Frank Bannister

In this edition, authors address a wide variety of topics.

Though it sometimes feels as if the question of e-government strategy attracts less attention than it used to (this may be a misapprehension on my part), the subject has not gone away. In their article Shaji Joseph and Anders Avdic take a sweeping look at where such strategies are leading the Nordic nations (in this instance Denmark, Sweden, Norway and Finland). As elsewhere in the field, the focus is on reform; the question being what type of reform? Using a content analysis of published documentation they classify reforms into three types: public sector reform, economic reform and e-democracy reform. Their results show that the emphasis in all countries is in that order, i.e. public sector reform is the most important strategic objective with economic reform second and e-democracy a poor third although there are subtle differences between the four countries. e-Democracy reform only features in Sweden and Finland for example. One of the many curious findings is the relative practicality of the Danish approach. While the other countries seem more concerned about scoring in the world rankings, the Danes seem more interested in delivering on the ground rather than ‘dream’ planning. It might be interesting to try this research model on an even wider scale and see how other countries compare.

As any discipline matures it attracts meta-research, i.e. research about research. A number of such papers about e-government research have been published over the years (including before 2000). Muhammad Yusuf, Carl Adams and Kate Dingley’s contribution is in this tradition. They choose to review e-government research as a mature discipline using abstracts from ECEG and ICEG. This work builds on and extends some work done by myself and Regina Connolly in 2010 (looking just at ECEG up to that time). Analysing 612 abstracts from these conferences the authors examine keyword counts, methodologies, themes and theories amongst other things. Several studies of this type have been done in the past twenty or so years yielding a large number of possibilities for categorisation. Using Wordle the authors generate two word clouds, one for ECEG and one for ICEG. What is remarkable is the difference between them with degrees of emphasis between the two conferences being quite distinct. And while the case study continues to dominate, a surprisingly wide range of methodologies have been deployed in the field. The authors conclude, however, that the times are changing. To find out how, you will have to read the article.

Leif Sundberg’s contribution to this edition combines an unusual topic with an unusual approach. The subject of his study is a number collaborating Swedish government agencies and two projects - the Business Registration Portal and the Government Messaging Service. Collaboration creates project and financial risks which are analysed in this paper using Logical Framework Approach (LFA), an objective-oriented technique for project evaluation. I have to confess that notwithstanding many years working as a project manager in a previous life, the LFA was new to me and for those involved in project management who have not encountered it either, it is worth a look. This process enables a researcher to see at what stages risks emerge and the bases on which decisions have been made. These risks turn out to be greatest when public values have to be implemented and the effectiveness of this implementation measured. To understand why you need to read the paper, but there are several important lessons for risk management that emerge including the need for appropriate top level governance where multiple collaborative actors and multiple public values are involved.

It has been a while since we have published an article on web site evaluation; this is a topic that is probably too popular for its own good and one web site evaluation tends to be much like the rest. However Aderonke Oni, Adekunle Okunyoe and Victor Mbarika’s examination of the state of play in Nigeria is a special case. Nigeria is Africa’s most populous nation (it has the world’s seventh largest population) with a highly complex mix of tribes and regions. Developing an e-government system in such a context is challenging to put it mildly and Nigeria continues to lag in the UN’s e-government ranking (it was at 141 in the 2014 rankings – a slight improvement on the preceding years). Notwithstanding government policies, the authors conclude that progress has been mixed. State governments are not maximising the potential of ICT and over a third of the 36 states in Nigeria did not have websites at all. The authors propose a series of simple and practical steps to ameliorate this situation including producing good guidelines and learning from successes in other comparable countries.

Every time a new technology emerges one of the first questions asked is “how do we harness this to our advantage?” There are times when the answer to this question is straightforward; there are other occasions where it is not so obvious. Social media and government falls into the latter heading. Ever since Facebook took off, there have been scholars and pundits opining on the transformative possibilities of this technology. So far, argue Reemiah Muneer Alotaibi, Muthu Ramachandran, Ah-Lian Kor and Amin Hosseinian-Far, an unappreciative public appears to be slow to respond to governments Web 2.0 offerings, especially when it comes to social media. This paper proposes and extension to the well-known Unified Theory of Acceptance and Use of Technology (UTAUT) model to measure the factors affecting take up of these tools. This paper is theoretical – that author does not try to test his model, but it is grounded firmly in the literature and is there for future researchers to test.

David Baker and Roger Chin’s article examines questions of availability and accessibility. This work extends an earlier piece of research into county government in the USA. Amongst the many interesting things in this paper is the changing nature of the recommendations for ease of availability and access over the years and the fact that, counter to what one might expect, the closeness of financial documents to the front of the web page does not seem to improve over time notwithstanding recommendations that they should be easier to find. In general the authors find that US local government could do better. The authors make a number of recommendations for improvement to practice and for further research.

Another Nordic paper in this edition is from Christian Madsen and Pernille Kræmmergaard whose topic is the interaction between single parents regarding on-line benefits. This reminded me of some work done by Stephen Colman and others in London back in the early days of e-government. This is, to use the authors’ phrase, an effort to turn citizens into their own caseworkers. Using domestication theory and a “warm expert” (an intriguing concept) the authors look at how users behave, share practices and even try to circumvent mandatory requirements. The paper is livened up by verbatim extracts from conversations between single parents and it is interesting to see how citizens arrive at their choice of channel with which to do business with the state. This is a rich and engaging piece of research which suggests that channel choice is as much a result of social interaction and process as it is of cognitive rationality.

Moving to Denmark, Keld Pedersen’s article addresses that old chestnut of how to get value from IT investments – this time in a local government context. One of many puzzles in information systems generally is why problems which are supposedly easy to fix persist over time. Pedersen’s approach is based on an extensive research project using interviews, documents, the literature and workshops in two local authorities and a covering a number of different services from firefighting to day-care. The author looks closely at one particular service, firefighting, and using interviews, documents, the literature and workshops in two local authorities and a covering a number of different services from firefighting to day-care. The author looks closely at one particular service, firefighting, and using interviews, documents, the literature and workshops in two local authorities and a covering a number of different services from firefighting to day-care. The author looks closely at one particular service, firefighting, and the use of a shared information system (ODIN). The author shows that there is a pattern of misalignments from process to task context between IT and the tasks that they are supposed to support. There are some interesting parallels here with the work of Elisabeth Frisk on the Swedish Fire Services. Frisk identifies poor decision making and lack of clarity about evaluation – a problem she addresses using a design approach to IT investment decisions. The pathologies identified in this paper show that there is perhaps scope for trying this in Denmark.

Two things made the study of e-voting in Australia particularly interesting. One is the fact that voting is compulsory and the other is the very sparseness of the country which makes the economics of mobile voting enormously attractive. In their paper Philip Zada, Grez Falzon and Paul Kwan note that Australia first introduced the secret ballot in 1855 (in Victoria) and since that time not much has changed it seems. The case for Internet or i-Voting is clear, but in order to use this system voters must satisfy certain criteria (such as being 20 km or more from a polling station). Using a survey, the authors examine the possibilities and limitations of using ICT for voting as well as the knowledgeability of the Australian voter when it comes to doing things online. Being Australia the paper is full of quirky facts (my favourite being that one of the main things Australians like about voting is “sausage sizzle”. I’ll let you find out what sausage sizzle is). This paper is rich with all sorts of information about voter perceptions. At the end the authors come up with five hypotheses which will be the subject of the next stage of their research. One of many findings is that voters are surprisingly strongly in favour of mobile voting despite the risks.

Finally (really finally!) this is my last editorial for EJEG. On June 30th 2016 I stood down as Editor after 15 years in the job and handed over the reins to capable hands of Carl Erik Moe. Editing a journal like this is a labour of love, but it is also a job in which one perforce learns a great deal from reading each submission (the great, the good and the, let’s say, not quite so good) as it arrives. When the journal was first established, e-journals, whilst not unknown, were still something of a novelty and how such a business model might work in the long term was something yet to be worked out. I think that all concerned can be proud that EJEG has survived and thrived and is the third longest standing e-government journal still being published today (the oldest being Government Information Quarterly and Information Polity). A journal like EJEG has a mission not just to publish good research and interesting ideas, but to help its contributors improve their work and to help those whose papers are rejected to understand why so that they can do better next time. I hope we have and continue to meet these criteria.

There is, as always, a large number of people to whom to say I would like to say thank you. First there are my three AEs, Carl Erik, Mary Griffith and Les Worrall. Then the three administrators with whom I have worked over the years, Anna, Richard and Meryl as well as the ACI/ACPIL team Sue, Dan and Louise Remenyi, Mandy, Carol and several others over the years. Good luck to all with the future of the journal.

Frank Bannister
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Where do the Nordic Nations’ Strategies Take e-Government?

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Abstract: An effective strategy is critical for the successful development of e-Government. The leading nations in the e-Government rankings include Sweden, Norway, Denmark, and Finland. Their leading role makes them interesting to study when looking for reasons to successful e-Government. The purpose of this research paper is to describe the e-Government development strategies of Nordic countries, which rank highly on the international stage. In particular, it aims to study the foci of these strategies. The approach is a document study of the e-Government development strategies of Sweden, Denmark, Norway, and Finland was carried out using a qualitative content analysis inductive method. The results show that the major focus of Nordic e-Government strategies is on public sector reforms. Other focus areas include economic reforms and, to a lesser extent, e-Democracy efforts. Sweden, Finland, and Norway have set ambitious policy goals in order to achieve global leadership in e-Government development. In response to the question posed by this paper’s title, we can say that Nordic e-Government strategies, except for Norway, focus more on reforming public sector services than on economic reforms. e-Democracy reforms are hardly focused on at all. Practical implications: Public sector policy makers can relate their policy foci to some of the more successful e-Government countries in the world. Research implications/originality is that this paper can apart from the findings also provide a means on how to identify the actual foci of a country’s e-Government policy.


1. Introduction

Many nations compete to become world leaders in e-Government development. “Some governments compete for leadership in offering online services. Others do not want to be left behind. Most governments have developed detailed strategies for realizing their e-government programmes” (Rabaiah & Vandijck, 2009). However, ranking e-Government development can be difficult. The United Nations [UN], World Bank [WB] and European Union [EU], for example, all use different indicators to rank e-Government development. What is clear, though, is that an effective strategy is critical for the successful development of e-Government. The leading nations in the e-Government rankings include Sweden, Norway, Denmark, and Finland. These Nordic nations aim to improve the efficiency and effectiveness of their public sector services with the help of electronic information and communication technologies (Wallström, Engström, Salehi-Sangari, & Styvén, 2009). In particular, national e-Government strategies aim to modernize the public sector. “E-Government continues to be recognized as a key strategy for improving government services and the effectiveness of public policies and programs” (Pardo, Nam & Burke, 2012). Similarly, transnational e-Government policies are also important for e-Government development (European Commission [EC], 2003; Goldkuhl, 2009). In March 2010, the EC launched ‘Strategy Europe 2020’ to overcome economic crisis through delivering sustainable economic and social benefits. Its goal was to equip national economies to meet the challenges of the ongoing decade through a single market and by using ultra-fast digital solutions (EC, 2011). As member states, the Nordic nations have formulated e-government strategies to attain these goals. We define an e-Government strategy as a “plan for e-government systems and their supporting infrastructure which maximises the ability of management to achieve organisational objectives” (Heeks, 2006). E-Government strategies are described in government policy documents. Policy refers to those plans, positions and guidelines of government that influence their decisions. Government policy can be reflected in legislation, regulations and programmes, and are referred to as policy instruments (Office of the Auditor General, 2003). Normally, the term policy does not denote what is actually done (Food and Agricultural Organisation [FAO], 2012; Andersson, 2005).
1.1 Purpose of the study

This study compares inductive e-Government strategies adopted in Nordic countries. Homogeneity in terms of their geography, economic situation, political system and level of e-Government development made it possible to make the relevant comparisons. Furthermore, e-Government practitioners, policy makers and readers in other countries can benefit from the e-Government strategies adopted by the Nordic nations. The specific purpose of this study is to compare and collate e-Government strategies in Nordic countries. To fulfil this purpose, this study sought to answer the following research question:

**Research question:** What are the foci of e-Government strategies in Nordic countries?

This paper is organized as follows. Section 2 describes central concepts and the theoretical background. It also offers a brief review of existing studies. Section 3 describes the method of study. Section 4 presents the results. Finally, section 5 discusses the foci of e-Government strategies in Nordic countries, ending with a conclusion.

2. Previous studies

In this section we present literature and theories relevant for a discussion of foci in e-Government strategies. Relevant fields are related to service delivery, economic benefits, participatory aspects, national contextual features and values.


E-Government interventions incur an economic cost; thus there are arguments for and against e-Government expenditure. E-Government initiatives can deliver reform, modernization, efficiency and cost effectiveness in service delivery. The UN (2012) referred to e-Government as a powerful tool for advancing sustainable development for all people across the world. Moreover, ‘some scholars have argued that e-Government is part of the shift from the conventional, ‘mass customised bureaucracy’ to the ‘customer-oriented bureaucracy’ (Korczynski, 2002). The authors of another study “find that e-government applications possess political properties that can be applied effectively by the political leadership as instruments to improve control over the government bureaucracy as well as to enhance essential government accountability and transparency” (Ahn & Bretschneider, 2011). However, e-Government initiatives have come under criticism from both practitioners and researchers. In spite of the propagated advantages of e-Government, the potential results from such huge investments are not evident (Codagnone & Undheim, 2008; Åkesson, Skålén & Edvardsson, 2008; Wallström et at. 2009). Furthermore, citizens expect e-Services that create value without an additional tax burden (Wallström et at. 2009). A lack of governmental resources (both human and financial) for e-Government is a greater challenge for the public sector than it is for the private sector (Coursey & Norris, 2008).

When studying e-Government strategies, one must also take into account the contextual features of the implementing countries. A country’s political, economic and social context is very relevant in e-Government development (Lee, Tan, & Trimi, 2005). Participatory e-Government projects necessitate long-term planning, with consideration given to socio-economic and political peculiarities (Porumbescu, Vrabie, & Ahn, 2012). The history of e-Government development began with the dissemination of information by governments. In developed countries, it has progressed to needs-based citizen services (Weerakkody, El-Haddad, Sabol,
Ghoneim & Dzupka, 2012). However, the potential for e-Government to provide needs-based services and customized services is still underutilized (Van Veenstra, Klievink & Janssen; 2011; Weerakkody, Janssen & Dwivedi, 2011; Weerakkody et al., 2012). E-Government initiatives must have the ability to integrate information through dynamic, multidimensional capabilities in both government and non-governmental organizations (Pardo, Nam & Burke, 2012). However, similar policies and similar strategies may not deliver the same outcome in different country contexts. “Similar e-government initiatives, implemented by different nations but aimed at achieving similar policy goals, produce different outcomes” (Eom, 2012). Moreover, a country’s political, economic, social and strategic peculiarities are very important in the formulation and implementation of e-Government strategies. Institutional arrangements, interactions of policy formulators and characteristics of policy processes are all factors in the outcome of e-government policy (Scharpf, 2000; Hall & Taylor, 1996; Timmermans, 2001; Saint-Martin, 2004; Skocpol & Ruechemeyer, 1996; Weaver & Rockman, 1993; Clemens & Cook, 1999; Hay, 2006; Peters, Pierre & King, 2005; Eom, 2012). “Lessons drawn from developed countries indicate that political, fiscal, social, strategic and organisational issues need to be addressed when formulating plans for deploying e-government” (Weerakkody et al., 2012).

Information technology is associated with a certain set of values; thus, it is difficult to introduce information technology in a setting where opposing values exist (Ebbers, 2002). For example, it would not make sense to use information technology to improve economic value (customer oriented) in an administrative system that is dominated by legal values. The rationalization of public administration and the improvement of e-Government quality are paradoxical aims. “The double objectives of quantity and quality are fundamentally contradictory. On the one hand, the government seeks to reduce the costs per citizen/customer transaction by increasing the speed with which cases are processed, and on the other hand they praise the qualities of customer service and encourage their employees to be quality-orientated” (Nygren, 2009). Moreover, efficiency and quality are not interchangeable characteristics (ibid). Democratic governments are obliged to provide equal services to citizens without a profit motive and irrespective of citizens’ ability to pay. In theory, then, efficiency, cost savings and quality improvement are not desirable aims of the public sector. The public and private sectors represent and operate on divergent value systems. The public sector is accountable to its citizens, while the private sector is driven by the desire to make a profit (Lash & Urry, 1994; Hogget, 1996; Nygren, 2009).

Tried-and-tested solutions can be changed to deliver novel solutions and services (Rabaiah & Vandijck, 2009). Instead of sticking to a single strategy to accomplish goals, governments need to be open to such new solutions. Following this brief review of the theoretical discussion related to e-Government strategies, the next section describes the method used for this study.

3. Method

Depending on the nature of the questions posed in a research study, methods can be classified as qualitative or quantitative as well as inductive or deductive. Our research question is qualitative by nature, since we are focusing a limited number of strategies and not aiming at generalizing more than that. As for the epistemological aspect we have chosen an inductive approach, since the field of e-Government strategies as we study it, is not yet thoroughly researched and thereby suitable for a more explorative approach. In case we would have chosen a deductive study our findings would have been dependent of the categories of the chosen (deductive) model and we might have missed new categories and dimensions.

This paper used a document study; using a qualitative content analysis method. The conceptual framework of a qualitative content analysis process is shown in figure 1.
A qualitative content analysis framework above has two possible approaches: inductive content analysis and deductive content analysis. Because of reasons described above this study used an inductive approach in which qualitative data were abstracted by being coded and grouped into categories. "When formulating categories by inductive content analysis, the researcher comes to a decision, through interpretation, as to which things to put in the same category" (Elo & Kyngäs, 2008). E-Government strategy documents contain qualitative data. A document study is a qualitative evaluation method; other similar methods include case studies and alternative (authentic) assessments (National Science Foundation [NSF], 1997).

3.1 Document Study

Existing records provide insights into a setting that cannot be observed in any other way. Information can be found in document form. Documents can be defined as any written or recorded material not prepared for the purposes of the evaluation or at the request of the enquirer (Lincoln & Guba, 1985). Documents can be divided
into two major categories: public records and personal documents (Guba & Lincoln, 1981). “Public records can
be collected from outside (external) or within (internal) the setting in which the evaluation is taking place”
(NSF, 1997). Policy manuals, descriptions of programme development and evaluation are internal documents.
The usefulness of documents in a study depends on accessibility and accuracy. Existing documents are useful
for comparing institutional policies both before and after the implementation of e-Government strategies
(ibid). The advantages and disadvantages of document studies are shown in table 1.

Table 1: Advantages and disadvantages of document studies (NSF, 1997)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Available locally; 2. Inexpensive; 3. Grounded in setting and the language in which they occur; 4. Useful for determining value, interest, positions, political climate, public attitudes, historical trends or sequences; 5. Provide an opportunity to study trends over time; 6. Unobtrusive</td>
<td>1. May be incomplete; 2. May be inaccurate; questionable authenticity; 3. Locating suitable documents may pose challenges; 4. Analysis may be time consuming; 5. Access may be difficult</td>
</tr>
</tbody>
</table>

3.2 Data analysis

The content analysis of the Nordic nations’ e-Government strategies followed five steps.

