Towards "Smart Governance" Through a Multidisciplinary Approach to E-government Integration, Interoperability and Information Sharing: A Case of the LMIP Project in South Africa

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Abstract. The integration and interoperability of e-government systems, and information sharing is essential in transforming governments to "smart governments" that deliver services to enhance the socio- economic inclusion and the quality of life of its citizens. The aim of this doctoral study is to understand institutional barriers to e-government integration, interoperability and information sharing preventing governments from transforming to smart governments. The study is an interpretive case study, using South Africa as a unique case of a developing country which has adopted the "smart" agenda. Findings will contribute to theory through advancing knowledge in the new research area of smart government as well as contributing to practice through generating applicable knowledge on digital transformation in the public sector.

Keywords: Smart government · Smart governance · Integration · Interoperability · Institutional theory · E-government

1 Introduction

E-government integration, interoperability and effective information sharing is one of the key priorities governments worldwide are implementing to increase efficiency in service delivery and to improve synergies across government agencies [15]. This is increasingly becoming important as governments are pressured to respond to the needs of the so called "smart society" though "smart governance" [11]. Smart societies leverage the power of technology for socio-economic development and other purposes [4, 9]. 'Smart governments' thus leverage the power of technology, knowledge and innovation in governing and service delivery. Information sharing, interoperability and integration of e-government are key in transforming governments to "smart governments" [9]. South Africa is one of the few countries in Africa that have adopted the 'smart' agenda in its bid to improve the lives of its citizens [11]. The lack of interoperability and integration has been identified by the South African government as one of the barriers in transforming the public service [23]. The absence of 'integrated information systems' for skills supply and demand across government for example, has

compromised the ability of government agencies to effectively collaborate in addressing developmental issues such as skills for inclusive growth [21].

South Africa has come up with measures aimed at improving integration, interoperability and information sharing. A significant example is the Labour Market Intelligence Partnership (LMIP) project launched in 2012 to build integrated systems for reliable collection, collation, analysis and sharing of reliable labour market intelligence to support evidence based decision making. The LMIP project thus presented an opportunity to conduct a study to understand the barriers governments face in integrating and interoperating their systems in their bid to transform to smart governments that are innovative, efficient, accountable, transparent and inclusive.

This study contributes to theory and knowledge in the discipline of e-government by using an institutional based view and multidisciplinary approach in understanding e-government integration and interoperability. Various disciplinary perspectives (information systems, information science, political science and public administration) are used to understand the complex social, political, economic, technical and regulative issues surrounding e-government. The use of multidisciplinary studies in e-government is supported by [18] who cited the fragmentation of literature in e-government as part of the problem in understanding complex issues such as integration and interoperability. The practical contribution would be to generate applicable knowledge on e-government integration and interoperability to promote digital transformation of the public sector.

2 Problem Statement and Purpose

The interoperability and integration of e-government systems, and information sharing has captured the attention of governments due to increased pressure to improve governance, service delivery and quality of life of citizens through offering 'smart' services. Integration and interoperability enable faster, efficient, effective and more comprehensive service delivery to citizens, business and collaboration among government agencies [18]. Governments are however still experiencing blockages in transforming to "smart governments" due to challenges with the integration and interoperability of e-government systems [4, 5, 15, 18, 19].

The purpose of the study is to understand e-government integration and interoperability institutional barriers so as to improve systems integration and interoperability for promoting collaboration and a seamless flow of information, knowledge and innovation across government for improving governance. In understanding the barriers, I use an institutional perspective and multidisciplinary approach.

2.1 Research Question

To address the problem highlighted above, **the main question** posed in this study is:

How can e-government integration and interoperability given its complexity be improved using a multidisciplinary approach and institutional perspective to help transform governments into "smart governments"?

