An analysis of the barriers to e-government integration, interoperability and information sharing in developing countries: a systematic review of literature

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Abstract

E-government in developing countries has attracted the attention of researchers and e-government practioners due to its perceived benefit in improving the quality of life of citizens. E-government integration, interoperability and information sharing has been identified as an enabler for transforming governments into smart governments that are responsive to the needs of their citizens in a smart society. The integration and interoperability of e-government systems has however proven to be complex. Using a systematic review of literature as the method of inquiry, the purpose of this study is to understand barriers to e-government integration and interoperability preventing the transformation of governments in developing countries into the so called "smart governments". We use meta-synthesis to integrate results from inter-related studies. Using institutional theory as a lens to analyse the barriers, we classified barriers into high level political and strategy barriers (those occurring at political and decision making levels of government) and organisational level implementation barriers (those occurring at organisational level, where actual implementation occurs).

Key words

Smart government, interoperability, integration, e-government, information sharing, institutional theory

1   Introduction

Governments worldwide are transforming to "smart governments" as a way of responding to increasingly connected and smart societies that demand efficient service delivery. Smart government is defined by Gil-Garcia (2012:274) as the "use sophisticated information technologies to interconnect and integrate information, processes, institutions, and physical infrastructure to better serve citizens and communities". Information sharing and the integration and interoperability of e-government systems emerged as one of the key enablers of transforming governments into smart governments (Du and Qin, 2014). In smart government, public organisations need to adapt and collaborate with each other to fully leverage the advantages of new technologies. Interoperability and integration is thus important in fostering collaboration between organisations (Maheshwari & Janssen, 2014). According to Jiménez, Solanas and Falcone (2014:22), "as technological advances in data gathering, processing, and management continue, our ability to move from an information society to a "smart" society will increasingly rely on improvements and expansion in technical, organizational, and other aspects of e-government interoperability". Governments especially in developing countries are however still experiencing blockages in moving up to higher levels of e-government maturity due to challenges with the integration and interoperability of e-government systems (Lam, 2005; Pardo, Nam & Burke, 2012). Achieving high levels of e-government interoperability is thus one of the most significant challenges facing public information systems managers (Lisboa & Soares, 2014).

Interoperability is defined as the ability of "independent or heterogeneous information systems or their components, controlled by different jurisdictions/administrations or by external partners, to

smoothly and effectively work together in a predefined and agreed upon fashion" (Scholl and Klischewski, 2007:900). Interoperability "is clearly a key issue and it has shown up as a principle in the conception and deployment of e-government initiatives" (Guijaro, 2007:93). Integration on the other hand "is the forming of a larger unit of government entities, temporary or permanent, for the purpose of merging processes and/or sharing information" as Scholl and Klischewski (2007:897) put it. Government to government information sharing is defined as the collaboration of two or more government agencies for information sharing purposes using information and communication technology tools (Fan & Zhang, 2014). From these definitions it is clear that integration, interoperability and information sharing are "intertwined and inextricably interrelated" (Scholl, Kubicek, Cimander & Klischewski, 2012). These are often confused and used interchangeable in literature hence the proposal by Scholl, Kubicek, Cimander & Klischewski (2012) for use of the compound acronym of INT-IS-IOP as a term for integration (INT), information sharing (IS), and interoperation/interoperability (IOP).

This paper is a response to earlier work by Scholl and Klischewski (2007) and Scholl, Kubicek, Cimander and Klischewski (2012) who called for the need to synthesize fragmented literature on e-government integration and interoperability. This is largely due to the fact that literature in e-government integration, interoperability and information sharing is scattered across disciplines such as public administration, information science, computer science and information systems, with studies exhibiting disciplinary bias (Scholl, Mai & Fidel, 2006; Scholl & Klischewski, 2007; Scholl, Kubicek, Cimander and Klischewski, 2012). Despite attempts made by the likes of Scholl & Klischewski (2007) and Scholl, Kubicek, Cimander and Klischewski (2012) to synthesize the fragmented literature originating from developed countries, there is still no evidence of such a synthesis of the literature related to developing countries that often face unique barriers. By understanding the barriers, developing countries can develop relevant strategies in response to some of these barriers preventing them from progressing to higher levels of e-government.