First, the e-Government strategy documents (fact sheets) of the Swedish, Danish, Finnish and Norwegian
governments were downloaded from the European Commission’s official portal ‘ePractice.eu’.

Second, all documents were thoroughly read. The close reading of e-Government fact sheets led to the initial identification of measures and themes. In turn, these allowed us to identify sub-categories of e-Government strategies.

Third, the sub-categories were finalized, coded and grouped into generic and main categories using conventional content analysis methods (Kondracki & Wellman, 2002; Patton, 2002; Hsieh & Shannon, 2005; Elo & Kyngäs, 2008) (see example in figure 2). This coding process (described below) was a crucial part of the analysis. Sub-categories were grouped into generic categories. This was carried out by associating any measures in the sub-categories with potential generic categories. If the aim of a sub-category is to explicitly show association (the aim or key word of the sub-category can indicate such association) with a generic category, this is the basis for classification. Generic categories are further classified into three main categories of Nordic e-Government strategies: public sector reforms, economic reforms and e-Democratic reforms, as presented in Appendix A. This classification follows the same pattern used to place sub-categories into generic categories. In this way, we generated a reform-based model of e-Government policies, which shows the differences between the Nordic countries in terms of reform types. Moreover, information on e-Government history, the latest e-Government strategy, the legal framework, the main e-Government actors at national, regional and local levels, and the e-Government infrastructure of Nordic countries was also gathered from the fact sheets using the conventional content analysis method (Hsieh & Shannon, 2005). This information was further used to compare the Nordic countries in terms of, for example, policy decision level.

Fourth, the frequencies of generic and main categories were identified to find the foci of e-Government strategies. Frequencies are meant to give a rough indication of the reforms prioritized by the four countries.

Figure 2: Abstraction process (Example adapted from Elo and Kyngäs, 2008)

Fourth, the frequencies of generic and main categories were identified to find the foci of e-Government strategies. Frequencies are meant to give a rough indication of the reforms prioritized by the four countries.
We are aware that this only allows a rough comparison to be made, because we do not take into consideration the significance of the various measures. However, we are able to claim, for example, that when a country has no measures at all in a certain generic category, this indicates low priority.

Fifth, the level of policy priority was drawn from the relative proportion of generic and main categories represented in e-Government strategy documents.

### 3.3 Criticism and suitability of the content analysis

The suitability of the content analysis method has been criticized by experts from the quantitative field, such as Hsieh and Shannon (2005), because of its qualitative nature. The main criticism is that content analysis is a “simplistic technique that did not lend itself to detailed statistical analysis, while others considered that content analysis was not sufficiently qualitative in nature” (Morgan, 1993). Other criticisms are based on its simplistic and non-analytical nature (Weber, 1990) and the researcher-dependent rigour of this method (Neundorf, 2002). However, the qualitative content analysis method is widely used in academic studies and has many benefits. For example, “Content analysis is a research method for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action” (Elo & Kyngäs, 2008). Other benefits of this method include its content-sensitiveness (Krippendorff, 1980); its flexibility in terms of research design (Harwood & Garry, 2003); the simplistic description of data; and its helpfulness in understanding the meaning of communication (Cavanagh, 1997) and identifying critical processes (Lederman, 1991). E-Government strategies in Nordic countries can be classified as qualitative data; thus, they cannot be processed quantitatively alone for a meaningful analysis.

### 4. Results

This comparative study shows that public sector reform is a strong focus (60% of measures) of e-Government strategies in Nordic countries. These Nordic nations have adopted similar measures for public sector reforms such as legal measures for e-Identification, service sector reforms and public sector integration efforts. The main and generic categories of e-Government strategic measures, along with the frequencies and percentage share of measures for the Nordic nations, are given in table 2 below.

#### Table 2: Main and generic categories of Nordic e-Government strategic measures

<table>
<thead>
<tr>
<th>Categories</th>
<th>Nordic countries</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sweden</td>
<td>Norway</td>
</tr>
<tr>
<td><strong>Main</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public sector reforms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal measures</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Public service reforms</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Public sector integration</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Digitised welfare</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total public sector measures</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Economic reforms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information society infrastructure</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Public private participation</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Business sector reforms</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Growth and competence</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Financial measures</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total economic measures</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>e-Democracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Participation</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Total measures</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

Public sector service reform (24%) has become the major focus of Nordic e-Government strategies. Public sector integration constitutes 20% of strategic measures. The Danish and Finnish e-Government strategies include digitized welfare. Digitized welfare refers to the delivery of welfare services using digital means. One
third of Nordic e-Government strategies are focused on economic reforms. However, economic measures varied between the individual nations. Information society infrastructural development, private public participation and business sector reforms are addressed by all four Nordic nations. Danish e-Government strategy addresses business sector reforms and information society infrastructure for economic reforms. E-Democracy measures are the least focused on (6%) among the main categories of Nordic e-Government strategy. Only Sweden and Finland address e-Participation using specific measures. Table 3 offers a brief comparison of the strategic e-Government development of the Nordic nations.

Table 3: Comparison of strategic e-Government development of the Nordic nations

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Sweden</th>
<th>Denmark</th>
<th>Norway</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latest e-Gov strategy</td>
<td>Digital agenda for Sweden with 143 measures in 4 strategic areas, with the goal of leading the world in e-Government. Aims for public Agency Efficiency improvement and innovation by 2014.</td>
<td>By 2015, digital self-service solutions as the normal procedure for citizens’ interaction with the public sector. Sixty individual initiatives under three main tracks.</td>
<td>Citizen services and back office infrastructure, simple and efficient public sector, innovation and value creation in the business sector, and aims for sustainable and inclusive development.</td>
<td>National Knowledge Society Strategy 2007-2015 formed by 400 specialists. It focuses on four priority-specific strategic goals and aims with 72 related measures.</td>
</tr>
<tr>
<td>Main actors: Regional and local levels</td>
<td>County councils and municipalities.</td>
<td>Strategic Committee for joint government cooperation; Local authorities.</td>
<td>Regional and local authorities.</td>
<td>Regional councils and Advisory Committee on Information Management in Public Administration (JUHTA).</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Government information portals for citizens and single point portal for businesses. Secure information exchange network between government agencies and EU bodies through an IP-based network.</td>
<td>Single Internet entry point for citizens with self-service and mobile platforms. E-service channel for businesses. Also, online trading portal and educational materials website with special design for digital illiterates.</td>
<td>One-stop service portal to citizens with secured interaction point, Point of single contact for businesses, standardization portal, and portal for geo-spatial infrastructure.</td>
<td>Citizen service portal with single access point for e-Services, enterprise services portal, geo-data portal.</td>
</tr>
</tbody>
</table>

Among the Nordic nations, Denmark is a pioneer of e-Government development (EU, 2012 b). Sweden, on the other hand, was the last to embark on its own e-Government strategy (EU, 2012 a). Their strategy revolves around integrated e-services, e-Identification, e-Participation and e-Inclusion, modernization, standardization,
and monitoring and legal frameworks. Denmark has three main tracks, which consist of clear policy goals. These goals include the complete abolition of paper-based administrative processes by 2015, the introduction of a digital welfare system in the education and healthcare sectors, and a joint public sector effort to achieve a digital strategy. The Norwegian e-Government strategy comprises a secure information society, ICT education of its citizens, innovation and value creation for businesses, growth and development, and the provision of public self-service facilities. Norway also has an ambitious goal: to create the world’s best public sector development through close cooperation between its public sector agencies. Current e-Government strategy of the Nordic nations aims to achieve considerable development in the following areas: human-centric and competitive society, the materialization of ideas for production and innovation, creation of innovative know-how and lifelong learning practices, and an interoperable information society (EU, 2011; EU, 2012 a; EU, 2012 b; EU, 2012 c). Finland aims to be among the top five e-Service provider nations in the world by 2015.

4.1 Limitation of this study

E-Government strategic documents were selected from the EU portal for e-Government strategies. Norway’s e-Government strategy was updated in 2011, whilst the other Nordic nations revised their strategies in 2012. Small Nordic nations such as Iceland, Greenland and Åland have not been included in this study. Since the publication of ‘Strategy Europe 2020’, most of the Nordic nations have formulated new e-Government/digital agenda strategies. However, in order to make a valid comparison that uses digital agenda documentation from all the Nordic nations, these most recent policies have been excluded from this study. Instead, the latest policy updates published on the EU portal have been used. Most of the facts and claims contained in official documents have been used as such in this study. The classification of generic categories and main categories was researcher dependent.

5. Discussion

Nordic e-Government policies were categorized into three main groups: public sector reforms, economic reforms and e-Democracy reforms. The result of this study shows that the main focus of Nordic e-Government strategies is public sector reforms. Of these three categories, the least focus is given to e-Democracy reforms. Within these categories, different strategy patterns emerge regarding overall aim, e-Government organization, citizen participation, economic measures, and standardization.

As for overall aim, the Danish e-Government strategy can be seen to be comparatively more objective and pragmatic in nature, while the other three Nordic countries have ambitious aims to become world leaders in e-Government. Swedish and Finnish e-Government strategies have as their goal the desire to become world leaders, although no particular benefits are specified. “For what reason (added value) it is important for the Swedish public administration to have a leading position in the eGovernment field is left untold” (Nygren, 2009).

Regarding organization, the UN (2012) has advocated a holistic approach to e-Government strategy planning for sustainable development. However the decentralized administrative system of the Nordic nations may hinder such a holistic approach. Denmark reduced the number of regions and municipalities and reorganized its administrative system in 2007 through a decentralization and re-centralization process. According to Lee, Tan and Trimi (2005), political, economic and social contexts are very relevant in e-Government development. The finance ministries of both Denmark and in Finland finance the administration of e-Government development. Three ministries are involved in Danish e-Government development. In Finland, two ministries are directly responsible for e-Government development and the formation of strategy. In the case of Norway, the Ministry of Government Administration, Reform and Church Affairs and the Department of ICT Policy and Public Reform play a major role in national e-Government development and strategy formation. Swedish e-Government is controlled by Ministry of Enterprise, Energy and Communication.

Citizen participation is part of the studied strategies in different ways. Norway has launched an open source-based e-Service to report faults and issues in all its municipalities to enable citizen participation in local administration. Through this service, emails can automatically be sent to the local authority so that faults and issues can be redressed. In Norway, there are relatively few central government projects to improve citizen online consultation and participation in policy making (EU, 2011). Finland follows a course of participatory e-Government strategy planning. “Around 400 specialists from the Government, local authorities, higher education institutions, businesses and organisations participated in the draft process” (EU, 2012 c). Contextual
differences are addressed in Nordic e-Government strategies, as suggested by Weerakkody et al. (2012). However, such contextual differences need to be studied further if we are to find out whether similar e-Government strategies and policy measures in Nordic nations would result in different outcomes, an idea put forward by Eom (2012).

One third of Nordic e-Government strategies focus on economic measures. This shows that governments’ efforts to offset their lack of resources for e-Government are a greater challenge for the public sector than it is for the private sector (Coursey & Norris, 2008). All Nordic countries, with the exception of Denmark, engage in public private partnership endeavours. Since the mid-1980s, Denmark has aimed to improve efficiency and effectiveness in the public and private sectors using ICT. “The recent financial recession and the measures taken in response have not had a real impact on e-Government development in Denmark. The Danish e-Government strategy is currently adopting a hesitant approach dictated largely by the Ministry of Finance which controls the purse strings” (Overgaard, 2011). Our findings point in the same direction: among the Nordic nations, Denmark has the least number of economic measures in its e-Government strategy. However, the paradoxical value of economics (customer orientation) associated with information technology and the legal value domination that exists in public administration (Ebbers, 2002) should be further investigated with the initiation of public private partnership efforts.

With the exception of Denmark, all of the Nordic nations have more than one e-Government strategy at work. These e-Government strategies are built on previous strategies. It can see from the above examples that Nordic e-Government strategies have sought to address the ever-changing nature of e-Government (Rabaiah & Vandijck, 2009). Denmark took 20 years to finalize the digital signature (Hoff & Hoff, 2010). All of the Nordic countries emphasize the importance of the standardization of software, systems and other e-Government artefacts for interoperability. However, standardization should not lead to supplier monopolies, as in the case of the Republic of Korea, where a lack of a proper e-Signature policy led to the creation of such a supplier monopoly. “Its consequences include unbelievable Microsoft monopoly with almost 99 percent market shares of Microsoft products, chronic addiction to Microsoft standards, bad computing practices, and fatal Web accessibility problems” (Park, 2012). For this reason, promotional policy towards open standards and software of Nordic e-government strategies gain importance.

All together our analysis has revealed a number of aspects of e-Government strategies that have been treated differently by the Nordic countries respectively. In what way these aspects are related to each other and how they affect the outcome for government and citizens is for future research to find out. A literature study by Muller & Skau (2015) indicates that the maturity of e-Government as described by Layne and Lee (2001) is not developing quickly, thus indicating that strategies could be improved. Further on the focus of the realization of e-Government tend to stress the supply side rather than the user side (Rana et al, 2013; Gidlund, 2015). These aspects might be useful to relate to the e-Government strategy content and its success in e-Government practice. Another researchable aspect of the development of e-Government during the last year also indicates that social media will play a role in strategy development (Sivaraja et al, 2015; Bonsón et al, 2015). Open data in e-Government strategies (Nugroho et al, 2015) is yet another relevant topic for future research.

5.1 Conclusion

In response to the research question “What are the foci of e-Government strategies in Nordic countries?” we conclude the following:

- Nordic e-government strategies focus on extensive public sector reforms that aim to overcome economic crisis through digital solutions.
- Economic reforms play a comparatively lesser role in Nordic e-Government strategic measures.
- E-Democracy reforms are only included in Swedish and Finish e-Government strategies to a minor extent.
- Participatory approach would facilitate needs-based e-Government strategy formation.
- Danish restructuring of public administration for better governance would lead to a holistic approach to e-Governance to attain sustainable development as suggested by the UN.
Powerful ministries handle e-Government portfolios at national levels.

Simultaneous e-Government strategies would be useful for the constant renewal of strategic goals to meet the recurring challenges.

To summarize conclusions, we can say that Nordic e-Government strategies, except for Norway, focus more on public service reforms than on economic reforms. E-Democracy reforms are hardly focused on at all. One reason for this is the inherent conflict in e-service efficiency for government in contrast to participative and effective e-services for citizens (Gidlund, 2015).

References


Hoff, J. V. & Hoff, F. V. (2010). The Danish eID case: twenty years of delay. Online source; accessed on 4.08.2012 from http://www.springerlink.com/content/h023035160/7u139/


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6. Appendix A: Abstracted e-Government strategies of Nordic Countries

The following table shows the e-government strategies of Nordic countries abstracted in sub-category, generic category and main category levels. These categories are abstracted from strategic documents published at ePractice.eu.

**Table 4: Abstracted e-Government strategies of Nordic Countries**

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Generic category</th>
<th>Main category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swedish Public Agencies would be mandated to quickly and effectively develop specific e-Government services with the private stakeholders to jointly develop common e-Services.</td>
<td>Private public participation = 2</td>
<td>Economic reforms = 6</td>
</tr>
<tr>
<td>Specific funding should be earmarked for those strategic projects which could prove beneficial to third parties.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strengthen the overall development capacity and innovative power of society.</td>
<td>Competence enhancement = 2</td>
<td></td>
</tr>
<tr>
<td>Innovation potential of society through e-Government.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financing of inter-agency projects.</td>
<td>Financial measures = 2</td>
<td></td>
</tr>
<tr>
<td>Clearer management and funding mechanisms for e-Government projects.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make it as easy as possible for as many people as possible to exercise their rights, fulfill their obligations and access public administration services.</td>
<td>E-Participation efforts = 3</td>
<td>E-Democracy reforms = 3</td>
</tr>
<tr>
<td>Flexible e-Government based on users’ needs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Launch of an Internet forum where citizens and businesses would be given the opportunity to take part in the shaping of future e-Government.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementing updated system for e-Identification.</td>
<td>Legal measures = 3</td>
<td>Public sector reforms = 12</td>
</tr>
<tr>
<td>E-Identification: the creation of a single and unified e-ID solution to access government services.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better technical/legal rules and regulations to promote the use of e-Identification and e-Services.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service orientation of public agencies and organizations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New governance structure for e-Government.</td>
<td>Public sector integration = 6</td>
<td></td>
</tr>
<tr>
<td>E-delegation to lead and coordinate the development of e-Government.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-delegation will coordinate the strategic e-Government projects.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swedish Public Agencies should select open standards and open source software.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swedish Public Agencies to monitor the development and the testing of IT for informed technological choices across the public administration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better integrated e-Services.</td>
<td>Public service</td>
<td></td>
</tr>
</tbody>
</table>
Increasing the efficiency of the Swedish Public Agencies. reforms = 3

Effective support service and shared service centres with help of the Tax Board and the National Police.

**Denmark**

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Generic category</th>
<th>Main category</th>
</tr>
</thead>
<tbody>
<tr>
<td>For businesses, all relevant communication will be fully digital by the end of 2012.</td>
<td>Business sector reforms = 1</td>
<td>Economic reforms = 3</td>
</tr>
<tr>
<td>Promotion of a common digital infrastructure that is secure and robust enough to cover future needs.</td>
<td>Information society infrastructure = 2</td>
<td></td>
</tr>
<tr>
<td>Effective sharing of reliable baseline data between administrations.</td>
<td>Digitized welfare = 3</td>
<td>Public sector reforms = 12</td>
</tr>
<tr>
<td>Investments up to DKK 1.5 billion to bring schools into the 'digital future'.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of welfare technology to advance the treatment of chronic illnesses outside of hospital, bringing it into private homes and thus engaging patients in their own treatment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting clear targets for the use of health IT, in order to facilitate everyday matters in hospitals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adoption of a law for the digital society.</td>
<td>Legal measures = 1</td>
<td></td>
</tr>
<tr>
<td>Introduction of common digital solutions by the government, regions and municipalities in order to allow them to develop together.</td>
<td>Public sector integration = 4</td>
<td></td>
</tr>
<tr>
<td>Public authorities and institutions should not develop their own systems; rather, they should adopt systems in areas in which good common solutions are already available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public digitization effort is coordinated effectively - across the government, regional and municipal authorities, and institutions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A stronger coordination of public digitisation efforts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital self-service solutions as the normal procedural way for citizens to interact with the public sector.</td>
<td>Public service reforms = 4</td>
<td></td>
</tr>
<tr>
<td>New joint digital strategy for rapid use of digital means by the government, municipalities and counties for a renewed and efficient public sector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper forms to be phased out and all citizens serve themselves online. All citizens must have a digital post box by 2014.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For individual citizens, easier and flexible transactions with the public authorities carried out digitally at a citizen's convenience, even outside of office hours.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Norway**

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Generic category</th>
<th>Main category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient use of ICT for economic growth and a high employment rate.</td>
<td>Growth enhancement = 2</td>
<td>Economic reforms = 10</td>
</tr>
<tr>
<td>Stimulating growth and development in the ICT industry by creating good framework conditions for electronic business and trade, service development and innovation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote development through private cooperation: credible partner for government agencies in renewing the public sector.</td>
<td>Private public participation = 2</td>
<td></td>
</tr>
<tr>
<td>Developing business standards to enable electronic interaction between public enterprises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion of a pan-European e-Commerce solution; and the support of environmentally-friendly public procurement.</td>
<td>Business sector reforms = 4</td>
<td></td>
</tr>
<tr>
<td>Electronic business processes and electronic procurement in the public sector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributing to innovation and value creation in the business sector by arranging for development and use of services based on a digital content.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT development for innovation and value creation in the business sector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion of a common digital infrastructure, secure and robust enough to cover future needs.</td>
<td>Information society</td>
<td></td>
</tr>
</tbody>
</table>
Effective sharing of reliable baseline data between administrations.  
E-Government focuses on providing services to citizens and developing the required back-office infrastructure.

