationship with all the dependent variables, can also be used to also be used assess whether the reduction of administrative burden for SMEs can be attained through the use of a mature e-government system. The table also shows how the three elements that were derived from the Public Value theory, namely efficiency, effectiveness and

improved democracy, are represented by the various dimensions of the net benefits measure. These elements were also used to measure administration efficiency/reduction of administration burden as theorized by researchers such as Hellang and Flak (2012) and Twizeyimana and Andersson (2019).

Table 3 – Net Benefits Measure

Administration Aspect	Net Benefit Dimension	Reference
Efficiency	Cost	Abdalla (2012); Olumoye and Govender (2018) Scott *et al.* (2016)
	Time	
	Communication	
Effectiveness	Convenience	Ashaye and Irani (2014); Gathungu and Mungai (2012); Robert, 2013; Schuppan, 2009 Scott et al. (2017
	Personalization	
	Ease of information retrieval	
Improved Democracy	Trust	Hellang and Flak (2012); Scott *et al.* (2016); Twizeyimana and Andersson (2019).
	Participation and democracy	

All three quality measures (information, service and system) are hypothesized to have a positive effect on both "use" and "user satisfaction". As noted by DeLone and McLean (2003), this hypothesis assumes that the quality measures are of high quality, hence the influence will be positive. Also, as per the updated model and as explained above, use and user satisfaction are interrelated, because even though the use of the system must precede "user satisfaction", a positive experience in using the system will lead to even more user satisfaction. In turn, if users are satisfied with the system, they are more likely to use the system even more. Additionally, as a result of suppliers using and being satisfied with the CSD system, it is hypothesized that they will realize the net benefits listed under the net benefits measure. These conclusions were supported by both Al Athmay *et al.* (2016) and Scott *et al.* (2016). Hence the final two hypotheses of the conceptual model for this study were derived as follows:

H8. "Use will have a positive influence on the Net benefits realized from the CSD system"

H9. "User Satisfaction will have a positive influence on the Net benefits realized from the CSD system"

Table 4: Summary of hypotheses

	Hypotheses	Construct
H1	"System quality has a positive influence on the Use of the CSD system"	System Quality
H2	"System quality has a positive influence on User Satisfaction in the CSD system"	
H3	"Information quality will have a positive influence on the Use of the CSD system"	

H4	"Information quality will have a positive influence on User Satisfaction in the CSD system"	Information Quality
H5	"Service quality will have a positive influence on the Use of the CSD system"	Service Quality
H6	"Service quality will have a positive influence on User Satisfaction in the CSD system"	
H7	"Use will have a positive influence on User Satisfaction in the CSD system"	Use/ User Satisfaction
H8	"Use will have a positive influence on the Net benefits realized from the CSD system"	Net Benefits
H9	"User Satisfaction will have a positive influence on the Net benefits realized from the CSD system"	

Chapter Conclusion

This chapter discussed the findings of the literature review, which aimed to evaluate existing studies relating to e-government systems within African context. The benefits and challenges of mature e-government systems were described and the research model. The theories used in e-government research were discussed next. The chapter concluded by discussing the associated hypotheses relating the evaluation of an e-government system. The next chapter presents the research methodology and approach that were used to gather and analyse data for this study.

Chapter 3. Research methodology

This chapter presents the research methodology and approach that was used to gather and analyse data. It starts by discussing the research paradigm and approach that was adopted. The rest of the chapter discusses the research design and methods used for this study. The chapter concludes by discussing the ethical considerations and limitation and threats to internal and external validity.

3.1 Research Paradigm and Approach

Researchers are guided by their philosophical worldview when they conduct their research. It is important for them to understand their philosophical worldview and own assumptions in order to be able to properly conduct and evaluate their research. This study adopts the critical realism branch of the post-positivism paradigm as a research philosophy. The Information Systems (IS) field deals extensively with human experiences, mostly of people in their interaction with technology. In the context of this study some of those experiences include the user's utilization of an e-government system and their satisfaction with it. It is not possible to measure such experiences in absolute terms, for example with the use of interval or ratio scales, and therefore alternative forms of measures are used, such as ordinal scales that are used to capture such phenomena in approximate terms, which still adds to the body of knowledge through finding out what is most probably true. This differs from the interpretivist paradigm, where researchers are aiming to gain a more in-depth understanding of experiences and perceptions and are therefore more likely to use qualitative methods (Urick, 2012). Critical realism can still allow the use some of the rigorous scientific methods that are employed by positivists to test theories for example, while also acknowledging the fallibility of observations, especially in social sciences, and accepting the role and assumptions of the researcher, that may influence their research (Harvey, 2002).

There are two main approaches followed by researchers when conducting their research, namely the inductive and deductive research approaches. The inductive approach begins with the observations of empirical data which leads to theories being formulated towards the conclusion of the study (Goddard and Melville, 2004). This means that the researcher usually starts the research process by collecting the data that might be relevant to his or her topic of interest and will eventually formulate a theory based on the findings (Blackstone, 2012). The inductive approach is usually less rigid than the deductive approach and enables researchers to find alternative explanations of reality (Jean-Paul, 2011).

In a deductive approach, researchers usually work in a reverse order compared to researchers using an inductive approach. They start with a theory that interests them, and then test it using data collected through research methods most suitable for their research (Blackstone, 2012). This process typically involves an extensive amount of literature study at the start of the research project to provide direction for the research questions or hypotheses (Creswell, 2013). Quantitative methods are more suitable to a deductive approach (Blackstone, 2012). The deductive approach is also more suitable if a researcher is investigating an established topic with abundant existing literature (Creswell, 2013). Many researchers have studied the success of e-government systems as shown by the numerous studies cited in the literature review section of this paper. As a result, there is sufficient available literature to enable the deductive approach to be adopted for this study. Hence the research topic and problem being examined in this research project will be studied more appropriately with quantitative methods using the deductive approach.

3.2 Research Design

Research design is the overall plan that explains more in detail how the research will be carried out. When formulating the research design, the research problem and questions are transformed into a research project (Jean-Paul, 2011; Van Wyk, 2012). The selection of the research method that will be used to conduct research should be based on the main purpose and objectives of the research and the questions that a researcher is attempting to answer. The design of a study influences the methods and techniques that will be employed in a study. It also influences all the major components of the research study, including samples, measures, data collection and analysis used together to address the research questions (Thomas, 2010). Therefore, a researcher should take due care in the selection of the research design because it affects the manner and methods used to collect data, which in turn will enable the researcher to answer questions and to accomplish the research objectives.

This study used the descriptive research design. According to Dulock (1993), descriptive research is conducted to achieve different purposes, including (1) to systematically describe facts or attributes of a population or subject of interest, (2) to provide an accurate representation or portrayal of the characteristics of certain individuals, groups or situations, (3) to discover and describe the link between variables and (4) to provide answer to questions related to ongoing events. These studies often entail a process of collecting and collating data that describe events, which is then tabulated or depicted in a structured manner. The main aim of this type of research is to describe the state of affairs as they currently exist. Descriptive studies include surveys and other information-gathering investigations of various types that aim to describe events as they currently exist (Kothari, 2004). The main aim of this study was to test the relationships between all the

relevant dimensions of the model that are predicted to contribute to the success of e-government systems, and to describe how the variables relate after they have been measured. Therefore, this study can be described as a descriptive, relational study as classified under category (3) in Dulock's (1993) definition.

A research methodology is the systematic set of procedures, academic methods, techniques and principles used to solve a research problem (Kothari 2004). This includes the various steps that are adopted by a researcher throughout the research process, including the selection of the research methods as amongst the most crucial of these steps. This phase influences major aspects of the research study, including which data collection instruments will be used, the sampling frame, population and approach, and the techniques that can be used to analyze the collected data (Thomas 2010). This research used quantitative research methods to collect and analyze data. The hypothetico-deductive scientific methodology is more suitable to problems that require the testing of data or validation of theories or hypotheses (Wilson, 2014). This was a cross-sectional study that employed the survey strategy to collect data. These type of studies are carried out one point in time, over a relatively short period of time (Levin, 2006). The quantitative survey strategy enables researchers to reach a large number of potential participants within a relatively short period time (Blackstone, 2012). This is useful since the quantitative methodology usually relies on a large enough sample to ensure that the results can be generalized to a larger population. The data collection instrument, sampling approach and analysis techniques are described below.

3.3 Data Collection Methods

The structured questionnaire was the chosen research instrument for data collection in this study. The potential participants included SMEs from all provinces in South Africa, since the use of the system is applicable nationally and across all levels of government. The key informant was the official responsible for administration and interaction with the system, as recorded on the system's database, or as determined during the data collection phase. The web based questionnaire was distributed via email to organizations that have been registered on the CSD system for at least two years or more years to ensure that they have sufficient experience using the system. According to Scott *et al.* (2016), surveying more experienced participants improves the chances of capturing more accurate responses from respondents. The potential participants were identified through contact with enterprises were randomly identified on common public access company databases such as Yellow Pages https://www.yellowpages.co.za/, and websites with entire sections that are dedicated to companies that conduct business with government, such as Lead 2 Business https://www.l2b.co.za/Home/Index? . The potential key informants were also identified through this process. The companies identified through this method formed the sampling frame of this study. Email was used as

a distribution method to ensure that a relatively large number of companies were reached in a relatively short space of time. The current total population of companies that are registered on the CSD system is approximately 800,000 (Central Supplier Database, 2019). However, the percentage of suppliers that are identified as SMEs is not currently clear. Therefore, attempts were made to determine this during the identification process with the actual total number still not clear because this study relied on publicly available information, and not the entire database. Nevertheless, based on the size of the whole database, the number of SMEs was expected to be large as well.

The questionnaire was developed in alignment with the conceptual framework and the research objectives. This was carried out through the construct operationalization process. Construct operationalization is the process of defining how to quantify or measure variables, which are not directly measurable themselves (Emmerich, Bogacheva, Bockholt, and Wendel, 2016). A construct is used to represent an entity, process event or concept that cannot be measured directly (Hecker and Violato, 2009). The process of operationalization usually involves providing a detailed description of variables, identifying specific indicators that will be used to represent the ideas and specifying the levels of measurement. These indicators are usually combined to form variables that are assigned values on specific measurement scales. This study used a five-point Likert-type scale for the questionnaire, which is an ordinal scale of measurement. Ordinal scales are necessary when measuring latent constructs such as these since is not possible to assign equal interval values or ratio scales values to concepts such as "user satisfaction" (Chin, Marcolin and Newsted, 2003; Steyn, Smit, Du Toit and Strasheim, 2003). The definition of how the constructs were measured, including the items that were included in the questionnaire is shown in Table 5 below.

There are several issues associated with the quantitative survey questionnaires. These include the risk that participants might interpret questions incorrectly since participants are unable to ask for clarification with these type of structured surveys (Fricker and Schonlau 2002; Salkind 2010). Other issues include coverage issues due to inappropriate sampling techniques, measurements errors and non-response from potential participants that may distort generalizability of the responses (Check and Schutt 2011). The random sampling techniques and the selection of the proper sampling frame and informants were anticipated to assist in reducing risks associated with sampling.

Adopting an instrument that has been tested and validated by other researchers, adequately stating the aims of the research, performing pilot studies, properly designing the questionnaire can help ensure validity and reliability of the collected data and mitigate other limitations of questionnaire surveys (Check and Schutt 2011; Salkind, 2010). The questionnaire was constructed with reference to prior studies, and therefore all the measures had been tested and validated by researchers such as Chen *et al*. (2015), Scott *et al.* (2016) and

Sørum *et al.* (2012). A pilot study was conducted to verify the suitability, validity and reliability and to refine the instrument as a whole. This also assisted in identifying issues with any of the questions and the layout of the questionnaire (Sørum *et al.,* 2012). To test validity, 40 companies were selected for pilot testing. Furthermore, two individuals who are academics and/or have companies registered on the CSD system were identified for pre-testing to obtain more detailed feedback about the instrument, which assisted in identifying errors and refining the instrument. All individuals and companies identified in the pilot study and pre-testing were not selected for the final survey.

3.3.1 Pre- and Pilot Testing

Although all the items within the research instrument were developed with reference to prior studies, which means that they were already empirically validated, pre- and pilot testing was still conducted to improve the content and face validity of the questionnaire. This was especially important because some of those items were used in different contexts to this particular study. Conducting a literature review and using prior studies is one of the first steps of proper research instrument development, however, checking for content validity is still needed to determine the extent the items of an instrument represent the domain of a construct that is being measured (Hardesty and Bearden, 2004; Yaghmaie, 2003). Face validity is an assessment of the presentation and relevance of the research instrument to determine whether it has meaning or makes sense to the respondents, therefore, the items within the research instrument should be reasonable, relevant, unambiguous and clear (Oluwatayo, 2012).

An IS academic with extensive knowledge of developing research instruments for quantitative studies, and an Honours student with the knowledge of both the CSD system (interacted with the system for his own company) and research methods were requested to review the research instrument as part of pre-testing. Items which were determined to be irrelevant, ambiguous and unclear were either replaced, rephrased or removed entirely to improve content and face validity. For example, items on the "Service Quality" construct were replaced with better phrased questions because pre-testing revealed that they may be ambiguous and may also overlap with the other quality constructs and may thus cause confusion. Some of the items from "User Satisfaction" were rephrased/or replaced because their conceptualisation seemed to be measuring only one aspect of the construct's domain, in this instance it was the "fulfilment" aspect. Therefore, some items were added to measure the other common aspect of the construct that is concerned with the respondent's reaction to "satisfaction". The complete list of changes (highlighted in grey) is listed in Appendix D.

Pilot testing was performed on a list of 40 selected companies who were initially contacted mainly telephone to ensure they were aware of the pilot testing. Responses were received from eight companies who agreed

to participate in the pilot testing. Most of the comments received from the respondents were about the duration of questionnaire, which they felt was too long, and that some of the questions seemed redundant. This could be confirmed by the fact that out of the eight who did participate, only four actually completed most or all of the questions (50%), indicating that they may have lost interest whilst completing the questionnaire. To rectify this situation, attempts were made minimize the items in questionnaire by removing ambiguous or redundant questions. However due consideration was done not to overly affect the validity and reliability whole instrument, therefore, it was ensured that each construct had at least three items so that appropriate statistical techniques could still be performed based on the remaining items. Table 5 shows all the items that made it to the final questionnaire.

Table 5: E-Government Success Measures and Questionnaire Items

Construct	Dimension	Questionnaire Items
System Quality	Response times	"The CSD website enables me to accomplish tasks more quickly"
	Usability	"The CSD website is easy to navigate and perform transactions"
		"The CSD website requires a lot of effort to use"
		"The CSD website provides helpful instructions for performing my task"
	Security and Confidentiality	"The security on the CSD website is sufficient"
		"The CSD website protects our company's confidential information"
Information Quality	Accurate	"Information provided by the CSD website is accurate"
	Relevant	"Information provided by the CSD website is relevant"
	Timeliness	"Information provided by the CSD website is up-to-date"
Service Quality	Support and training	"Support provided to users of the CSD system has been sufficient"
		"Training on the use of the CSD system has been sufficient"
		"There is always support available if we need help with the CSD system"
Use	Performance	"Using the CSD website would improve my performance in bidding for government goods and services"
	Productivity	"Using the CSD website would improve my productivity in fulfilling orders or responding to requests for quotation"
	Usefulness	"Overall, I find the CSD website useful"
User satisfaction	Interaction and satisfaction	"I feel that the CSD website adequately meets my needs of interaction with the government entity"
		"I find using the CSD system enjoyable"
		"Overall, I am pleased with the general performance of the CSD system"
Net Benefits	Cost	"Using the CSD website saves the organization money."

		"Using the CSD website reduces the cost of providing the service."
	Time	"Using the CSD website saves me time"
		"The CSD website provides a quicker response to a question or request than other means (e.g. offline interaction)"
	Convenience	"It is important that I can use the CSD website around the clock."
		"It is important that I can access the CSD website from a number of different locations (e.g. home, work, library, post office)."
	Personalization	"I am able to personalize the services offered by the CSD website."
		"I value the personalized services offered by the CSD website."
	Communication	"Using the CSD website is an efficient way of communicating with government departments."
		"Using the CSD website is a valuable way of communicating with government departments."
	"Ease of information retrieval"	"The CSD website contains a lot of useful and up-to-date, complete and verified procurement information"
		"The CSD website answers any queries I might have about government procurement"
	Trust	"I feel comfortable interacting with the CSD website since it generally fulfils its duties efficiently."
		"I always feel confident that I can rely on the CSD website to do its part when I interact with it"
	Participation and democracy	"The CSD website enhances my feeling of being part of an active democracy."
		"The CSD website encourages transparency."
		"The CSD website encourages accountability."

The question regarding "Number of Employees" was the only demographic question in the final questionnaire because all the respondents could tell how many employees they had at any given moment. Other common company descriptive questions were considered but not used in the final questionnaire because it was possible for the respondents to factually have more than one answer to the same question, as a result they would end up not responding because they would not know which one to choose. For example, during the pilot testing, only two responded to the "Industry" question, with the reason being that the same company could be an events management company, as well as be involved in catering services, and providing stationery and other office supplies. Similarly, it was determined that the key informants usually played various roles within SMEs, therefore, the vast majority would probably not be able to respond to the question regarding what position they hold within the organization.

3.3.2 Sampling and Respondents

Sampling can be defined as the action or process that is used to determine a subset of a larger population of the interest of study (Bhattacherjee, 2012). Sampling is very useful in research as it is usually not possible obtain the participation of the entire population in a research project. Depending on the quality and type of

sampling, the result of a study can be generalized to the general population, provided that the sample is representative of the whole population (Delice, 2010).

A sample size of 1000 was selected for this study based on sampling guidelines and results of previous studies. Siddiqui (2013) recommends a sample size of at least 250 for research instruments with 25 items in order to perform factor analysis and other appropriate statistical techniques. This study has a total of 34 items, therefore a greater sample would be required. Additionally, previous studies that also investigated the effect of e-government systems on companies have shown very low response rates or limited sample sizes, with Kwok (2014) only managing to obtain 113 responses from potential SMEs, and Arendsen *et al.* (2014) only managing a 12% (191 responses out of 1725) response rate from a survey companies selected for their study. Therefore, at least 1000 potential respondents would be selected to be part of the sample in order to improve the chances of obtaining at least 100 usable responses. To achieve this, initial searches were conducted on company directory websites such as Yellow Pages and Lead 2 Business to obtain details about potential participants, including contact details, as described at the beginning of this chapter. Once this was done, attempts were then made to verify if the company has been registered on the CSD system for at least two years, and that it was classified as an SME or equivalent. This was done by verifying with publicly available information on the websites of government and state owned entities. These included national and provincial government departments, local and metropolitan municipalities, as well as state owned entities such Gateway Airports Authority Limited, Independent Development Trust, Mandela Bay Development Agency, and the South African Social Security Agency.

These organizations keep such lists to make it easier for winning bidders of government tenders to identify qualifying suppliers if they want to subcontract part of the contract. For example, the Preferential Policy Framework Act stipulates that wherever it feasible, the winning bidder must subcontract a contract above R30 million to qualifying designated groups, of which being an SME is one of the main qualifying criteria (Preferential Procurement Policy Framework Act (5/2000). Having the required level of Broad-Based Black Economic Empowerment (B-BBEE) is the other main criterion. The South African government defines these types of organizations as exempted micro enterprises (EME) or qualifying small business enterprises (QSE). Therefore, the various state entities keep such lists on their websites with latest verified information which was used to confirm and validate qualifying suppliers for this study. The companies on these lists were from various industries and provided different goods and services such as building and facility construction and maintenance services, general cleaning services, catering services, travelling agencies, events management, transport services, security and protective services, electrical services, office supplies and recruitment advertising.