The purpose of this study is to systematically analyse and understand barriers to e-government integration, interoperability and information sharing preventing governments in developing countries from transforming into "smart governments" using institutional theory as a theoretical lens. A systematic review of literature was used to identify and analyse published evidence on barriers of e-government integration and interoperability in developing countries. The following question shaped this study:

What barriers are governments in developing countries facing in achieving higher levels of e-government integration, interoperability and information sharing necessary to transform to smart government?

Findings from this study will help e-government practioners, policy makers and researchers in understanding the nature and extent of the e-government integration and interoperability problem in developing countries by using institutional theory as a lens. This is critical in developing appropriate strategies for e-government.

2 Theoretical framing

The authors make use of institutional theory in the analysis of e-government integration, interoperability and information barriers emerging from literature. The theory is based on the belief that organisations are influenced by pressure from the internal and external social and cultural environment they operate in (Bjorck, 2004; Jacobson, 2009; Scott, 2014). We examine the role of isormophic pressures in institutions identified by DiMaggio and Powell (1983). We examine coercive isomorphism that is, formal and informal political influence to institutionalise certain rules and practices, mimetic isomorphism which stems from pressure to mimic other institutions as a response to uncertainty and minimising risk, and normative isomorphism associated with professionalisation of organisational actors. We adopt Scott's definition of institutions as comprising of "regulative, normative and cultural-cognitive elements that, together with associated activities and resources,

provide stability and meaning to social life" (Scott, 2014:56). The theory helps in understanding the complex and interlinked relationships inherent among institutional mechanisms, technology and the socio-economic context, and other organisational factors (Luna-Reyes& Gil-Garcia, 2011). Institutional theory provided a useful theoretical lens for analysing issues confronting governments in transforming and responding to changes such as e-government. Institutional theory also identifies the role of internal and external forces in influencing organizations' legitimate behaviours (DiMaggio & Powell, 1983; Zheng, Chen, Huang and Zhang, 2013). This afforded the authors a lens through which internal and external forces in e-government integration, interoperability and information sharing can be reasonably understood.

3   Methodology

The study uses a systematic review of literature as its main method of enquiry. Extensive literature from across disciplines used in the study of e-government integration and interoperability exists but little evidence is available on studies that have attempted to synthesize the fragmented literature (Scholl &   Klischewski, 2007). The use of a systematic review is ideal for synthesising fragmented literature so as to produce new knowledge previously missed in existing studies (Crossan & Apaydin, 2010). A systematic review of literature is a scientific, replicable transparent process that aims to increase rigour and minimize bias through exhaustive literature by providing an audit trail of evidence used in drawing conclusions of the study (Tranfield, Denyer & Smart, 2003). A systematic review of literature uses "systematic data collection procedures, descriptive and qualitative data analysis techniques, and theoretically grounded synthesis" (Crossan & Apaydin, 2010).We conducted the systematic review in three stages as recommended by Tranfield, Denyer and Smart (2003); (stage I: planning the review, stage II: conducting the review, stage III: reporting and dissemination). Stage I involved ; (i) the identification of the need for a review after a preliminary review of literature and; (ii) the development of a review protocol on how the systematic review will be conducted (see figure 1) . Stage II, was the actual review which involved the selection of studies, assessing the quality of studies for inclusion and exclusion, data extraction from the studies and finally the synthesis and discussion of results. We used the meta-synthesis approach to provide a qualitative synthesis. The goal of meta-synthesis is to generate new knowledge or a "or a more profound interpretation and understanding of research findings" (Korhonen, Hakulinen, Viitanen, Jylhä & Holopainen, 2013). The final stage of the systematic review process involved the final write-up that culminated in the development of this research paper.