The following research **sub-questions** are posed:

1. *What is the extent of e-government integration, interoperability and cross boundary information sharing in South Africa?*
2. *What institutional barriers is the South African government facing in its bid to improve information sharing, integration and interoperability of its systems for strengthening smart governance?*
3. *How has the South African government responded to institutional barriers to e-government information sharing, integration and interoperability?*

3   Related Work

Interoperation and integration of e-government systems, information, processes, institutions, and physical infrastructure to provide better services and create an enabling environment is an enabler of smart governance [4]. Governments, both developed and developing, are thus embarking on initiatives to transform to smart governments that deliver better services and quality of life to their citizens. According to [15], integration and interoperability is however "not an end in itself but an enabler for helping government use technology to improve government services and operations. Citizens do not demand interoperability; rather, systems must be interoperable to effectively meet citizens' demands". Interoperability also plays a major role in improving government efficiency through enhancing government communication, administrative efficiency and streamlining processes which improves the quality of public service delivery [26]. Information sharing, interoperability and integration of e-government systems increase Government to Government (G2G) efficiency. G2G efficiency has an impact on the performance of other e-government services, such as Government to Citizen (G2C) and Government to Business (G2B) [26].

Previous studies (mostly from developed countries) in e-government integration, interoperability and information sharing such as [3, 4, 15, 18, 19] identified constraints such as policy, legislation, resourcing, leadership, structures and technology etc. Few such studies from developing countries exist and this presented an opportunity to contribute to literature by attempting to understand some of these barriers using a multidisciplinary approach and institutional perspective. The socio-historic, socio-economic and political contexts, which are important in understanding developmental issues such as e-government, are some of the key focal areas in this study.

3.1   Key Definitions

Smart government and related concepts are still fairly new and scholars have not agreed on what it entails [5, 17]. It has been characterized as the use of technologies in the provision of services, [5] for example, argues that a smart government "integrates information sources of multiple departments and multiple business system functions on a large scale, and then provides the on-demand dynamic portfolio smart services". It has also been defined as a government that "uses sophisticated information technologies to

interconnect and integrate information, processes, institutions, and physical infrastructure to better serve citizens and communities" [4]. Scholl and AlAwadhi [17] adopted a technological neutral definition. They define smart government as "the intelligent and adaptive office, authority, or function of governing" and smart governance as "the capacity of employing intelligent and adaptive acts and activities of looking after and making decisions about something". Keeping in line with a technological neutral definition emphasising Holland's [7] call for social inclusion in smart agendas, I define smart government as:

An accountable and transparent government that is digitally transformed, innovative, uses knowledge, social, economic and political systems, and other tools for effective internal functioning, governance and service provision, in the pursuit of inclusive growth.

Integration, interoperability and information sharing are also interrelated terms which have been confused by some scholars [19]. I adopt the following definitions:

E-government Integration is "the forming of a larger unit of government entities, temporary or permanent, for the purpose of merging processes and/or sharing information" [18].

Interoperability "represents a set of multidimensional, complementary, and dynamic capabilities needed among these networks of organizations in order to achieve successful information sharing" [15].

Inter-agency information sharing is the exchanging of information between government agencies or giving agencies in the same network access to information [3].

Scholl et al. [19] concluded that integration, interoperability and information sharing are "intertwined and inextricably interrelated". They proposed the use of the compound acronym of INT-IS-IOP as a term for integration (INT), information sharing (IS), and interoperation/interoperability (IOP). This approach is adopted in this study.

4 Theoretical Framing

Institutional theory, a multidisciplinary theory with roots in sociology, political science and economics underpins this study. It is "one of these more integrative approaches that recognize the importance of the context in which ICT are embedded and help to understand the influences of various factors on their selection, design, implementation, and use" [12]. The "IS field's practical interest in the development, use, and management of information systems may have diverted analysts to lower levels of analysis and hence, away from studying how regulative processes, normative systems, and cultural frameworks shape the development of e-government systems..." [14]. However, developments in technology have led to an emphasis on information systems research that seeks to understand its impact on institutions and their immediate environments [10, 14]. In this study I explore how the three pillars of institutions (regulative, normative and cultural-cognitive) identified by [20] influence digital transformation. Institutional theory is based on the belief that organizations, and the individuals who populate them, are shaped by rules, norms, values, beliefs, and taken-for-granted assumptions that are partly of their own design become established as authoritative guidelines for social behavior [20].