Through this process, over 10000 qualifying suppliers were identified over a two month period from beginning of August to the end of September 2019. This list was then sorted randomly using the Microsoft Excel "Rand" function, and the first 1000 were selected based on the sampling strategy already discussed above. Since these were usually very small companies with few staff members, the key informant was usually the main contact as already noted during the identification phase in 95% of the times. This was first noted during the pilot testing. Only twice out of the 40 that were tried was the researcher referred to a different individual when they were requested to participate in the pilot testing. However, this was still confirmed during the data collection phase, mainly through telephone calls, but also through emails in some cases where the individuals could not be located through the telephone.

3.3.3 Survey administration

Emails were sent to each key informant of the identified companies, inviting them to participate in the research project. The email informed them that that they were being invited to participate in an online survey about the benefits of a mature e-government to business (G2B) system in South Africa. The survey was conducted entirely electronically and the participant information sheet also served as the cover letter of the questionnaire (Appendix C). The potential participants were informed on the description and purpose of the study, and their rights, including informed consent and the voluntary nature of their participation. The emails were accompanied by telephone calls making them aware of the survey and purpose of the research in anticipation that many might not be aware of the emails because of their busy schedule.

3.4 Data Analysis Methods

Statistical quantitative techniques were used for analysing the data collected from the survey. The IBM's Statistical Package for the Social Sciences (SPSS) was the tool used to perform a number of statistical tests. Microsoft Excel was used to initially format and clean the data before it could be imported to SPSS. The first test performed involved confirming the validity and reliability of the data. The Cronbach's alpha coefficient was used as the initial reliability measure, and 0.70 was adopted as the standard cut-off point. A number of researchers regard 0.70 as the minimum acceptable reliability coefficient (Cortina, 1993; Gliem and Gliem, 2003; Nunnaly, 1978; Santos, 1999). The reliability coefficient technique is one of the most popular methods used to verify that there is internal consistency among the items that were used to operationalize a construct. The Principal Component Analysis was used verify both convergent and discriminant validity. Convergent validity is more concerned with how closely a measure relates to a construct, while discriminant validity is concerned with the extent to which a measure only measures the

construct it is meant to measure instead of other constructs (Bhattacherjee, 2012; Kothari, 2004). These concepts ensure that constructs are both empirically and theoretically distinct, meaning that an item should measure one thing only, and should share more variance with items within its own constructs rather than items from other constructs. In order to determine sampling adequacy, the Bartlett test should be significant and a KMO value that is greater than 0.5 is usually considered suitable, although some researchers prefer it to be above 0.8, since they consider only values above 0.8 as "very good" or "great", and values above 0.9 as "marvellous" or "superb" (Williams, Onsman and Brown, 2010; Akbulut *et al.,* 2008).

Descriptive statistics were performed to derive data about the profile of participants and also to identify any patterns that may exist within the data. Furthermore, inferential statistics were used to test the hypotheses. This included using the null hypothesis concept to assess the statistical significance of the observed results and to reduce the risk of measurement errors. The p value testing was used to show the statistical significance of the test results. A p value that is less than 0.05 is generally considered satisfactory evidence that the observed findings are statistically significant (Ellis and Steyn, 2003). This was the value adopted for this study to reject the null hypothesis. Rejecting the null hypothesis means we are mostly likely not observing the relationships in our data by chance. The correlation analysis (Pearson) and multiple regression analysis techniques were used to test the hypotheses and determine any relationships that may exist between the variables. A correlation analysis can be used to measure the strength of the association between two constructs. The Pearson correlation analysis is a common approach in traditional parametric statistics that used for analysing normally distributed data (Bishara and Hittner, 2012). Other alternatives include the Spearman correlation, which is a non-parametric test mostly used for ordinal and categorical data and when parametric assumptions are violated. Multiple regression is a statistical technique that is used to measure the combined effect of two or more independent variables on a dependent variable (Higgins, 2006).

3.5 Ethical Considerations

The conduct of the researcher should be beyond reproach when carrying out research. Researchers must take into account several considerations to ensure that their conduct is acceptable. The researcher should have an appropriate plan and be committed to produce useful knowledge before the research project begins (Schutt 2011). This research was conducted in accordance to the ethical principles and processes of the University of the Witwatersrand. As such, the ethical clearance was requested and obtained from Ethics Committee prior to the collection of any data. The ethics clearance certificate (protocol number CBUSE/1529) is included in Appendix F.

The researcher was committed to confidentiality, privacy and anonymity of study participants. Informed consent was sought from participants as well. The data collected was treated with care and the rights of the participants protected, and this was communicated in the covering letter that preceded the questionnaire. Additionally, the potential participants were informed that participation was completely voluntary and they could cease participation at any point during the completion of the questionnaire. This study also adopted other general principles associated with good ethical research, including respect for human dignity, ensuring that no harm is suffered by the participants, and ensuring justice and inclusiveness (Israel and Hay, 2006; Wester, 2011). Since the study was aimed at company informants concerning their official duties who were asked questions strictly related to their use of the CSD system and not focusing on individual people or personal matters, there was no possibility of having issues with vulnerable persons.

3.6 Limitations and Threats to Internal and External Validity

The study did not evaluate some essential aspects of mature e-government systems because those were not part of the scope. For instance, a lot of literature in Sub Saharan Africa revealed that the most significant barriers to these type of systems in this region are social and environmental in nature (Amegavi *et al.* 2017; Bwalya and Mutula, 2016; Bwalya, 2009; Hassan, Mike and Guyo, 2017; Manda, 2017; Olumoye and Govender, 2018; Onyancha, 2008; Ouma, 2014; Ruhode, 2013). Although the conceptual model integrated the public value theory to cater for some of these factors, such as trust in government, some other key factors such as the effect of ICT infrastructure and government policies could not be included because focus was more on understanding the success of using the e-government system and not the effect of these other factors. Other researchers can attempt to explore these other aspects and add to the body of knowledge as well, by looking, for example, at the role played by the lack of appropriate infrastructure on the successful adoption and success of mature e-government systems. Additionally, this was a quantitative study, therefore qualitative studies looking at the same phenomena could attain an even deeper understanding of these very complex e-government systems, of which a purely relational, descriptive study may not be able to accomplish. Furthermore, the study only focused SMEs, therefore its findings may not be applicable to other types of companies, especially since bureaucracy may impose a more disproportionate administrative burden on SMEs than on multinational companies with large budgets (Aristovnik and Obadić, 2015; Ntaliani and Costopoulou, 2017).

The other potential shortcomings and threats to this research include issues related to external and internal validity that are commonly associated with quantitative studies. Issues with sampling and non-response bias may present a challenge with regard to the generalization of the results to the whole population, which may

affect external validity (Bhattacherjee, 2012). However, the sampling approach adopted in this study should have been sufficient in addressing most of those concerns. The random sampling method within the sampling frame meant that all potential participants had an equal chance of being selected. Attempts were made to use the most appropriate sample size as well. The internal validity refers to the confidence that a researcher is drawing the correct causal conclusions from the research, including ruling out other alternative explanations with confidence (Roe and Just, 2009). This risk is especially prominent is in a study that uses a complex and multi-dimensional research model such as the one adopted in this study, where the possibility of cofounding exists, with several independent variables which might be acting at the same time on other variables such as the three quality dimensions all acting on "use" and "user satisfaction".

Additionally, this was also a cross-sectional study, which meant that the evaluation methods would gather and analyse the data as it was at a specific point in time. Therefore, there was also the threat of ambiguous temporal precedence to internal validity, which means it may be difficult to know which variable had an effect on another (Coryn and Hobson, 2011). Only a longitudinal study over a longer period of time or true, controlled experiments can evaluate the true impact that an intervention has on dependent or other variables (Wells and Yang, 2008). These threats have partially been addressed in this study through the use a validated research design and an instrument that has been tested and validated by numerous other studies that were already discussed, as well as using analytical techniques that are appropriate for this purpose. Selection bias may also have presented a threat to internal validity in this study because anonymous online surveys have the inherent attribute of self-selection, and it may be difficult to know whether there the responses were mainly from participants from specific demographics with greater motivation for participation, which may have distorted results. This was mitigated in this study by the fact that the random sample selected for this study was from of a wide range of companies with different attributes from all provinces in South Africa.

Chapter Conclusion

This chapter presented the research methodology and approach that were adopted for this research report. It starts by discussing the research paradigm and approach. The research design and methods that were adopted were discussed next. The chapter concluded by discussing the ethical considerations and limitation and threats to internal and external validity. The next chapter discusses how the collected data was cleaned, validated, and analysed and reported.

CHAPTER 4. DATA ANALYSIS

This chapter discusses the analysis of data and results of this study. The chapter begins by explaining the data screening process, the results of missing data and outlier analyses. Then the respondents' profile analysis is presented. Thirdly, the chapter details the validity and reliability analysis process. The chapter concludes by presenting the results of hypotheses testing.

4.1 Data screening

A total of 126 responses were received after approximately four weeks of data collection. The survey was sent to 1000 potential participants, therefore a response rate of just over 12% was obtained. The response rate during the fourth week was almost zero, even for those who were sent one time reminders through telephone calls and promised to participate but never did. Both the response rate and number of responses were already in line with previous similar studies on companies, therefore data collection was ended at the end of the fourth week since no notable increase in the response rate could be anticipated. The collected data was formatted and cleaned on Excel before it was imported to SPSS. As part of this process, items with reverse meanings were also given reverse coding. This included items such as "The CSD website requires a lot of effort to use".

4.2 Missing values and outliers

The screening for missing values revealed that only six out of the 126 respondents did not complete significant parts of the questionnaire (10% or more items). Most completed the entire questionnaire with a few exceptions, leaving 120 responses before outliers were examined. This shows a significant improvement from the pilot testing, where 50% of all responses were unusable, indicating the usefulness of the amendments that were made after testing for content and face validity during the pre- and pilot testing phases. This could also mean that the efforts that were made to identify the correct key informants who were familiar with the subject matter were largely successful since almost all the respondents completed all or almost all of the significant questions.

The results were slightly different with regard to demographic data, where only 20 of the 125 respondents did not respond to the "Number of Employees" question, leaving 106 respondents with valid responses. This response rate was still good and can provide useful information regarding the nature of the SMEs that were

surveyed. This variable was used for descriptive purposes and not used as a control variable, thus not affecting the main sample.

The remaining responses were assessed for outliers. An outlier is an observation or a response which is unusually high or low when compared to others. Values which are far away or deviate a lot from most responses may suggest that those particular responses are not from the same population as the other responses (Ghosh and Vogt, 2012). The SPSS standardized score function was used to calculate the z-score for each of the responses. A z-score that is greater than 3 or less than -3 is considered to be an outlier, which is rule of thumb based on the empirical rule that approximately 99.7% of all observation of the data should be within three standard deviations from the mean (Kannan, Manoj and Arumugam, 2015). All of the remaining responses were well within these maximum and minimal standardized scores, with only two items from the "Information Quality" construct exceeding a value of two (the maximum was 2.19, and the minimum -2.18 respectively). All other responses from all other variables were within the 1.8 and -1.8 range, therefore leaving all of the remaining 120 responses as usable cases.

4.3 Respondent Profile

The "Number of Employees" item was the only demographic question that was asked in the questionnaire for reasons which were explained in Section 4.3.1. This was used to determine the size of companies that were surveyed. As could be expected based on the population that was targeted for this study, the size of the companies was very small, with the vast majority (89.6%) of the 106 companies that responded having between one and ten employees, as shown in Table 6. The next biggest group were those companies with between 11 and 50 employees, with 6.7%. The remaining two groups made up only 1.9% each.

Table 6: Number of Employees

		Frequency	Valid Percent	Cumulative Percent
Valid	1 to 10	95	89.6	89.6
	11 to 50	7	6.6	96.2
	51 to 100	2	1.9	98.1
	Over 100	2	1.9	100.0
	Total	106	100.0	

4.4 Validity and Reliability

Prior to testing the various hypotheses and performing further statistical analysis, the data was tested for both validity and reliability.

4.4.1 Inter-Item Correlations

Before performing the KMO and Bartlett tests, Inter-Item Correlation analysis was carried out to determine if items within the same construct were more highly correlated with each other than with items from other constructs. This was also verified by checking whether each item correlates at least 0.3 with at least one other item within the same construct. Only one item was found to correlate less than 0.3 with all the other items within the same construct. It was the questionnaire item "The CSD website requires a lot of effort to use", which was in the "system quality" construct. This was also the only item in the entire questionnaire with a reverse meaning from its original construct, so it may have confused most of the respondents since it still gave low correlations of less than 0.2 with all the other five items within the "system quality" construct, even after it was reverse coded. Therefore, this item was dropped from further analysis. All the other items were more highly correlated with other items within the same construct, with each correlating by more than 0.3 with at least two other items within the same dataset. All the results from this test are listed in Appendix H.

4.4.2 Principal Component Analysis (PCA)

Principal Component Analysis (PCA) was used to determine if the data showed any evidence of convergent validity, which reveals whether all that the items that were used to measure a construct load highly into the same component. This technique was also used to provide evidence of discriminant validity, which demonstrates the level of cross-loading of each of the items to determine whether the items only measure the construct it is meant to measure instead of other constructs. The Kaiser-Meyer-Olkin (KMO) and Bartlett tests were performed first to determine whether the size of the sample, in relation to the number of items, was large enough to justify factor analysis. After the initial PCA analysis, the results of the rotated Varimax solution revealed that several items were did not have any significant loading on their respective components and there was evidence of cross leadings, and were therefore dropped. These included three from the "system quality" construct, and two from the "net benefits" construct, both related

to “convenience”. Additionally, all the remaining “service quality” items were found to be loading into the same component as the “system quality” construct, indicating that there may be a conceptual overlap, therefore the “service quality” construct was also dropped because it seemed like it did not match very well with the conceptual model. The PCA analysis was performed again on the entire scale after these initial changes, and the Bartlett’s test of sphericity was found to be significant. The KMO was over 0.9, which can be considered very good (Williams, Onsman and Brown, 2010; Akbulut *et al*., 2008). This indicates that sampling was adequate and that the data can be considered for factor analysis.

Table 7: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.934
Bartlett's Test of Sphericity	Approx. Chi-Square	3460.653
	df	325
	Sig.	.000

Independent Variables Validity Analysis

SPSS extracted a three component factor solution for the independent variables, which accounts for the vast majority (83.74%) of the total variance. As demonstrated in Table 8 below, the results the PCA analysis on all the independent variables reveal evidence of uni-dimensionality for the two remaining quality constructs, as all the items have loaded onto a single component representing a single concept or phenomenon. Both “user” and “user satisfaction” loaded onto a single component, which was not unexpected in a conceptual sense as per the both the original and updated IS Success Model, which note that these constructs are interrelated and both jointly contribute to the realization of net benefits. "Use" usually precedes "user satisfaction" in a real business scenario, however, a positive experience with "use" is also hypothesized to lead to greater "user satisfaction". All the items have a significant loading into their components, with all having values exceeding or very close to 0.8. This shows evidence of convergent and discriminant validity, as all the items are highly correlated with all the other items within the same component and none of the items are highly correlated with items measuring another construct, since all the cross loading were insignificant (lower than 0.4, and therefore not shown in the results table).

Table 8: Independent Variables Rotated Component Matrix[a]

	Component		
	1	2	3
System Quality 5			.834
System Quality 6			.831
Information Quality 1		.866	
Information Quality 2		.893	
Information Quality 3		.868	
Use 1	.857		
Use 2	.852		
Use 3	.845		
User Satisfaction 1	.888		
User Satisfaction 2	.876		
User Satisfaction 3	.796		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Absolute values < 0.40 were suppressed.

Dependent Variable Validity Analysis

The analysis showed evidence of uni-dimensionality across the remaining fifteen items within the dependent variable and evidence of convergent and discriminant validity. And each item has a significant loading into a single component (all greater than or close to 0.8). The analysis extracted a one component factor solution, which accounts for 75.102% of the total variance.

Table 9 : Dependent Variable Component Matrix[a]

	Component
	1
Net Benefits 1 - Costs	.904
Net Benefits 2 - Costs	.889
Net Benefits 3 - Time	.872
Net Benefits 4 - Time	.887
Net Benefits 7 - Personalization	.782
Net Benefits 8 - Personalization	.829
Net Benefits 9 - Communication	.902
Net Benefits 10 - Communication	.888
Net Benefits 11 - Ease	.844
Net Benefits 12 - Ease	.805

Net Benefits 13 - Trust	.877
Net Benefits 14 - Trust	.895
Net Benefits 15 - Democracy	.898
Net Benefits 16 - Democracy	.855
Net Benefits 17 - Democracy	.863

Extraction Method: Principal Component Analysis.

a. Absolute values < 0.40 were suppressed

4.4.3 Cronbach's alpha

The next step was to verify the reliability of the research scales. The Cronbach's alpha function was used to measure the internal consistency of all the remaining measures. Measures with Cronbach's alpha coefficients that are equal to or exceed 0.70 are considered to be reliable (Cortina, 1993; Gliem and Gliem, 2003; Nunnaly, 1978; Santos, 1999). As can be seen from Table 10 below, all the constructs had reliability coefficients above 0.7, with "system quality" having the lowest at 0.72. The rest had scores all exceeding 0.9, with the "net benefits" measure having a particularly high score of 0.976. After further analysis, none of the items were dropped because none of the "Item-to-Total" correlations were below 0.4, all of them were over 0.56 or higher.

Table 10: Reliability analysis

	Number of items	Cronbach's Alpha
System Quality	2	.722
Information Quality	3	.927
Use	3	.920
User Satisfaction	3	.943
Net benefits	15	.976

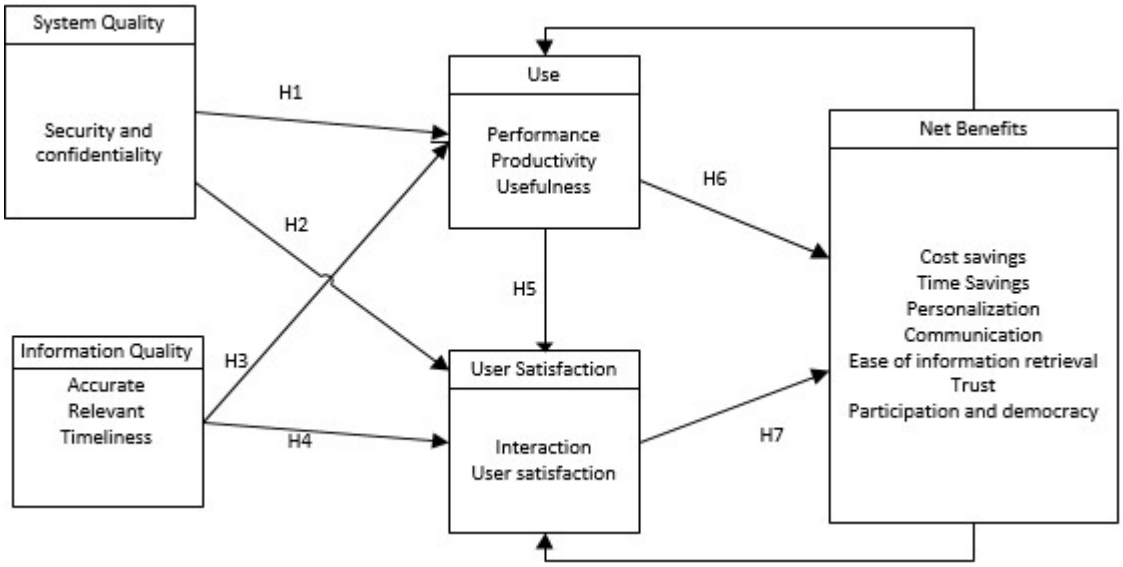
4.4.4 Revised research model

After checking for both validity and reliability, only the "service quality" construct was dropped completely from the conceptual model. As a result, the two hypotheses related to this construct were also dropped. The rest of the constructs retained enough items to continue with further analysis. The following are the hypotheses of the revised model (Table 11 and Figure 2):

Table 11: Hypotheses of the revised model

	Hypotheses	Construct
H1	"System quality has a positive influence on the Use of the CSD system"	System Quality
H2	"System quality has a positive influence on User Satisfaction in the CSD system"	
H3	"Information quality will have a positive influence on the Use of the CSD system"	Information Quality
H4	"Information quality will have a positive influence on User Satisfaction in the CSD system"	
H5	"Use will have a positive influence on User Satisfaction in the CSD system"	Use/ User Satisfaction
H6	"Use will have a positive influence on the Net benefits realized from the CSD system"	Net Benefits
H7	"User Satisfaction will have a positive influence on the Net benefits realized from the CSD system"	

Figure 2: Revised Research Model



4.5 Hypothesis Testing

Correlation analysis and regression analysis were used to test the hypotheses to determine if there was evidence to support any or all of the hypotheses that were formulated in the revised research model of this study. The multiple items per construct were first merged into single variables using the composite scores function on SPSS in order to perform correlation and multiple regression analyses. After the composite variables were created, descriptive statistics were performed to derive composite scores and data distribution statistics on the variables. Table 12 below shows that all the composite variables were

normally distributed, with skewness for all variables between +-1. The scores for asymmetry and kurtosis that are between -2 and +2 are considered acceptable in showing normal univariate distribution (Chemingui and Ben lallouna, 2013).