3.1   Review protocol

A literature search was conducted across six databases namely; Taylor and Francis, Sage, Science Direct, IEEE, Google Scholar and Wiley Online. Key words used include "e-government integration", "e-government interoperability", "public information systems", "government information sharing", AND "developing countries" OR "emerging economies". The search included peer reviewed journal articles, book chapters and conference papers written in English and published between 2000 and 2015. Non- peer reviewed journal articles and conference papers, books and grey literature were excluded. The choice of databases ensured that top journals and conference papers from disciplines such as information systems, information science, computer science and public administration were included due to the multidisciplinary nature of e-government. Studies focusing on e-government integration, interoperability and information sharing at local government level were excluded as the study was focusing on integration and interoperability at national government level. Non-peer reviewed journal articles and conference papers were also excluded. The literature search across the six databases retrieved 349 papers. Of the 349 papers retrieved, only 19 papers met the inclusion criteria. Meta-synthesis was used to integrate results from different but inter-related qualitative studies. Figure 1 summarises the review protocol.
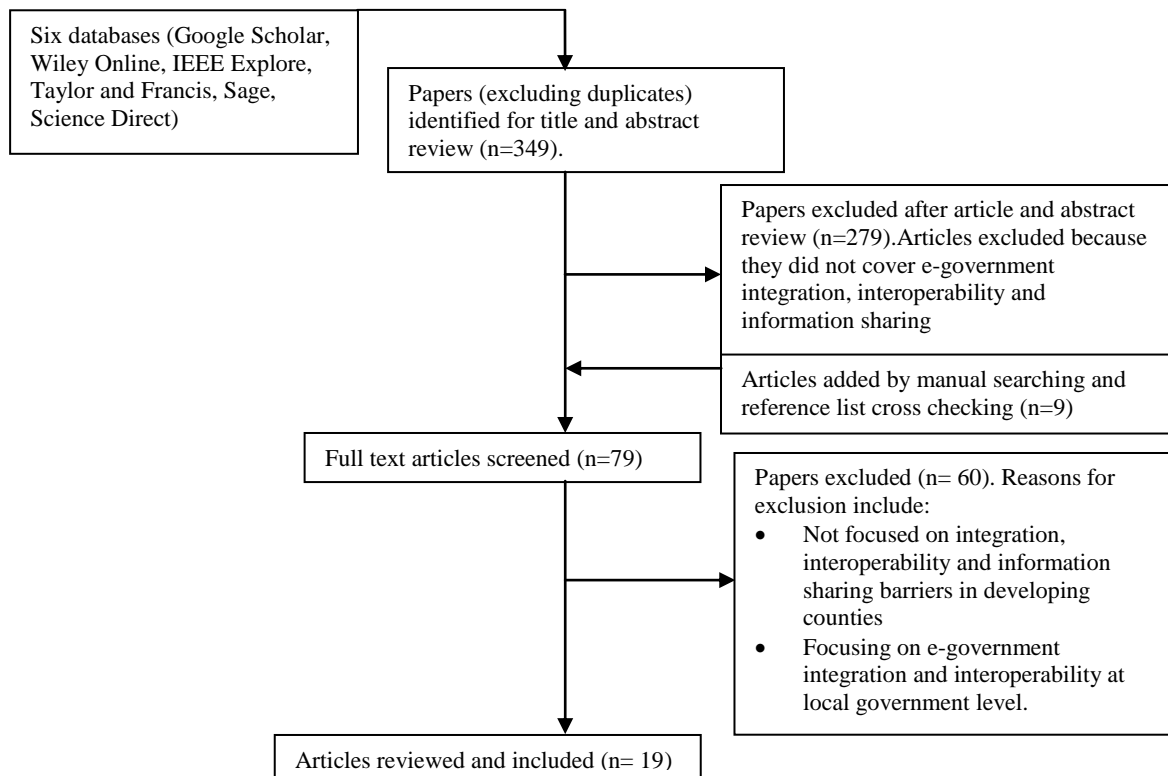
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│ Six databases (Google   │
│ Scholar, Wiley Online,  │────┐
│ IEEE Explore, Taylor    │    │
│ and Francis, Sage,      │    ▼
│ Science Direct)         │  ┌──────────────────────────┐
└─────────────────────────┘  │ Papers (excluding         │
                             │ duplicates) identified    │
                             │ for title and abstract    │
                             │ review (n=349).           │
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┌────────────────────────────────────┐
│ Papers excluded after article and  │
│ abstract review (n=279).Articles   │
│ excluded because they did not      │
│ cover e-government integration,    │
│ interoperability and information   │
│ sharing                            │
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│ Articles added by manual searching │
│ and reference list cross checking  │
│ (n=9)                              │
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│ Full text articles screened  │
│ (n=79)                       │
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│ Papers excluded (n= 60). Reasons   │
│ for exclusion include:             │
│  • Not focused on integration,     │
│    interoperability and            │
│    information sharing barriers    │
│    in developing counties          │
│  • Focusing on e-government        │
│    integration and                 │
│    interoperability at local       │
│    government level.               │
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│ Articles reviewed and included (n= 19)│
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Figure 1: Review protocol