ICT development for simplification and efficiency improvement in the public sector and to secure a sustainable and inclusive development of society.

Digital self-service solutions to improve quality, accessibility and flexibility. ICT for public sector overhaul and efficiency.

Making public data accessible for further use and distribution, and promoting smart, climate-friendly ICT solutions.

Good public self-service solutions and striving for efficient public administration by coordinating public ICT projects.

Launching of a new citizen portal on the Internet.

Create the world’s best public sector with emphasis on quality, efficiency, user-centrism, openness, participation, good organization and sound management.

Renewing the public sector for providing direction and priorities in developing the public sector, through eInitiatives across the government.

Development of effective transverse management models.

Electronic ID enabling the exchange of sensitive information and the development of advanced services for citizens and businesses.

Secure e-ID solutions.

Finland

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Generic category</th>
<th>Main category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland’s strategy document was drawn up in cooperation with 400 specialists from government, local authorities, higher education institutions, businesses and organizations.</td>
<td>E-participation efforts = 2</td>
<td>E-Democracy efforts = 2</td>
</tr>
<tr>
<td>Use online services to transform Finland into a working online democracy with increased transparency, where citizens can initiate an issue and follow up its progress electronically.</td>
<td>Public private participation = 3</td>
<td>Economic reforms = 10</td>
</tr>
<tr>
<td>Create public services as processes across organizational lines within public administration in cooperation with other parties.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Networked administration for the various stages in a business life cycle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop rules and pricing models that increase joint activity, innovativeness and competitiveness in order to benefit from the information produced by the public sector.</td>
<td>Information society infrastructure = 4</td>
<td></td>
</tr>
<tr>
<td>Provide a first-rate foundation for proactive service production and research by national databases, registers and statistics materials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offer an information and communications infrastructure that functions on a 24/7 basis by 2015.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliable, high speed connections with comprehensive regional coverage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availibility and compatibility of data infrastructure with greater consistency between services, equipment, networks and systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use public administration embedded systems in logistics, micropayment, remote and access monitoring, automation of functions. Also, provide customers with proactive services.</td>
<td>Business sector reforms = 3</td>
<td></td>
</tr>
<tr>
<td>Develop new and innovative businesses, introduce teleworking and produce digital services that are close to the customer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniform customer interfaces are to be created for citizens and businesses in order to allow access to public services.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noticeably increase the importance of practices and services related to information security.</td>
<td>Legal measures = 2</td>
<td>Public sector reforms = 17</td>
</tr>
<tr>
<td>Develop solutions for electronic identification between different information networks and the flexible use of various electronic services with a single sign on.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design ICT equipment, software and electronic barrier-free services so that they are easily accessible.</td>
<td>Public service reforms = 7</td>
<td></td>
</tr>
<tr>
<td>Produce public sector information that is user-friendly within the public sector itself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base data transfer between IT systems on open standards and interfaces and develop national level solutions for the electronic service interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Government to ensure e-Services for citizens and businesses in all main services by 2013.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information society development and the spread of electronic public services.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop electronic services to forecast the needs of citizens and organizations and use existing information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-channel, proactive and interactive e-Services above and beyond those that citizens and businesses are currently using.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gather digital content produced by public authorities into a digital library to serve citizens, enterprises and research organizations free-of-charge.</td>
<td>Digitised welfare = 3</td>
<td></td>
</tr>
<tr>
<td>Access a national electronic archive service for archiving patient information in the public sector and for distributing information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide diverse educational opportunities with regard to computer literacy through adult and employee education.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government launched projects, primarily to re-arrange public information systems.</td>
<td>Public sector integration = 5</td>
<td></td>
</tr>
<tr>
<td>Networked administration of services that are accessible and easy to locate through multiple channels, providing support for citizens’ everyday life situations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish a comprehensive network of joint service points, high-quality e-Services and phone service centres to allow citizens to view services as seamless concepts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create public services as processes across organizational lines within public administration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop the interoperability of all public administration information systems.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A Review of e-Government Research as a Mature Discipline: Trends, Themes, Philosophies, Methodologies, and Methods

Muhammad Yusuf¹, Carl Adams² and Kate Dingley²

¹University of Trunojoyo, Madura, Indonesia
²School of Computing, University of Portsmouth, UK

Abstract: This paper aims to identify themes, trends, research philosophies, methodologies and methods used in E-Government studies. This research uses a novel structure literature review method to capture the evolving research focus in the E-Government literature. It examines all abstracts from the European Conference on E-Government (ECEG) papers from 2007 to 2012 and International Conference on E-Government (ICEG) papers from 2007 to 2010. This paper also compares previous research covering themes and models of E-Government research. The research findings are: 1) case study and potential case study is dominant methods, 2) there are various research philosophy, methodology and methods on e-government field, and 3) e-government is evolving over time and is maturing as a discipline. An analysis also shows lack of works covering development of theory in e-government domain. This paper provides further contribution by using a novel approach for conducting a structured literature review, based on evaluating abstracts and key words, and in a corresponding method to method to validate classification of themes that emerge using focus group discussion sessions.

Keywords: e-government, themes, trends, philosophy, methodology, method, literature review, ICEG, ECEG

1. Introduction

This introductory section provides a brief overview of E-government. It then goes on to previous research, research aims, contributions, implications and structure of this paper.

E-Government is a relatively young discipline and evolving as new technologies emerges. It applied in an increasing number of government activity in many countries. Consequently, one would expect that E-Government research and activity also change and evolve particularly in the main themes, concepts, models, trends, philosophy, methodologies and methods.

There has been a selection of previous works that captures some of the changing and evolving focus of E-Government research activity as follows: Siau and Long (2005) proposed the five stage model using a qualitative meta-synthesis methodology; Irani, Love and Montezami (2007) summarised papers that examined the past, present and future aspects of E-Government; Yildiz (2007) reviewed the limitation of the E-Government literature; Heeks and Bailure (2007) examined view points, philosophies, theories and methods of E-Government based on journals and conference papers; Bertot, Jaeger and McClure (2008) presented various issues about citizen-centred e-government implementation; Wimmer, Codagnone and Janssen (2008) identified 13 themes in the eGovRTD2020 project. Those 13 themes were summarised from regional workshops with experts, governments, ICT, industry, consulting, and academia. The output was an e-government research roadmap; Bolivar, Munoz and Hernandez (2010) also studied the themes and methodologies on E-Government from 321 articles published in Journals from Information Science and Library Science also Public Administration Subjects; Bannister and Connoly (2010) discussed about research topics, trends and types from 544 papers presented on European Conference on E-Government (ECEG) from 2001 to 2009 and others.

This research aims to identify some of this evolving focus of E-Government research activity as well as providing an alternative analysis to complement previous works that examined the changes in E-Government research. We conducted a novel structured literature review to capture and collate together key themes, research philosophies, methodologies and methods of e-Government based on European Conference on E-Government Volume 14 Issue 1 2016 (pp 18-35), available online at www.ejeg.com
Hence, this paper make contribution by providing both an update evaluation on e-government research activity and a complementary evaluation to previous works that tried to do the same thing. This paper focuses on evolving themes, trends, philosophy, methodologies and methods used in research within the e-government domain. Those illustrate e-government is a dynamic and becoming mature as a discipline. However, the review results show lack of theory development in this field. This paper also contributes a method for conducting literature review, especially on e-government.

Therefore, this paper has implication for researchers as a reference for conducting research in e-government area, especially to understand research opportunities, identifying themes, core issues, research philosophies and methodologies. The structure of this paper will be Introduction, Research methods, Previous Research, Findings and Analysis, Conclusion, Acknowledgement and References.

This paper is structures as follows. First, we capture introduction, then research methods, previous research, findings and analysis, discussion and finally we draw conclusions.

2. Research Methods

This section describes the methods used in this literature review. Figure 1 below illustrates the flow of research methods and will be explained in more details below:

Figure 1: Flow of literature review method

Firstly, we searched e-government conferences in Google Search Engine. Conferences are important as public sources to get to get update about E-Government development and project activities. Therefore, conference provides snapshot about E-Government activities. Then, we found some conferences, such as (Yusuf, Adams and Dingley, 2014):

- ECEG organized by Academic Conferences and Publishing International Limited (ACPI)
- ICEG organized by ACPI
- International Conference on E-Government (ICEG) organized by World Academic of Science, Engineering and Technology (WASET)
- GCC E-Government and E-Services Conference organized by Datamatix
Some good papers from ICEG and ECEG will be published in the Electronic Journal of E-Government (EJEG). The EJEG is Rated level 1 in the Danish Government bibliometric lists, indexed by the Institution of Engineering and Technology in the UK, listed in Ulrich’s Periodical Directory, the Norwegian Social Science Data Services, the Open Access Journals database, the EBSCO database of electronic Journals and the Cabell Directory of Publishing Opportunities, listed in ProQuest database and indexed by the Institution of Engineering and Technology in the UK (European Conference on E-Government, 2012). Therefore, those indexes above indicate that both conferences have good quality and feasible to be selected.

We focus on ECEG from 2007 to 2012 since this literature review was conducted at 2013. Therefore, ECEG papers on later years are not included. Moreover, the ICEG was not held at 2011 and 2012 (International Conference on E-Government, 2010). Therefore, we only focused on ICEG papers from 2007 to 2010. The papers’ abstracts from ICEG 2007 to 2012 were selected for review since some papers have been covered E-Government issues before 2007 and limited papers covered the issues from 2007 to 2012.

Following this, we reviewed 612 abstracts and collected all the keywords and collated them into a list. More than 1000 keywords were collected from all the abstracts of both selected conferences. The keywords represent the core issues in the papers which written by the papers’ authors, therefore it provides a robust dataset. Then, the words were entered into Wordle cloud software to help identify the dominant words based on frequency. In the output image, bigger size keywords indicated larger frequency of keywords. (Yusuf & Adams, 2014)

Then, we sorted, counted the keywords and selected the top ten keywords based on the highest numbers. The keyword “E-Government” had the highest number, but it was ignored since this literature review was identified the main issues in E-Government. After that, we created graphics which described trends of keywords every year. Additionally, a diagram was created to show the core issues in E-Government.

Moreover, a Focus Group Discussion (FGD) was conducted in order to get themes based on participants’ perspectives about E-Government and their justification. FGD was chosen as commonly used in social
constructivist research and qualitative methodology. In the FGD, participants were divided into 4 groups and asked to classify all the keywords into groups and gave themes for each classification. They then discussed the reasons why they grouped the keywords and wrote the themes. The FGD’s participants came from various backgrounds and levels of knowledge about computing technology, public management, politics, government, education, health, finance as they relate to E-Government. They also have expertise, or are conducting research into the following areas (Yusuf & Adams, 2014):

- E-Government from Computer Science & Information Systems
- E-Government from Public Administration
- E-Government from Marketing and Communications
- E-Government from Management Sciences
- E-Government from Library and Information Sciences
- E-Government from Public and Policy Sciences
- E-Government from Accounting, Business and Economics.
- Practitioners on Government (Education/Finance/Health)
- Citizens

Participants also came from International people such as Indonesia, Ghana, Kurdistan of Iraq, China, UK, Libya, etc as well as they have various first language. Some of participants did not use English as their first language. It may influence their perceptions and perspectives about the keywords. Therefore, the participants represents mixed group of people, perspectives and perceptions. As part of the ethics procedure, participants of the FGD wrote and signed consent form before they started the process of FGD.

Then, we analysed the literature review results from both selected conferences and the FGD results. The analysis captured relationship top ten keywords and titles from the FGD

Furthermore, all the abstracts from both selected conferences were reviewed, and then we collected and counted philosophies, methodologies and methods used by the papers authors were. Some papers have clearly stated methodologies and methods presented in the abstracts but some others are not clearly stated. Therefore, unclear methodologies and methods were classified as Not Clear Stated. For instance, the paper’s authors only wrote countries where the research done without stated clearly that it is a case study. So that, those papers classified as a case study and potential case study researches. After that, we categorised those into Research Paradigms, Research Approaches, Research Methodologies, Research Methods, Way to conclusion and other. Other category refers to Not Clear Stated (Yusuf, Adams and Dingley, 2014).

Next step, the results were presented through graphics of research methodologies and research methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012 as well as the top ten of methodologies and methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012. This has resulted in aspects such as research paradigms, way to conclusion and other categories not being presented as graphics since the number of those classifications are quite small (Yusuf, Adams and Dingley, 2014).

Finally, we collected some journals on same topic about themes and research methodology on E-Government, made comparison and analysis with those previous journal. Those journals used to validate the results of our literature review based on ECEG from 2007 to 2012 and ICEG from 2007 to 2010.

3. Previous Research

This section examines previous works that focussed on themes of E-Government research activity. Siau and Long (2005) proposed the five stage model of E-Government using a qualitative meta-synthesis approach to integrate different E-Government stage models into a synthesized one. This model provides a synthesized conceptual framework for researchers and practitioners to evaluate e-Government development. Case studies or action research was suggested to understand how to implement E-Government successfully.

Furthermore, Yildiz (2007) argued about the limitations of the E-Government concept including: no standard definition of the concept, the way the term is interpreted by different interest groups and the issue that ambiguous, poorly defined and/or context-dependent rhetoric, contains more hype and promotional efforts than aspects of change to meet the E-Government agenda. Therefore, Yildiz (2007) suggested two points which were classified into topical suggestions, such as: policy processes and the political nature of E-Government as well as methodological suggestions about looking at the topic from output to process.

While Heeks and Bailure (2007) did literature review, they did not find any concepts about research philosophy. Many researchers did not examine a research philosophy regarding E-Government research. Most methods were unclear and had a poor epistemology as well as a mix of deductive or inductive approaches. Additionally, just few papers had clear position as pure positivist, some papers tend towards an unclear positivist approach but there were not papers from social constructivist viewpoint. The analysis showed there was a dominant research philosophy from one philosophic approach. Overall, further studies about research philosophy in E-government are needed to make E-Government stronger as a discipline. They also found knowledge frameworks such as theory-based work, framework-based work, model-based work, schema-based work, concept-based work, category-based work, non framework-based work. The highest numbers of papers were model based-work and the lowest number papers were theory-based work. They summarize various research methods used by E-Government researchers and the results are: No discernible method (20 papers), Hunt and peck (19 papers), Questionnaire (15 papers), Document analysis (14 papers), Interview (14 papers), Web Content evaluation (7 papers), Literature Review (6 papers), Reflection on project experience (6 papers), Observation (3 papers) and others (7 papers). The results describe limited methods used in E-Government research. Those results will be compared with our literature review results. It will be interesting to get update about the changes happened in the E-Government methods (Heeks and Bailure, 2007).

Moreover, Bertot, Jaeger and McClure (2008) summarised area of citizen centred E-Government Research from various papers into some points:

- Needs, Abilities and Expectations
- Literacy
- Community Engagement and Partnerships
Wimmer, Codagnone and Janssen (2008) identified 13 themes in eGovRTD2020 project which is funded by European Commission. The 13 research themes are interrelated to each other and the multidisciplinary field. Those themes are:

- Trust in E-Government
- Semantic and cultural interoperability of public services
- Information quality
- Assessing the value of government ICT investment
- eParticipation, citizen engagement and democratic processes
- Mission-oriented goals and performance management
- Cyber infrastructures for e-Government
- Ontologies and intelligent information and knowledge management
- Governance of public-private-civic sector relationships
- Government’s role in the virtual world
- Crossing borders and the need for governance capabilities
- E-Government in the context of socio-demographic change
- Data privacy and personal identity

Bolivar, Munoz and Hernandez (2010) did literature review and found different research themes in E-Government, such as:

- Technological innovation and modernization in public administration management,
- E-Government programme/project evaluation and policy analysis,
- E-Participation and digital democracy,
- E-Services,
- Accountability, transparency and dissemination of information,
- Behaviour of citizens in relation to the applications of E-Government,
- E-Government and personnel/human resources,
- Legislative architecture,
- Intergovernmental relations,
- Digital divide and resistance barriers to E-Government,
- Organizational theory and behaviour.

They also found methodologies used in E-Government as varied as:

- Action Research,
- Case studies,
- Content analysis,
- Comparative analysis,
- Critical incident technique,
- Chi-Square method,
- Ethnographic studies,
- Evaluation research,
- Factorial analysis,
- Feasibility studies,
Empirical research methods are more dominant rather than non-empirical. The dominant quantitative methods consist of regression analysis, followed by structural equation modelling and evaluation research. The graphic of qualitative and quantitative trends showed qualitative methodology become decreased and quantitative methodology increased from 2000 to 2009 (Bolivar, Munoz and Hernandez, 2010).

Bannister and Connolly (2010) reviewed and found the following topics, such as: National, Evaluation, E-Democracy, Local Government, Interoperability, E-Voting, E-Participation, Identity, E-Procurement, and Website. The most popular topic is National evaluation which described the state of E-Government or some aspect of E-Government in specific countries. Furthermore, the types of each topic are varied; therefore there is not clear trend. They also found various types of papers include conceptual, investigative, case, theoretical, methodological and technical approaches. The dominant type is case studies. Additionally, they classified papers into type and sub type, and then found these results: Concept/Concept, Investigative/Analytic, Case/Concept, Case/Descriptive, Case/Discussion, and Theoretical/Theoretical which Concept/Concept is the most dominant type and sub type. The study showed that investigative and numerical research papers increased, while conceptual research decreased. Also, they found E-Government research tends toward analytical and investigative research.

4. Findings and Analysis

This section captures literature review findings and analysis regarding those results. We will explain more details below.

5. Themes in E-Government

Based on our literature review of abstracts of ECEG from 2007 to 2012 and ICEG from 2007 to 2010, some themes emerge as explained more details below:

Figure 3 and 4 below describe the keywords which were processed through Wordle software. In the figure below, there are some dominant keywords which are public, management, eGovernment, Government, information, and others which demonstrated that these words were used frequently in the ECEG from 2007 to 2012. Therefore, those dominant keywords show that authors of papers in the ECEG 2014 using those keywords in many papers. (Yusuf & Adams, 2014). Additionally, the figure below shows that some keywords such as E-Government, Public, Information, Digital, Government, and others are also dominant in papers of ICEG from 2007 to 2010. (Yusuf & Adams, 2014)
The issue with E-Government is that it encompasses many different aspects and papers cover these diverse issues, creating a wide variety of relevant keywords.