Table 12: Composite scores and Distribution for whole scale

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
System Quality	120	1.00	5.00	2.9917	1.44795	-0.046	.221	-1.285	.438
Information Quality	120	1.00	5.00	3.8000	1.24377	-0.945	.221	-0.118	.438
Use	119	1.00	5.00	3.3978	1.37935	-0.430	.222	-1.067	.440
User Satisfaction	118	1.00	5.00	3.1893	1.44903	-0.189	.223	-1.331	.442
Net Benefits	108	1.00	5.00	3.3012	1.27601	-0.264	.233	-1.120	.461

4.5.1 Correlation Analysis

Bivariate correlation analysis was used to measure the strength of the association between two constructs. Pearson's correlation was used for this purpose since all the composite variables of the revised model were determined to be normally distributed, and the collected data was treated as approximating interval-level measurement, as it is common in social sciences. The coefficient of correlation, which is usually denoted as r, was used to determine whether the associations are significant or not, so that relationships that are driven by chance factors can be ruled out. It was used to assess the relationships between all the independent variables and the "net benefits" measure as a whole. Table 13 shows that there were positive associations between all the variables, and they were all significant at $p<0.01$.

Table 13: Correlations Matrix

		System Quality	Information Quality	Use	User Satisfaction	Net Benefits
System Quality	Pearson Correlation	1	.452**	.464**	.503**	.452**
	Sig. (2-tailed)		.000	.000	.000	.000
Information Quality	Pearson Correlation	.452**	1	.560**	.559**	.556**
	Sig. (2-tailed)	.000		.000	.000	.000

Use	Pearson Correlation	.464**	.560**	1	.875**	.843**
	Sig. (2-tailed)	.000	.000		.000	.000
User Satisfaction	Pearson Correlation	.503**	.559**	.875**	1	.892**
	Sig. (2-tailed)	.000	.000	.000		.000
Net Benefits	Pearson Correlation	.452**	.556**	.843**	.892**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

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

Composite variables of the individual elements of the "net benefits" measure were also created to determine which of the independent variables contributed the most to which element of the measure. This assisted with determining which elements in particular contrite the most to the reduction of administrative burden on SMEs.

Table 14: Composite scores and Distribution for Net Benefits Measure

	N	Minimum	Maximum	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
NB Costs	119	1.00	5.00	3.1849	-.173	.222	-1.403	.440
NB Time	119	1.00	5.00	3.1975	-.216	.222	-1.306	.440
NB Personalization	120	1.00	5.00	3.3625	-.308	.221	-1.128	.438
NB Communication	114	1.00	5.00	3.2807	-.284	.226	-1.370	.449
NB Ease	120	1.00	5.00	3.1875	-.147	.221	-1.150	.438
NB Trust	117	1.00	5.00	3.2821	-.211	.224	-1.138	.444
NB Democracy	119	1.00	5.00	3.4426	-.471	.222	-1.060	.440

The skewness and kurtosis of the individual elements of the "net benefits" measure were similar to the scores of the whole measure, all showing normal distribution. Therefore, Pearson's correlation was again used again to measure the strength of the relationship between the independent variables and each of the elements of the "net benefits" measure. The relationships were also all found to be significant at $p<.01$ (Appendix G).

Based on the above results, the hypotheses of this study (revised model) can now be evaluated:

Hypothesis 1

It was hypothesised that "system quality" will have a positive influence on the use of the CSD system. The correlation between "system quality" and "use" returned a sample correlation coefficient of 0.464, which is statistically significant at the 0.01 level ($r=0.464$, $p<0.01$). This provides support for Hypothesis 1. Therefore, "system quality" has a positive effect on the use of a mature e-government system in the context of this study.

Hypothesis 2

It was hypothesised that "system quality" will have a positive influence on user satisfaction in the CSD system. The correlation between "system quality" and "user satisfaction" returned a sample correlation coefficient of 0.503, which is statistically significant at the 0.01 level ($r=0.503$, $p<0.01$). This provides support for Hypothesis 2. Therefore, "system quality" has a positive effect on a user's satisfaction with a mature e-government system in the context of this study.

Hypothesis 3

It was hypothesised that "information quality" will have a positive influence on the use of the CSD system. The correlation between "information quality" and "use" returned a sample correlation coefficient of 0.560, which is statistically significant at the 0.01 level ($r=0.560$, $p<0.01$). This provides support for Hypothesis 3. Therefore, "information quality" has a positive effect on the use of a mature e-government system in the context of this study.

Hypothesis 4

It was hypothesised that "information quality" will have a positive influence on user satisfaction in the CSD system. The correlation between "system quality" and "user satisfaction" returned a sample correlation coefficient of 0.559, which is statistically significant at the 0.01 level ($r=0.559$, $p<0.01$). This provides support for Hypothesis 4. Therefore, "information quality" has a positive effect on a user's satisfaction with a mature e-government system in the context of this study.

Hypothesis 5

It was hypothesised "use" will have a positive influence on "user satisfaction" in the CSD system. The correlation between "user" and "user satisfaction" returned a sample correlation coefficient of 0.875, which is statistically significant at the 0.01 level ($r=0.875$, $p<0.01$). This provides support for Hypothesis 5. Therefore, "use" has a positive effect on a user's satisfaction with a mature e-government system in the context of this study.

Hypothesis 6

It was hypothesised that "use" will have a positive influence on the "net benefits" realized from the CSD. The correlation between "user" and "net benefits" returned a sample correlation coefficient of 0.843, which is statistically significant at the 0.01 level ($r=0.843$, $p<0.01$). This provides support for Hypothesis 6. Therefore, "use" has a positive effect on the "net benefits" realized from mature e-government system in the context of this study.

Hypothesis 7

It was hypothesised that "user satisfaction" will have a positive influence on the "net benefits" realized from the CSD system. The correlation between "user satisfaction" and "net benefits" returned a sample correlation coefficient of 0.892, which is statistically significant at the 0.01 level ($r=0.892$, $p<0.01$). This provides support for Hypothesis 7. Therefore, "user satisfaction" has a positive effect on the "net benefits" realized from the CSD system in the context of this study.

4.5.2 Regression Analysis

Multiple regression analysis was performed to gain even further insights into the combined effects of the independent variables on the "nets benefits" dependent variable. This study assumed that there are positive relationships between the "net benefits" construct and "information quality", "system quality" and "service quality" based on previous research in the e-government, and in particular from the study by Scott *et al.* (2016). Although, based on the revised research model of this study, the only independent variables that were tested were "system quality" and "information quality". According to Scott *et al.* (2016), in

addition to assessing the combined effects of the independent variables on the "nets benefits" construct, multiple regression can also be used to assess the nomological validity of a scale. Nomological validity is used in construct evaluation mainly to confirm the behaviour of a construct within a wider theoretical context or group of constructs (Bagozzi, 1981; Scott *et al,* 2016) . This is usually done in relation to newly developed constructs, but it was useful in this study as well since the context is completely different (evaluating companies in South Africa instead of individuals in the USA) and the model was slightly revised from the model used by Scott *et al*. (2016). Additionally, the research model only allowed for an indirect assessment of the effect of the quality dimensions on the "net benefits" measure, that was moderated through "use" and "user satisfaction". This assessment allowed for additional insights on the relationship between these variables.

After multiple regression analysis was performed, the results revealed that "system quality" and "information quality" participated in a combined significant relationship with the "net benefits" measure, with an R^2 coefficient of 0.361, which was significant at 0.001. This suggests the model explains roughly 36% of the variability in the attainment of "net benefits". The independent variable that has the largest significant effect on "net benefits" is "information quality" with a standardized beta coefficient of 0.92, which is significant at the $p<0.001$ level. "System quality" also has significant effect with a standardized beta coefficient of 0.78. The multiple regression model results and assumptions are listed in Appendix E.

Chapter conclusion

This chapter discussed the analysis of data and results of this study. The data screening process was explained, including the results of missing data and outlier analyses. Then the respondents' profile analysis was presented. The chapter also detailed the validity and reliability analysis process. The chapter concluded by presenting the results of hypotheses testing. The next chapter will discuss these findings in greater detail and also relate these findings to existing literature.

CHAPTER 5. DISCUSSION AND INTERPRETATION OF RESULTS

This chapter focuses on interpreting the results, discussing the results and relating them back to previous e-government studies to determine whether the results confirm or differ from expectations. The chapter begins by recapping the research objectives, then discussing which of the hypotheses were supported and how they relate back to literature.

5.1 Recapping Research Objectives

The main purpose of this study was to test the relationships between the dimensions that are predicted to contribute to the success of mature e-government systems. To achieve this purpose, the following research objectives were formulated:

1. Conduct a literature review of e-government systems.
2. Expand on the DeLone and McLean IS Success model with the inclusion elements from the Public Value theory as a theoretical lens underpinning this study.
3. Test the relationships between the constructs of the model that are predicted to contribute to the success of mature e-government systems.
4. Discuss the findings.
5. Offer recommendations on future work.

The first objective, which was completed in Chapter 2, aimed to review existing studies relating to e-government systems within the African context and other regions, including Asia, Europe, North and South America, in order to be able to know where to place the concepts, theories and findings that were discussed in this study. The second objective was aimed at developing this study's research model and the associated hypotheses relating the evaluation of an e-government system. The previous chapter dealt with the third objective and was meant to analyse the collected data in order to test the hypotheses that were formulated. The fourth objective relates to this chapter and discusses the findings and then relates them back to e-government studies found in the literature to determine whether the findings confirm or differ from expectations.

The research problem that this study was attempting to provide some answers to is that, although there are numerous e-government studies, the measurement of e-government success is arguably still not well understood by both practitioners and researchers (Heeks, 2008; Scott *et al.,* 2016; Stefanovic, Marjanovic, Delić, Culibrk and Lalic, 2016). Therefore, there was lack of empirical studies that validate the benefits mature e-government systems within the South African context, and Africa in general. As a result, the CSD (Central Supplier Database) system was selected as the mature e-government system, and its effect was measured against the perceptions of SME companies in South Africa. The literature review revealed that there are few studies that are focused on the effect of e-government systems on companies, especially within the African context. The conceptual model adopted in this study was developed by combining the IS Success model, with some elements of the Public Value theory, as adopted by Scott *et al.* (2016), to measure the net benefits of an e-government system. After verifying the reliability and validity of the data that was collected, the research model was left with seven hypotheses that were tested and evaluated in Chapter 4. The next section discusses how these hypotheses were supported by the findings and how do they relate to similar studies in literature.

5.2 Supported Hypotheses

All the hypotheses of this study (revised model) were supported.

5.2.1 Hypothesis 1

"System quality has a positive influence on the Use of the CSD system"

"System quality" was used to measure the supplier's perceptions of the technical performance of CSD system, with a particular emphasis on security and confidentiality. These were amongst the most cited elements both during literature review (as described in Section 2.2 and 2.5) and pilot testing. Even during the data collection process, those respondents who did offer to provide additional comments suggested that the reason that many were so reluctant to participate was because of fears of being subjected to fraudulent and other corrupt activities, since the criminals use emails in most of those scams to lure them. Conceptually, it is probably more likely that security and confidentiality will play a bigger role in mature e-government systems with high levels of integration than on more basic systems since integrated systems with more data sharing exposes the user's data to more government departments and other state entities. Therefore, most of the participants regarded system security as a critical aspect of system quality.

Within the IS success model, "systems quality" is expected to lead to higher system use (Delone and McLean, 2003). The results indicated that "system quality" had a positive significant effect on system "use", therefore the hypothesis that "system quality" has a positive influence on the use of the CSD system" was supported within the context of this study. This is consistent with other studies that measured the same constructs (Al Athmay *et al*., 2016; Abdelsalam *et al.,* 2012; Floropoulos *et al*., 2010). The findings of the study by Floropoulos et al. (2010) showed that "system quality" was one of the significant positive determinants of perceived usefulness of an e-government system. Abdelsalam *et al.* (2012) also found that greater system quality leads to increased use of an e-government system. Similarly, the results of the study by Al Athmay *et al*. (2016) revealed that system quality had a strong impact on the intention to use e-government systems. The results of these studies seem to show that there is greater uniformity regarding the relationship between "system quality" and system "use" within the e-government systems in contexts where the users of the system understand the net benefits of those systems properly. Although some researchers have argued the relationship between "system quality" and "use" or "intention to use" is either insignificant or inconclusive within the e-government context, they also explained that this was likely because the users of e-government systems may not completely understand the net benefits or advantages of using e-government systems (Rana *et al*., 2012; Wirtz and Kurtz, 2017). Nevertheless, most of the studies support the positive relationship between these variables as discussed in Section 2.3.

5.2.2 Hypothesis 2

"System quality will have a positive influence on user satisfaction in the CSD system"

The IS success model predicts that "systems quality" is expected to lead to higher "user satisfaction" (Delone and McLean, 2003). The evidence supports the strong positive relationship between "systems quality" and "user satisfaction", thus supporting the hypothesis that "system quality" has a positive influence on the user's satisfaction with the CSD system" within the context of this study. The relationship between "systems quality" and "user satisfaction" ($r=0.503$, $p<0.01$) is slightly stronger than the relationship between "systems quality" and system "user" ($r=0.464$, $p<0.01$). This supports the findings of the study by Abdelsalam *et al.* (2012), which found that the relationship between "systems quality" and "user satisfaction" was stronger than the relationship between "systems quality" and system "use". The authors also suggest that e-government systems with lower quality negatively affect use and satisfaction of users, and thus the ultimate success of an e-government initiative. Chen *et al.* (2015) found that system quality does not affect system "use" and "user satisfaction". However, it seemed like there was still a lot of manual intervention in the system they were evaluating, and users also expressed major reservations about the quality of the system,

thus suggesting it may have not been a mature e-government system. Additionally, other researchers such Rana *et al.* (2015) also found support for the positive relationship between these variables, and suggest that the context and demographics may play a significant role in the findings of such studies.

5.2.3 Hypothesis 3

"Information quality will have a positive influence on the Use of the CSD system"

"Information quality" was used to measure the accuracy, relevance and completeness of the information provided by the CSD system. The results showed that "information quality" has a positive effect on the "use" of a mature e-government system. Therefore, Hypotheses 3 was supported in the context of this study. These results supported the results of a study by Chen *et al*. (2015), which found that "information quality" had a consistent and significant influence on both "use" and "user satisfaction". Similar findings were made by Floropoulos *et al.* (2010). On the other hand, Abdelsalam *et al*. (2012) had different results, with the influence of information quality on both "use" and "user satisfaction" shown to be not significant. This study focused only on local governments, which may suggest that results are different in these demographics. However, the study only sampled 48 respondents. Although the 48 respondents represented 100% of the population, the sample size may not be adequate enough for most statistical techniques, thus it is difficult to compare the results of that study with this study and the others which have been referenced here, since all of them had at least 110 respondents or more. Additionally, other studies also support the hypothesis that there is a positive relationship between "information quality" and "use" (Teo *et al*., 2008; Alhussain, 2017)

5.2.4 Hypothesis 4

"Information quality will have a positive influence on User Satisfaction in the CSD"

The results showed that "information quality" has a positive effect on the "user satisfaction" with a mature e-government system. Therefore, Hypotheses 4 was supported in the context of this study. These results supported the results of a study by Chen *et al*. (2015), which found that "information quality" had a consistent and significant influence on both "use" and "user satisfaction". Similar findings were made by Floropoulos et al. (2010). On the other hand, Abdelsalam *et al*. (2012) had different results, with the influence of information quality on both "use" and "user satisfaction" shown to be not significant. The limitations of that study have already been discussed in Section 5.2.4. Furthermore, other more recent studies such as Roky and Meriouh (2015) and Yakubu and Dasuki (2018) have provided additional support for this hypothesis.

5.2.5 Hypothesis 5

"Use will have a positive influence on User Satisfaction in the CSD system"

Numerous researchers attempted to describe and measure the relationship between these variables even before DeLone and McLean developed the original IS Success Model in 1992. According to Bokhari (2005), although it was common to employ system "use" and "user satisfaction" as measures of IS Success, they were rarely both used simultaneously to assess the same system. Researchers began assessing this relationship and the initial studies showed mixed results (Kim, 1989; Mawhinney, 1990). As a result, Bokhari (2005) carried out a meta-analysis of studies that evaluated the relationship between "use" and "user satisfaction" in attempts to resolve inconsistencies. They found that there exists a significant positive relationship between these variables in most of the studies they reviewed, thereby providing some validation for DeLone and McLean's (2003) argument that "use" and "user satisfaction" are interrelated and both jointly contribute to the realization of net benefits. Regarding the nature and direction of relationship, the authors concluded that even though the results are largely inclusive, it may be argued that a relationship may exist in both directions, with "user satisfaction" acting as positive feedback that adds towards greater use of a system. This study also found that "use" has a positive effect on a user's satisfaction in the context of this study. Several recent studies have also provided support for this hypothesis (Floropoulos *et al.,* 2010; Veeramootoo *et al.,* 2018; Wei *et al.,* 2017; Zhou, 2013).

5.2.6 Hypothesis 6 and Hypothesis 7 – Net Benefits

H6: "Use will have a positive influence on the Net benefits realized from the CSD system"

H7: "User Satisfaction will have a positive influence on the Net benefits realized from the CSD system"

This study aimed to validate the IS success model in the context of an e-government system in South Africa that was developed for companies that conduct business with government entities. Findings from this study support the hypothesis that "use" and "user satisfaction" will have a positive influence on the "net benefits" realized from the CSD system. These results are in line with some other studies, such as Ojo (2017), who found that "use" and "user satisfaction" significantly influenced perceived "net benefits" in the context of hospital information systems in Nigerian teaching hospitals, and Jaafreh (2017) who also found that both these variables had a significant positive relationship with the "net benefits" measure. The 'user satisfaction" variable ($r=0.892$, $p<0.01$) had a slightly stronger effect on the "net benefits" than "use" ($r=0.843$, $p<0.01$).