4   Discussion and analysis of results

There are a myriad of barriers to integration and interoperability that are still puzzling academic researchers and e-government practitioners. This notion is substantiated by Scholl and Klischewski (2007:890) who argue that "the complex nature or the exact extent of these challenges and constraints regarding integration and interoperability are not well understood, neither in practice nor in theory". Below we review evidence on e-government integration, interoperability and information sharing barriers in developing countries.

4.1   Barriers to e-government integration, interoperability and information sharing

*Technology constraints***:** Information technology (IT) forms the basis of inter-organizational interoperability within the "organizational, sociological, ideological and political contexts" (Yang & Wu, 2012). Technological or technical barriers are amongst the most common barriers preventing governments from achieving interoperability and integration. Integration and interoperability studies in Hong Kong by Lam (2005) and in Taiwan by Yang and Wu (2012) cited technological factors such as incompatible technical and data standards, changing technology, lack of flexibility in legacy systems and different security models as some of the major threats to achieving integration. Studies on the state of e-government in Sub-Saharan Africa concluded that standards to ensure interoperability and portability of government information systems are inadequate (Ngulube 2007). Integration and interoperability also bring with it security concerns in systems and data that government agencies share (Dos Santos & Reinhard, 2012; Yang & Maxwell, 2011). Standards, security concerns and changing technology are the most common technology issues in e-government integration and interoperability. Although technology barriers emerged as the most common barriers to integration and interoperability, evidence from literature revealed that these are often easy to address. We argue that technology constraints are also influenced by other factors such as resourcing constraints (also discussed in this paper). Poor resourcing of e-government initiatives in developing countries have prevented governments from acquiring, upgrading and maintaining technology systems necessary to achieve desired levels of integration, interoperability and information sharing.

Human capital constraints: Fan, Zhang and Yen (2014:123) argue that IT skills and expertise play a critical role in ensuring the success of e-government integration. Studies by Heeks (2002) concluded that lack of ICT and management skills in most African countries are to blame for slow progress in e-government. Developing countries in Asia and the Middle East such as Bangladesh have also reported inadequate ICT skills as a constraint in ICT and e-government development (Imran & Gregor, 2010). In Sub-Saharan Africa, human resources are scarce due to the brain drain and lack of capacity building programmes (Ifinedo, 2006; Ngulube, 2007; Mutula & Mostert, 2010). Studies in Botswana also cited low ICT skills levels among government officials tasked with implementation of e-government initiatives as a serious concern (Nkwe, 2012). This has hindered most developing countries especially in Africa from progressing towards higher levels of e-government. Here again we see the lack of financial resources contributing significantly to this constraint by preventing governments from training and retaining skilled human resources to drive the e-government agenda.