Furthermore, the authors classified the top ten keywords based on frequency. Figure 4 and 5 below illustrate the top ten keywords which emerged from both selected conferences papers. In the ICEG papers from 2007 to 2010, the top ten keywords are E-Democracy, E-Governance, E-Commerce, E-Participation, Governance, and E-Government implementation, Public Sector, E-Voting, Public Policy and Transparency.
Also, the emerged top ten keywords from the ECEG 2007 to 2012 are Interoperability, E-Democracy, ICT Support, E-Participation, Identity Management, Local Government, E-Governance, Public eServices, E-Voting and Trust Issue. The trend of those keywords varies as shown in the figure 5 and 6 above. (Yusuf & Adams, 2014)

There are 4 keywords which are the same in the top ten keywords of both conferences, as follows: E-Democracy, E-Participation, E-Voting and E-Governance. However, the rest of the keywords are different, such as: Local Government, Public Sector, Public Policy, Interoperability, ICT Support, E-Government implementation, Transparency, Public eServices, Governance, Trust Issues, E-Commerce and Identity Management. Therefore, the authors assumed that those four keywords are the core issues in E-Government Activity as described in the diagram below (Yusuf & Adams, 2014).
We also conducted FGD to validate the keyword’s classification. The participants were divided into 4 groups and they wrote various themes as shown in the table 1 below.

Table 1: List of Title based on Group Subject of FGD (Yusuf & Adams, 2014)

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizen</td>
<td>Countries</td>
<td>E-Government</td>
<td>Regional</td>
</tr>
<tr>
<td>Security</td>
<td>Finance</td>
<td>Policy</td>
<td>Actors</td>
</tr>
<tr>
<td>Countries</td>
<td>People Usability</td>
<td>Democracy</td>
<td>E-Services</td>
</tr>
<tr>
<td></td>
<td>Accessibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards and Policies</td>
<td>E-Government</td>
<td>Tools-Technology</td>
<td>Management</td>
</tr>
<tr>
<td>E-Government Transactions</td>
<td>Abbreviations</td>
<td>Tools-Design</td>
<td>Research</td>
</tr>
<tr>
<td>E-Government Activities</td>
<td>Ambiguous</td>
<td>Tools-Research</td>
<td>Information</td>
</tr>
<tr>
<td>Legal</td>
<td>Health</td>
<td>Tools-Practice</td>
<td>Technology-Usability</td>
</tr>
<tr>
<td>Technology</td>
<td>Bug wards</td>
<td>Structure-Information Needs</td>
<td>Technology-Security</td>
</tr>
<tr>
<td>Taxation</td>
<td>IT Service Related</td>
<td>Culture</td>
<td>Technology</td>
</tr>
<tr>
<td>Government Services</td>
<td>Future</td>
<td>Public Management</td>
<td>Legal</td>
</tr>
<tr>
<td>E-Government Portal</td>
<td>Research Methods + Themes</td>
<td>Concepts</td>
<td>Education</td>
</tr>
<tr>
<td>Management</td>
<td>Management</td>
<td>Communication</td>
<td>Economics Finance</td>
</tr>
<tr>
<td>Election</td>
<td>Issues</td>
<td></td>
<td>E-Governance</td>
</tr>
<tr>
<td>Characteristics of E-Government</td>
<td>Public</td>
<td>Politics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unclassified</td>
<td>Jargon</td>
</tr>
</tbody>
</table>

The diagram in the figure 7 above shows the result from the quantitative process and table 1 above is the result from qualitative process. E-Governance is the only similar word from both classification, however some other titles are related to the issue in the diagram, such as Democracy and Politics related to E-Democracy, Citizen related to E-Participation, Public Management related to Public Services and Public Sector, Technology related to ICT Supports. Therefore, the various titles in the FGD table are fundamentally same with numerous keywords. Those things are interrelated each others. Both classification results also indicated that E-Government issues consist of technological issues and non-technological issues.

6. Research Methodologies and Methods on E-Government

In this section, we present a classification of research philosophy and methodologies in the E-Government area. The collected data will be classified into research paradigms, research approaches, research methodologies, research methods, demonstrate conclusion and others. Table 2 and 3 below illustrate methodologies and methods of the ECEG papers from 2007 to 2012 and the ICEG papers from 2007 to 2010.

Table 2: Methodologies and Methods from ECEG 2007 to 2012 (Yusuf, Adams and Dingley, 2014)
<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>ITEMS</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research Paradigms</strong></td>
<td>Critical Realist</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Interpretive</td>
<td>1</td>
</tr>
<tr>
<td><strong>Research Approaches</strong></td>
<td>Quantitative and Qualitative</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Quantitative</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Empirical Quantitative</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Qualitative</td>
<td>8</td>
</tr>
<tr>
<td><strong>Research Methodologies</strong></td>
<td>Case Study and potential case study</td>
<td>325</td>
</tr>
<tr>
<td></td>
<td>Empirical Approach</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Exploratory Study</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Soft system methodology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Q Methodology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hybrid Methodology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ethnographic</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Comparative Analysis</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>UN/CEFACT Modelling Methodology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>System Thinking Methodologies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Grounded Theory</td>
<td>2</td>
</tr>
<tr>
<td><strong>Research Methods</strong></td>
<td>Survey</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Literature Review</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Questionnaire</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>10</td>
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<tr>
<td></td>
<td>Statistical</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>In-Depth Interview</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Structural Equation Modelling</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Workshop / Focus Group</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Document analysis</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Semi structured telephone interviews</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Recorded interviews</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Website analysis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Semiotic Analysis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Comparative Semi-structured interviews</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Online Survey</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Archival Search</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Annual Reports</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Web-based research</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Online Questionnaire</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Checklist</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Brainstorming</td>
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</tr>
<tr>
<td></td>
<td>In-depth semi structured interviews</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Meta-analysis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Systematic Approach</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Formal Method</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Regression and correlation analysis</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 3: Methodologies and methods from ICEG 2007 to 2010 (Yusuf, Adams and Dingley, 2014)

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>ITEMS</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Paradigms</td>
<td>Interpretative</td>
<td>1</td>
</tr>
<tr>
<td>Research Approaches</td>
<td>Quantitative Empirical</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Qualitative</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Qualitative and Quantitative Empirical</td>
<td>3</td>
</tr>
<tr>
<td>Research Methodologies</td>
<td>Empirical Approach</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Soft System Methodology (SSM)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Case Study and potential case study</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Usability Research</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Complex Thinking Theory</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Comparative Approach</td>
<td>1</td>
</tr>
<tr>
<td>Research Methods</td>
<td>Questionnaire</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Survey</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Extensive review of literature review</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Government Documents</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Research Reports</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Observation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Browsing</td>
<td>1</td>
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<tr>
<td></td>
<td>Comprehensive Content Analysis</td>
<td>1</td>
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<td></td>
<td>Desk Research</td>
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<tr>
<td></td>
<td>Interview</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>In-Depth Interviews</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Intensive review of literature review</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Telephone Interview</td>
<td>1</td>
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<tr>
<td></td>
<td>Dialoguecircles</td>
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<tr>
<td></td>
<td>Semi-structured interview</td>
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</tr>
<tr>
<td></td>
<td>Focus Group Deliberation</td>
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<tr>
<td></td>
<td>In-Depth Document Analysis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>In-Depth Review</td>
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<tr>
<td></td>
<td>Meta-analysis</td>
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<tr>
<td></td>
<td>Formal Method</td>
<td>1</td>
</tr>
<tr>
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<td>Formal Method-Equation based method</td>
<td>1</td>
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<td></td>
<td>Structural Equation Analysis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Correlation Research</td>
<td>1</td>
</tr>
<tr>
<td>Way to Conclusion</td>
<td>Inductive</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>Not Clear Stated</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 2 and 3 above shows that research paradigms on the E-Government domain are interpretative and critical realist. Research approaches include qualitative, quantitative and mixed methods. In those
conferences, the quantitative approach was stated as quantitative, quantitative empirical or empirical quantitative as well as mixed method stated as Qualitative-Quantitative and Qualitative-Quantitative empirical. Both tables above also demonstrate that case study and potential case study approaches as well as survey are dominant methods. Some of the papers authors did not states clearly that they used case study, but they only wrote place or country where their research was done. Therefore, those papers are categorised as case study and potential case study research papers. A lot of authors did not state what methodologies or methods which they used; hence those grouped as Not Clear Stated.

**Figure 8:** Trend of Research Methodologies on ECEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

**Figure 9:** Trend of Research Methodologies on ICEG 2007 to 2010 (Yusuf, Adams and Dingley, 2014)

Figure 8 and 9 above illustrates research methodologies used from the ECEG 2007 from 2012 and the ICEG 2007 to 2010. The Y axis refers to number of papers and the X axis refers to the year of the conference. The figures above describe various methodologies in E-Government domain such as Case study, Empirical Approach, Soft system methodology (SSM), Usability Research, Comparative Approach, Exploratory Study, Q Methodology and Hybrid Methodology. Both graphics illustrate that the case study and potential case study is the most popular of research methodology.
Figure 10: Trend of Research Methods on ECEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

There are many methods used in E-Government paper from Desk research to empirical research as well as quantitative to qualitative. Survey appears to be the dominant method in ECEG 2012 and ICEG 2007 to 2009.

Figure 11: Trend of Research Methods on ICEG from 2007 to 2010 (Yusuf, Adams and Dingley, 2014)
Figure 12 and 13 above illustrate the top ten methodologies and methods used by the authors of papers in ECEG from 2007 to 2012 and ICEG from 2007 to 2010. There are similar trends, such as case study and potential case study are the most popular and are the most frequently method used in each year. The second most frequently method is Not Clear stated. Both figures also point out various methods such as survey, Questionnaire, Interview, Empirical Approach and Literature review or an Extensive Literature Review.

7. Discussion

This section provides discussion based on findings above. There are some important points from the previous researches and our focussed literature review which will be discussed below.

First, the research of Bolivar, Munoz and Hernandez (2010), Bannister and Connolly (2010) as well as our focussed literature review have same result that case study research is the dominant method. There are some reasons that case study is the most popular research methodology. In this paper, we combine case study and potential case study. First, case study captures richness and depth understanding about E-Government practicalities in particular context, environment, country and place. Each context has own challenges. It happens because of numerous complex factors, such as social, politics, economics, legal, culture and other which influenced E-Government implementation in various context. Therefore, generalisation for different
context may not be suitable for E-Government implementations and rich case study research may not be
generalizable. Second, case studies also have very specific focus, not applicable elsewhere, such as:

- Why particular E-Government technologies successfully implemented in particular context but failed in
  other contexts?
- What kinds of factors influencing successful or failure of E-Government implementation in a particular
  context?
- In addition, there are some interesting discussion points as following:
- Do we need more case study research since many case studies have been done?
- Should we start collating together the body of work embedded with these case studies, identify
  characteristics for building general models which applies to a new context?
- How to collate together many previous case studies research and get the general model based on
  different characteristics and contexts?
- How to apply the general model into a new context?
- Would the underlying philosophical standing of the previous research be changed or compromised if they
  were collated together?
- What is the suitable philosophical standing for collating together existing case studies?

Second, the research of Heeks and Bailure (2007), Bolivar, Munoz and Hernandez (2010) and our literature
review shows that there is a diversity of philosophy, methodology and methods in the E-Government field. E-
Government is interdisciplinary where every discipline has its own philosophical standing, methodology, and
methods. Each methodology and method has advantages as well as limitations. Those diversities make
significant contribution and enrichment to develop E-Government as a mature discipline. Also, there are some
dominant methodologies and methods, but it does not mean the other methodologies and methods are less
important and useless.

Third, our literature reviews and other works, such as Siau and Long (2005), Irani, Love and Montezami (2007),
Connolly (2010) themes and research methodology describe how E-Government evolving as discipline.

Fourth, Heeks and Bailure (2007), Bannister and Connolly (2010) and our focussed literature review identified
there is a lack of theory development in E-Government area. However, variety of different theories can be
used in researching E-Government (Heeks & Bailure, 2007). Therefore, Researches on developing, testing and
applying theory are needed to develop E-Government as a discipline. Theory of E-Government can be taken
from other related disciplines such as Politics, Sociology, Computing, Information System, Public Management,
Economics and others, or mixed the theories from those interdisciplinary.

Fifth, there are a large number of E-Government references which are dispersed in the books, journal,
conference papers, databases, etc; therefore good repeatable methods are needed to do reviews of those
many references. Previously, Webster and Watson (2002) recommended some steps to do a literature review
as follows:

- Start by choosing leading journals in the topic area
- Go backward by reviewing citations for the articles to decide which article should be chosen
- Go forward by using Web of Science to identify articles citing the key articles identified in the previous
  step.

Webster and Watson (2002) also explained that there are two approaches to do literature reviews, which are
include Concept-Centric and Author Centric. Concept Matrix means literature review based on the concept
and found some authors. In contrast, Author centric means literature review based on author and found some
concepts per author. Then, it is necessary to compile the result using Concept-Matrix and adding unit analysis
into the Concept–matrix. For example, DeLone and McLean (1992) include a set of tables summarizing the
literature on IS by level of analysis, type of study and success measures.

Thus, the structured literature review method in this paper can be an option of method, especially in E-
Government references. There are strong points from the methods as following:
Based on one of the most established conferences on E-Government (ECEG) and a good conference on E-Government (ICEG) where the participants came from around the world, multi languages, and multi cultures.

Based on some good journals in same topic about concept, themes, research philosophy and methodology, therefore the result of those journals validated the focussed literature review result from ECEG and ICEG.

FGD used to validate the results of themes classification and get further analysis about the themes.

This literature review combines quantitative process and qualitative process.

This literature review method also has limitations as follows:

Based on the abstracts (not full papers) since the authors wanted to know the trends, themes and research methodologies.

The journals were only selected from Google Scholar engine. There are other good databases, such as web of knowledge, web of science, EBSCO, Taylor & Francis Online, and other publisher sites.

This literature review method did not examine papers from other E-Government conferences from other company, for instance: ICEGOV. Therefore, the authors could not generalise the result for all references of E-Government. The results are only based on the selected conferences, journals and time period. Different choice of conference may have different result.

This literature review did not capture all ECEG and ICEG proceedings, such as ECEG before 2007, ECEG 2013 and ECEG 2014 and ICEG before 2007.

Indeed, there are changes in themes, research philosophies and methodologies over time and it illustrates that E-Government is a dynamic domain and evolving to be mature as discipline.

8. Conclusions

In this section, we have conclusions from our research as explained below. In Summary, this research shows some points such as case study and potential case study research is dominant, diversity on research philosophy, methodology and methods in E-Government domain, also E-Government is evolving over time and becoming mature as discipline.

Theory development in E-Government is needed by adding and combining existing theories from other disciplines such as Politics, Sociology, Computing, Information System, Economics, Public Management and others.


There are various research paradigm, research approach, research methodologies, research methods and ways to reach conclusions used by researchers from the ECEG 2007 to 2012 and the ICEG 2007 to 2010. The research paradigms include Interpretative and critical realist approaches. This paper also shows qualitative, pure quantitative and mixed method as research approaches. Overall, case study and potential case study as well as survey are the dominant methods used by E-Government researchers.

This paper also has contribution and novelties by providing the structured literature review method. It also provides an example for guidance to other researchers, particularly early researchers on options for conducting repeatable literature review methods capturing input from large numbers of reference material from around the world.
The summary above illustrate that there are changes in E-Government domain including research philosophy and methodologies. E-Government has also grown and matured as a discipline since researchers used various research philosophies and methodologies in this domain.

In the future, it seems interesting to do research on theory development in E-Government since it is still very limited, especially in the specific areas, such as E-Participation, E-Voting, E-Democracy, E-Governance, and others.

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References
Risk and Decision in Collaborative e-Government: An Objectives-Oriented Approach

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Abstract. Developing e-services in the public sector is a demanding task that involves a variety of stakeholders and values. Further complexity is added by organizational and institutional challenges, especially when specialized government agencies are expected to collaborate to create seamless, integrated services. This paper focuses on decision making and risk analysis in two Swedish collaborative e-Government cases. Empirical material consists of semi-structured interviews and project documentation, which are analyzed using an objectives-oriented Logical Framework Approach (LFA). The results highlight two factors that influence the outcomes of the projects; governance for collaboration and financial models for distributing resources between government agencies. When these formal support mechanisms are not provided, they become risks for the projects and create uncertainties in decision processes. While the studied government context has matured enough to develop fully functional platforms for e-services, these uncertainties become issues when public values are to be measured and evaluated. The paper concludes by suggesting the use of public values as objectives together with measurable indicators in order to create a common language for decision making and risk management across government agencies.

Keywords: Risk, decision making, e-Government, objectives-oriented, logical framework approach, public values

1. Introduction

The Swedish government has set up an initiative to investigate the costs associated with information technology (IT) in the public sector. In 2014, national agencies alone spent 24-31 billion SEK on IT, which represented 10-13% of their total costs (Ekonomistyrningsverket, 2014). Some of these funds have been invested in large e-Government projects for the purpose of increasing government performance and lessening costs through the use of Information and Communication Systems (ICTs). However, large-scale projects are known to be resource demanding and high in risk (Evangelidis, 2005; Flyvbjerg et al. 2003; Denker 2007; Willcocks & Griffiths, 1994). E-government is a research area that has been explored by multiple disciplines, using a variety of theories and methods (Flak & Rose, 2005; Bannister & Connolly, 2014:1). While the term “e-Government” is fairly new, IT has been used and studied in the public sector since the 1970s (Grönlund & Horan, 2005). The e-Government field is complex both in practice and theory, with large bureaucratic organizations that are supposed to meeting the needs of diverse stakeholders by creating a multitude of public values (Flak et al. 2009). Many e-Government projects have failed over the years, which has resulted in tax money being wasted and citizen trust being lowered.

Initiatives for e-Government emanate from policy makers within the European Union and national governments (e.g. European Commission, 2010; Regeringskansliet 2008, 2012). A policy can be understood as the basic principles by which the public sector is guided; it can also be seen as an enabler of change in organizational conditions (Linnefell, Hallin, Lagergren, 2014). In this paper, the Swedish national strategy for collaborative e-services is treated as the main policy document that guides cross-agency e-Government initiatives. The 2012 Swedish national e-Government strategy for collaborative e-services was a work in progress in parallel to the development of the cases studied in this paper. It contains three objectives that were supposed to be reached by 2015 (Regeringskansliet, 2012), namely:

- a) An easier everyday-life for citizens
- b) Open government that supports innovation and participation
- c) Higher quality and efficiency of government services

The strategy is essentially a further development of the objective in a 2008 national action plan for e-Government;
In 2010 it shall be as easy as possible for as many as possible to exercise their rights and obligations and take part of the government service. Where it offers an advantage for citizens and entrepreneurs and where quality, security and productivity can be increased, government should collaborate. Then, Sweden will retain a leading position in e-Government (Regeringskansliet, 2008).