Furthermore, all the variables in this study have a significant positive relationship with each other and with the "net benefits" measure, therefore giving credence to the revised research model's constructs and interrelationships within the context of SME companies in South Africa. Also, "system quality" and "information quality" participated in a combined significant relationship with the "net benefits" measure, as described in Section 4.5.3. Thus supporting the findings by Scott *et al.* (2016), who also validated IS success by evaluating a comprehensive "net benefits" construct to measure the success of e-government within the context of the United States of America (USA) federal government websites. The findings of this study also show that SME companies perceive public value from all of dimensions of the "net benefits" measure of the revised research model, including cost, time, communication, convenience, personalization, ease of retrieval, trust and democracy. This means that all three elements (efficiency, effectiveness, and democracy) of the Public Value theory are supported within the context of this study. This also suggests that the administrative burden of SMEs can be reduced by well-developed, mature e-government systems, when implemented and used properly.

Chapter conclusion

This chapter focused on interpreting the results, and discussed the findings and related them back to e-government studies that are found in the literature to determine whether the findings confirm or differ from expectations. The next chapter provides a summary of this research and discusses the implications and concludes the study.

CHAPTER 6. CONCLUSION

This chapter summarises the results, describes the contribution of this study to both academia and practice, and concludes this research.

6.1 Summary of Results

The purpose of this study was to test the relationships between the dimensions that are predicted to contribute to the success of mature e-government systems in South Africa. The DeLone and McLean IS Success model was used a theoretical lens and integrated elements from the Public Value theory, namely efficiency, effectiveness and improved social value, to cater for the unique aspects of e-government systems. The research gap investigated in this study was that there was lack of empirical studies that validate the benefits mature e-government systems within the South African context, and Africa in general. An online email survey was used to collect data from South African SME companies that use the CSD e-government system. After the data collection period, 120 usable responses were received from companies across various industries and provinces in South Africa.

All the predicted relationships between all the constructs were supported by the results of this study, except for "service quality" which had to be dropped from the research model after failing validity scrutiny. From the revised research model, the results indicated that both "system quality" and "information quality" had a significant effect on both system "use" and "user satisfaction". The association between system "use" and "user satisfaction" was also confirmed, with the analysis showing a strong significant correlation between the two variables. System "use" and "user satisfaction" were also shown to both have a significant influence on the attainment of "net benefits". The nomological validity of the research model was also confirmed by the findings, and both "system quality" and "information quality" were found to have a combined significant relationship with the "net benefits" measure. Therefore, apart from the exclusion of "service quality", the findings of this study validated almost the entire updated DeLone and McLean IS Success model. However, the revised model used in the final analysis is in line with the original IS Success model, since it also did not have "service quality" as part of the measures of IS success.

The findings also revealed that SME companies perceive public value from all of dimensions of the "net benefits" measure of the revised research model, for all dimensions that were derived from the Public Value theory, namely, efficiency, effectiveness and improved democracy. These perceived net benefits included reduced cost, improved time, better communication, convenience, personalization, ease of retrieval, trust

and democracy. Therefore, the findings of this study suggest that administrative burden of SME companies can be reduced by well-developed, mature e-government systems, when implemented and used properly.

6.2 Implications for Academia

This research validates almost the whole updated IS Success model in the context of SME companies in South Africa. Findings from this study give credence to the model's constructs and interrelationships, except for the "service quality". This study also suggests that the model can be employed successfully in different contexts. For example, Scott *et al.* (2016) validated the model within the context of the USA Federal government websites. Which was a type of G2C e-government system. The study by Stefanovic *et al.* (2016) validated model in the context of e-government employees (G2E). This study adds to the government to business (G2B) literature, in particular SME companies using the CSD e-government system in South Africa. This study also supports findings of researchers such Sørum *et al.* (2012) who argued for the importance of using multi-dimensional success measures to effectively capture the value mature e-government systems. This was conceptualized by the multi-dimensional "net benefits" measure in this study, which was largely validated when the results showed that there were significant levels of correlations with other multi-dimensional variables such as "information quality" and "user satisfaction".

6.3 Implications for Practice

The implication for governments and IS practitioners working in the public sector is that SME companies perceive public value from mature e-government systems within the African context. Another implication is that SME companies in South Africa view intangible benefits as equally important as tangible gains. This means that efficiency and effectiveness gains such as reduced costs and ease of retrieving information are viewed as equally important as intangible benefits such as trust and transparency. This suggests that governments should consider all different dimensions when measuring the net benefits of an e-government system, and during policy formulation and subsequent implementation of e-government initiatives. The findings reveal that the administrative burden of SMEs can be reduced by well-developed, mature e-government systems, highlighting the importance of properly designing and implementing quality e-government systems. This is vital in a country with a troubled economy like South Africa, since academic literature indicates that administrative burden has disproportionate effect on SMEs than on larger companies. Therefore, governments should ensure that they adequately cater for SMEs when planning and implementing their e-government initiatives, especially considering that SMEs are generally regarded as engines for economic growth in many countries.

6.4 Limitations of the study

The general limitations of quantitative survey research are also applicable to this study. These were discussed in detail in Sections 3.3 and 3.6. Although the sample size of 120 companies was adequate for statistical analysis, and the validity and reliability of the collected data was verified, the large size of the total population suggests that generalizing the results of this study should be treated with caution. The CSD database currently has over 800.000 registered companies, of which the majority can be estimated to be SMEs based on literature, with the percentage of companies that are categorized as SMEs making up to 99% of the total number of companies in some regions, such as the United States of America and the European Union (Bhaird, 2010; Virglerová, Dobeš and Vojtovič, 2016). Therefore, a larger sample is probably needed to generalize the results to the entire population. This study also analysed only one system, thus it is uncertain if different results would have been obtained if two or more systems were analysed.

6.5 Recommendations for future research

Assessing the interdependence of variables as per the updated IS success models was outside the scope this study. For example, system "use" and "user satisfaction" were revealed to have a strong positive relationship as predicted by the model, but this study did not analyse the direction of that relationship and the effect these variables have on each other, since they are also theorized to be interdependent. Other researchers could design their data collection and analysis methods in such a way to be able to analyse such a relationship. Longitudinal studies could also be better suited for examining the cause and effect of these relationships. Similarly, other researchers may consider qualitative and mixed methods in order to attain a more in-depth understanding of the nature of these relationships. Furthermore, this research did not consider the effect environmental factors on the success of e-government systems. Considering that South Africa is a developing country, future studies could look into the effect of environmental factors such as lack of internet penetration and social exclusion on SMEs that use e-government systems within the country.

6.6 Conclusion

Innovations and advances in the information and communications (ICT) technology sector over the years has encouraged many state entities to gradually integrate technological artefacts in their initiatives to provide goods and services to their citizens. Although there have been numerous e-government studies, the measurement of e-government success is arguably still not well understood by both practitioners and researchers. This research contributed to literature evaluating the various factors that contribute to the success of highly mature e-government systems on SMEs in South Africa. In order to accomplish this, the

updated DeLone and McLean IS Success model, in conjunction with the Public Value theory, was used to test the relationships amongst the relevant IS success variables using quantitative survey research design. The findings indicated all the predicted relationships had a positive effect on the success of an e-government system. The findings also showed that SME companies perceive public value from mature e-government systems. The findings of this research will potentially assist both practitioners and researchers in understanding the influence and success of complex e-government systems and enable governments to properly plan their e-government initiatives, and also be able to justify their investments in such systems.

References

Abdalla, S., 2012. *An e-government adoption framework for developing countries: A case study from Sudan.* Doctoral Dissertation.

Abdelsalam, H.M., Reddick, C.G. and El Kadi, H.A., 2012. Success and Failure of Local E-Government Projects: Lessons Learned from Egypt. In *Digital Democracy: Concepts, Methodologies, Tools, and Applications* (pp. 183-201). IGI Global.

Abu-Shanab, E. and Shehabat, I., 2018. The influence of knowledge management practices on e-government success: A proposed framework tested. *Transforming Government: People, Process and Policy*, *12*(3/4), pp.286-308.

Akbulut, Y., Şendağ, S., Birinci, G., Kılıçer, K., Şahin, M.C. and Odabaşı, H.F., 2008. Exploring the types and reasons of Internet-triggered academic dishonesty among Turkish undergraduate students: Development of Internet-Triggered Academic Dishonesty Scale (ITADS). *Computers & Education*, 51(1), pp.463-473.

Åkesson, M. and Edvardsson, B., 2008. Effects of e-government on service design as perceived by employees. Managing Service Quality: *An International Journal*, 18(5), pp.457-478.

Akkaya, C., Obermeier, M., Wolf, P. and Krcmar, H., 2011, August. Components of trust influencing egovernment adoption in Germany. In *International Conference on Electronic Government* (pp. 88-99). Springer, Berlin, Heidelberg.

Al Athmay, A.A.A., Fantazy, K. and Kumar, V., 2016. E-government adoption and user's satisfaction: an empirical investigation. *EuroMed Journal of Business,* 11(1), pp.57-83.

Al Salmi, M., Mohtar, S. and Hasnan, N., 2017. How to implement successful e-Government: Case study of Sultanate of Oman. *International Business and Accounting Research Journal*, 1(2), pp.109-117.

Alawneh, A., Al-Refai, H. and Batiha, K., 2013. Measuring user satisfaction from e-Government services: Lessons from Jordan. *Government Information Quarterly*, *30*(3), pp.277-288.

Al-Busaidy, M. and Weerakkody, V., 2009. E-government diffusion in Oman: a public sector employees' perspective. *Transforming Government: People, Process and Policy*, *3*(4), pp.375-393.

Al-Hujran, O., Al-Debei, M.M., Chatfield, A. and Migdadi, M., 2015. The imperative of influencing citizen attitude toward e-government adoption and use. *Computers in human Behavior*, *53*, pp.189-203.

Alenezi, H., Tarhini, A. and Sharma, S.K., 2015. Development of quantitative model to investigate the strategic relationship between information quality and e-government benefits. *Transforming Government: People, Process and Policy*, *9*(3), pp.324-351.

Alhussain, T., 2017. Assessing information quality of blackboard system. *Int. J. Comput.,* 25(1), pp.1-7.

Alhyari, S., Alazab, M., Venkatraman, S., Alazab, M. and Alazab, A., 2013. Performance evaluation of e-government services using balanced scorecard: An empirical study in Jordan. *Benchmarking: an international journal*, *20*(4), pp.512-536.

Alshehri, M. and Drew, S., 2011. E-government principles: implementation, advantages and challenges. *International Journal of Electronic Business*, 9(3), pp.255-270.

Alshehri, M., Drew, S., Alhussain, T. and Alghamdi, R., 2012. The Effects of Website Quality on Adoption of E-Government Service: An Empirical Study Applying UTAUT Model Using SEM. In *23rd Australasian Conference On Information Systems* (pp. 1-13).

Alshibly, H. and Chiong, R., 2015. Customer empowerment: Does it influence electronic government success? A citizen-centric perspective. *Electronic Commerce Research and Applications*, *14*(6), pp.393-404.

Amagoh, F., 2016. Determinants of e-government diffusion in Nigeria: An examination of theoretical models. *Information Development*, *32*(4), pp.1137-1154.

Amegavi, G.B., Aduo-Adjei, K., and Owusu, R., 2017. Overcoming the hurdles of intra-organizational information sharing in e-government implementation in Ghana. *Journal of Information Technology Management*, 28(4), p.31.

Andersen, K.V. and Henriksen, H.Z., 2006. E-government maturity models: Extension of the Layne and Lee model. *Government information quarterly*, 23(2), pp.236-248.

Arendsen, R., Peters, O., Ter Hedde, M. and Van Dijk, J., 2014. Does e-government reduce the administrative burden of businesses? An assessment of business-to-government systems usage in the Netherlands. *Government information quarterly*, *31*(1), pp.160-169.

Aristovnik, A. and Obadić, A., 2015. The impact and efficiency of public administration excellence on fostering SMEs in EU countries. *Amfiteatru Economic Journal*, 17(39), pp.761-774.

Ashaye, M.O.R. and Irani, Z., 2014. E-government Implementation Benefits, Risks, and Barriers in Developing Countries Evidence from Nigeria. *US-China Education Review*, 13.

Badri, M.A. and Alshare, K., 2008. A path analytic model and measurement of the business value of e-government: An international perspective. *International Journal of Information Management*, *28*(6), pp.524-535.

Bagozzi, R.P., 1981. *Evaluating structural equation models with unobservable variables and measurement error: a comment.*

Baharon, B.M., Yap, C.S., Ashar, S.F.E., Hanafi, M.H.H.M. and Hazmi, M.S.R.M., 2017. Citizen Satisfaction with E-Government Portals in Malaysia. *International Journal of Business and Information*, *12*(3), pp.289-309.

Bancilhon, J-M. and Cohen, J, F. 2012. First Steps to a Systematic Review in Information Systems. *Working paper*

Belanche, D., Casaló, L.V. and Flavián, C., 2010. Providing online public services successfully: the role of confirmation of citizens' expectations. *International Review on Public and Nonprofit Marketing*, *7*(2), pp.167-184.

Belanche, D., Casaló, L.V. and Flavián, C., 2012. Integrating trust and personal values into the Technology Acceptance Model: The case of e-government services adoption. *Cuadernos de Economía y Dirección de la Empresa*, *15*(4), pp.192-204.

Bélanger, F. and Carter, L., 2008. Trust and risk in e-government adoption. *The Journal of Strategic Information Systems*, *17*(2), pp.165-176.

Bennett, D., 2015. *Factors influencing the success of an E-participation project in South Africa* (Doctoral dissertation, University of Cape Town).

Bhaird, C. M. (2010). *Resourcing Small and Medium Sized Enetrprises*. Springer Verlag: Berlin, 2010

Bhattacharya, D., Gulla, U. and Gupta, M.P., 2011. Validation of E-Commerce Portal Service Quality Scale in E-Government Portal. *Asia Pacific Business Review*, *7*(2), pp.13-24.

Bhattacherjee, A., 2012. *Social science research: Principles, methods, and practices*. USF Tampa Library Open Access Collections.

Bishara, A.J. and Hittner, J.B., 2012. Testing the significance of a correlation with nonnormal data: comparison of Pearson, Spearman, transformation, and resampling approaches. *Psychological methods*, 17(3), p.399.

Blackstone, A., 2012. Sociological Inquiry Principles: Qualitative and Quantitative Methods. *Maine: Flat World Knowledge*.

Bokhari, R.H., 2005. The relationship between system usage and user satisfaction: a meta-analysis. *Journal of Enterprise Information Management*, 18(2), pp.211-234.

Burke, M., 2012. A decade of e-government research in Africa: Section I: Themes and approaches to inform e-strategies. *The African Journal of Information and Communication*, 2012(12), pp.2-25.

Bwalya, K.J. ed., 2012. Handbook of Research on E-Government in Emerging Economies: Adoption, E-Participation, and Legal Frameworks: Adoption, E-Participation, and Legal Frameworks. *IGI Global*.

Bwalya, K.J., 2009. Factors Affecting Adoption of e-Government in Zambia. The Electronic Journal of *Information Systems in Developing Countries*, 38(1), pp.1-13.

Bwalya, K.J. and Mutula, S., 2016. A conceptual framework for e-government development in resource-constrained countries: The case of Zambia. *Information Development*, 32(4), pp.1183-1198.

Carter, L. and Weerakkody, V., 2008. E-government adoption: A cultural comparison. *Information Systems Frontiers*, *10*(4), pp.473-482.

Carter, L., 2008. E-government diffusion: a comparison of adoption constructs. *Transforming Government: People, Process and Policy*, *2*(3), pp.147-161.

Castelnovo, W., 2013, June. A stakeholder based approach to public value. In *Proceedings of 13th European conference on Egovernment* (pp. 94-101).

Central Supplier Database (2019), Central Supplier Database for the South African Government. Retrieved: 13/08/2019. https://secure.csd.gov.za/

Chan, F.K., Thong, J.Y., Venkatesh, V., Brown, S.A., Hu, P.J.H. and Tam, K.Y., 2010. Modelling citizen satisfaction with mandatory adoption of an E-Government technology. *Journal of the Association of Information Systems,* 11(10), pp.519-549.

Check, J. and Schutt, R.K., 2011. *Research methods in education*. Sage Publications.

Chemingui, H. and Ben lallouna, H., 2013. Resistance, motivations, trust and intention to use mobile financial services. *International Journal of Bank Marketing*, 31(7), pp.574-592.

Chen, J.V., Jubilado, R.J.M., Capistrano, E.P.S. and Yen, D.C., 2015. Factors affecting online tax filing–An application of the IS Success Model and trust theory. *Computers in Human Behavior*, 43, pp.251-262.

Chen, Y.C., 2010. Citizen-centric e-government services: Understanding integrated citizen service information systems. *Social Science Computer Review*, *28*(4), pp.427-442.

Chin, W.W., Marcolin, B.L. and Newsted, P.R., 2003. A partial least squares latent variable modelling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information systems research*, 14(2), pp.189-217.

Cortina, J.M., 1993. What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, *78*(1), p.98.

Coryn, C.L. and Hobson, K.A., 2011. Using nonequivalent dependent variables to reduce internal validity threats in quasi-experiments: Rationale, history, and examples from practice. *New Directions for Evaluation*, *2011*(131), pp.31-39.

Creswell, J.W., 2013. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Cruzes, D.S. and Dybå, T., 2011. Research synthesis in software engineering: A tertiary study. *Information and Software Technology*, 53(5), pp.440-455.

Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, pp.319-340.

Davison, R.M., Wagner, C. and Ma, L.C., 2005. From government to e-government: a transition model. *Information technology & people*, 18(3), pp.280-299.

Delice, A., 2010. The Sampling Issues in Quantitative Research. *Educational Sciences: Theory and Practice*, 10(4), pp.2001-2018.

DeLone, W.H. and McLean, E.R., 1992. Information systems success: The quest for the dependent variable. *Information systems research,* 3(1), pp.60-95.

DeLone, W.H. and McLean, E.R., 2003. The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), pp.9-30.

Department of Planning, Monitoring and Evaluation (2015), STANDARD DOCUMENTS TO BE SUBMITTED FOR ALL BIDS. Retrieved: 06/07/2019. https://www.dpme.gov.za/advertisements/Tenders/Bid%20document%20for%20T2%20of%202015.pdf

Di Mascio, F., Natalini, A. and Stolfi, F., 2017. The implementation of administrative burden reduction policy: Mechanisms and contexts in the study of Europeanization. *Comparative European Politics*, 15(2), pp.264-285.

Drew, M.A.S.J., 2011. E-government principles: implementation, advantages and challenges. *International Journal of Electronic Business,* 9(3), pp.255-270.

Dwivedi, Y.K., Rana, N.P., Janssen, M., Lal, B., Williams, M.D. and Clement, M., 2017. An empirical validation of a unified model of electronic government adoption (UMEGA). *Government Information Quarterly*, 34(2), pp.211-230.

Dulock, H.L., 1993. Research design: Descriptive research. *Journal of Pediatric Oncology Nursing*, 10(4), pp.154-157.

Ebenezer, A., 2018. Assessing the Effect of e-Government Initiatives on Business Activities. In *Russian Regions in the Focus of Changes: Conference proceedings.—Ekaterinburg,* 2018 (pp. 61-71). LLC Publishing office EMC UPI.

Ellis, S.M. and Steyn, H.S., 2003. Practical significance (effect sizes) versus or in combination with statistical significance (p-values): research note. *Management Dynamics: Journal of the Southern African Institute for Management Scientists*, *12*(4), pp.51-53.