Institutional isomorphism is also used to understand institutional barriers to integration and interoperability and how pressure to achieve legitimacy influences institutional transformation. Legitimacy is defined as, "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" [24].

5 Methodology

In social sciences, the choice of methodology is influenced by the nature of the phenomena or problem [13]. The methodological choices made in this study were as a result of their appropriateness in addressing the research problem through the **research question** and **sub-questions** highlighted in Sect. 2 and Subsect. 2.1.

5.1 Research Philosophy

This study assumes an interpretevist qualitative paradigm as it seeks to generate an understanding of the social, political, technological, and economic context inherent in e-government. This is key in gaining insights into the complex issues surrounding e-government integration and interoperability. The role of the researcher in interpretevist research is to interpret his or her own understanding of phenomena hence the principle of objectivity common in positivist research will not be applied in this study.

5.2 Research Design

An interpretive case study research design is adopted in this study. The case study method has gained popularity due to a shift of information systems research from a technical perspective towards an organizational and social perspective where the emphasis is the study of social and organizational issues such as culture, behaviour and structure in relation to technology [1]. The complexity of the e-government information sharing, integration and interoperability problem being investigated in this study justifies the use of this approach. One of the primary outcomes of this study is to contribute towards building theory in e-government which is still in its developmental stages. This also justifies the use of a case study method which is appropriate in theory building where theory is absent or is still in formative stages [1]. Theory building in e-government has largely been influenced by research originating from developed countries. An opportunity is being missed for researchers from developing countries to share their knowledge and experiences in contributing to the body of knowledge especially in social sciences where the social context influences how we view the world.

5.3 Data Collection

For the purposes of collecting data, documents, semi-structured interviews and a review of literature are used in this study. Purposive sampling was used to select the

participants (a minimum of 10 senior officials) responsible for policy and ICT from across six national departments. Additional participants will be selected through snowball sampling. More than one approach in collecting data (triangulation) was used so as to minimise the exclusion of any relevant evidence taking into account the complexity of the problem. Moreover, no single source of data could adequately provide required data to answer the questions posed in this study, hence prompting the use of multi-sources of data. The data collection methods used each have their own strengths and play a complementary role in addressing the weaknesses in each.

5.4   Data Analysis

Qualitative analysis, whose role is to understand and make sense of phenomena and to uncover emerging themes, patterns, and insight rather than predicting or explaining, was done simultaneously with data collection so as to identify gaps in the data as recommended by Bhattacherjee [2]. The role of qualitative data analysis is to understand and make sense of phenomena and to uncover emerging themes, patterns, and insight rather than predicting or explaining [2].

Thematic analysis was used in analysing data. Coding was conducted in interview and documentary data so that evidence could be put into a limited number of categories appropriate to the research problem for easy analysis. A combination of open (inductive) and closed (deductive) coding was used. Closed coding was used to select themes identified from literature and theory while open coding was used to identify new themes that emerged during the data collection and analysis process.

6   Discussion of Preliminary Results

In this section, I discuss the preliminary results from evidence gathered from documents and interviews conducted so far. Although it's still too early to draw conclusions, some of the findings so far point to institutional leadership, collaboration and coordination, information and communication infrastructure, policy and legislation as some of the contentious issues in South Africa's digital transformation efforts.

Institutional leadership: In the transformation to smart government, leadership plays an important role in providing strategic direction, putting in place coercive mechanisms such as regulations, structures and norms that help shape desired behavior in institutions. Leadership also influences the transformation of cultural-cognitive elements such as practices, beliefs and shared values. Despite some of the notable achievements such as the development of supportive policies, leadership remains one of the most significant challenges in digital transformation in South Africa. This ranges from lack of clarity of roles between the various key departments driving the smart agenda resulting in lack of accountability, government department 'turf wars' and dysfunctional structures. The institutional leadership challenge in the smart government agenda in South Africa has compromised transformation due to poor coordination of resources and institutional activities.