Socio-technical / Socio-cultural constraints: The role of culture and other social aspects in the successful implementation and adoption of e-government is well documented. According to Ifinedo (2006) cultural norms and patterns of social behaviour have an impact in the development of e-government. Codella and Lannaci (2010) warn against viewing information and communication technology (ICT) in isolation and propose the socio-technical perspective where social aspects such as culture are embedded in technology. In Africa, for example the challenge is the multi-cultural nature and language diversity in the majority of countries (Schuppan, 2008). In South Africa which has eleven official languages for example, implementing e-government equitably in the multi-cultural society requires a multi-lingual and multi-cultural approach which is challenging in e-government as the process has to overcome cultural differences and resolve long-standing hostilities (Maumbe, Owei & Alexander, 2008).Governments often find themselves in the middle of competing concerns of various stakeholder groups when it comes to interoperability and information sharing initiatives (Fedorowicz & Culnan, 2010).In most African countries, the socio-historic and socio-cultural context plays a major role in influencing policy decisions including e-government. This arguably makes socio-cultural and socio-technical constraints common.Such constraints can be challenging to address due to their complexity. We also argue that the multi-cultural nature of the majority of African countries, make information sharing more complex and resource intensive.

Organisational constraints: Under preparedness of participating government agencies, a slow pace of government reform, and outdated legacy systems and government processes can hinder e-government integration and interoperability (Lam, 2005; Fan, Zhang & Yen, 2014).Under preparedness is often due to the fact that the e-government agenda in both developed and developing countries is often directed by external and influential bodies such as the United Nations and similar international bodies. According to Lisboa and Soares (2014:639), "many countries are moving towards implementing interoperability frameworks, not only because they perceive them as an important instrument to foster and facilitate interoperability of public systems but also due to financial and political pressures set by prominent and powerful organisations and institutions such as the European Commission, United Nations, and the World Bank". Here we observe the role of coercive isorphomic pressure in influencing government policy decisions to adopt integration, interoperability and information sharing initiatives.

The role of internal institutional forces in the success of e-government integration and interoperability initiatives also deserves closer attention. In China, studies by Yang and Maxwell (2011) found that complexity in integration and interoperability is exacerbated by the different organisational cultures, values and trust issues among participating government agencies. In Mexico, studies by Luna-Reyes, Gil-Garcia and Cruz (2007) concluded that interorganisational collaboration, a cornerstone for e-government integration and interoperability is often compromised by weak institutional frameworks, unsupportive organisational structures and managerial constraints leading to the failure of such initiatives. Their findings are supported by e-government integration studies in developed countries such as Denmark, Netherland and UK.Weerakkody, Janssen &Hjort-Madsen (2008) concluded that the traditional organization of government agencies vertically around functional structures with no

standardised processes have resulted in poor coordination of processes and integration of underlying e-government systems presents a significant challenge. Studies in Nigeria also identified rigid structures and bureaucratic systems as a stumbling block in e-government progression as these delay progress in the implementation of e-government institutional mechanisms (Ifinedo, 2006).These issues may be a contributing factor to resistance to change which is another constraint (Ndou, 2004, Lips, O'Neill & Appel, 2011; Nkwe, 2012).

Administrative culture and context play a significant role in influencing integration, interoperability and information sharing practices in e-government. For example, in India Paul and Paul (2012) argued that despite the fact that e-government is similar across the world, the Indian context is more complex than in developed countries due to multi-tier administrative structures, diverse culture and different processes across government. In China for example, the political context has influenced strict regulation in the governance of information infrastructure including e-government integration and information sharing (Fan, Zhang & Yen, 2014). In developed countries context also plays a central role. In the USA for example, the fear of terrorism has influenced information sharing practices and the prioritisation of information privacy and security in e-government agendas (Comfort, 2005; Popp & Poindexter, 2006; Yang, 2008).The political context is thus also a significant example of how political forces can influence information sharing practices due to increased security concerns and privacy intrusion triggered by a sensitive political environment.