Emmerich, K., Bogacheva, N., Bockholt, M. and Wendel, V., 2016. Operationalization and Measurement of Evaluation Constructs. In *Entertainment Computing and Serious Games* (pp. 306-331). Springer, Cham.

Engineering News (2019), SME sector 'critical' to growing South Africa's economy – Pityana: 09/08/2019. https://www.engineeringnews.co.za/article/sme-sector-critical-to-growing-south-africas-economy-pityana-2019-04-11

Fan, J. and Yang, W., 2015. Study on e-government services quality: The integration of online and offline services. *Journal of Industrial Engineering and Management*, *8*(3), p.693.

Fang, Z., 2002. E-government in digital era: concept, practice, and development. *International journal of the Computer, the Internet and management*, 10(2), pp.1-22.

Fath-Allah, A., Cheikhi, L., Al-Qutaish, R.E. and Idri, A., 2014. E-government maturity models: A comparative study. *International Journal of Software Engineering & Applications*, 5(3), p.71.

Floropoulos, J., Spathis, C., Halvatzis, D. and Tsipouridou, M., 2010. Measuring the success of the Greek taxation information system. *International Journal of Information Management*, *30*(1), pp.47-56.

Forbes (2019), South Africa Launches $95m Fund To Grow Small Businesses. Retrieved: 09/08/2019. https://www.forbes.com/sites/tobyshapshak/2019/03/29/south-africa-launches-95m-fund-to-grow-small-businesses/#4ef9ec54850c

Fricker, R.D. and Schonlau, M., 2002. Advantages and disadvantages of Internet research surveys: Evidence from the literature. *Field methods*,*14*(4), pp.347-367.

Fröhlich, K., 2017, May. Evaluating the effects of e-government initiatives on citizen-centric goals at selected Namibian Government Ministry. In *IST-Africa Week Conference (IST-Africa), 2017* (pp. 1-9). IEEE.

Gathungu, J. and Mungai, A.N., 2012. Contextual factors affecting e-government strategy implementation and its impact on public sector performance in Kenya. *Journal of Arts and Humanities,* 1(1), p.143.

Gerpott, T.J. and Ahmadi, N., 2016. Use levels of electronic government services among German citizens: An empirical analysis of objective household and personal predictors. *Transforming Government: People, Process and Policy*, *10*(4), pp.637-668.

Gliem, J.A. and Gliem, R.R., 2003. Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. *Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*.

Goddard, W. and Melville, S., 2004. *Research methodology: An introduction*. Juta and Company Ltd.

Ghosh, D. and Vogt, A., 2012, July. Outliers: An evaluation of methodologies. In *Joint statistical meetings* (pp. 3455-3460).

Goodhue, D.L., Wybo, M.D. and Kirsch, L.J., 1992. The impact of data integration on the costs and benefits of information systems. *MIS Quarterly*, pp.293-311

Gupta, B., Dasgupta, S. and Gupta, A., 2008. Adoption of ICT in a government organization in a developing country: An empirical study. *The Journal of Strategic Information Systems*, *17*(2), pp.140-154.

Ha, T.T., 2016. Empirically Testing the Public Value Based Conceptual Framework for Evaluating E-Government Performance in Vietnam. *Modern Economy*, 7(02), p.140.

Hamid, A.A., Razak, F.Z.A., Bakar, A.A. and Abdullah, W.S.W., 2016. The effects of perceived usefulness and perceived ease of use on continuance intention to use e-government. *Procedia Economics and Finance*, *35*, pp.644-649.

Hardesty, D.M. and Bearden, W.O., 2004. The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs. *Journal of Business Research*, 57(2), pp.98-107.

Harvey, D.L., 2002. Agency and community: A critical realist paradigm. *Journal for the theory of social behaviour*, *32*(2), pp.163-194.

Hasan, M., Maarop, N., Naswir, R.Y., Samy, G.N., Magalingam, P., Yaácob, S. and Daud, S.M., 2018. A proposed conceptual success model of citizen-centric digital government in Malaysia. *Journal of Fundamental and Applied Sciences*, 10(2S), pp.35-46.

Hassan, A.M., Mike, I. and Guyo, W., 2017. Effect of integrated service approach on service delivery at Huduma centres in the public service of Kenya. *European Journal of Business and Social Sciences*, 6(03), pp.01-12.

Heather, K.E.K., 2015. *Challenges towards e-government adoption in Kenyan public administration: A survey of provincial administration*, Uasin-Gishu County (Doctoral dissertation, Moi University).

Hecker, K. and Violato, C., 2009. Validity, reliability, and defensibility of assessments in veterinary education. *Journal of veterinary medical education*, *36*(3), pp.271-275.

Heeks, R., 2008. Benchmarking egovernment: improving the national and international measurement, evaluation and comparison of egovernment. *Evaluating information systems*, *257-301*.

Hellang, Ø. and Flak, L.S., 2012, September. Assessing effects of egovernment initiatives based on a public value framework. In *International Conference on Electronic Government* (pp. 246-259). Springer, Berlin, Heidelberg.

Higgins, J., 2006. *The radical statistician: A beginners guide to unleashing the power of applied statistics in the real world*. Jim Higgins Publishing.

Hossain, M.D., Moon, J., Kim, J.K. and Choe, Y.C., 2011. Impacts of organizational assimilation of e-government systems on business value creation: A structuration theory approach. *Electronic Commerce Research and Applications*, *10*(5), pp.576-594.

Huang, Z. and Benyoucef, M., 2014. Usability and credibility of e-government websites. *Government Information Quarterly*, *31*(4), pp.584-595.

Hung, S.Y., Chang, C.M. and Kuo, S.R., 2013. User acceptance of mobile e-government services: An empirical study. *Government Information Quarterly*, *30*(1), pp.33-44.

Husin, M.H., Loghmani, N. and Zainal Abidin, S.S., 2017. Increasing e-government adoption in Malaysia: MyEG case study. *Journal of Systems and Information Technology*, *19*(3/4), pp.202-227.

Hussein, R., Mohamed, N., Rahman Ahlan, A. and Mahmud, M., 2011. E-government application: an integrated model on G2C adoption of online tax. *Transforming Government: People, Process and Policy*, *5*(3), pp.225-248.

Iyer, L.S., Singh, R., Salam, A.F. and D Aubeterre, F., 2006. Knowledge management for Government-to-Government (G2G) process coordination. *Electronic Government-Inderscience-,* 3(1), p.18.

Israel, M. and Hay, I., 2006. *Research ethics for social scientists*. Sage.

Jaafreh, A.B., 2017. Evaluation Information System Success: Applied DeLone and McLean Information System Success Model in Context banking System in KSA. *International Review of Management and Business Research*, 6(2), pp.829-845.

Jean-Paul, M., 2011. *A conceptual framework for information technology project management auditing* (Doctoral dissertation, UNIVERSITY OF JOHANNESBURG).

Jiang, X. and Ji, S., 2014. E-government web portal adoption: The effects of service quality. *e-Service Journal*, *9*(3), pp.43-60.

Kaisara, G. and Pather, S., 2011. The e-Government evaluation challenge: A South African Batho Pele-aligned service quality approach. *Government information quarterly*, *28*(2), pp.211-221.

Kamau, G., Njihia, J. and Wausi, A., 2016, May. E-government websites user experience from public value perspective: Case study of iTax website in Kenya. In *IST-Africa Week Conference, 2016* (pp. 1-8). IEEE.

Kannan, K.S., Manoj, K. and Arumugam, S., 2015. Labeling methods for identifying outliers. *International Journal of Statistics and Systems*, 10(2), pp.231-238.

Kassim, E.S. and Hussin, H., 2013. A success model for the Malaysian government e-procurement system: the buyer perspective. *International Journal of Electronic Government Research (IJEGR)*, *9*(1), pp.1-18.

Keoduangsine, S. and Goodwin, R., 2009, December. User satisfaction model for mobile e-government service. In *Proceedings of the 11th International Conference on Information Integration and Web-Based Applications & Services* (pp. 609-612). ACM.

Kim, K.K., 1989. User satisfaction: A synthesis of three different perspectives. *Journal of Information Systems*, 4(1), pp.1-12.

Kolsaker, A. and Lee-Kelley, L., 2008. Citizens' attitudes towards e-government and e-governance: a UK study. *International Journal of Public Sector Management*, *21*(7), pp.723-738.

Kothari, C.R., 2004. *Research methodology: Methods and techniques*. New Age International.

Kumar, R., Sachan, A. and Mukherjee, A., 2017. Qualitative approach to determine user experience of e-government services. *Computers in Human Behavior*, *71*, pp.299-306.

Kumar, S.P., 2017. Internet of Things for sophisticated e-governance: A special focus on agricultural sector. *International Journal of Trend in Research and Development.*

Kumar Sharma, S., Al-Shihi, H. and Madhumohan Govindaluri, S., 2013. Exploring quality of e-Government services in Oman. *Education, Business and Society: Contemporary Middle Eastern Issues*, *6*(2), pp.87-100.

Kurfalı, M., Arifoğlu, A., Tokdemir, G. and Paçin, Y., 2017. Adoption of e-government services in Turkey. *Computers in Human Behavior*, 66, pp.168-178.

Kwok, C., 2014. Implementing successful G2B initiatives in the HKSAR: An empirical evaluation of G2B websites. *Journal of Information, Communication and Ethics in Society*, *12*(3), pp.219-244.

Lai, C.S.K. and Pires, G., 2010. Testing of a model evaluating e-government portal acceptance and satisfaction. *The Electronic Journal Information Systems Evaluation*, *13*(1), pp.35-46.

Lallmahomed, M.Z., Lallmahomed, N. and Lallmahomed, G.M., 2017. Factors influencing the adoption of e-Government Services in Mauritius. *Telematics and Informatics*, *34*(4), pp.57-72.

Lean, O.K., Zailani, S., Ramayah, T. and Fernando, Y., 2009. Factors influencing intention to use e-government services among citizens in Malaysia. *International Journal of Information Management*, *29*(6), pp.458-475.

Lee, A. and Levy, Y., 2014. The effect of information quality on trust in e-government systems' transformation. *Transforming Government: People, Process and Policy*, 8(1), pp.76-100.

Lee, J., Kim, H.J. and Ahn, M.J., 2011. The willingness of e-Government service adoption by business users: The role of offline service quality and trust in technology. *Government Information Quarterly*, *28*(2), pp.222-230.

Levin, K.A., 2006. Study design III: Cross-sectional studies. *Evidence-based dentistry*, *7*(1), p.24.

Liang, S.W. and Lu, H.P., 2013. Adoption of e-government services: an empirical study of the online tax filing system in Taiwan. *Online Information Review*, *37*(3), pp.424-442.

Lin, F., Fofanah, S.S. and Liang, D., 2011. Assessing citizen adoption of e-Government initiatives in Gambia: A validation of the technology acceptance model in information systems success. *Government Information Quarterly*, *28*(2), pp.271-279.

Magoutas, B. and Mentzas, G., 2010. SALT: A semantic adaptive framework for monitoring citizen satisfaction from e-government services. *Expert Systems with Applications*, 37(6), pp.4292-4300.

Mahmoodi, R.K. and Nojedeh, S.H., 2016. Investigating the Effectiveness of E-government Establishment in Government Organizations. *Procedia-Social and Behavioral Sciences*, 230, pp.136-141.

Manda, M.I., 2016. An analysis of the barriers to e-government integration, interoperability and information sharing in developing countries: a systematic review of literature. In *Proceedings of ACIST* Accra Ghana,

Manda, M.I., 2017, September. Towards "Smart Governance" Through a Multidisciplinary Approach to E-government Integration, Interoperability and Information Sharing: A Case of the LMIP Project in South Africa. In *International Conference on Electronic Government* (pp. 36-44). Springer, Cham.

Mapanoo, M.E.D. and Caballero, J.M., 2018. E-Government for human capability development program: An implementation of G2E System for enhanced government services. In *MATEC Web of Conferences* (Vol. 189, p. 10005). EDP Sciences.

Matavire, R., Chigona, W., Roode, D., Sewchurran, E., Davids, Z., Mukudu, A. and Boamah-Abu, C., 2010. Challenges of eGovernment project implementation in a South African context. *The Electronic Journal Information Systems Evaluation*, 13(2), pp.153-164

Mawhinney, C.H., 1990, November. A study of computer use by knowledge workers: user satisfaction versus system use. In *Proceedings Annual Meeting of Decisions Sciences Institute*. San Diego, CA (pp. 954-956).

Mberi, T., Wanyoike, T. and Sevilla, J., 2016, May. The implementation of an e-Government system in developing countries: A case of taita Taveta county, Kenya. In *IST-Africa Week Conference*, 2016 (pp. 1-7). IEEE.

Meijer, A., 2015. E-governance innovation: Barriers and strategies. *Government Information Quarterly*, 32(2), pp.198-206.

Mencinger, J., Aristovnik, A. and Verbič, M., 2014. The Impact of Growing Public Debt onEconomic Growth in the European Union. *Amfiteatru Economic*, 16(35), pp.403-414.

Morales, D.E.P., 2018, April. Analysis of Digital Government in Ecuador: Review of Ecuadorian Agenda with Regard to the Digital Government Stage Framework. In *2018 International Conference on eDemocracy & eGovernment (ICEDEG)* (pp. 345-350). IEEE.

Morgeson, F.V. and Mithas, S., 2009. Does E-government measure up to E-Business? Comparing end user perceptions of US federal government and E-business web sites. *Public Administration Review,* 69(4), pp.740-752.

Mosweu, O., Bwalya, K. and Mutshewa, A., 2016. Examining factors affecting the adoption and usage of document workflow management system (DWMS) using the UTAUT model: Case of Botswana. *Records Management Journal*, 26(1), pp.38-67.

Mpinganjira, M., 2015. Use of e-government services: the role of trust. *International Journal of Emerging Markets,* 10(4), pp.622-633.

Mutula, S.M., 2008. Comparison of sub-Saharan Africa's e-government status with developed and transitional nations. *Information Management & Computer Security*, 16(3), pp.235-250.

Mutula, S.M. and Mostert, J., 2010. Challenges and opportunities of e-government in South Africa. *The electronic library*, 28(1), pp.38-53.

Napitupulu, D., Syafrullah, M., Rahim, R., Amar, A. and Sucahyo, Y.G., 2018, May. Content validity of critical success factors for e-Government implementation in Indonesia. In *IOP Conference Series: Materials Science and Engineering* (Vol. 352, No. 1, p. 012058). IOP Publishing.

Nkwe, N., 2012. E-government: challenges and opportunities in Botswana. *International journal of humanities and social science,* 2(17), pp.39-48.

Ntaliani, M. and Costopoulou, C., 2017. Reduction of administrative burdens for SMEs. *Administration & Society*, 49(8), pp.1143-1164.

Nunnaly, J. 1978. *Psychometric theory*. New York: McGraw-Hill.

Ojo, A.I., 2017. Validation of the DeLone and McLean information systems success model. *Healthcare informatics research*, 23(1), pp.60-66.

Olumoye, M.Y. and Govender, I., 2018. An empirical investigation of factors influencing integrated e-Government implementation in Nigeria: A case of housing and urban development agency. *The Electronic Journal of Information Systems in Developing Countries*, 84(1), p.e12012.

Oluwatayo, J.A., 2012. Validity and reliability issues in educational research. *Journal of Educational and Social Research*, 2(2), pp.391-400.

Onyancha, O.B., 2008. E-Governance in Africa: Challenges, trends, and issues. In *Moi University 3rd Annual International Conference*.

Osman, I.H., Anouze, A.L., Irani, Z., Al-Ayoubi, B., Lee, H., Balcı, A., Medeni, T.D. and Weerakkody, V., 2014. COBRA framework to evaluate e-government services: A citizen-centric perspective. *Government information quarterly*, *31*(2), pp.243-256.

Ouma, F.K., 2014, May. Impediments to interagency statistical information sharing amongst government agencies in Uganda: A G2G adoption. In *IST-Africa Conference Proceedings,* 2014 (pp. 1-11). IEEE.

Ovais Ahmad, M., Markkula, J. and Oivo, M., 2013. Factors affecting e-government adoption in Pakistan: a citizen's perspective. *Transforming Government: People, Process and Policy*, 7(2), pp.225-239.

Ozkan, S. and Kanat, I.E., 2011. e-Government adoption model based on theory of planned behavior: Empirical validation. *Government Information Quarterly*, *28*(4), pp.503-513.

Palaco, I., Park, M.J., Kim, S.K. and Rho, J.J., 2019. Public–private partnerships for e-government in developing countries: An early stage assessment framework. *Evaluation and program planning*, 72, pp.205-218.

Papadomichelaki, X. and Mentzas, G., 2012. e-GovQual: A multiple-item scale for assessing e-government service quality. *Government Information Quarterly*, *29*(1), pp.98-109.

Pappa, D. and Stergioulas, L.K., 2006, September. G2C and C2G: Emerging principles and architectures in e-government and e-participation. In *eGovernment Workshop* (Vol. 6).

Pardo, T.A., Nam, T. and Burke, G.B., 2012. E-government interoperability: Interaction of policy, management, and technology dimensions. *Social Science Computer Review,* 30(1), pp.7-23.

Patola, I.E. and Kurniawan, N.B., 2016, October. Modelling IT public value for IT performance measurement in government organization: A case study: BPS-statistics Indonesia. In *Information Technology Systems and Innovation (ICITSI), 2016 International Conference on* (pp. 1-6). IEEE.

Pillay, K.N., 2013. *e-Government in South Africa: Predictors to failure and success* (Doctoral dissertation, University of the Witwatersrand).

Prybutok, V.R., Zhang, X. and Ryan, S.D., 2008. Evaluating leadership, IT quality, and net benefits in an e-government environment. *Information & Management*, *45*(3), pp.143-152.

Puron-Cid, G., 2013. Interdisciplinary application of structuration theory for e-government: A case study of an IT-enabled budget reform. *Government Information Quarterly*, *30*, pp. S46-S58.

Rana, N.P., Dwivedi, Y.K., Lal, B., Williams, M.D. and Clement, M., 2017. Citizens' adoption of an electronic government system: towards a unified view. *Information Systems Frontiers*, *19*(3), pp.549-568.

Rana, N.P., Dwivedi, Y.K. and Williams, M.D., 2013. Evaluating alternative theoretical models for examining citizen centric adoption of e-government. *Transforming Government: People, Process and Policy*, 7(1), pp.27-49.

Rana, N.P., Dwivedi, Y.K., Williams, M.D. and Weerakkody, V., 2015. Investigating success of an e-government initiative: Validation of an integrated IS success model. *Information Systems Frontiers*, 17(1), pp.127-142.

Rana, N.P., Williams, M.D., Dwivedi, Y.K. and Williams, J., 2012. Theories and theoretical models for examining the adoption of e-government services. e-Service Journal: *A Journal of Electronic Services in the Public and Private Sectors*, 8(2), pp.26-56.

Rehman, M., Esichaikul, V. and Kamal, M., 2012. Factors influencing e-government adoption in Pakistan. *Transforming Government: People, Process and Policy*, *6*(3), pp.258-282.

Rey-Moreno, M., Felício, J.A., Medina-Molina, C. and Rufín, R., 2017. Facilitator and inhibitor factors: Adopting e-government in a dual model. *Journal of Business Research*.

Robert, I., 2013. *Adoption of electronic government in Tanzania: Opportunities and obstacles* (Doctoral dissertation, Mzumbe University).

Roky, H. and Al Meriouh, Y., 2015. Evaluation by users of an industrial information system (XPPS) based on the DeLone and McLean model for IS success. *Procedia Economics and Finance*, 26, pp.903-913.