Both documents are aimed at making it easier for citizens to use government services as well as increasing efficiency. The 2012 strategy adds an objective of openness and participation that focuses on social media and the use of open data.

The Swedish political system is characterized by weak central regulation and strong departments. This can lead to rivalries between the ministries that make each department work in “stove-pipes” instead of towards a shared strategic objective (Grönlund, 2009; Grönlund & Lindblad-Gidlund, 2010; Ilshammar et al. 2005; Melin & Axelsson, 2009). On a national level, a committee (E-delegationen) with a counselling function for e-Government was established in 2009. It consisted of sixteen general directors from the most IT-concentrated departments and one representative from SKL, an interest organization for the municipalities and counties. The committee was disbanded in 2014 because of lack of a clear mission scope and support from central government as well as difficulties in evaluating the results (Statskontoret, 2014). The members continue to meet in a more informal setting.

In this decentralized context, questions arise as to how the public values in policy documents are to be achieved, and what the conditions for collaboration between agencies look like. The policies mentioned in the introduction of this paper contain value-based objectives that can be understood as the overall goals of Swedish e-Government. These values are also at stake because of the high risk associated with the creation of public e-services.

The aim of this paper is to examine how decisions are made and how risks emerge in a particular decentralized Swedish e-Government context. Applying an objectives-oriented framework (as described in 2.2) to two cases of collaborative e-Government allows the factors that directed the decision processes, the casual relations between these factors and the actors who were involved to be identified.

This paper proceeds as follows. (1) is followed by theoretical background and an analytical framework (2). Methods and materials are then presented in (3) and results are summarized and analyzed in (4). Conclusions and thoughts about future research are presented in (5).

2. Theoretical background

2.1 Risk, decision making and Public Values

Government can be roughly separated into three separate spheres in a democratic society: formal politics, administration and civil society (Figure 1). While these spheres are mutually dependent on a number of relations, they are also distinct from each other in terms of their cultures, legal status and mode of operation (Grönlund & Horan, 2005).

![Figure 1: Different spheres of government and the relations between them (Grönlund & Horan, 2005 (used with permission))](image-url)
In prior research, maturity models have tried to predict and prescribe how e-Government grows from simply being present online to offering more complex and integrated services (see for example Layne & Lee’s heavily quoted paper from 2001). While such models have been criticized for being over-simplified and theoretically weak (Bannister, 2015), they usually indicate that the more e-Government and its users mature, the more challenging it is to create seamless, whole-government solutions. This puts pressure on governments to adapt and change their processes to meet new demands from citizens. Government agencies traditionally specialize in performing certain services. This specialization can create adversarial conditions both internally and between agencies when different functions are supposed to collaborate (Dawes & Pardo, 2002). When implementing large-scale e-Government projects in mature contexts, business plans with measurable goals and results become important. Business process management also becomes a crucial factor for success, since deploying holistic e-service solutions demands not only technological resources but also the reengineering of established processes (Müller & Skau, 2015).

A large-scale IT-system is a complex system that requires vast resources and offers critical functions to a large number of users. A complex system usually consists of several hard- and software components, which makes it difficult for an individual or small group of individuals to have complete knowledge of the system (National Research Council, 2000; Nelson & Ravichandran, 2004). With size and complexity, various risks are increased. Many of these risks are inherited from the information system (IS)/IT field and have to do with human resources and technical competence, security and usability. However, the public sector has some characteristics that add even more complexity to the equation. Organizational diversity, conflicting objectives, regulatory issues and intergovernmental relationships are examples of factors that can prevent successful e-Government implementation (Gil-Garcia & Pardo, 2005; Lam, 2005; Loukis & Charalabidis, 2013). A possible explanation for the high risk that is connected with large-scale IT projects is that management practice has not kept up with human ambition. This is not only a problem within the realm of IS; it also applies to other various large-scale areas, such as infrastructure megaprojects (Flyvbjerg et al. 2003).

Risk became a field of applied science in the 1960s. While there are variations in the definition of risk, it is always connected with two factors: uncertainty and impacts on human values (Hansson, 2007, Aven & Renn, 2009, Rosa, 1998). Decisions and risks are entangled and problematic because decision makers have to base their choices on knowledge about the unknown. At best, decisions regarding risk can be based on some sort of probability (Hansson, 2007). Risks are events that might have an impact on something that some or many individuals care about. Hence, risks are threats to values. This adds further challenges when studying risk, since values vary between people, between cultures and over time. While probabilities may be assessed somewhat objectively, values are highly subjective. This dual nature of risk calls for a multi-disciplinary approach when studying the field. A broad definition that links risk with negative effects on public values is used in this paper. E-government values can be seen as a synthesis of previous public management paradigms such as Weberian bureaucracy and New Public Management. Examples of such values include accountability, efficiency, transparency and citizen-oriented approaches (Persson & Goldkuhl, 2010). The definition of public values can be ambiguous. Bozeman (2009) argues that there is no need for a single definition of public values and that it is rather a question of normative ideals and consensus about the benefits, obligations and principles that exist between the government and its citizens. Bannister and Connolly (2014:2) define values as a mode of behavior; a way of doing things that is held to be correct. The advantage with this definition is that values can be expressed by verbs and thus operationalized. In order to develop theory of how public managers should behave, Moore (1995) argues that two basic issues must be resolved: what managers need to do in order to produce values and how to measure whether value has been created. In an emerging view of public administration, a broad range of democratic values are prominent. The Governments role is a guarantor of public values while citizens are problem solvers and co-creators, actively engaged in producing them. This “new” paradigm is a networked, multi-sectored, power-sharing and collaborative government. In part, this view is a response to the fragmentation caused by the New Public Management (NPM) paradigm that dominated the public sector in the 1980-1990s. According to NPM, government managers and agencies are expected to work as autonomous units in order to reduce the hierarchical structures of traditional bureaucracy (Bryson, Crosby & Bloomberg, 2014). Since technology itself is not value free, the deployment of ICTs requires that decision makers prioritize between sometimes conflicting values (Bannister & Connolly, 2014:2). Many e-Government solutions have vast target groups, sometimes even the majority of a country’s population. This puts great demands on those involved in making decisions about public e-services, since there are many public values and a variety of stakeholders that are going to be affected. The literature stresses the importance of user participation as a possible remedy for some of the problems in large-scale projects (Flyvbjerg et al., 2003; Savoldelli, Codagnone, & Misuraca, 2014). Seeing the user as a stakeholder with influence on system design
has been a common practice in the IS field for some time. In e-Government, this concept is adopted in research and practice by enabling the citizens to be participating stakeholders. This can be a challenging task, however, as the users of public e-services are often a heterogeneous group (Axelsson, Melin, Lindgren, 2012). While user inclusion is not a guarantee for success per se, it can strengthen public values such as democracy and transparency.

When performing research on values, questions about their constitution arise. For instance, what do the internal relationships between values look like? An effective method to sort values is to create hierarchies in which end values are separated from means values. The difference is that end values are pursued for their own sake while means values are pursued in order to achieve end values (see, for example, Jørgensen & Bozeman, 2007; Keeney, 1988; Keeney & McDaniels, 1999; Gregory & Keeney, 1994). Since value prioritizing in the public sector depends on task and administrative level, Andersen et al (2012) suggest performing case studies and interviews in order to achieve a deepened understanding of public values. Witesman & Walters (2015) argue that a universal value hierarchy might be difficult to achieve, but small context-relevant hierarchies might be useful to describe, predict and explain decisions of public administrators.

2.2 Analytical framework: The Logical Framework Approach (LFA)

The analytical framework used in this paper is the Logical Framework Approach (LFA), which is an objectives-oriented tool for planning, analyzing and evaluating projects. The LFA frames certain features of a project (such as problem analysis, objectives, stakeholders, indicators and risks) and helps to structure them into a logical order of cause and effect. The framework was initially developed by the U.S. military and adapted for the National Aeronautics and Space Administration in the 1960s (Bakewell & Garbutt, 2005). In 1970 the U.S. Agency for International Development adopted LFA as an evaluation tool with the goal of increasing accountability (Sartorius, 1991). Its use has since spread throughout the world, especially by organizations working with international development such as the United Nations and the Swedish International Development Cooperation Agency (SIDA) (NORAD, 1999).

The LFA can be divided into the following components:

- Analysis of the project’s context
- Stakeholder analysis
- Problem analysis
- Objective analysis
- Planning of activities and resources
- Setting of relevant measurable indicators
- Identifying risks and assumptions

While there are some variations in what order and how to use LFA, the framework’s main purpose is objective fulfillment through a structured process of cause and effect. Before setting an objective, a problem analysis has to be performed in order to figure out exactly what is going to be solved through the project. Relevant stakeholders also have to be identified and the context in which the project takes place must be described. Objectives can then be set and resources and activities can be planned accordingly. Two additional features of the LFA are indicators and risks/assumptions. Indicators are measurable goals that are used to evaluate objective fulfillment, while assumptions are important events, conditions or decisions that a project is dependent on. These features can be inserted into a log-frame that gives a visual overview of the project (Figure 2).
A strategic objective is an overall aim that all other objectives are supposed to support (Keeney, 1992). In order to adapt the framework to the e-Government field, this level of the framework is translated into public values. A point of departure is thus that the overall goal of e-Government should be public values, as discussed in 2.1. A project objective is the ultimate purpose of a project which will contribute to the strategic objective. To assess objective fulfillment, measurable indicators are to be specified along with the sources of verification that will be used to measure them. An assumption is a prerequisite that an objective is dependent upon. If there is a chance that an assumption will not be fulfilled, it becomes a risk. Once objectives and indicators have been set, a project can use resources such as human and economic capital to perform activities that lead to results (or outputs).

The logic of the framework works both horizontally and vertically. When using the framework for project planning, the objectives are set before the indicators and assumptions are identified. The planning of relevant activities and resources needed to achieve expected outputs can then be initiated: If assumptions/risks are fulfilled and the necessary inputs and resources are available to perform certain activities, then outputs will be created. If all necessary outputs are created, then the project objective will be fulfilled (provided additional assumptions/risks at higher levels are also fulfilled). Progress is measured by indicators that must be capable of being objectively measured from specified sources of verification (SoV). The project objective in turn contributes to the overall strategic objective.

3. Method and material

The two cases studied in this paper are 1) the “Verksamt” business registration portal (www.verksamt.se) and 2) the “Mina Meddelanden” government messaging service (www.minameddelanden.se). Both of these cases have a large potential user base and are demanding in terms of economic and human resources. Case 1 is hereinafter referred to as the Business Registration Portal (or BRP), while Case 2 is referred to as the Government Message Service (or GMS). The BRP, which is a collaboration between three national government agencies, features an e-portal that users can utilize to register their companies and manage information related to their business. The GMS, which is a collaboration between seven national agencies and one municipality, offers an e-portal through which users can sign up to receive electronic messages from government agencies, replacing some postal services. Both cases are relatively well documented. After reading project documentation, key informants who had coordinating or leading roles in the development of the cases were identified and interviewed. Quotes from the material are translated from Swedish by the author.

The empirical material consists of:
- Pre-studies and project plans from both cases (see Table 1); and
- Interviews with key informants who were involved in the cases’ project development (see Table 2); and
Table 1: Examples of documentation

<table>
<thead>
<tr>
<th>Document name and date</th>
<th>Scope</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Company (June 26, 2007)</td>
<td>Pre-study with context and problem analysis.</td>
<td>BRP</td>
</tr>
<tr>
<td>Phase 2 (September 2, 2009)</td>
<td>Planning for further development of the e-portal, including a spreadsheet with identified risks.</td>
<td>BRP</td>
</tr>
<tr>
<td>Safe messaging service for the government (March 31, 2010)</td>
<td>Pre-study with context and problem analysis, including appendixes of legal concerns, external analysis and cost analysis.</td>
<td>GMS</td>
</tr>
<tr>
<td>Architecture order (March 9, 2010)</td>
<td>Technical requirements of the e-portal.</td>
<td>GMS</td>
</tr>
<tr>
<td>Constituting meeting (November 26, 2013)</td>
<td>Planning for hosting and cost distribution between 2014 and 2016.</td>
<td>GMS</td>
</tr>
<tr>
<td>User need analysis (2012)</td>
<td>Results from a user survey.</td>
<td>GMS</td>
</tr>
</tbody>
</table>

Table 2: Interviews

<table>
<thead>
<tr>
<th>Role</th>
<th>Involved in</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delegated purchaser (A)</td>
<td>GMS</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Program manager (B)</td>
<td>BRP</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Coordinator (C)</td>
<td>Both cases</td>
<td>90 minutes</td>
</tr>
<tr>
<td>Minister secretary (D)</td>
<td>Policy making</td>
<td>65 minutes</td>
</tr>
<tr>
<td>Communicator (E)</td>
<td>BRP</td>
<td>75 minutes</td>
</tr>
<tr>
<td>Municipality coordinator (F)</td>
<td>BRP</td>
<td>90 minutes</td>
</tr>
<tr>
<td>Investigator (G)</td>
<td>GMS</td>
<td>55 minutes</td>
</tr>
</tbody>
</table>

The methodological approach is interpretative, accompanied by ontological realism: events are treated as parts of an objective reality while humans perceive some of these events in terms of risks and values. To reduce eventual bias, data has been triangulated and gathered from both interviews and project documentation. The Logical Framework Approach described in 2.3 has been operationalized by using it as a lens through which data is structured and analyzed. The empirical material has been scanned for objectives, assumptions and indicators. Based on the components of the LFA, (see 2.3) interview questions have been structured under four themes:

**Background and objectives**
- Was any background information gathered before starting the project?
- How was the project initiated?
- What is the main problem that the project is supposed to solve?
- What is the long-term purpose of the project?

**Decision making and resources**
- How were decisions made during development?
- How were issues that arose between agencies resolved?
- What resources (human/economic) were used during development?

**Indicators and measurement**
- Were any specific factors set that would lead to objective fulfillment?
- Were there any measurements of objectives?
- Is there a plan for further development of the system? If yes, what actors are involved?

**Assumptions and risks**
- Are there any factors that can influence the project in a negative way? If yes, which of these factors have been most problematic?
Are there any side effects (positive/negative) that can arise from the project?

4. Results and analysis

In this section, the results from each case are presented and then inserted into log-frames and analyzed. The log-frames are by no means exhaustive, especially when it comes to the lower levels with inputs and activities; however, they highlight findings that have had effects on the projects.

4.1 Case 1: Verksamt – Business Registration Portal (BRP)

Background and objectives
The decision to launch BRP was based on a problem that was formulated in a 2007 pre-study: *It is complicated to start up a business in Sweden*. The pre-study was part of a larger goal in which the agencies that were involved in providing information and services to businesses sought ways of creating collaborative solutions. This included non-electronic sources such as information folders. The initiatives came from employees at respective agency since they found that much of their information related to the same topic, e.g. how to start a business, but contained different terminology and sometimes-contradictory information. To start a business, a citizen had to contact each agency separately. A meeting with the general directors of the agencies was initiated. This was a first step towards the collaboration which would later lead to the development of BRP. A proposed solution was an online portal where users could register and manage their businesses. A project group consisting of people from three national government agencies (namely the Companies Registration Office, the Tax Agency and the Agency for Economic and Regional Growth) was established by the corresponding general directors. Development began in January 2009 and the first version of the portal was launched in June of the same year.

Decision making and resources
All development was performed using open source solutions and internal resources. According to the program manager, there was a short deadline with a limited budget since the general directors did not want to risk a large cost overrun. The survival of the project was based on getting something up and running. Initially the portal contained general information and a service for registering a sole trader online. The portal soon grew and additional functionality was added over time. Because of the short deadline, the project group used an iterative development approach. Many decisions were based on continuous user input from focus groups, live testing and communication with administrators from the Companies Registration Office. Decisions in the group were based on consensus. It was soon realized that different agencies often had different objectives: where one agency wanted high benefits for the users, another wanted more benefit for the agency itself.

The government is sending us paintings from far above. We are supposed to interpret the paintings. One such painting can represent increased utility for entrepreneurs. The problem is, there are many different opinions on what that utility consists of. – informant C.

If consensus could not be reached on an issue, it was to be sent up the hierarchy to the general directors; however, this was rarely – if ever – necessary. During the early phase of the project, some group members were replaced. By the end, the project group was strong and all members strove towards the same objectives.

In the beginning it was necessary to tie loose ends together and establish the ideas within the project group. We managed to get a good group going and deliver in time, which many had said would be impossible. – informant B.

When the e-portal was developed further, important factors for success that were mentioned in the project documentation were shared objectives, the development of models and methods for collaboration, and communication between agencies. The next step in the development of the BRP is to integrate the municipalities’ e-services towards entrepreneurs with the national services. This is a separate and ongoing project.

Indicators and measurement
During the pre-study, a benefit indicator of 72 million SEK per year until the year 2012 was set for BRP. The expected benefit was divided between society (39%), entrepreneurs (57%) and government (4%). It was never measured, but it *probably was reached* (informant B), since the e-portal had more users than expected. Later, indicators were changed from absolute numbers to percentages. One such indicator was that 40% of all
company registrations should be done electronically. Another aimed at 75% user satisfaction. These indicators are measured twice per year. The government has also set a long-term goal of having more users in 2020 than in 2012.

Assumptions and risks
A repeated phrase in interviews and documents is the investment paradox, which can be described as a missing standardized financial model for collaboration. If agency x invests 10 million SEK in a project and created (internal) value happens to be favorable for agency y, there is no way of allocating resources between x and y.

Apart from the tight deadline and restricted budget, the risks that were initially identified mainly concerned managerial issues such as unclear decision mandate, lack of documentation and human resources. While risk workshops were held at first, later on risks were treated as they appeared. Technological and privacy risks were not prioritized because BRP is based on pre-established agency services that have been integrated into the e-portal. Legal and regulatory issues were of a greater concern. While some laws were changed, other regulations made for the physical room had to be interpreted to suit an online environment.