Political constraints: The majority of governments in developing countries are still undergoing political transformation. Slow transformation to democracy in many developing countries in Africa has been cited as a constraint to e-government development (Maumbe, Owei & Alexander, 2008; Schuppan, 2008). Rigid political structures, inefficiency in governance, and corruption have been cited as some of the significant barriers preventing e-government development especially in Africa (Ifinedo, 2006; Schuppan, 2008). Political instability and bad governance in some developing countries have slowed e-government progression (Ndou, 2004). We also ague that rigid structures, lack of political transformation and poor governance suggests lack of political will and may perpetrate a culture of secrecy in government. This is not conducive for information sharing as governments might fear that transparency might subject them to public scrutiny and the need to account for their decisions thereby threatening their legitimacy.

Resource constraints: Costs and lack of resources hamper the integration and interoperability of information systems (Weerakkody, Dwivedi, Williams, Brooks & Mwange, 2007). E-government integration projects can easily spiral out of control due to the complexity of e-government integration projects (Yang & Maxwell, 2011). In China, Fan, Zhang and Yen (2014) argue that costs in development, implementation, maintenance and training associated with e-government integration projects are a barrier to the integration of e-government systems, especially in cases where benefits are not clearly defined and costs are not known. In Africa, the majority of countries are still battling with poverty hence e-government is not an immediate priority (Ifinedo, 2006; Ngulube, 2007; Maumbe, Owei & Alexander, 2008). Financial resourcing is critical as it has an impact on other resources and activities such as human resources, technology infrastructure and policy and strategy formulation and implementation.

Strategy constraints: A lack of shared e-government goals and objectives, over-ambitious e-government milestones, lack of ownership, poor governance, and absence of implementation guidance compromises integration initiatives (Lam, 2005; Weerakkody, Dwivedi, Williams, Brooks & Mwange, 2007). Our observation is that the significant challenge in developing countries seems not to be absence of strategy but the absence of appropriate and context specific strategies as Ndou (2004) puts it. Poor e-government strategies or their absence has thus hindered the majority of the countries in Africa and other developing countries in moving to higher levels of e-government (Ngulube, 2007; Shcupman, 2008). Chen, Chen, Huang, and Ching (2006) and Majdalawi, Talmarabeh, Mohammad, and Quteshate (2015) identified lack of leadership support and commitment, citizen non-participation, poor resourcing and poor intellectual capital as constraints preventing the successful implementation of e-government strategies in developed countries. We also argue that strategy execution more than

strategy absence seems to be a serious constraint preventing progress in e-government integration, interoperability and information sharing. Resourcing and activities associated with strategy implementation thus continue to be a serious barrier in effective implementation.

Policy and legal constraints: The lack of a supportive e-government legal and policy framework has been cited as one of the barriers to e-government development (United Nations, 2014). This is however not unique to developing countries. In New Zealand, Lips, O'Neil and Eppel (2011) identified restrictive laws and regulations and concerns over issues of citizen's privacy and confidentiality as major barriers. Lam (2005), in similar studies conducted New Zealand, Hong Kong and Singapore also identifies concerns over citizen privacy, data ownership and lack of e-government policy that addresses these concerns, as constraints in e-government integration and interoperability. Personal information sensitivity and protection issues also emerged as a policy concern in Europe and the United States of America (USA) (Otjacques, Hitzelberger & Feltz, 2007; Guijarro, 2007).Policy compatibility is critical.In China, studies by Fan, Zhang and Yen (2014) found that lack of policy compatibility and enforcement has resulted in poor e-government implementation. Policy and legislation thus play a major role as a regulative mechanism for influencing desired social behavior through legal sanctioning. The legal and policy framework is critical in managing risks, providing a legal basis for allocating resources, encouraging inter-agency collaboration and building trust which are all crucial in successful e-government integration, interoperability and information sharing.