Collaboration, coordination and integration of services: The government of South Africa has recognised the role of collaboration in realising its vision of a digitally transformed and smart government. Inter-organizational collaboration defined by [16] as involving "sets of negotiations that are demanded by the lack of predefined institutional roles that accompany market and authority based relationships", is a key enabler of integrated government. The clustering of government departments is one strategy that has been used to foster collaboration, coordination and integration. Preliminary findings show that inter-governmental collaboration and integration are more pronounced within departments in the same cluster e.g. security cluster. Collaboration and integration is likely to happen when institutions share a common mandate. Trusting relations are thus more likely to be reinforced and reproduced when there are strong institutional forces promoting common obligations on both parties [12].

Social and political cohesion was also found to influence collaboration and integration as it cements trust in inter-organizational relations [8]. The lack of social and political cohesion is one of the significant barriers in policy development and implementation. Government sometimes finds itself at odds with citizens, private business, civil society and other social partners due to lack of cohesion. This suggests that full institutionalization or sedimentation of 'smart governance' which is characterized by social cohesion, trust, established structures, norms and practices is far from being reached.

An analysis of the interview data conducted so far further revealed that power and politics in institutions play a significant role in the success of integration initiatives in government. An understanding of the interplay between power, politics, collaboration, trust and institutionalization of new structures, systems, norms and value systems has the potential to contribute to institutional theory and will be investigated further.

Information and communication infrastructure: Preliminary findings pointed to the poor state of communication and information infrastructure such as broadband in South Africa as a cause for concern. Broadband connectivity is a key technology for digital connectivity, without which interoperability and integration of systems is compromised. This has also been a threat to "inclusive government", a key dimension of smart government identified by Gil-Garcia et al. [6]. The poor state of ICT infrastructure including electricity in rural areas where 40% of South Africa's population lives, is a threat to government vision of being a smart government that governs a smart, connected and digitally inclusive society by 2030 [22]. Smart government is about inclusivity and creation of a smart and connected citizenry [11]. The current state of affairs is likely to exclude the already marginalized citizenry and increase the connectivity divide. A smart, connected and engaged citizenry promotes participative government, a key outcome of smart government identified by [6]. Citizen participation and engagement is also important in legitimising governments and their institutions whose existence is primarily to serve the interests of its citizens.

Innovative policy and legislative framework: Legislative reforms and innovative policies are important regulative institutional mechanisms for supporting the smart agenda. Legislation and policies allow governments to put in place resources and governance mechanism (smart governance) in response to challenges brought by the

smart society. The journey to smart governance in South Africa began in 1998 after the Presidential Review Commission on the performance of the public sector identified the governance of information resources and ICT in the public sector as key in its transformation [25]. South Africa has developed a comprehensive e-government policy and legislative framework which addresses crucial issues such as the integration of services and systems, interoperability, cyber-security, personal privacy and infrastructure development. What remains a significant challenge is the implementation of policy and legislation as witnessed by delays in implementation of key policies and legislation such as the Protection of Personal Information Act (2013), Integrated ICT Policy initiated in 2013 and Cybercrimes bill promulgated in 2015. Issues of trust, privacy and security thus remain an 'Achilles heel' in the current framework due to delays in implementation. This is worsened by poor policy and legislation harmonization as new policies and legislation are developed. This ultimately compromises the effectiveness of policy and legislation as mechanisms for effecting transformation.

Mimetic pressures in the setting of development agenda, including ICT policy direction have been evidenced. South Africa's adoption of the Digital Migration Policy and Strategy (a key strategy for broadband penetration) derives from the 2006 International Telecommunications Union resolution where member states were given a June 2015 deadline to migrate. South Africa's failure to meet the deadline points to poor policy implementation, especially where policy direction is influenced by external forces without sufficient resourcing. Governments especially in developing countries, often have to choose between international standards and best practices, and domestic priorities such as poverty reduction and reducing inequalities etc. This conflict is likely going to lead to governments failing to effectively implement policies as they often aim to please both. Domestic priorities are essential as governments use social obligation as a basis for legitimacy. Externally, governments are coerced to comply with international regulations for legitimising themselves in the global context.

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