Analysis, case 1

| Strategic objective: | Indicators/SoV: |
| Creating an easier everyday life for citizens. | 72 million SEK benefit/year until 2012 (SoV: missing). |
| Project objective: | 40% of all companies registered through the e-portal (SoV: business statistics/e-portal statistics). |
| Making it easier to register and start a business in Sweden. | 75% user satisfaction (SoV: user surveys). |
| | More users in 2020 than in 2012 (SoV: e-portal statistics). |

| Outputs: | Indicators: |
| The “www.verksamt.se” e-portal. | Development will be finished by the deadline (SoV: published e-portal). |

| Activities: | Inputs: |
| Establish a project group. | Human and economic resources from government agencies. |
| Develop an e-portal. | Results from live testing and user participation. |

Figure 3: Log-frame of BRP

The aim of BRP e-portal is to make it easier to register and start up a company in Sweden. This contributes to the public value of making everyday life easier for citizens that exists in the Swedish e-Government policy. Reading the above log-frame from top to bottom, we can see that a method for measuring benefits and distributing resources between agencies is needed in order to evaluate the project objective; this is especially true for the first set indicator of 72 million SEK/year. Considering that the user base has surpassed expectations, one can conclude that some value has been created; however, as evaluation suffers from a lack of formal methods for measuring and transferring benefits between agencies, there is no source of verification connected to the first indicator. When indicators were switched, it was possible to use statistics from the Business Registration Office and BRP e-portal in order to measure what percentage of companies had registered and customer satisfaction. The log-frames used in this paper add an important dimension to risk management: They show when identified risks arise by dividing a project into stages. As seen in Figure 3, when the project is supposed to implement the overall public values, the problem with measuring becomes an issue. If this had been dealt with at the lower levels, it would not have advanced further into the value hierarchy.
4.2 Case 2: Mina Meddelanden – Government Message Service (GMS)

Background and objectives
The development of GMS started in 2009; it was at first a part of BRP, since the agencies involved saw common advantages for having a digital messaging service. The benefit that was primarily expected was cost reduction through a decrease in the volumes of printed paper and postage. In the project documentation, more focus is given to internal agency than user demands. GMS later became a standalone project with a separate e-portal. Informant A stated that the reason for this was that the two projects have different target groups: BRP’s target group consists of entrepreneurs, while GMS’s target group includes all citizens who receive government mail. The GMS can be described as a standardized infrastructure for sending messages. The government supplies one mailbox in the infrastructure but the users can also choose to receive mail from a number of mailboxes supplied by private companies.

Decision making and resources
The Tax Agency was given the overall responsibility for the project since they had the most suitable infrastructure. In addition to the agencies that were already involved in the BRP, representatives from four additional national government agencies and one municipality participated in setting up the requirements for GMS. All development was done using internal resources from the Tax Agency, although some external consultants were used as counselors. Decisions taken by the group with responsibility for setting requirements were consensus-based, with one exception: if no agreement could be reached, the decisive factor would be a vote that was weighted on the basis of total agency staff salaries. While the preferred financial model from a cost/utility-perspective was (saved) postage costs, the expected volume numbers reported by the agencies were regarded as uncertain. The salary model was chosen as a pragmatic, short-term solution (as reported in project documentation). During development, two project leaders quit and had to be replaced. Many people who were engaged in the project complained about not knowing where the project was heading in the long run, which caused tensions both between agencies and among Tax Agency employees.

Indicators and measurement
A GMS e-portal was launched in 2011, but there have been problems getting agencies and users to sign up for the service. The Company Registrations Office was the first agency that sent messages through GMS, followed by the Tax Agency and the Transport Agency. An early indicator of 11 million messages sent in 2014 was set, but the volumes never came close to that. Two user-surveys were made during the development. Many users requested being able to receive mail from big national agencies as well as from regional government offices. However, there was no way to act on this input, since the involvement of other agencies was beyond the project’s control:

_We (the Tax Agency) can’t measure utility for the involved agencies. That is their own responsibility. Nor can we tell other agencies that they should or must join GMS. Rather, we tell them “There is a great opportunity here that you can be a part of.”_ – informant A.

The number of participating agencies (namely seven national and one municipal) can be put in perspective by looking at the total number of government actors in Sweden: National government consists of around 350 agencies, while the country is divided into 20 regional counties and 290 municipalities.

Assumptions and risks
Informants from both projects mention the lack of central governance as a main concern. Informant D describes the policies mentioned in the introduction (Regeringskansliet 2008 & 2012) as strategic documents without implementation programs. The process of producing the documents is a negotiation between all government departments. The results can therefore become somewhat diluted, with no mention of concrete activities that the agencies should undertake. No larger central follow-up of results is being conducted.

The lack of governance caused many disagreements when agencies have tended to prioritize their internal objectives over a shared project objective. Many agencies have invested in their own e-portals and do not prioritize collaboration projects. The list of agencies connected to the electronic mailbox has grown in 2015 from four to nine national agencies and from one to two municipalities. However, some of these actors are only sending one or a few types of messages through the portal. As the number of involved agencies grew, the limitations of the salary model for financing and decision-making were revealed. While the model has not been formally replaced, in practice the collaborating agencies are now seeking other solutions.
While no specific model for risk identification was used in GMS, specialized government organizations were involved in the mitigation of security and legal risks.

The National Defence Radio Establishment performed penetration tests and the Civil Contingencies Agency was consulted. Laws and regulatory risks were discussed with the Data Inspection Board. One example of a legal concern is the issue of user space: when a user is filling out an online form and saves it for later, the data is stored on a government server but is considered the property of the user. This could be resolved by a new interpretation of an old law. An unresolved regulatory issue is that private actors are prevented to send government messages through the portal. While this is not a problem on a national level, it will become an issue if a municipality or county that outsources some of its services to a private sector partner joins the list of participating agencies.

The number of users grows over time, but at a slow rate. While the e-portal has not reached its indicators and objectives, the informants refrain from calling it a failure. Informant G describes the GMS as a tactical asset for value creating from which new services and government collaboration will eventually grow. However, to create more advanced functionality such as two-way communications, some legal obstacles need to be overcome, similar to the case with BRP.

Analysis, case 2

<table>
<thead>
<tr>
<th>Strategic objective: Attaining higher quality and efficiency in government services.</th>
<th>Indicators: 11 million messages sent in 2014 (SoV: e-portal statistics).</th>
<th>Assumptions/risks: Relevant agencies choose to collaborate. The existence of a model for measuring values and distributing resources between agencies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities: Set requirements. Create an e-portal.</td>
<td>Inputs: Human and economic resources from government agencies.</td>
<td>---</td>
</tr>
</tbody>
</table>

Figure 4: Log-frame of GMS

As seen in Figure 4, the objective of GMS supports the public value of increased government efficiency. Reading the log-frame, it can be seen that an important assumption arises at the project objective level: The project is dependent on participation from other agencies, which is voluntarily. The project is now stuck in a catch-22: If a critical mass of agencies does not join, citizens will not find the service useful. If citizens do not sign up, agencies see no point in spending resources on integration. This situation has consequences for decision making, such as:

- Decision models, such as the salary model, are used for pragmatic reasons rather than for maximizing values. For example, if it were applied, the Unemployment Office’s weight would be about 30%, while it is currently only using the system to send one type of message.
- Indicators such as 11 million messages sent by 2014 are set under extreme uncertainty and appear more like speculative guesses than prognoses.
- Meeting demands from user input is affected, since their needs are based on agency participation.

While security and legal risks were mitigated with the help of specialized agencies, the results suggest that the most important factors for this project do not have to do with technological issues, but rather with organizational flaws. The implementation of public values through e-Government must be done through a transformative process in which institutional structures are adapted to serve citizen demands. When public values serve as strategic objectives, they need to be accompanied by measurable indicators in order to be
realized. However, it is important that differentiated government agencies receive proper support mechanisms in order to enable unified interpretations of objectives and establishment of common indicators for project fulfillment. Whether these mechanisms should come from a specialized “e-agency” or from more centralized top-management for e-Government is beyond the scope of this paper. However, when they are in place, ICTs in the public sector can be used as enablers for change and the implementation of public values.

5. Conclusions and further research

This paper has studied decision and risk in two Swedish collaborative e-Government cases. Interviews and project documentation have been analyzed by using the objectives-oriented Logical Framework Approach. By using log-frames to recreate the projects, it has been possible to identify at what stage specific risks emerge in the studied cases and on what grounds decisions have been made. The results indicate that the most severe risks emerge when public values are to be implemented and measured. The reason for this is that many decisions are made under uncertainty given that relevant assumptions are beyond the project’s control. The results show that Swedish electronic Government has evolved enough to develop functional e-portals and mitigate security and legal risks. However, the political system has not kept up and is currently a bottle-neck that reduces value for the users. A lack of top-level governance and financial models for distributing resources between agencies creates and reinforces continuous stove-piping instead of encouraging collaboration. One of the projects suffers from this more, since it is heavily dependent on participation from other agencies. However, there are also some positive signs of collaboration in the studied context. One of the analyzed cases managed to get a strong group of competences from three different agencies to work towards the same objectives by using an iterative approach and working closely with the users. In order to give specialized government agencies a common language for interpreting objectives, it is suggested that public values are used as objectives, in combination with measurable indicators. However, this requires a government function that supplies e-Government projects with formal support mechanisms.

This study is limited to one national e-Government context and two case studies. Further studies should continue to explore public values in relation to formal tools for decision making and project planning in different contexts. While this paper is an attempt to reconstruct decision making and risk, it would be interesting to see intervention studies that convert theories of decision making and objective-oriented approaches into e-Government practice. Since public values are factors that distinguish e-Government from other research fields, future studies should continue to theorize about them; however, efforts should also be made to link existing theories with good practice.

References


Evaluation of E-Government Implementation: The Case of State Government Websites in Nigeria

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Abstract: This study evaluated the extent to which current status of e-government implementation in Nigeria conforms to the national IT policy strategy. The study is based on content analysis of the official websites of the thirty six states and the federal capital territory of the country. It focuses on the content, functional and construction features of the websites. It was found that, out of the thirty six states, only twenty-three (64 percent) had websites and mostly provide textual information; few provide downloadable digital documents and functional online interactions. We recommend that, in addition to the National IT policy, Nigerian government needs to have an established guideline for its e-government implementation and NITDA needs to be more proactive in its duty of monitoring IT policy implementation. The site designers should acknowledge the importance of government websites as the main channels for information dissemination, for facilitating citizens’ interaction with government and for transforming government operations. Thus, the websites must be more than static notice boards but be function-oriented, dynamic and interactive.

Keywords: content analysis, e-government, Nigeria, Website, evaluation, IT policy, ICT

1. Introduction

Government and public sector managers have, within the last decade, come to the realization that Information Communication Technology (ICT) is a viable tool that can help them achieve their aims; deliver efficient and cost effective services to its citizenry, clients and partners (Olasina, 2012). Nigeria, a burgeoning democracy in Africa (Olatokun and Adebayo, 2012), has come to realize the fact that no developing country or growing economy can be sustained without the integration of ICT with its development strategy and therefore, has adopted technology aimed at enhancing the growth of her economy. The Nigerian Government saw the need for the country to participate in the race to becoming a digitized society and how ICT can empower the people (Akinsola et al., 2005). Due to this, ICT was declared a national priority, resulting in the formulation of a policy for Information Technology in 2001. Nigeria being a fast growing and lucrative telecommunications and ICT market in Africa is still ranked low in e-government provision to its citizen (Adeyemo, 2010).

The United Nations E-government survey in 2012 showed that Nigeria has e-government development index of 0.3063 and occupies the 136th position in the overall world ranking. It is important to note that this index is below the world’s benchmark index of 0.4882 (UN e-government survey, 2012). The benefit of implementing e-government in a developing country such as Nigeria include among others, improved efficiency, convenient and faster access to government services, increased transparency, accountability of government functionaries, reduced costs of administrative services, and improved democracy (Kamar and Ongo’ndo, 2007). Nigeria is however, far from achieving these practices.

The aim of this paper is to examine the extent to which the current status of e-government implementation in Nigeria conforms to the national IT policy. The motivation for this research is in three folds; first, to examine how government institutions at the state level have responded to the National IT policy strategy to use technology to bring government close to the people, promote transparency, accountability and strengthen democracy. The second motive is to evaluate the provisions on state governments’ portal websites towards achieving the e-government objectives. Third, to proffer useful suggestions that when incorporated, will enhance the achievement of e-government objectives in Nigeria. The paper is organized as follows; Section 2 provides a brief background to e-government, e-government models, review of previous government websites evaluation research and the Nigerian e-government implementation process. Section 3 presents the research framework. Section 4 reports the research findings and Section 5, recommendations and concluding remarks.
2. Literature Review

E-government refers to the use of internet technology as a platform for exchanging information, providing services and transacting with citizens, businesses, and other arms of government (UN government survey, 2004, 2005, and 2008). The World Bank defined e-government as the use of information communication technology to transform government by making it more accessible, effective, and accountable to its citizenry (2010). In recent times, several countries around the world are making major efforts at improving their public sector and regenerating their public administration in order to make them more transparent, proficient, streamlined, and more service oriented through the use and application of ICT. The appropriate use of ICT to achieve the goals of the governments of nations for a reformed public sector and ultimately for improved economic development is what makes up e-government. The focus of e-government is therefore, on the provision of governmental services via the use of information technology with the aim of enhancing the service level relationships between government and its various stakeholder groups, such as the citizen, businesses, tourists and other governmental agencies (UN, 2008).

E-government cannot be seen as a single-step process or executed as a solitary project. It is evolutionary in nature, involving multiple stages of implementation (Jayashree and Marthandan, 2010). There are various models developed to describe the stages of e-government implementation. These models have some stages in common but also have some differences as well. A few of these models which have been tested and seen to be consistent include: the World Bank’s three stage model (Jayashree and Marthandan, 2010), the Gartner’s four stage model (Baum and Di Maio, 2000), Layne and Lee’s four-stage model (Layne and Lee, 2001), United Nation’s five stage model (UNASPA, 2001) and the Jayashree and Marthandan’s five stage Model (Jayashree and Marthandan, 2010). The UN’s model has been the most popular and adapted in various e-government reports (UN e-government survey, 2004, 2005, and 2008). The stages in the model are:

**Stage 1 - Emerging presence:** Here, a government makes its online presence with an official website which include links to ministries or departments. Information is majorly inactive and there is little or no interaction with citizens.

**Stage 2 - Enhanced presence:** Governments provide more information on public policy and governance and makes them easily accessible to citizens. Links are made to record information such as newsletters, documents, reports, laws etc.

**Stage 3 - Interactive presence:** Governments provide online services like downloadable forms for applications and an interactive portal with services to ease their use by citizens

**Stage 4 - Transactional presence:** This stage enables a two-way contact between ‘citizen and government’. It includes options for paying taxes, applying for ID cards or passports and other functions similar to G2C interactions.

**Stage 5 - Networked (or fully integrated) presence:** This is the most sophisticated level of e-government implementation. It integrates all e-government service dimension Government to Government (G2G), Government to Citizens (G2C) and Government to Business (G2B). At this stage, government, through technology, becomes proactive in connecting with and answering citizens’ needs.

2.1 Government Website Evaluation Metrics

Website is a platform through which governments around the world promote openness and facilitate efficient interaction with citizens. Web measurement index is one of the factors that contribute to high e-government development index (UN E-government Survey, 2008). Several research works and frameworks for evaluating government websites have been reported in literature following the recognition of the prominent role that websites play in bringing together citizens, businesses and governments.

The Website Attribute Evaluation System (WAES) was developed by Cyberspace Policy Research Group (CyPRG). WAES is being extensively used to analyse e-government websites for organizational transparency, interactivity, and openness (La Porte et al., 2001). The UN’s Division of Public Economic and Public Administration proposed e-government readiness index which has been used extensively to assess the progress of UN member countries in e-government implementation. The UN e-government readiness index averages Web Measure Index, Human Capital Index and Telecommunication Infrastructure Index to determine e-government implementation status of member countries. Liu et al. (2010) further developed a framework consisting of content index, function index and construction index for evaluating government portal websites. West (2005) assessed and rated the global e-Government initiatives based on the information availability, service delivery, and public access features in the government websites.
Evaluation of e-government implementation has attracted the attention of researchers within the last two decades. Many research works in this domain have been conducted using government websites. The research works have had different focus though the object of evaluation is the same. For instance, Kaaya (2001) used content analysis approach to determine the websites status of Kenya, Tanzania and Uganda governments. The evaluation criteria used in this study is a combination of WAES (La Porte et al., 2002) and utility indicators (Holliday, 2002). Attributes adapted from WAES include website ownership, freshness and usability attributes (Kaaya, 2001). Kaylor et al. (2002) assessed the level of e-government implementation using function attributes of government website. Boussarhan and Daoudi (2014), in their own approach, focused on accessibility using Web Accessibility Initiative Guidelines (WCAG). The main focus of the research works include accessibility, usability, website quality, level of implementation and performance. Table 1 gives a summary of prominent research works on government website evaluation.

Table 1: Selected Government Website Evaluation Research

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study Area</th>
<th>Key Dimensions Used</th>
<th>Research Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makoza (2013)</td>
<td>Government ministries and departments websites of Malawi</td>
<td>Functions and characteristics</td>
<td>Level of implementation</td>
</tr>
<tr>
<td>Asiimwe and Lim (2010)</td>
<td>Govt. websites in Uganda</td>
<td>Design layout, navigation, legal policies</td>
<td>Usability</td>
</tr>
<tr>
<td>Liu et al. (2010)</td>
<td>Content, function and construction</td>
<td>Websites of the 30 capital cities in China</td>
<td>Performance</td>
</tr>
<tr>
<td>Baker (2009)</td>
<td>e-Govt. websites in the U.S</td>
<td>Online services, accessibility accommodations, information architecture, legitimacy, navigation, user help</td>
<td>Usability</td>
</tr>
<tr>
<td>Stoica and lia (2009)</td>
<td>Website of Romanian Cities</td>
<td>Security, personal data protection, usability, contents type of services provided and digital democracy.</td>
<td>Level of implementation</td>
</tr>
<tr>
<td>Toots (2006)</td>
<td>Social security services website in Estonia</td>
<td>Content, interactivity, usability, aesthetics</td>
<td>Website quality</td>
</tr>
<tr>
<td>Esterling et al. (2005)</td>
<td>Websites members of the U.S. Congress</td>
<td>Audience, contact, usability, interactivity, usability, innovation</td>
<td>Website quality</td>
</tr>
<tr>
<td>Choudrie et al. (2004)</td>
<td>Singapore, Finland, Canada, Hong Kong and Australia</td>
<td>Accessibility, quality and privacy.</td>
<td>Usability</td>
</tr>
</tbody>
</table>
2.2 E-Government in Nigeria

The Nigerian Government recognized the potential of Information Communication Technology to empower citizens especially youths, women and disables and the need of the country to participate in the race to becoming a digitized society (Awoleye et al., 2008). To this end, ICT was declared a national priority, resulting in the formulation of a policy for Information Technology in 2001. Nigeria laid foundation for e-government when it adopted the National Policy on Information Technology (IT) ‘USE IT’ policy document. The document spelt out the strategies and guideline for e-Government implementation in Nigeria. The enabling law of the National Assembly known as the National Information Technology Development Act of 2007 was later promulgated. This law formally set up the National Information Technology Development Agency (NITDA). NITDA was authorized to formulate, devise, develop and promote the use of Information Technology in Nigeria (Olatokun and Adebayo, 2012). E-Nigeria, an initiatives aimed at connecting communities, vital agencies, institutions of government and educational institutions at all levels with ICT are currently being pursued by the government (Fatile and Olufemi, 2012). Despite these government initiatives, Nigeria still struggles to have a notable improvement in its e-government ranking.

UN e-government survey (2008) showed the world’s e-government readiness average as 0.4514. Europe was reported taking the lead among the five regions in the world with an average of 0.6490 followed by the Americas with an average of 0.4936, Asia was next with 0.4470, Oceania had 0.4338 and Africa lagged far behind with an average of 0.2739. Also in the 2012 United Nations survey, West Africa is seen to be the lowest in Africa with a regional index of 0.2171 as compared to the world’s average of 0.4882. The graph below illustrates e-government ranking of African regions.