Leadership constraints: Top leadership at national government department level plays a significant and positive role in e-government integration initiatives by managing change, securing resources and minimising resistance to change (Ndou, Fan, Zhang & Yen, 2014). Lam (2005) echoes the same sentiments stipulating that the lack of in-house management, integration project champions and technical expertise is a major blow in integration initiatives. The lack of political will is arguably one of the significant leadership challenges in e-government developing as political leaders are ultimately responsible for promulgating policy and legislation that supports e-government development (Shcupman, 2008). The importance of political leadership is reinforced by Dawes, Cresswell and Pardo (2009:398) who note that political leadership commands power and authority that is critical for "negotiating powerful bureaucratic processes such as budgeting, clarifying leadership responsibilities and ensuring the participation of all key people". Ndou (2004) also highlights the importance of institutional leadership, where a leading institution in government takes charge of coordination, resourcing, influencing and motivating other players in government initiatives. In this instance we argue that leadership uses normative mechanisms such as standards, procedures and rules to influence desired social behavior.We also argue that these institutions can influence desired behaviour by providing visionary and exemplary leadership in e-government that other participating government institutions might want to mimic.

Information constraints: Information sharing is one of the major objectives of e-government interoperability and integration (Fan, Zhang & Yen, 2014). Several factors have hindered the ability of governments to effectively share information for effective service delivery. Issues of information quality have an impact on the willingness of government agencies to participate in cross domain information sharing (Yang & Maxwell, 2011). There is fear that poor quality information will expose the government agencies to reputational risk (Yang & Maxwell, 2011; Fan, Zhang & Yen, 2014). Other information constraints include perceived political risks, loss of power and competitive advantage associated with sharing certain information (Zhang & Dawes, 2006; Fan, Zhang & Yen, 2014). Government agencies may also fear that sharing information will result in the government agency losing control once information is shared and as a result being subjected to public scrutiny (Yang & Maxwell, 2011). We argue that the use of information for political leverage, power and influence in government is a barrier to information sharing.

*Trust and privacy concerns:*Institution-based trust is anchored on transparency, responsibility of government with citizens' information through policy and legislative measures, increasing citizen participation, and improved efficiency and effectiveness of e-government services as described by Tolbert and Mossberger (2006). In China, Fan, Zhang and Yen (2014) identified trust as one of the

key constraints in achieving interoperability and integration. They argue that participating government agencies may also fear that integration may result in misinterpretation or misuse of the information or exposure of sensitive information. Similarly in Botswana, studies revealed that participants in e-government had safety concerns when sharing information with public agencies online or electronically (Nkwe, 2012). Information privacy and security has also become a topical issue in e-government integration and interoperability due to a growing need for both public and private institutions to protect the privacy and rights of citizens for legal, social, political and economic reasons (Fan, Zhang & Yen, 2014).In developing countries, citizens may distrust governments due to a history of corruption, political instability and dictatorship. This in turn may deter citizens and other stakeholders from participating in e-government initiatives. It is clear that in the absence of perceived ethical standards in government, mistrust in government as an institution increases. Regulative and normative mechanisms in government such as policy, legislation and standards are thus critical in building trust.

4.2   Summary of e-government integration, interoperability and information sharing barriers

In figure 2 below, we summarise e-government integration, interoperability and information sharing barriers into high level strategic and political barriers and lower-level implementation barriers.

Strategic and political level barriers are those experienced at higher levels of government where political and public sector leadership are responsible for formulation of overarching national policy, legislation and national strategies for implementation. Leadership at political level are responsible for making the important decisions, formulating policy and strategy and influencing positive behaviour, fostering trust and managing change. Identification of national priorities including e-government also occurs at this level. National policy and legislation are regulative mechanisms that address integration and interoperability and provide a strong basis for driving e-government integration and interoperability initiatives through strategy formulation and legal sanctioning. They provide a legal basis for resource allocation, restructuring of processes and systems, fostering trust and nomination of institutional leadership to coordinate and influence e-government development. The absence thereof, is a serious threat to the success of e-government integration, interoperability and information sharing initiatives.