Roe, B.E. and Just, D.R., 2009. Internal and external validity in economics research: Trade-offs between experiments, field experiments, natural experiments, and field data. *American Journal of Agricultural Economics*, *91*(5), pp.1266-1271.

Rose, J., Persson, J.S. and Heeager, L.T., 2015. How e-Government managers prioritise rival value positions: The efficiency imperative. *Information polity*, 20(1), pp.35-59.

Ruhode, E., 2013. *E-government implementation for inter-organisational information sharing a holistic information systems approach for developing countries* (Doctoral dissertation).

Sá, F., Rocha, Á., Gonçalves, J. and Cota, M.P., 2017. Model for the quality of local government online services. *Telematics and Informatics*, *34*(5), pp.413-421.

SABC News, 2018. SABC News Online, viewed 09 November 2018 <http://www.sabcnews.com/sabcnews/in-conversation-with-jack-ma-at-invest-sa/>

Saha, P., Nath, A.K. and Salehi-Sangari, E., 2012. Evaluation of government e-tax websites: an information quality and system quality approach. *Transforming Government: People, Process and Policy*, *6*(3), pp.300-321.

Salkind, N.J. ed., 2010. *Encyclopedia of research design* (Vol. 1). Sage.

Sang, S., Lee, J.D. and Lee, J., 2009. E-government adoption in ASEAN: the case of Cambodia. *Internet Research*, *19*(5), pp.517-534.

Santos, J.R.A., 1999. Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension*, *37*(2), pp.1-5.

SARS (2019), SMALL BUSINESSES AND VAT. Retrieved: 09/08/2019. https://www.sars.gov.za/ClientSegments/Businesses/SmallBusinesses/Pages/Small-Businesses-and-VAT.aspx

Schaupp, L.C., Carter, L. and McBride, M.E., 2010. E-file adoption: A study of US taxpayers' intentions. *Computers in Human Behavior*, *26*(4), pp.636-644.

Scholl, H.J. and Klischewski, R. (2007). Government integration and interoperability: Framing the research agenda. *International Journal of Public Administration*, 30(8), 889-920.

Schuppan, T., 2009. E-Government in developing countries: Experiences from sub-Saharan Africa. *Government Information Quarterly*, 26(1), pp.118-127.

Schutt, R.K., 2011. *Investigating the social world: The process and practice of research*. Pine Forge Press.

Scott, M., DeLone, W. and Golden, W., 2016. Measuring eGovernment success: a public value approach. *European Journal of Information Systems*, *25*(3), pp.187-208.

Seddon, P. and Kiew, M.Y., 1996. A partial test and development of DeLone and McLean's model of IS success. *Australasian Journal of Information Systems*, 4(1).

Seddon, P.B., 1997. A respecification and extension of the DeLone and McLean model of IS success. *Information systems research*, 8(3), pp.240-253.

Seo, D., Tan, C.W. and Warman, G., 2018. Vendor satisfaction of E-government procurement systems in developing countries: an empirical research in Indonesia. *Information Technology for Development*, pp.1-28.

Shafi, A.S. and Weerakkody, V., 2009. Understanding citizens' behavioural intention in the adoption of e-government services in the state of Qatar. In *ECIS* (pp. 1618-1629).

Shan, S., Wang, L., Wang, J., Hao, Y. and Hua, F., 2011. Research on e-government evaluation model based on the principal component analysis. *Information Technology and Management*, *12*(2), pp.173-185.

Sharma, S.K., Govindaluri, S.M. and Gattoufi, S., 2015. Understanding and predicting the quality determinants of e-government services: a two-staged regression-neural network model. *Journal of Modelling in Management*, *10*(3), pp.325-340.

Shyu, S.H.P. and Huang, J.H., 2011. Elucidating usage of e-government learning: A perspective of the extended technology acceptance model. *Government Information Quarterly*, *28*(4), pp.491-502.

Siddiqui, K., 2013. Heuristics for sample size determination in multivariate statistical techniques. *World Applied Sciences Journal*, 27(2), pp.285-287.

Snilstveit, B., Oliver, S. and Vojtkova, M., 2012. Narrative approaches to systematic review and synthesis of evidence for international development policy and practice. *Journal of development effectiveness,* 4(3), pp.409-429.

Sørum, H., Medaglia, R., Normann Andersen, K., Scott, M. and DeLone, W., 2012. Perceptions of information system success in the public sector: Webmasters at the steering wheel?. *Transforming Government: People, Process and Policy*, *6*(3), pp.239-257.

Stafford, T.F. and Turan, A.H., 2011. Online tax payment systems as an emergent aspect of governmental transformation. *European Journal of Information Systems*, *20*(3), pp.343-357.

Stefanovic, D., Marjanovic, U., Delić, M., Culibrk, D. and Lalic, B., 2016. Assessing the success of e-government systems: An employee perspective. *Information & Management*, *53*(6), pp.717-726.

Steyn, A., Smit, C., Du Toit, S. & Strasheim, C., 2003. *Modern Statistics In Practise* Fifth., Pretoria: Van Schaik Publishers.

Teo, T.S., Srivastava, S.C. and Jiang, L., 2008. Trust and electronic government success: An empirical study. *Journal of management information systems*, *25*(3), pp.99-132.

Thi, L.S., Lim, H.E. and Al-Zoubi, M.I., 2014. Estimating influence of toe factors on E-government usage: evidence of Jordanian Companies. *International Journal of Business and Society*, 15(3), p.413.

Thomas, P.Y., 2010. *Towards developing a web-based blended learning environment at the University of Botswana* (Doctoral dissertation).

Toots, M., 2019. Why E-participation systems fail: The case of Estonia's Osale. ee. *Government Information Quarterly.*

Tripathi, R., Gupta, M.P. and Bhattacharya, J., 2012. Interoperability adoption among government and corporate portals in India: a study. *Journal of Enterprise Information Management*, *25*(2), pp.98-122.

Tripathi, R., Gupta, M.P. and Bhattacharya, J., 2013. Effect of organizational factors on interoperability adoption for Indian portals. *Transforming Government: People, Process and Policy*, *7*(3), pp.285-308.

Turkel, E., and Turkel, G., 2016. Public Value Theory: Reconciling Public Interests, Administrative Autonomy and Efficiency. *Review of Public Administration and Management*, 4(2).

Twizeyimana, J.D. and Andersson, A., 2019. The public value of E-Government–A literature review. *Government Information Quarterly*.

UK Cabinet Office (2006). *Administrative burdens—Routes to reduction*. London, UK: Better Regulation Executive

Urick, M.J., 2012. Exploring generational identity: A multiparadigm approach. *Journal of Business Diversity,* 12(3), pp.103-115

Van Wyk, B., 2012. *Research design and methods Part I.* University of Western Cape.

Vathanophas, V., Krittayaphongphun, N. and Klomsiri, C., 2008. Technology acceptance toward e-government initiative in Royal Thai Navy. *Transforming Government: People, Process and Policy*, 2(4), pp.256-282.

Veeramootoo, N., Nunkoo, R. and Dwivedi, Y.K., 2018. What determines success of an e-government service? Validation of an integrative model of e-filing continuance usage. *Government Information Quarterly*.

Verdegem, P. and Verleye, G., 2009. User-centered E-Government in practice: A comprehensive model for measuring user satisfaction. *Government information quarterly*, *26*(3), pp.487-497.

Verkijika, S.F. and De Wet, L., 2018. E-government adoption in sub-Saharan Africa. *Electronic Commerce Research and Applications*, *30*, pp.83-93.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D., 2003. User acceptance of information technology: Toward a unified view. *MIS quarterly*, pp.425-478.

Virglerová, Z., Dobeš, K. and Vojtovič, S., 2016. The perception of the state's influence on its business environment in the SMEs from Czech Republic. *Administratie si Management Public*.

Wang, H.J. and Lo, J., 2010, November. Exploring citizens' intention to use government websites in Taiwan: An empirical study. In *Proceedings of the 12th International Conference on Information Integration and Web-based Applications & Services* (pp. 524-531). ACM.

Wei, K.M., Tang, Y.T., Kao, Y.C., Tseng, L.C. and Wu, H.H., 2017. Using an updated Delone and McLean model to assess the success of implementing the ward cleaning logistics system in a medical center. *Journal of Statistics and Management Systems*, 20(5), pp.965-976.

Welch, E.W., Feeney, M.K. and Park, C.H., 2016. Determinants of data sharing in US city governments. *Government Information Quarterly*, *33*(3), pp.393-403.

Welch, E.W., Hinnant, C.C. and Moon, M.J., 2004. Linking citizen satisfaction with e-government and trust in government. *Journal of public administration research and theory*, 15(3), pp.371-391.

Wells, N.M. and Yang, Y., 2008. Neighborhood design and walking: a quasi-experimental longitudinal study. *American journal of preventive medicine*, *34*(4), pp.313-319.

Wester, K.L., 2011. Publishing ethical research: A step-by-step overview. *Journal of Counseling & Development*, *89*(3), pp.301-307.

Wilkins, D., 2016. *A case study investigation of e-Government adoption using an open source software-based web portal in developing countries: The case study of e-Liberia* (Doctoral dissertation, Colorado Technical University).

Williams, B., Onsman, A. and Brown, T., 2010. Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, 8(3).

Wilson, J., 2014. *Essentials of business research: A guide to doing your research project*. Sage.

Wirtz, B.W. and Kurtz, O.T., 2017. Determinants of citizen usage intentions in E-government: An empirical analysis. *Public Organization Review*, *17*(3), pp.353-372.

Yaghmaie, F., 2003. Content validity and its estimation. *Journal of Medical Education*, 3(1).

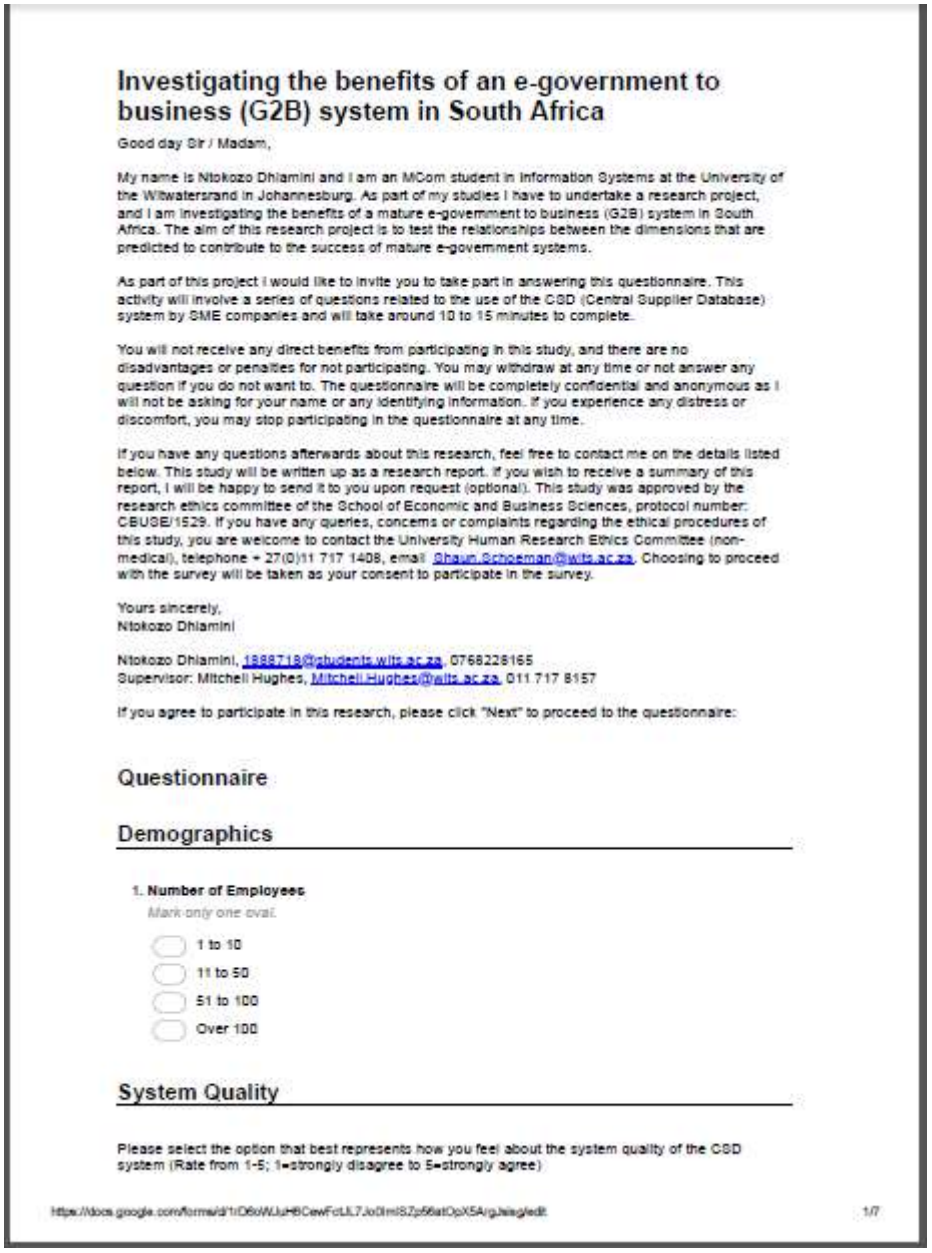
Yakubu, M.N. and Dasuki, S., 2018. Assessing eLearning systems success in Nigeria: an application of the DeLone and McLean Information Systems Success Model. *Journal of Information Technology Education: Research*, 17, pp.183-203.

Zaied, A.N.H., 2012. An integrated success model for evaluating information system in public sectors. *Journal of Emerging Trends in Computing and Information Sciences*, *3*(6), pp.814-825.

Zheng, D., Chen, J., Huang, L. and Zhang, C., 2013. E-government adoption in public administration organizations: integrating institutional theory perspective and resource-based view. *European Journal of Information Systems*, *22*(2), pp.221-234.

Zhou, T., 2013. An empirical examination of continuance intention of mobile payment services. *Decision support systems,* 54(2), pp.1085-1091.

APPENDIX A – RESEARCH INSTRUMENT



Investigating the benefits of an e-government to business (G2B) system in South Africa

Good day Sir / Madam,

My name is Ntokozo Dhlamini and I am an MCom student in Information Systems at the University of the Witwatersrand in Johannesburg. As part of my studies I have to undertake a research project, and I am investigating the benefits of a mature e-government to business (G2B) system in South Africa. The aim of this research project is to test the relationships between the dimensions that are predicted to contribute to the success of mature e-government systems.

As part of this project I would like to invite you to take part in answering this questionnaire. This activity will involve a series of questions related to the use of the CSD (Central Supplier Database) system by SME companies and will take around 10 to 15 minutes to complete.

You will not receive any direct benefits from participating in this study, and there are no disadvantages or penalties for not participating. You may withdraw at any time or not answer any question if you do not want to. The questionnaire will be completely confidential and anonymous as I will not be asking for your name or any identifying information. If you experience any distress or discomfort, you may stop participating in the questionnaire at any time.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report. If you wish to receive a summary of this report, I will be happy to send it to you upon request (optional). This study was approved by the research ethics committee of the School of Economic and Business Sciences, protocol number: CBUSE/1529. If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email Shaun.Schoeman@wits.ac.za. Choosing to proceed with the survey will be taken as your consent to participate in the survey.

Yours sincerely,
Ntokozo Dhlamini

Ntokozo Dhlamini, 1888718@students.wits.ac.za, 0768228165
Supervisor: Mitchell Hughes, Mitchell.Hughes@wits.ac.za, 011 717 8157

If you agree to participate in this research, please click "Next" to proceed to the questionnaire:

Questionnaire

Demographics

1. **Number of Employees**

Mark only one oval.

- 1 to 10
- 11 to 50
- 51 to 100
- Over 100

System Quality

Please select the option that best represents how you feel about the system quality of the CSD system (Rate from 1-5; 1=strongly disagree to 5=strongly agree)

https://docs.google.com/forms/d/1rD6oWJuH6CewFctJL7Jo0ImlSZp56atOpX5ArgJsisg/edit 1/7

2. **The CSD website enables me to accomplish tasks more quickly**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

3. **The CSD website is easy to navigate and perform transactions**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

4. **The CSD website requires a lot of effort to use**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

5. **The CSD website provides helpful instructions for performing my task**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

6. **The security on the CSD website is sufficient**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

7. **The CSD website protects our company's confidential information**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

Information Quality

Please select the option that best represents how you feel about the quality of information from the CSD system (Rate from 1-5; 1= strongly disagree to 5=strongly agree)

8. **Information provided by the CSD website is accurate**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

9. **Information provided by the CSD website is relevant**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

10. **Information provided by the CSD website is up-to-date**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

Service Quality

Please select the option that best represents how you feel about service quality of the CSD system (Rate from 1-5; 1= strongly disagree to 5=strongly agree)

11. **Support provided to users of the CSD system has been sufficient**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

12. **Training on the use of the CSD system has been sufficient**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

13. **There is always support available if we need help with the CSD system**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

Use

Please select the option that best represents how you feel about using the CSD system (Rate from 1-5; 1=strongly disagree to 5=strongly agree)

14. **Using the CSD website would improve my performance in bidding for government goods and services**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

15. **Using the CSD website would improve my productivity in fulfilling orders or responding to requests for quotation**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

16. **Overall, I find the CSD website useful**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

User satisfaction

Please select the option that best represents your satisfaction with the CSD system (Rate from 1-5; 1=strongly disagree to 5=strongly agree)

17. **I feel that the CSD website is effective in fulfilling my needs of interaction with the government entity**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

18. **I find using the CSD system enjoyable**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

19. **Overall, I am pleased with the general performance of the CSD system**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

Net Benefits

Please select the option that best represents the benefits of the CSD system (Rate from 1-5; 1=strongly disagree to 5=strongly agree)

20. **Using the CSD website saves the organization money.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

21. **Using the CSD website reduces the cost of providing the service.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

22. **Using the CSD website saves me time**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

23. **The CSD website provides a quicker response to a question or request than other means (e.g. offline interaction).**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

24. **It is important that I can use the CSD website around the clock.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

25. **It is important that I can access the CSD website from a number of different locations (e.g. home, work, library, post office).**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

26. **I am able to personalize the services offered by the CSD system**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

27. **I value the personalized services offered by this website.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

28. **Using the CSD website is an efficient way of communicating with government departments.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

29. **Using the CSD website is a valuable way of communicating with government departments.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

30. **The CSD website contains a lot of useful and up-to-date, complete and verified procurement information**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

31. **The CSD website answers any queries I might have about government procurement**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

32. **I feel comfortable interacting with the CSD website since it generally fulfils its duties efficiently.**
Mark only one oval.