![Figure 1: Trends in e-government development in Africa 2008-2012 (Source: UN E-Government Survey, 2012)](image)

The surveys by the United Nations from 2008 to 2012 showed that Nigeria dropped in its rankings from 2008 through to 2010, 2012 but experienced a rise in 2014. This is clearly illustrated in Figure 2.

<table>
<thead>
<tr>
<th>Country</th>
<th>E-gov. development Index</th>
<th>World e-gov. development ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Verde</td>
<td>0.3551 0.4297 0.4064</td>
<td>127 118 108</td>
</tr>
<tr>
<td>Ghana</td>
<td>0.3735 0.3159 0.2754</td>
<td>123 145 147</td>
</tr>
<tr>
<td>Gambia</td>
<td>0.2285 0.2688 0.2117</td>
<td>167 161 167</td>
</tr>
<tr>
<td>Nigeria</td>
<td>0.2529 0.2676 0.2687</td>
<td>141 162 150</td>
</tr>
</tbody>
</table>

![Figure 2: Nigeria’s e-Government readiness ranking in 2010 to 2014 (Source: UN E-Government Survey, 2012 and 2014)](image)

Nigeria came in with an average of 0.3063 and 136th position in the overall world ranking; Cape Verde (0.4158) and Ghana (0.2997) took the first and third positions in West Africa respectively in the 2008 survey, but in the 2012 survey, Nigeria dropped to 0.2676 and an e-readiness ranking of 162 and also dropped to fourth position.
in West Africa as Cape Verde (0.4297) remained in first place while Ghana (0.3159) and Gambia (0.2688) took second and third positions respectively. In 2014 report, Nigeria was able to move up leaving position 162 to 141 with 0.293 e-government development indexes (EGDI) and also ranked among the countries with lower middle e-government implementation (UN E-government Survey, 2014).

According to the United Nation 2008 survey, it was noted that countries that were always at the top positions and had high rankings (i.e. the European countries) had invested heavily in deploying broadband infrastructure, coupled with an increase in the implementation of e-government applications for their citizens. And countries that lagged at the bottom were because of low scores on the education, infrastructure and Web measurement indices.

3. Research Method

According to Parajuli (2007), there is a conjuncture between websites and their contents to materialize e-government vision. It thus implies that contents and functions provided by government portal websites have important roles to play in achieving e-government goals. Likewise, a well-designed website in terms of attractiveness and ease of use are additional motivating factor for users. Incidentally, previous research works on government websites evaluation are largely skewed away from these focus. While many research works have majorly focused on accessibility and usability as reported in Table 2 contents and functions have not been given adequate and the much needed attention. Nielson (2000) rated websites content to be much more important than sites look and feel. Kaylor et al. (2002) observed a lacuna in research which could help decision makers determine the exact set of functions that constitutes leading edge. This study therefore, made a choice of the Lui et al. (2010) framework to evaluate State government websites in Nigeria because it integrates the contents, functions and construction indexes for evaluating government websites identified in literature.

Content index: Deals with how well government is committed to disseminating timely information. Government websites is not an ordinary website; it should promote openness and transparency of administration by providing adequate and updated information about government and its activities. The UN e-government model defines the enhanced online presence of government as one in which it provide dynamic, specialized and regularly updated information. The content of government should be geared towards open administration, publicity and provision of unique and innovative services to citizens. Open administration according to Liu et al. (2010), is governments using the portal websites as platforms to periodically disclose the official information such as governmental notice, personnel change, financial report, statistic result, tourist guideline, policy, and regulation, profiles of government official including official responsibilities, photograph and contact information to the public. Promoting open administration through web content extends to breaking news. Publicity refers to how well information about the basic characteristics of the city is presented on regular basis.

Function index: The function service index checks if the government portal is service oriented. A service-oriented government portal is one that delivers integrated online services to the citizens with high efficiency and effectiveness (Liu et al., 2010). The function index also examines the interaction performance of the government websites, that is, functions that facilitate citizens understanding of government’s administrative procedure, allows online services such as license renewal, registration forms download and submission and offer citizens and government interaction. The functional index captures major highlights of transactional and connected presence of e-government model (UN e-government survey, 2004, 2005; 2008). According to World Bank, online transaction has the potential for cost savings, accountability through information logs and productivity improvements for governments (Jayashree and Marthandan, 2010). Government website function can be categorized into four subdivisions: online transactions, administrative question and answer, citizen participation and special function such as link to external social media sites. Kaylor et al. (2002) in assessment of e-Government initiatives identified twelve categories of services that governments provide through their websites. These services include payments, registration, permits, licenses, communication, document, application etc. Aside online transactions, government websites should also provide platforms for two-way communication between government and citizens to enhance public participation in policy making (Moon, 2002; Parajuli, 2007; Liu et al., 2010).

Construction index: The construction index examines the technological performance of government websites including design features, information features and Web features of the websites. Design features include aesthetic properties, the normal property, user’s perceived ease of use of the website and multiple versions of
the website in different languages. Information features refer to website management functions such as timeliness, diversity of content presentation and regular update of the information presented on the websites. The Web features include the website’s clicking rate connecting speed, stability and accessibility of government websites. According to Zahedi, Pelt, and Song (2001) and Parajuli (2007), websites should be accessible to all the people regardless of their expertise, literacy personality, physical abilities and etc. Good layout, aesthetics, ease of use, multi-language, timeliness, connecting speed, stability, accessibility and system maintenance are all requirements for a government portal website to deliver good services to the citizens as well as function well in internal management.

3.1 Survey Method
The study is based on content analysis of the official websites of the thirty six states in Nigeria. Content analysis is a logical method of coding symbolic content by identifying common patterns in media (Panagiotopoulos, Moody and Elliman, 2012). However, there is no need to code symbolic content in this study, we used the web content to document the features appearing in the Nigeria state government websites and Federal Capital Territory (FCT) website based on the coding framework developed from Liu et al (2009) content index, function index and construction index for government websites. The initial code was validated by an expert revision to ensure that the research instrument will capture the essential features in a considerably good amount of time per website. The final coding framework used for the survey as shown in Tables 2 and 3 consists of 28 variables describing the content, function and construction features e-government websites. The governmental website survey lasted for one month starting from February 2, 2015.

The content and function evaluation was conducted by the first author, who is an experienced web designer and e-government scholar. One evaluator is appropriate and sufficient since the content and function indexes questions do not entail subjective judgements. In the evaluation, websites that do not provide the kind of contents or functions in the coding framework is marked “0” for the respective variable.

The third index, i.e., construction, involves three sub-indexes which are design features, information features and web features. These are all technological variables for assessing the effectiveness of government websites. Due to the subjective nature of the questions involved in assessing the construction index, six experts who are experienced in web design from the Department of Computer and Information Sciences, Covenant University, Nigeria were involved in the evaluation. Each of the Experts evaluated twenty-three websites based on the variables in Table 3. Six-point Likert-type scale ranging from 1 = Strongly Disagree (SSD), 2 = Disagree (SD), 3 = Slightly Disagree (D), 4 = Slightly Agree (A), 5 = Agree (SA), and 6 = Strongly Agree (SSA). Features that is completely absent is scored zero. This approach was used to determine the level of agreement of the six evaluators with the existence of the features in Table 3 on the government websites.

4. Finding and Implications
Only twenty three (23) states and the federal capital territory have dedicated websites, which means only 68% of Nigerian State Government is online. The website of Sokoto State Government is under construction; Benue State Government maintains only online blog; Eboyin, Kastina, Kano, Kebbi, Imo, Gombe, Zamfara, Nasarawa, Yobe and Bayelsa State Governments are not online.

4.1 Content
Openness of administration is the efforts of governments using websites as platforms to constantly disclose official information to the public, such as governmental notice, personnel change, financial report, statistic result, tourist guideline, policy, and regulation. The analysis on open administration implies that the state governments are not open to the public in their administration. Considering the nine indexes of open administration provided by Liu et al. (2010), content analysis of the 23 state government websites and the federal capital territory, revealed that only fourteen (58 percent) of these websites have contents relating to official information. The websites of States such as Ogun, Rivers and Delta provide only names and positions of
administrative officials such as the executives, legislatures and judiciary members. The websites of Enugu and Abia states provide names, positions and contacts of executive members but photos and duties are not provided. Osun State website provides only photo and credential of the executive members.

In respect of basic organizational introductory information such as information relating to organization functions, affiliated organization, persons in charge of various responsibilities, office addresses and contacts information, only thirteen states (54 percent) provided some of these information. Akwa Ibom, Osun, Edo and Delta States for instance provide functions or objectives of various ministries and persons in charge but office address and contact of officials were not made published on the site. Ogun State on the other hand provides only names and contacts of various heads of ministries and detailed information about departments and agencies including their mission, objectives, vision, office address, emails and phone numbers.

It was also revealed that state governments in Nigeria are not using their websites to educate citizens on regulation and policies. None of the state websites contains information relating to work regulations. Only two states (8 percent) have information on policies. Lagos state for instance, provides information on traffic policy and Niger State makes available Nigeria constitution and policies and guideline for public private partnership in the state.

As presented in Table 2, almost all the states dedicated their websites to publicizing news on government activities, breaking news in the state but information relating to specific departments or agencies were generally not presented on the websites. Contrary to recommendation for open administration, it is generally not the practices of state governments in Nigeria to publish information on recruitment, give notification on call to tenders or public spending. The only exceptions are Lagos and Oyo States. Oyo published the names of school teachers who were reinstated after an initial compulsory retirement and Lagos State during the period of this investigation published a notice for recruitment on the website Bulletin. The state governments are also not yet in the practice of publicizing their annual administrative plan. The analysis revealed that only ten states (42 percent) have the government agenda for the tenure published on their websites. Seven states (Lagos, Delta, Enugu, Ogun, Rivers, Niger and Cross River states) constituting 29 percent, provided downloadable PDF report of government financial activities and development plan. Lagos state provides document relating to various financial activities such as budget appraisal, budget review, budget analysis, budget call circular, yearly and half year financial appraisal, audited financial statement, etc while the other five states provided only state budget. The websites of sixteen states (67 percent) contain information about the basic characteristics of the state such as geography, climate, resource, population, etc. This information are generally well presented in all the sixteen states websites so that visitors can have good knowledge of the respective states.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is there official information such as credential of government officials, photo, position, duty, contact information?</td>
<td>14</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>2. Is there organisational information such as organisation functions, affiliated organization, person in charge, office address and contact of officials?</td>
<td>13</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>3. Does the site contains information relating to the responsibility of government officials such as duty, affiliated office/organisation, office address and contact information?</td>
<td>6</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>4. Is there information on government policy?</td>
<td>2</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>5. Does the site contain news relating to department, industries, State government activities, breaking news, popular topics of the state?</td>
<td>23</td>
<td>96%</td>
<td></td>
</tr>
<tr>
<td>6. Does the website contain information on administrative plan or proposed activities</td>
<td>10</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>7. Is there information on legislative activities?</td>
<td>4</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>8. Is there any information about official recruitment?</td>
<td>2</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>9. Does the website contain information about the basic characteristics of the state such as geography, climate, resource, population, etc?</td>
<td>16</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>10. Is there annual report of government activities?</td>
<td>7</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>11. Does the website contain state-featured exhibition?</td>
<td>4</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>12. Does the website provide introduction about online transactions available?</td>
<td>1</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>13. Does the website allow downloading of forms for service registration or complaint?</td>
<td>3</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>14. Does the website allow submission of forms?</td>
<td>0</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>15. Does the websites offer any form of public consultation or suggestions?</td>
<td>0</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>16. Are there online channels for complaint?</td>
<td>12</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>17. Does the website provide online survey functions?</td>
<td>0</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>18. Are opinion collection functions provided?</td>
<td>3</td>
<td>13%</td>
<td></td>
</tr>
</tbody>
</table>
Is online comment function provided?  2  8%
20. Does the website provide functional online messaging forum, blog, and RSS?  6  25%
21. Does the website provide specialized functions such as links to Facebook, email, Twitter, Linkedin, etc?  19  79%

Table 3: Website Construction (on a 1-6 scale)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The layout of the website is very good?</td>
<td></td>
</tr>
<tr>
<td>2. The website is easy to navigate?</td>
<td></td>
</tr>
<tr>
<td>3. Is there multiple version of the website in different languages?</td>
<td></td>
</tr>
<tr>
<td>4. Does the website give current and updated information?</td>
<td></td>
</tr>
<tr>
<td>5. Is the content of the website provided in different format using words, tables, picture, audio and video?</td>
<td></td>
</tr>
<tr>
<td>6. Does the website load fast when you click to go to a new page?</td>
<td></td>
</tr>
<tr>
<td>7. When view the site on different browsers, does it present the same content in consistent manner?</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Function

Information provisioning is the basic function of government websites while provision of online transactions such as registration, service reservation form download and online interaction with citizens serves as the main platform through which public bodies are transforming their array of relationships with citizens, businesses and other governments. Analysis of the function index of Nigerian states websites based on online transaction and citizen participation, shows that Nigerian states e-govern ment implementation is still at basic information provisioning stage. The transformation aspect of having a Web portal is yet to be fully incorporated in all the twenty four state with online presence.

Electronic Services: None of the state government websites have implemented online transaction such as renewal of vehicle license, and driver’s licenses payment of taxes and traffic tickets; change of address; application for certificates, making appointments for vehicle emission inspections and driving tests. Not making provision for these services on the websites is an indication that government bodies are not ready to use technology to transform their operations. Lagos State on the other hand implemented a fully functional house hold energy and emission calculator which citizens can use to predetermined their monthly electricity bill but no payment functionality implemented. Niger and Ogun States are the only states that show signs of future implementation of electronic services. The two states made provision for various electronic services (online bidding, Tax payment, job application, vehicle registration services, bill payment services, birth & death registration, etc) on their websites but the functions are under implementation.

Online Interaction: Platforms for online interaction with citizens have been introduced to an extent in some of the states’ websites. States such as Osun State provides a direct online submission to the office of the Executive Governor of the state on various topics of interest. Twelve state websites in all; Anambra, Oyo, Enugu, Akwa Ibom, Taraba, Edo, Delta, Bauchi, Niger, Rivers, Kogi and Osun, making 50 percent of the total sample have online contact page which could to be used to submit comments or complaints. Edo and Oyo States also implemented comments platforms for sharing opinion on each of the news posted on the website. Six States; Edo, Anambra, Niger, Osun, Ogun and Rivers provide Really Simple Syndication (RSS) while nineteen states (79 percent) provide other specialized functions such as links to Facebook, email, Twitter, LinkedIn, etc.

4.3 Construction Index

Result of the construction index of the twenty four state government websites evaluated for design features, information features and web features is presented in Table 4. The evaluation of design features of the websites with respect to layout, ease of navigation and multi-language shows that the websites have good layout and are easy to navigate. Twenty two states (92 percent) have mean score greater than 3.5 for good layout the only exception are Kogi and Ondo states with 2.0 mean score. The analysis also shows that the navigation features in websites except in Lagos, Cross Rivers, Kogi, and Anambra are considerably good. Twenty states (83 percent) have mean score above 3.5. However none of the states provided versions of the websites in another language besides English, probably because English is the official language of the country. Since English is not the major language for any region of the country, government may need to rethink its Web strategy to provide versions of the websites in major language of the respective states to promote inclusive participation.
Analysis of the information features of the state government websites, in terms of timeliness and diversity of presentation, revealed the poor maintenance and management of some state websites. For instance, most recent article in Niger state website was published in October 2012 and last account record available for download is for 2010 accounting year. Likewise in Anambra state, the latest news published is Dec 17th 2014. Only seven States (29 percent) could be said to really provide timely and up-to-date information. A more detailed analysis of the features shows that only Lagos state has up-to-date content for downloadable documents. Other states that allow document download such as Delta, Enugu, Ogun, Rivers, Niger and Cross River States have 2013 documents as the most recent content on the site.

The Web features of the government websites was assessed using three variables: connecting speed, clicking rate and stability. Only three states Oyo, Ondo and Anambra did not present the same content on different browsers. They also do not load fast when clicked to go to a new page. This study does not focus on the entire web feature guideline but also observed that all the state websites have functions yet to be fully implemented and as a result, there are a lot of broken links in all the websites.

5. Conclusion

This research examined e-government implementation in line with the Nigeria national IT policy statement which is to use IT as the major driving force to re-engineer and rapidly transform governance to interface with the needs of its citizenry by establishing transparency at national, state and local government levels. State governments’ websites were therefore evaluated to assess their level of compliance with the policy statement. The empirical work presents an overview of the efforts of state governments towards implementation of e-government. The level of implementation since 2001 when the policy statement was issued shows that government institutions are not maximizing the potentials of ICT to achieve the stated objectives.

The yardsticks used in the study may not have been completely exhaustive in assessing e-government implementation in the country, but have helped to characterize the overall e-government status in Nigeria. Government intends to replace traditional government with electronic governance, create an easy and free access to government information, establish websites for improved government image and serve as information centers for the citizenry (NITDA, 2001) but the contents, functions and web features that are critical to actualizing these are not fully implemented or completely missing in most of the government websites. Continuous lack of appropriate content to promote transparency and functions that will transform government activities both internally and in interacting with citizens will further make the country rank low in the global competition of digital governance initiatives. The site designers should acknowledge that government websites are the main channels for disseminating information as well as platforms for transforming government operations. Thus, they must be more than static notice boards but function oriented, dynamic, interactive, ubiquitous, searchable and networkable.

Table 4: Mean Score of the Technological Performance of State Websites and FCT

<table>
<thead>
<tr>
<th>Layout</th>
<th>Ease of Navigation</th>
<th>Timeliness</th>
<th>Presentation Diversity</th>
<th>Connecting Speed</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagos</td>
<td>3.17</td>
<td>2.67</td>
<td>3.67</td>
<td>3.83</td>
<td>2.33</td>
</tr>
<tr>
<td>Edo</td>
<td>3.5</td>
<td>3.83</td>
<td>4.33</td>
<td>3.5</td>
<td>4</td>
</tr>
<tr>
<td>Ekiti</td>
<td>3.67</td>
<td>4</td>
<td>4</td>
<td>4.33</td>
<td>4.33</td>
</tr>
<tr>
<td>Abia</td>
<td>4</td>
<td>4.6</td>
<td>2.2</td>
<td>3.6</td>
<td>4</td>
</tr>
<tr>
<td>Ondo</td>
<td>3.58</td>
<td>3.78</td>
<td>3.55</td>
<td>3.73</td>
<td>3.67</td>
</tr>
<tr>
<td>Anambra</td>
<td>3.17</td>
<td>3.5</td>
<td>1.67</td>
<td>3.17</td>
<td>3.5</td>
</tr>
<tr>
<td>Oyo</td>
<td>3.51</td>
<td>3.73</td>
<td>3.24</td>
<td>3.64</td>
<td>3.64</td>
</tr>
<tr>
<td>Kogi</td>
<td>3.57</td>
<td>3.91</td>
<td>3.16</td>
<td>3.61</td>
<td>3.86</td>
</tr>
<tr>
<td>Enugu</td>
<td>3.58</td>
<td>3.92</td>
<td>2.97</td>
<td>3.62</td>
<td>3.83</td>
</tr>
<tr>
<td>Akwa</td>
<td>3.57</td>
<td>3.9</td>
<td>2.8</td>
<td>3.56</td>
<td>3.75</td>
</tr>
<tr>
<td>Taraba</td>
<td>3.5</td>
<td>3.79</td>
<td>2.9</td>
<td>3.56</td>
<td>3.71</td>
</tr>
</tbody>
</table>
We recommend that in addition to the National IT policy, Nigerian government needs to have established guideline for its e-government implementation taking clue from countries such as UK, USA, etc who have successfully used IT to transform government operation from traditional to electronic governance. Establishing a national standard for government websites design will assist the nation to further exploit the benefits offered by ICTs in promoting good governance and monitor compliance. As noted by Parajuli (2007), e-government should continuously grow through learning, investing, and developing guidelines and standards to achieve successful implementation and to meet citizens’ expectation. The National Information Technology Development Agency (NITDA) needs to be more proactive in its responsibility of monitoring, regulating and evaluating the progress of National IT Policy implementation.