Implementation level barriers are experienced at organisational level (the individual government department or agency level) where the actual implementation occurs. Several issues are confronting government departments and agencies in their bid to achieve interoperability and integration. These include cultural cognitive and normative elements such as values, belief systems, norms, standards and practices that can influence trust among government agencies, citizens' trust of government, work ethics, privacy and security concerns. Cultural practices can also be a constraint especially where government agencies work in silos and do not collaborate. Technology challenges are also experienced at implementation level where government agencies have to worry about issues of compatibility, standards, security and architecture in interoperating or integrating systems. The intellectual capital and skills needed to drive interoperability and integration at organisational level are some of the issues confronting governments at implementation level. Interestingly our analysis revealed that technology seems to be no longer the most adverse challenge but the social aspect of technology, where cultural and other organisational issues in the implementation and adoption of technologies are starting to receive more attention.
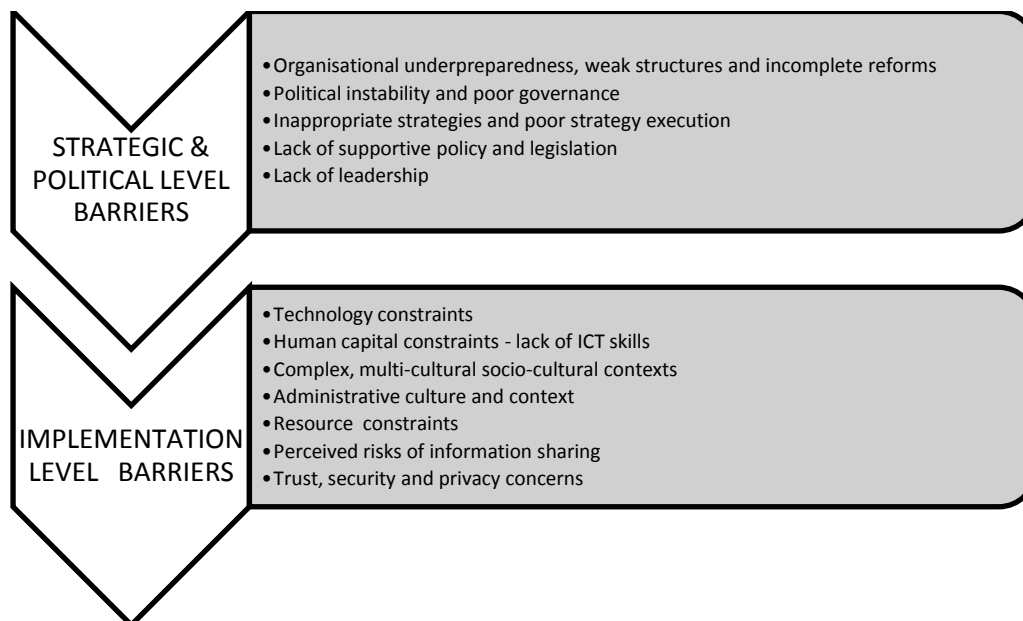
Figure 2: Summary of e-government integration, interoperability and information sharing barriers in developing countries

5   Conclusions and suggestions for future research

E-government interoperability, integration and information sharing is a complex issue that e-government researchers and practitioners are still grappling with in developing countries. This study helped unpack the myriad of barriers using institutional theory as a lens to reasonably understand the complex issues confronting governments in their bid to transform. We also concluded that barriers are experienced at two levels, (i) the strategy and political level where policy, legislation and strategy to drive e-government is formulated and (ii) the implementation level where organisations are confronted by technology, skills, cultural and resources challenges that compromise the effective implementation of decisions and strategies. Understanding the regulative, normative and cultural cognitive issues is thus critical in addressing some of these barriers preventing governments from achieving the desired levels of integration, interoperability and information sharing.

Barriers to e-government integration, interoperability and information sharing are largely non-technical in nature as revealed by our study. This reiterates the need to move away from viewing e-government integration and interoperability purely as a technical issue isolated from other factors. The human, social, economic and other elements have taken centre stage as critical elements that deserve more attention in an attempt to understand issues confronting e-government integration and interoperability. This calls for the need for multidisciplinary studies that incorporate various disciplines such as public administration, political science, information systems, information science and sociology to effectively understand the different facets of e-government and what interventions may be taken to address these barriers.

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