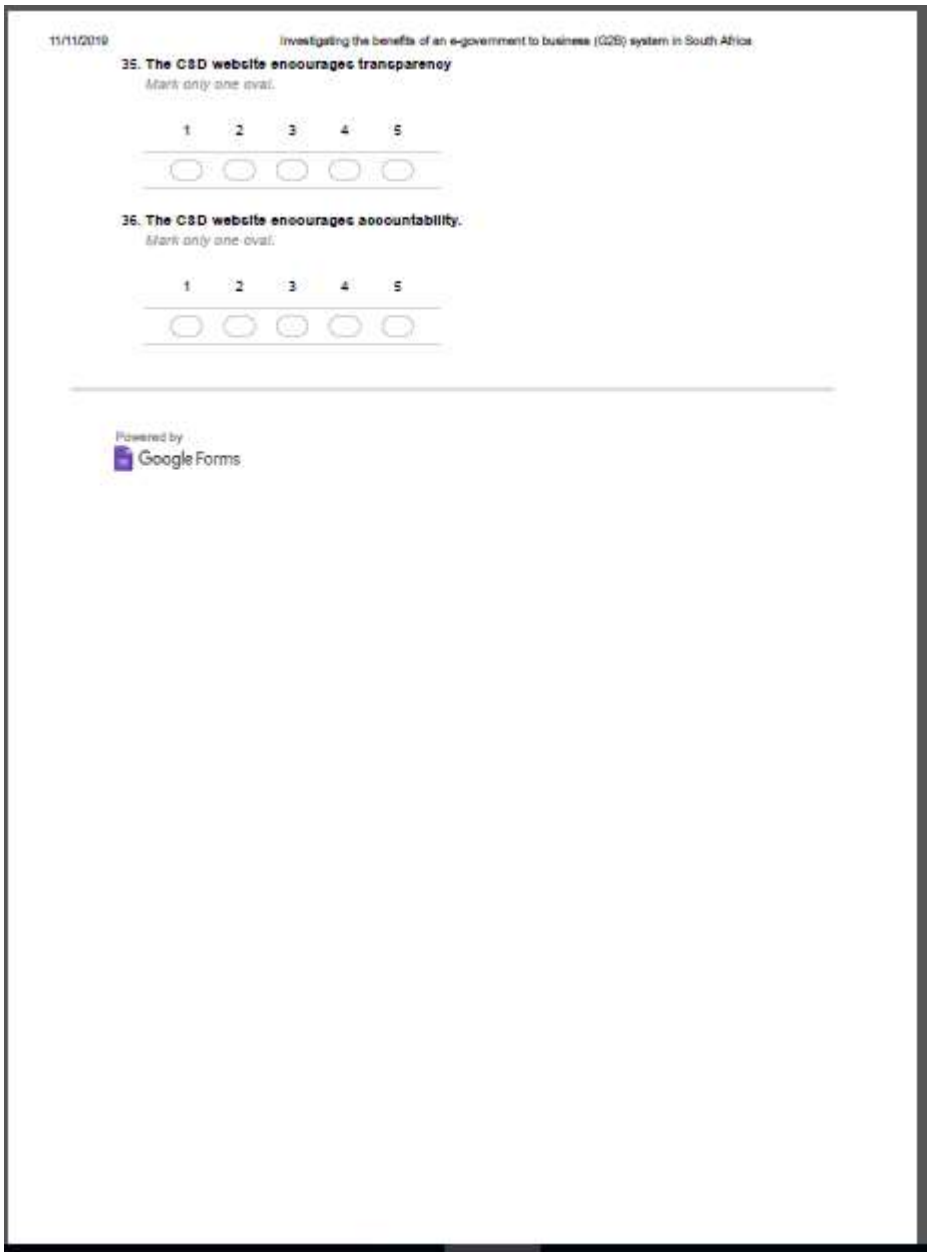
1	2	3	4	5
◯	◯	◯	◯	◯

33. **I always feel confident that I can rely on the CSD website to do its part when I interact with it**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

34. **The CSD website enhances my feeling of being part of an active democracy.**
Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯



11/11/2019 Investigating the benefits of an e-government to business (G2B) system in South Africa

35. The CSD website encourages transparency

Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

36. The CSD website encourages accountability.

Mark only one oval.

1	2	3	4	5
◯	◯	◯	◯	◯

Powered by Google Forms

APPENDIX B – MODELS/FRAMEWORKS USED IN E-GOVERNMENT STUDIES

Model/Framework	Number	References
Author developed models or frameworks	28	"Akkaya *et al.* (2011); Alawneh *et al.* (2013); Al-Busaidy and Weerakkody (2009); Alenezi *et al.*(2015); Alshibly and Chiong (2015); Arendsen *et al.* (2014); Badri and Alshare (2008); Bhattacharya et at, (2011); Carter (2008); Carter and Weerakkody (2008); Gerpott and Ahmadi (2016); Hossain *et al.* (2011); Kassim and Hussin (2013); Keoduangsine and Goodwin (2009); Kumar Sharma *et al.* (2013); Lee, Kim and Ahn (2011); Meijer (2015); Mpinganjira (2015); Rana *et al.* (2017); Rehman *et al.* (2012); Sá *et al.* (2017); Seo *et al.* (2018); Sharma *et al.* (2015); Tripathi *et al.* (2013); Verdegem and Verleye (2009); Welch *et al.* (2016); Wirtz and Kurtz (2017); Zheng *et al.* (2013)"
Integrated models	21	"Al Athmay *et al.*(2016); Amagoh (2016) ; Belanche *et al.* (2012); Bélanger and Carter (2008); Chen (2010); Fan and Yang (2015); Fröhlich (2017); Hussein *et al.* (2011); Kwok (2014); Lai and Pires (2010); Lallmahomed, *et al.* (2017); Lean *et al.* (2009); Liang and Lu (2013); Prybutok *et al.* (2008); Sang *et al.* (2009); Schaupp et al (2010); Scott *et al.*2016); Shan *et al.* (2011); Stafford and Turan (2011); Wang, and Lo (2010); Zaied (2012)"
"DeLone and McLean IS Success Model"	10	"Abdelsalam *et al.* (2012); Chen *et al.* (2015); Chutimasku *et al.* (2008); Floropoulos *et al.* (2010); Jiang and Ji (2014); Rana *et al.* (2015); Sørum *et al.* (2012); Stefanovic *et al.* (2016); Teo et al (2008); Veeramootoo *et al.*(2018)"
"Technology Acceptance Model (TAM)"	8	"Al-Hujran *et al.* (2015); Baharon *et al.* (2017); Hamid *et al.* (2016); Husin *et al.* (2017); Kolsaker and Lee-Kelley (2008); Lin *et al.* (2011); Shyu and Huang (2011); Vathanophas *et al.* (2008)"
"UTAUT"	7	"Alshehri *et al.* (2012); Chan *et al.* (2010); Gupta *et al.* (2008); Kurfalı *et al.* (2017); Mosweu *et al.*(2016); Ovais Ahmad, Markkula and Oivo (2013) ; Shafi, and Weerakkody (2009)"
No clearly defined model	2	"Mberi *et al.* (2016); Morgeson and Mithas (2009)"
"Public value model"	2	"Kamau *et al.* (2016); Patola and Kurniawan (2016)"
Qualitative coding techniques	2	Åkesson and Edvardsson (2008); Kumar *et al.*(2017)
"Theory of planned behaviour (TPB)"	2	"Hung *et al.* (2013); Ozkan and Kanat (2011)"
UMEGA	2	"Dwivedi *et al.* (2017); Verkijika and De Wet (2018)"
"Adoption space model for interoperability"	1	"Tripathi *et al.* (2012)"
"Balanced Scorecard"	1	"Alhyari *et al.* (2013)"
"CFA model for system quality"	1	"Saha *et al.*(2012)"

“COBRA model”	1	“Osman *et al.* 2014”
“Components of strategic constituencies approach”	1	“Mahmoodi and Nojedeh (2016)”
“Conceptual research map for the role of InfQual”	1	“Lee and Levy 2014”
“E-gov service quality model (e-GovQual)”	1	“Papadomichelaki and Mentzas (2012)”
“e-SQ evaluation approach”	1	“Kaisara and Pather (2011)”
“Facilitators of e-government use in a dual model”	1	“Rey-Moreno *et al.* (2017)”
“Heuristic evaluation approach”	1	“Huang and Benyoucef (2014)”
“IST model for e-government”	1	“Puron-Cid (2013)”
“SALT Framework”	1	“Magoutas and Mentzas (2010)”
“Subjective measure of confirmation of expectations”	1	“Belanche *et al.* (2010)”
	97	

APPENDIX C – PARTICIPATION INFORMATION SHEET

Good day

My name is Ntokozo Dhlamini and I am an MCom student in Information Systems at the University of the Witwatersrand in Johannesburg. As part of my studies I have to undertake a research project, and I am investigating the benefits of a mature e-government to business (G2B) system in South Africa. The aim of this research project is to test the relationships between the dimensions that are predicted to contribute to the success of mature e-government systems.

As part of this project I would like to invite you to take part in answering this questionnaire. This activity will involve a series of questions related to your use of the CSD (Central Supplier Database) system and will take around 10 to 15 minutes to complete.

You will not receive any direct benefits from participating in this study, and there are no disadvantages or penalties for not participating. You may withdraw at any time or not answer any question if you do not want to. The questionnaire will be completely confidential and anonymous as I will not be asking for your name or any identifying information. If you experience any distress or discomfort, you may stop participating in the questionnaire at any time.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report. If you wish to receive a summary of this report, I will be happy to send it to you upon request (optional). This study was approved by the research ethics committee of the School of Economic and Business Sciences, protocol number: CBUSE/1529.If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email Shaun.Schoeman@wits.ac.za. Choosing to proceed with the survey will be taken as your consent to participate in the survey.

Yours sincerely,

Ntokozo Dhlamini, 1888718@students.wits.ac.za, 0768228165

Supervisor: Mitchell Hughes, Mitchell.Hughes@wits.ac.za, 011 717 8157

APPENDIX D – PRE- AND PILOT TESTING AMENDMENTS

Construct	Draft Questionnaire Items	Final Questionnaire Items	Amendment performed
System Quality	"The CSD website enables me to accomplish tasks more quickly"	"The CSD website enables me to accomplish tasks more quickly"	
	"The CSD website can be accessed immediately"		**Removed**
	"The CSD website is easy to navigate and perform transactions"	"The CSD website is easy to navigate and perform transactions"	
	"The CSD website requires a lot of effort to use"	"The CSD website requires a lot of effort to use"	
	"The CSD website provides helpful instructions for performing my task"	"The CSD website provides helpful instructions for performing my task"	
	"The security on the CSD website is sufficient"	"The security on the CSD website is sufficient"	
	"The CSD website protects our company's confidential information"	"The CSD website protects our company's confidential information"	
Information Quality	"Information provided by the CSD website is accurate"	"Information provided by the CSD website is accurate"	
	"Information provided by the CSD website is relevant"	"Information provided by the CSD website is relevant"	
	"Information provided by the CSD website is up-to-date"	"Information provided by the CSD website is up-to-date"	
Service Quality	**"Information provided by the CSD website is sufficient for the task at hand"**		**Removed**
	"The service provided by the CSD website responds quickly to my needs"	**"Support provided to users of the CSD system has been sufficient"**	**Replaced**
	"The service provided by CSD website has the ability to respond to my needs"	**Training on the use of the CSD system has been sufficient**	**Replaced**
	"The service provided by the CSD website is dependable"	**There is always support available if we need help with the CSD system**	**Replaced**
	"The service provided by CSD website understands my needs"		**Removed**
Use	"Using the CSD website would improve my performance in bidding for government goods and services"	"Using the CSD website would improve my performance in bidding for government goods and services"	
	"Using the CSD website would improve my productivity in fulfilling orders or responding to requests for quotation"	"Using the CSD website would improve my productivity in fulfilling orders or responding to requests for quotation"	
	"Using the CSD website would enhance my effectiveness in responding to requests for quotation"		**Removed**
	"Overall, I find the CSD website useful"	"Overall, I find the CSD website useful"	
User Satisfaction	**"I feel that the CSD website is efficient in fulfilling my needs of interaction with the government entity"**	**I find using the CSD system enjoyable**	**Replaced**
	"I feel that the CSD website is effective in fulfilling my needs of interaction with the government entity"		**Removed**
	"The CSD website has short response times for general inquiries."		**Removed**
	"The CSD website has short response time to users with specific problems"		**Removed**

	"Overall, I am satisfied with the CSD website"	**Overall, I am pleased with the general performance of the CSD system**	**Rephrased**
Net Benefits	"Using the CSD website saves the organization money."	"Using the CSD website saves the organization money."	
	"Using the CSD website reduces the cost of providing the service."	"Using the CSD website reduces the cost of providing the service."	
	"I value the cost savings from using the CSD website"		**Removed**
	"Using the CSD website saves me time"	"Using the CSD website saves me time"	
	"The CSD website provides a quicker response to a question or request than other means (e.g. offline interaction)"	"The CSD website provides a quicker response to a question or request than other means (e.g. offline interaction)"	Removed
	"I can accomplish things more quickly because of using the CSD website."		**Removed**
	"Using the CSD website enables me to avoid having to deal directly with government staff."		**Removed**
	"It is important that I can use the CSD website around the clock."		**Removed**
	"It is important that I can access the CSD website from a number of different locations (e.g. home, work, library, post office)."	"It is important that I can access the CSD website from a number of different locations (e.g. home, work, library, post office)."	
	"The CSD website allows me to terminate what I am doing at any time."		**Removed**
	"I am able to personalize the services offered by the CSD website."	"I am able to personalize the services offered by the CSD website."	
	"I value the personalized services offered by the CSD website."	"I value the personalized services offered by the CSD website."	
	"Using the CSD website is an efficient way of communicating with government departments."	"Using the CSD website is an efficient way of communicating with government departments."	
	"Using the CSD website is a valuable way of communicating with government departments."	"Using the CSD website is a valuable way of communicating with government departments."	
	"Using the CSD website is an effective way of communicating with government departments."		**Removed**
	"The CSD website contains a lot of useful and up-to-date, complete and verified procurement information"	"The CSD website contains a lot of useful and up-to-date, complete and verified procurement information"	
	"The CSD website helps me to understand more about government procurement"		**Removed**
	"The CSD website answers any queries I might have about government procurement"	"The CSD website answers any queries I might have about government procurement"	
	"I feel comfortable interacting with the CSD website since it generally fulfils its duties efficiently."	"I feel comfortable interacting with the CSD website since it generally fulfils its duties efficiently."	
	"I always feel confident that I can rely on the CSD website to do its part when I interact with it"	"I always feel confident that I can rely on the CSD website to do its part when I interact with it"	
	"I am comfortable relying on the CSD website to meet its obligations."		**Removed**

	"The CSD website enhances my feeling of being part of an active democracy."	"The CSD website enhances my feeling of being part of an active democracy."	
	"The CSD website encourages transparency."	"The CSD website encourages transparency."	
	"The CSD website encourages accountability."	"The CSD website encourages accountability."	
	"The CSD website makes me feel that decision-makers listen to me."		**Removed**

APPENDIX E – MULTIPLE REGRESSION RESULTS AND ASSUMPTIONS

Multiple Regression Results and Assumptions of the Independent Variables - Information and System Quality - on the Nets Benefits Dependent variable

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.601[a]	.361	.349	1.02939

a. Predictors: (Constant), Information_Quality, System_Quality

b. Dependent Variable: Net_Benefits

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.955	2	31.478	29.706	.000[b]
	Residual	111.263	105	1.060		
	Total	174.218	107			

a. Dependent Variable: Net_Benefits

b. Predictors: (Constant), Information_Quality, System_Quality

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.797	.343		2.323	.022		
	System_Quality	.227	.078	.255	2.927	.004	.801	1.248
	Information_Quality	.468	.092	.442	5.079	.000	.801	1.248

a. Dependent Variable: Net_Benefits

Collinearity Diagnostics[a]

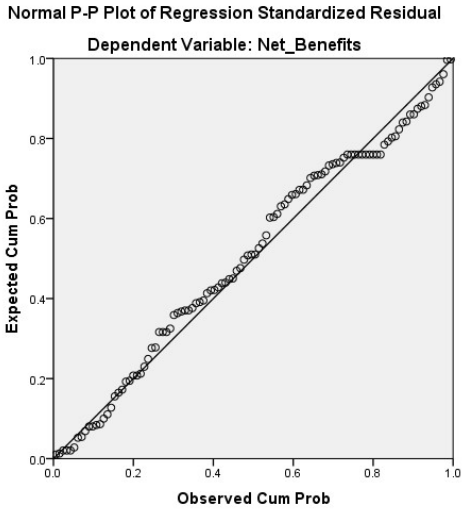
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	System_Quality	Information_Quality
1	1	2.856	1.000	.01	.02	.01
	2	.100	5.343	.22	.93	.06
	3	.044	8.074	.77	.05	.93

a. Dependent Variable: Net_Benefits

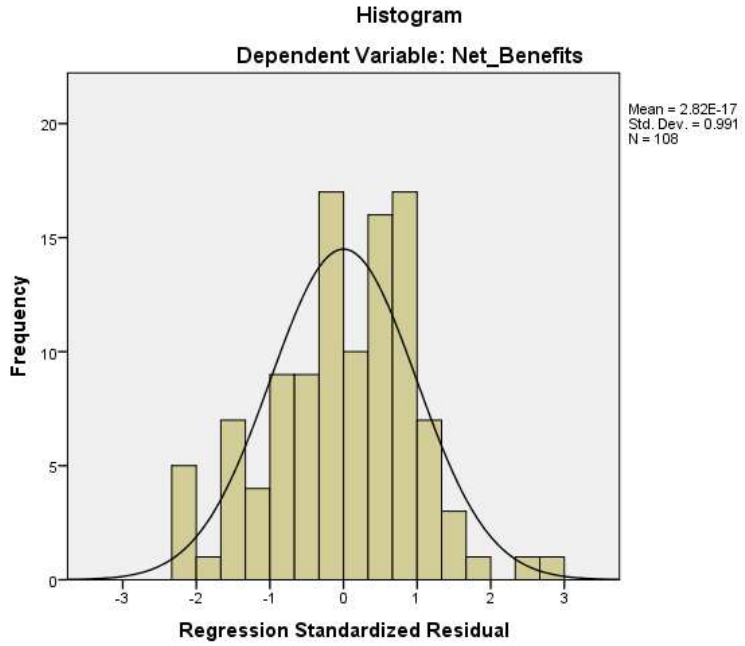
Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.797	.343		2.323	.022		
	System_Quality	.227	.078	.255	2.927	.004	.801	1.248
	Information_Quality	.468	.092	.442	5.079	.000	.801	1.248
a. Dependent Variable: Net_Benefits								

Tolerance values are very close to 1 and VIF scores are below 5, therefore we can be satisfied that the collinearity of the independent variables is not problematic.

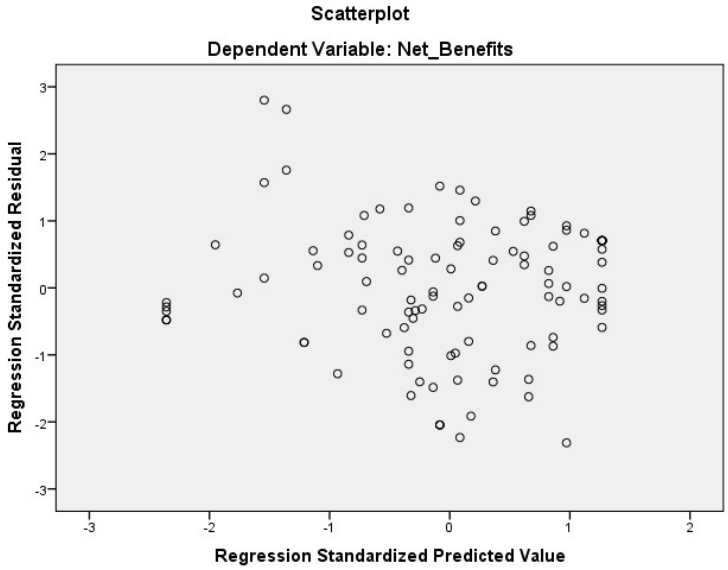
The scatter plot below suggests that the residuals are approximately normally distributed



This image presents another view of the residuals.



The appears to be some slight curves, however, none of points connect to present a clear curve pattern to be certain that the linearity assumption was violated. Additionally, points are following fan-shaped pattern, therefore the heteroscedasticity assumption was violated.



APPENDIX F – ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF ECONOMICS AND BUSINESS SCIENCERS ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: CBUSE/1529**
PROJECT TITLE	**Investigating the benefits of a mature e-government to business (G2B) system in South Africa.**
INVESTIGATOR	**Mr. Ntokozo Dhlamini**
SCHOOL/DEPARTMENT OF INVESTIGATOR	**School of Economic and Business Sciences**
DATE CONSIDERED	**22 August 2019**
DECISION OF THE COMMITTEE	**Approved unconditionally**
EXPIRY DATE	**31 October 2019**
ISSUE DATE OF CERTIFICATE	**16 September 2019**

CHAIRPERSON
(Dr Suvera Boodhoo)

cc: **Supervisor: Mr Mitchell Hughes**

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature

17 / 09 / 2019
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX G – CORRELATIONS BETWEEN NET BENEFITS ELEMENTS AND INDEPENDENT VARIABLES

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

	System Quality	Information Quality	Use	User Satisfaction	NB Costs	NB Time	NB Personalization	NB Communication	NB Ease	NB Trust	NB Democracy
System Quality	1	.452**	.464**	.503**	.384**	.404**	.424**	.393**	.441**	.461**	.425**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	120	120	119	118	119	119	120	114	120	117	119
Information Quality	.452**	1	.560**	.559**	.500**	.533**	.512**	.478**	.538**	.555**	.542**
	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	120	120	119	118	119	119	120	114	120	117	119
Use	.464**	.560**	1	.875**	.795**	.793**	.715**	.784**	.705**	.750**	.815**
	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	119	119	119	117	118	118	119	113	119	116	118
User Satisfaction	.503**	.559**	.875**	1	.820**	.801**	.750**	.825**	.802**	.825**	.848**
	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	118	118	117	118	117	117	118	112	118	115	117
NB Costs	.384**	.500**	.795**	.820**	1	.904**	.764**	.802**	.779**	.822**	.834**
	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	119	119	118	117	119	118	119	113	119	116	118
NB	.404**	.533**	.793**	.801**	.904**	1	.752**	.779**	.795**	.785**	.809**

Time	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	119	119	118	117	118	119	119	113	119	116	118
NB_Personalization	.424**	.512**	.715**	.750**	.764**	.752**	1	.773**	.707**	.750**	.720**
	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	120	120	119	118	119	119	120	114	120	117	119
NB_Communication	.393**	.478**	.784**	.825**	.802**	.779**	.773**	1	.808**	.785**	.780**
	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	114	114	113	112	113	113	114	114	114	111	113
NB_Ease	.441**	.538**	.705**	.802**	.779**	.795**	.707**	.808**	1	.812**	.766**
	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	120	120	119	118	119	119	120	114	120	117	119
NB_Trust	.461**	.555**	.750**	.825**	.822**	.785**	.750**	.785**	.812**	1	.837**
	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	117	117	116	115	116	116	117	111	117	117	116
NB_Democracy	.425**	.542**	.815**	.848**	.834**	.809**	.720**	.780**	.766**	.837**	1
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	119	119	118	117	118	118	119	113	119	116	119

APPENDIX H – INTER-ITEM CORRELATIONS

		System Quality 1	System Quality 2	System Quality 3	System Quality 4	System Quality 5	System Quality 6	Information Quality 1	Information Quality 2	Information Quality 3	Service Quality 1	Service Quality 2	Service Quality 3	Use 1	Use 2	Use 3	User Satisfaction 1	User Satisfaction 2	User Satisfaction 3
System Quality 1	Pearson Correlation	1	.816**	-.001	.788**	.397**	.451**	.544**	.503**	.532**	.557**	.519**	.503**	.524**	.558**	.616**	.591**	.589**	.545**
	Sig. (2-tailed)		.000	.995	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
System Quality 2	Pearson Correlation	.816**	1	-.019	.707**	.478**	.481**	.616**	.672**	.666**	.661**	.636**	.580**	.653**	.616**	.668**	.635**	.670**	.618**
	Sig. (2-tailed)	.000		.838	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
System Quality 3	Pearson Correlation	-.001	-.019	1	-.146	-.165	-.130	-.056	-.150	-.126	-.080	-.151	-.054	-.175	-.154	-.086	-.149	-.098	-.075
	Sig. (2-tailed)	.995	.838		.116	.074	.160	.546	.106	.173	.392	.103	.562	.060	.095	.356	.107	.294	.425
	N	118	118	118	117	118	118	118	118	118	118	118	118	117	118	118	118	117	117
System Quality 4	Pearson Correlation	.788**	.707**	-.146	1	.492**	.400**	.634**	.607**	.630**	.587**	.556**	.519**	.512**	.556**	.549**	.578**	.565**	.535**
	Sig. (2-tailed)	.000	.000	.116		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	119	119	117	119	119	119	119	119	119	119	119	119	118	119	119	119	118	118
System Quality 5	Pearson Correlation	.397**	.478**	-.165	.492**	1	.566**	.369**	.377**	.460**	.445**	.454**	.434**	.340**	.315**	.405**	.336**	.424**	.378**
	Sig. (2-tailed)	.000	.000	.074	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119

		System Quality 1	System Quality 2	System Quality 3	System Quality 4	System Quality 5	System Quality 6	Information Quality 1	Information Quality 2	Information Quality 3	Service Quality 1	Service Quality 2	Service Quality 3	Use 1	Use 2	Use 3	User Satisfaction 1	User Satisfaction 2	User Satisfaction 3
System Quality 6	Pearson Correlation	.451**	.481**	-.130	.400**	.566**	1	.346**	.352**	.337**	.421**	.485**	.318**	.443**	.357**	.427**	.413**	.483**	.481**
	Sig. (2-tailed)	.000	.000	.160	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Information Quality 1	Pearson Correlation	.544**	.616**	-.056	.634**	.369**	.346**	1	.842**	.745**	.579**	.489**	.485**	.457**	.478**	.508**	.520**	.488**	.498**
	Sig. (2-tailed)	.000	.000	.546	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Information Quality 2	Pearson Correlation	.503**	.672**	-.150	.607**	.377**	.352**	.842**	1	.848**	.524**	.421**	.441**	.518**	.509**	.524**	.496**	.521**	.537**
	Sig. (2-tailed)	.000	.000	.106	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Information Quality 3	Pearson Correlation	.532**	.666**	-.126	.630**	.460**	.337**	.745**	.848**	1	.550**	.407**	.463**	.474**	.465**	.452**	.439**	.499**	.474**
	Sig. (2-tailed)	.000	.000	.173	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Service Quality 1	Pearson Correlation	.557**	.661**	-.080	.587**	.445**	.421**	.579**	.524**	.550**	1	.790**	.832**	.601**	.573**	.612**	.695**	.668**	.628**
	Sig. (2-tailed)	.000	.000	.392	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119

		System Quality 1	System Quality 2	System Quality 3	System Quality 4	System Quality 5	System Quality 6	Information Quality 1	Information Quality 2	Information Quality 3	Service Quality 1	Service Quality 2	Service Quality 3	Use 1	Use 2	Use 3	User Satisfaction 1	User Satisfaction 2	User Satisfaction 3
Service Quality 2	Pearson Correlatio	.519**	.636**	-.151	.556**	.454**	.485**	.489**	.421**	.407**	.790**	1	.781**	.627**	.655**	.598**	.681**	.657**	.586**
	Sig. (2-tailed)	.000	.000	.103	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Service Quality 3	Pearson Correlatio	.503**	.580**	-.054	.519**	.434**	.318**	.485**	.441**	.463**	.832**	.781**	1	.612**	.626**	.607**	.685**	.660**	.619**
	Sig. (2-tailed)	.000	.000	.562	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Use 1	Pearson Correlatio	.524**	.653**	-.175	.512**	.340**	.443**	.457**	.518**	.474**	.601**	.627**	.612**	1	.875**	.749**	.789**	.765**	.697**
	Sig. (2-tailed)	.000	.000	.060	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	119	119	117	118	119	119	119	119	119	119	119	119	119	119	119	119	118	118
Use 2	Pearson Correlatio	.558**	.616**	-.154	.556**	.315**	.357**	.478**	.509**	.465**	.573**	.655**	.626**	.875**	1	.748**	.793**	.763**	.660**
	Sig. (2-tailed)	.000	.000	.095	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
Use 3	Pearson Correlatio	.616**	.668**	-.086	.549**	.405**	.427**	.508**	.524**	.452**	.612**	.598**	.607**	.749**	.748**	1	.807**	.847**	.817**
	Sig. (2-tailed)	.000	.000	.356	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119

		System Quality 1	System Quality 2	System Quality 3	System Quality 4	System Quality 5	System Quality 6	Information Quality 1	Information Quality 2	Information Quality 3	Service Quality 1	Service Quality 2	Service Quality 3	Use 1	Use 2	Use 3	User Satisfaction 1	User Satisfaction 2	User Satisfaction 3
User Satisfaction 1	Pearson Correlation	.591**	.635**	-.149	.578**	.336**	.413**	.520**	.496**	.439**	.695**	.681**	.685**	.789**	.793**	.807**	1	.894**	.773**
	Sig. (2-tailed)	.000	.000	.107	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	120	120	118	119	120	120	120	120	120	120	120	120	119	120	120	120	119	119
User Satisfaction 2	Pearson Correlation	.589**	.670**	-.098	.565**	.424**	.483**	.488**	.521**	.499**	.668**	.657**	.660**	.765**	.763**	.847**	.894**	1	.873**
	Sig. (2-tailed)	.000	.000	.294	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	119	119	117	118	119	119	119	119	119	119	119	119	118	119	119	119	119	118
User Satisfaction 3	Pearson Correlation	.545**	.618**	-.075	.535**	.378**	.481**	.498**	.537**	.474**	.628**	.586**	.619**	.697**	.660**	.817**	.773**	.873**	1
	Sig. (2-tailed)	.000	.000	.425	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	119	119	117	118	119	119	119	119	119	119	119	119	118	119	119	119	118	119

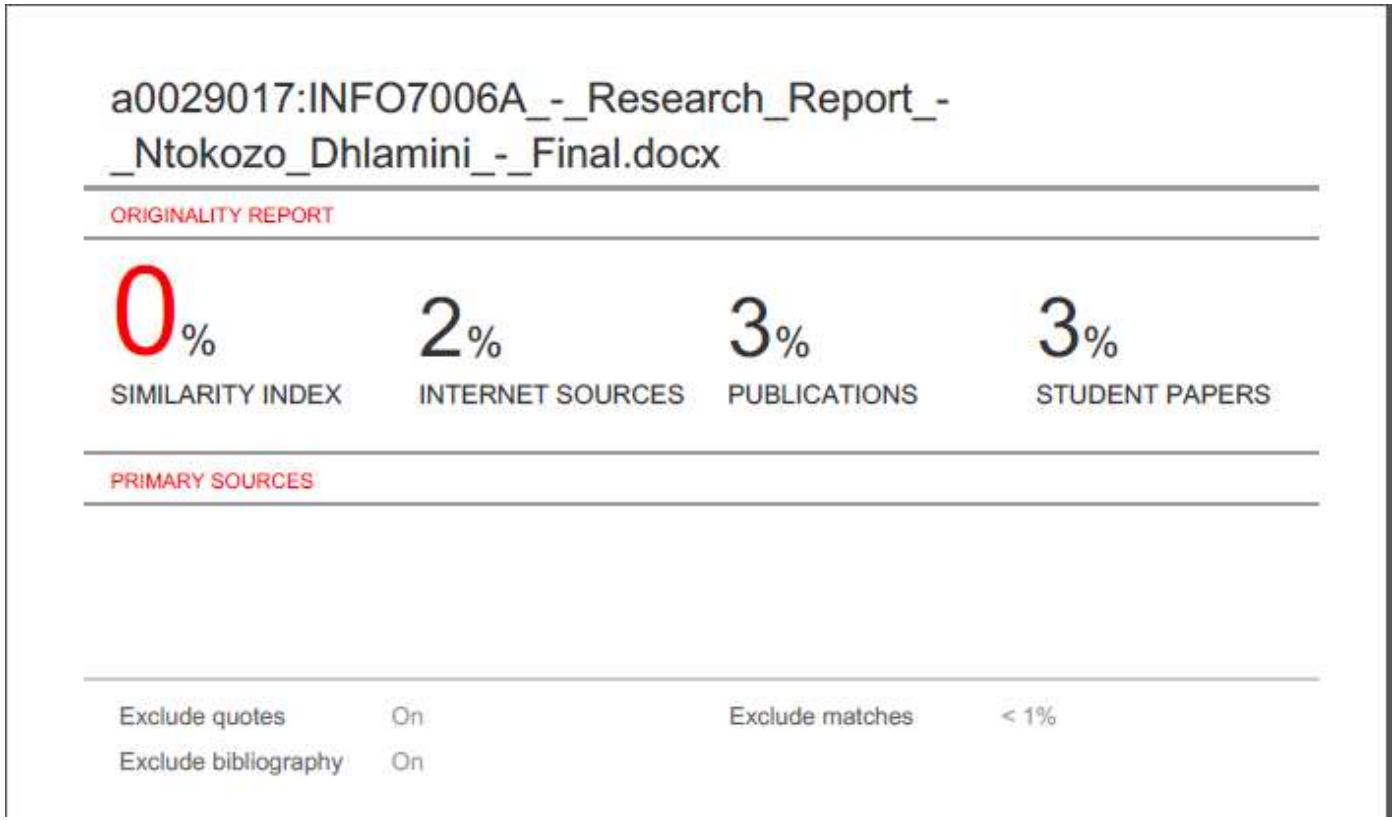
Net Benefits 1 - Costs	Net Benefits 2 - Costs	Net Benefits 3 - Time	Net Benefits 4 - Time	Net Benefits 5 - Convenience	Net Benefits 6 - Convenience	Net Benefits 7 - Personalization	Net Benefits 8 - Personalization	Net Benefits 9 - Communication	Net Benefits 10 - Communication	Net Benefits 11 - Ease	Net Benefits 12 - Ease	Net Benefits 13 - Trust	Net Benefits 14 - Trust	Net Benefits 15 - Democracy	Net Benefits 16 - Democracy	Net Benefits 17 - Democracy
1	.872**	.890**	.807**	.648**	.533**	.721**	.695**	.799**	.755**	.704**	.657**	.760**	.773**	.821**	.751**	.754**
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.872**	1	.834**	.798**	.631**	.505**	.712**	.686**	.753**	.743**	.721**	.731**	.794**	.761**	.768**	.723**	.737**
.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
119	119	119	118	116	119	119	119	118	114	119	119	117	118	119	119	118
.890**	.834**	1	.810**	.679**	.535**	.712**	.663**	.758**	.742**	.739**	.643**	.707**	.712**	.763**	.703**	.711**
.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.807**	.798**	.810**	1	.628**	.518**	.687**	.667**	.713**	.710**	.733**	.713**	.744**	.750**	.765**	.697**	.728**
.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
119	118	119	119	116	119	119	119	118	114	119	119	117	118	119	119	118
.648**	.631**	.679**	.628**	1	.812**	.671**	.652**	.636**	.600**	.611**	.521**	.673**	.656**	.600**	.649**	.597**
.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
117	116	117	116	117	117	117	117	116	113	117	117	115	116	117	117	116

Net Benefits 1 - Costs	Net Benefits 2 - Costs	Net Benefits 3 - Time	Net Benefits 4 - Time	Net Benefits 5 - Convenience	Net Benefits 6 - Convenience	Net Benefits 7 - Personalization	Net Benefits 8 - Personalization	Net Benefits 9 - Communication	Net Benefits 10 - Communication	Net Benefits 11 - Ease	Net Benefits 12 - Ease	Net Benefits 13 - Trust	Net Benefits 14 - Trust	Net Benefits 15 - Democracy	Net Benefits 16 - Democracy	Net Benefits 17 - Democracy
.533**	.505**	.535**	.518**	.812**	1	.633**	.649**	.571**	.561**	.562**	.464**	.544**	.576**	.530**	.609**	.551**
.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.721**	.712**	.712**	.687**	.671**	.633**	1	.816**	.734**	.677**	.635**	.564**	.648**	.657**	.632**	.611**	.569**
.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.695**	.686**	.663**	.667**	.652**	.649**	.816**	1	.775**	.738**	.699**	.626**	.727**	.765**	.723**	.694**	.668**
.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.799**	.753**	.758**	.713**	.636**	.571**	.734**	.775**	1	.943**	.765**	.709**	.721**	.782**	.782**	.703**	.719**
.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
119	118	119	118	116	119	119	119	119	114	119	119	117	118	119	119	118
.755**	.743**	.742**	.710**	.600**	.561**	.677**	.738**	.943**	1	.772**	.742**	.700**	.782**	.746**	.697**	.727**
.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
115	114	115	114	113	115	115	115	114	115	115	115	113	114	115	115	114

Net Benefits 1 - Costs	Net Benefits 2 - Costs	Net Benefits 3 - Time	Net Benefits 4 - Time	Net Benefits 5 - Convenience	Net Benefits 6 - Convenience	Net Benefits 7 - Personalization	Net Benefits 8 - Personalization	Net Benefits 9 - Communication	Net Benefits 10 - Communication	Net Benefits 11 - Ease	Net Benefits 12 - Ease	Net Benefits 13 - Trust	Net Benefits 14 - Trust	Net Benefits 15 - Democracy	Net Benefits 16 - Democracy	Net Benefits 17 - Democracy
.704**	.721**	.739**	.733**	.611**	.562**	.635**	.699**	.765**	.772**	1	.746**	.695**	.703**	.730**	.687**	.696**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.657**	.731**	.643**	.713**	.521**	.464**	.564**	.626**	.709**	.742**	.746**	1	.776**	.758**	.660**	.628**	.659**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.760**	.794**	.707**	.744**	.673**	.544**	.648**	.727**	.721**	.700**	.695**	.776**	1	.876**	.780**	.723**	.745**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
118	117	118	117	115	118	118	118	117	113	118	118	118	117	118	118	117
.773**	.761**	.712**	.750**	.656**	.576**	.657**	.765**	.782**	.782**	.703**	.758**	.876**	1	.814**	.757**	.783**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
119	118	119	118	116	119	119	119	118	114	119	119	117	119	119	119	118
.821**	.768**	.763**	.765**	.600**	.530**	.632**	.723**	.782**	.746**	.730**	.660**	.780**	.814**	1	.838**	.815**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119

Net Benefits 1 - Costs	Net Benefits 2 - Costs	Net Benefits 3 - Time	Net Benefits 4 - Time	Net Benefits 5 - Convenience	Net Benefits 6 - Convenience	Net Benefits 7 - Personalization	Net Benefits 8 - Personalization	Net Benefits 9 - Communication	Net Benefits 10 - Communication	Net Benefits 11 - Ease	Net Benefits 12 - Ease	Net Benefits 13 - Trust	Net Benefits 14 - Trust	Net Benefits 15 - Democracy	Net Benefits 16 - Democracy	Net Benefits 17 - Democracy
.751**	.723**	.703**	.697**	.649**	.609**	.611**	.694**	.703**	.697**	.687**	.628**	.723**	.757**	.838**	1	.867**
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
120	119	120	119	117	120	120	120	119	115	120	120	118	119	120	120	119
.754**	.737**	.711**	.728**	.597**	.551**	.569**	.668**	.719**	.727**	.696**	.659**	.745**	.783**	.815**	.867**	1
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
119	118	119	118	116	119	119	119	118	114	119	119	117	118	119	119	119

APPENDIX I – TURN-IT-IN REPORT



a0029017:INFO7006A_-_Research_Report_-_Ntokozo_Dhlamini_-_Final.docx

ORIGINALITY REPORT

0%	2%	3%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		