In the first category of features, the state governments need to use their websites to educate citizens on regulation and policies. They also need to provide more value adding information to the citizens such as information on call to tenders or public spending, recruitment, budget, financial appraisal and audited financial statement. It is also important for the websites to provide information on administrative plans, proposed activities and legislative activities. Information provided on responsibility of government officials such as duty, affiliated office or organisation, office address and contact information need to be improved upon to make them more accessible to the citizens.

In the second category of features, the implementation needs to go beyond information provisioning. Online services that will make the government websites useful to citizens and business needs to be implemented. These include online transaction such as renewal of vehicle and driver’s license, payment of taxes and traffic tickets; change of address; application for certificates, making appointments for vehicle emission inspections and driving tests. Implementation of these features will help the government to maximize the benefits of ICT in transforming their operations and in rendering quality services to the public. As observed by Maheshwan et al (2007) and Asiimwe & Lim, (2010), however, implementing these features however, requires planning For instance, selecting appropriate partner for service delivery or other third party operations such as electronic payment (e-payment) must be carefully planned out.

In the third category of features, the state governments need to rethink their Web accessibility strategy. Multilingual options is completely missing in all the websites studied. According to Parajuli (2007), state governments need to recognize the existence of plethora of languages and cater for multilingual communities. Accessibility features such as keyboard support and transcript of audio should be included in the websites design for people with disability.

Comparing the attributes assessed with the UN e-government model, it can be concluded that twenty-three state websites are in second stage of e-government implementation model. The implementation can however, be described as moribund because some important feature of the emerging presence and enhanced presence of the UN e-government are missing in almost all the twenty-three websites. For instance, none of the sites has links to ministries or departments, only two sites provide information on laws and there are no reports on government activities.
It is unwholesome that thirteen states are yet to have online presence since 2001 that IT policy was enacted and information infrastructure provided across levels of government in Nigeria. The present status of e-government websites indicate that technological potential has not been maximized to comply with National IT strategy. Moreso, this current status of implementation lacks capability to promote transparency, accountability and strengthen democracy that e-government is set achieve. Future work in this domain should therefore, investigate internal constraints and factors that impact on each state’s e-government implementation. The evaluation metrics used in this study can be used in future studies to assess the federal government and other agencies websites.

References


Oyekanmi, O. (2005), Nigeria’s Place in the ICT World Today. The University of Ibadan Press, Ibadan, Nigeria


Factors Affecting Citizens’ use of Social Media to Communicate with the Government: a Proposed Model

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Abstract: With the emergence of Web 2.0 technology, governments are able to deliver quality services and fully satisfy the needs of their citizens. Despite the importance of this emerging trend, identifying and attracting an audience for government-affiliated social media (SM) services has proved to be a significant challenge. The figures for public participation in government2.0 remain below expectations. This paper is one of the few attempts to identify those factors affecting citizens’ decisions to use SM platforms as a means for communication with their government. To develop a new model of SM adoption, this research study is based on a literature review, and will extend the Unified Theory of Acceptance and Use of Technology (UTAUT) model by integrating cultural factors identified by the Hofstede model (masculinity, uncertainty avoidance, power distance and collectivism) and factors related to the trust and motivational model. This paper has created a comprehensive taxonomy of those factors that influence the adoption of SM among citizens, while providing a list of hypotheses for evaluating the significance of these factors.

Keywords: Government 2.0; Citizen; UTAUT; Web 2.0; Social media

1. Introduction

The definition of government2.0 can be given as: “The use of web 2.0 tools within government organisations and their interactions with citizens” (Mergel, 2012:34). According to Magro (2012) and Steenkamp and Hyde-Clarke (2014), SM is something that includes social networking platforms like Google+ and Facebook, microblogging platforms such as Twitter, other blogging platforms, wikis and media-sharing websites like Flickr and YouTube. All are considered as platforms that enable data sharing in a participatory manner. SM possesses four primary advantages (Bertot et al., 2010): participation; empowerment; time; and collaboration. SM’s nature ensures that it is a collaborative and participatory phenomenon, shaped by social interaction. This brings about the potential for users to relate to one another and create social circles for distributing information or attaining a shared goal. Within the context of e-participation, SM presents superior governmental and political decision-making paths and policies, introducing the general public into the decision-making process while making sure that those decisions undertaken by governments are legitimised owing to voter input, thus increasing governmental transparency and responsiveness.

SM empowers users, providing a platform and ubiquitous access to the Web, and thus the means to publish their thoughts or information without great cost and making media democratic (Unsworth & Townes, 2012). According to Linders (2012), government2.0 involves voters and governments as equal partners. Regarding time, SM technology means users can broadcast data in near-real-time and send information to specific individuals (Bertot et al., 2010). Furthermore, according to Aladalah, Cheung and Lee (2015), a number of Web2.0 processes are free, enabling people to be contacted in an informal, direct way.

Globally, governments may try to develop innovative platforms and strategies through which to enhance communication with their citizens, although without their widespread adoption such platforms will not be effective. According to Statista (2014), there are more than 1.6 billion users of leading networks worldwide, and 64% of Internet users’ access SM services. According to Statista, SM platforms are a popular means by which Internet users stay connected with their friends and family, read news and engage with other content. A report produced by Capgemini entitled Assessing User Centric eGovernment performance in Europe - eGovernment Benchmark 2012 highlights that (based on 28,000 citizens from 32 countries) only 46% of Europe’s Internet population use online public services (Capgemini, 2012), demonstrating that 54% of users with full Internet access were not comfortable using and were not motivated to use SM/e-government.
services to communicate with their government. With over 1.6 billion users connected to SM, why are so many citizens failing to use e-government services? Citizens’ motivation and willingness to connect to government 2.0 are necessary, but why do citizens collaborate, participate and communicate regarding public matters? When contrasted with general SM, usage identifies that the successful implementation of e-government services depends on governmental backing and citizen satisfaction and willingness to adopt such services (Alomari, 2014). End-user (consumers/citizens) satisfaction with adoption, usage and success of (SM) platforms plays an important role, and is crucial in identifying those critical factors that influence citizens (Mergel, Schweik & Fountain, 2009; Coskunçay, 2013).

The factors affecting the acceptance of communicating interaction using SM in a governmental context have not been comprehensively studied. This research study intends to highlight those factors that influence user choice with regard to accepting SM as a communicative channel with the government.

A number of theories exist concerning general SM technology adoption. Although general, they are nevertheless relevant with regard to overall technological adoption. Traditional adoption models within the field of information and technology (IT) can be altered and elongated if applied to the adoption of original or innovative technology (Pederson & Ling, 2003). A new e-adoption model needs to be devised, capable of concentrating on especially important elements for SM as well as creating a comprehensive taxonomy of the factors influencing SM adoption among citizens. The model proposed in this research is an extension of the original UTAUT, and uses information gathered from a literature review. Various aspects have been selected from models that the authors believe assists researcher understanding of how SM may be made prevalent among a citizenry. Consequently, these factors have been defined and categorised as: UTAUT factors; perceived motivation factors; trust and cultural factors.

This paper will be structured as follows: Section 2, from an individual perspective, critically reviews the published literature concerning SM adoption and adoption theories; Section 3 describes the model constructs with a detailed rationale for each hypothesis; Section 4 provides the proposed research model and research hypotheses; Section 5 proposes a methodology; and Section 6 provides a conclusion and a summary of the study’s various contributions and limitations.

2. Theoretical background

2.1 Related works

Kwon and Wen (2010) have assessed the impact of individual differences on user intention regarding the use of social network services (SNS) (human-relationship-oriented systems), analysing factors such as social identity, altruism, telepresence and perceived encouragement, and demonstrating the influence of these factors on SM. A similar study was conducted by Ramirez-Correa (2013) into the utilisation of SNS. The original version of the technology acceptance model (TAM) was improved by adding three perceived values: social identity, telepresence and altruism. A structured equation model was then used to test the modified model, with the findings demonstrating Generation Y’s acceptance of social networking services in Chile.

Pai and Arnott (2013) tried to devise a comprehensive understanding of the underpinning factors affecting the utilisation of social networking sites (SNSs). The study explored the users’ insights on five characteristics, 10 outcomes and four values interlinked with SNS acceptance - focusing exclusively on Facebook. The findings revealed that users looked for four major values when using SNSs: belonging, self-satisfaction, confidence and reciprocal interactions. The reasons behind the adoption of social networking services were explored by Lee and Suh (2013) and a constructed model developed based on three well-known hypotheses: TAM, network externality and innovation diffusion theory (IDT). Data were gathered through a survey targeting social networking sites like Facebook and Twitter. Results revealed that perceived usefulness (PU), perceived ease of use (PEU), members (M) and compatibility (C) had a significantly positive effect on actual usage (AU) of social networking services. Herein, members are defined as “the degree to which a person uses a particular technology or system because of other users (e.g., friends, family, etc.)” (Lee & Suh, 2013, p. 4), and this is represented as social influence within the UTAUT model; while compatibility is defined as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (Lee & Suh, 2013, p. 5). Alarcón-Del-Amo, Lorenzo-Romero and Del Chiappa (2014) explored the acceptance of SNS use by Italians. A model based on technology adoption was used with additions relating to trust and perceived risk. Consequently, most studies conducted in this area have major limitations and few generalised results. The limitations may include analysing the gathered data in relation to a particular city, grouping or association based on general adoption, or targeting a specific field such as education or commerce.
With regard to assimilating information of SM use as a means to communicate with governments, targeting users from larger age groups across various SM networks is vital for generalisation purposes. To the researcher's knowledge, no extant research aims to explore the factors affecting users' acceptance of SM as a tool for communicating with the government, although some studies focusing on a single factor, like trust, were found (Shah, 2010; Song & Lee, 2013). However, the model was only proposed by Alharbi (2014) from a citizen’s perspective; this study intends to assess those elements impacting individuals’ motivation to utilise e-participation services in Saudi Arabia regarding government websites. The framework suggested herein is comprised of a single dependant variable (the intent of the individual to participate in e-participation) and three further control variables: attitude, design and trust. Furthermore, the moderating effects on the connection among each predicator and the individual’s intent to utilise e-participation regarding power distance, cultural dimensions and uncertainty avoidance are also set into the model.

2.2 Adoption theory

Over the past few decades, various technological theories and models have been used to scrutinise those critical factors influencing the adoption of emerging technologies, and these divide into two broad categories or levels: the individual level and the organisational level (Alotaibi et al., 2015).

Related theories on technology adoption at an individual level:

- Theory of reasoned action (Fishbein & Ajzen, 1975)
- Theory of planned behaviour (Ajzen, 1985)
- Technology acceptance model (Davis, Bagozzi & Warshaw, 1989)
- Unified theory of acceptance and use of technology (Venkatesh et al., 2003).

2.2.1 Unified theory of acceptance and use of technology

In the context of information system (IS)/IT adoption, TAM was one of the most widely-accepted theories prior to the UTAUT model’s existence. Venkatesh et al. (2003) identified the fact that many constructs from extant theories and models are similar, and thus it is important to integrate different constructs under a single theory: UTAUT. The UTAUT model was developed from a review and consolidation of the constructs of eight theories that previous research had utilised to investigate Information and Communication Technologies’ (ICTs) usage behaviour (theory of reasoned action, technology acceptance model, motivational model, theory of planned behaviour, a combined theory of planned behaviour/technology acceptance model, model of PC utilisation, innovation diffusion theory and social cognitive theory). Additionally, as TAM2 was developed to enhance the explanatory power of the original TAM model, UTAUT was developed in a similar manner to overcome the limitations of the TAM2 extended model. The UTAUT model defines the direct determinants of intent to use and behavioural intent to use. The direct determinants of behavioural intention are performance expectancy, effort expectancy and social influence; while the direct determinants of intention to use are facilitating conditions as defined below (Venkatesh et al., 2003; Al-Shafi & Weerakkody, 2010):

- Performance expectancy: The extent to which an individual believes that using a system/technology/tool will improve their job performance.
- Effort expectancy: The degree of effortlessness associated with the use of the system based on perceived ease of use, complexity and actual ease of use.
- Social influence: The degree to which peers/surroundings positively or negatively influence the use of the system.
- Facilitating conditions: The degree to which an individual trusts that an organisational or technical infrastructure is available for the system.
- Behavioural intention: Immediate predictor to adopt technology.
- Adoption behaviour: The actual use and associated behaviour of the innovation/system.

These relationships were moderated through age, gender, experience, voluntariness and educational level (Venkatesh et al., 2003). According to Venkatesh et al., (2003) and Al Awadhi and Morris (2008), this model is a milestone regarding literature on acceptance theory, and intends to expound upon the user’s intentions to employ IS and related usage behaviour. The original UTAUT was subjected to empirical testing and, according
to Venkatesh et al., (2003), demonstrated significant support for the model. Aspects impacting the adoption of SM by citizens in sufficient detail are expounded upon below. Research hypotheses are founded in order to subject the model to testing constructs including in-depth rationale regarding all hypotheses given.

3. Factors affecting citizens’ adoption of SM

3.1 Constructs for the UTAUT

3.1.1 Performance expectancy

One strong predictor of the intent to use IT in accordance with previous research was performance expectancy (Venkatesh et al., 2003; Al Awadhi & Morris, 2008; Kingsley et al., 2013), which concerns citizen belief in use and acceptance of SM; it has temporal and financial advantages compared to other channels, which may help improve their performance when communicating with governmental organisations.

3.1.2 Effort expectancy

Several researchers discovered that effort expectancy can impact intent to use and associated behaviour (Schaper & Pervan, 2007; Kingsley et al., 2013). Perceived usefulness, according to TAM, is affected by perceived ease of use; the system is similar and so will have greater utility, according to Wangpipatwong et al. (2008). Conversely, others have propounded the argument that effort expectancy has negligible impacts on intent to use and related behaviour (Chau & Hu, 2001). Effort expectancy is measured by the perceptions of SM ease of use when communicating with governmental organisations, and ease of learning when utilising these tools or services.

3.1.3 Social influence

The subjective norm, as a strong predictor within different theories, reflects the effects of social influence behaviour in TRA, TAM2 and TPB, and is represented as social influence in the UTAUT model aiming to measure user satisfaction based on others’ opinions. Social cognitive theory, to evaluate individual behaviour and intention, is widely used and is based on various determined factors such as social influence, cognitive and other personal factors and behaviours (Coskunçay, 2013). Social influence, as a direct or indirect determinant of intent to use a system, can be defined as perceived external pressure one realises towards the cognisant process about innovation, adopting it to another level wherein others consider the use of the new system (Mazman, Usluel & Çevik, 2009). Many studies have demonstrated a positive effect on social influence on behavioural intention in e-government settings (Al Awadhi & Morris, 2008; Al-Shafi & Weerakkody, 2010). In the context of SM for e-government services, social influence is a significant word of mouth (WOM) concept, wherein experience can influence another’s decision to adopt (SM). Contemporaneously, SM platforms are facilitating the WOM effect. The use of “Like” or “Tweet” by individuals is subsequently viewed by friends and followers, raising awareness and/or interest (Xitong & Lynn, 2013; Alomari, 2014). This suggests that a positive influence on individuals can motivate large numbers of citizens towards the adoption of SM channels.

4. Added Constructs/Antecedent Factors

4.1 Perceived motivation

Motivation has a significant part to play in tailoring adaptation of e-governmental services (Bwalya & Mutula, 2014). Former research has assessed the part played by motivation concerning Internet usage, confirming it has had a positive effect on emerging and original technology use (Stafford & Stern, 2002). A considerable amount of research has assessed the part played by either extrinsic or intrinsic factors motivating actors regarding users’ technology use as well as its adoption. This research provides a broad addition to this through the inclusion of extrinsic motivation (EM) as well as perception-level intrinsic motivation (IM).

4.1.1 Incentives

Some attempt to expand diffusion theory to extra complex adoption situations has been made. For instance, it is up to an organisation to support or not support the adoption of SM communication openly through direct preferences and/or commands and reward systems and motivations (Dillon, 2001). Citizens have different incentives for SM use for different activities. What incentives do governments need to give their citizens to promote two-way communication use? To incentivise citizens to use government2.0, a government should consider the available resources. Margetts and Yared (2003) argue for four governemnt resouces: money,
legitimate authority, time and information and expertise. Although business organisations find financial incentives to attract consumers, public administration, conversely, has to find different ways to encourage and motivate citizens and businesses to adopt new ways of communication to give money to the government. To attract customers to their social platform, many business organisations give rewards (i.e. loyalty points, freebies). The first UK Internet bank, Egg, offered interest rate benefits, an approach subsequently used by major banks as a financial incentive for customers (Margetts & Yared, 2003). SM services and banking services differ, but both show citizens’ behaviour towards adopting services in return for rewards. Shao (2009) defines four factors relevant to SM use and adoption: information, entertainment, social interaction and self-expression. Reliable, accurate, dynamic and entertaining information incentivises citizens, although government focus and strategies are needed to attract online users by increasing customer centricity, providing incentives and improved services.

4.1.2 Accessibility

Owing to increasing numbers of governmental SM platforms, traditional policies relevant to access of information and inclusion have to be reconsidered. Information policies should be redirected to the adoption of factors associated with SM (Jaeger, Bertot & Shilton, 2012). Governmental bodies frequently try to reach out using often inaccessible, third-party social tools, trying to embed such tools on their websites which results in a negative impact on their functionality. This indicates disagreement between access strategy and SM tradition. Emphasis must then be placed on developing policies that give priority to the global usability of government SM performance, ensuring equal access for all people globally (Jaeger et al., 2012). Furthermore, the access/quality policy ensures that information includes aspects like “relevancy, accuracy, reliability, and timeliness” (Zmud, Lind & Young, 1990, p. 443). Mandal and McQueen (2012) contend that access/quality would probably have considerable influence as regards accepting SM such as Facebook. Conversely, governmental agencies need to possess verified accounts to stop spoofing behaviour. According to Stowe (2015), this presents an expedient means by which users can guarantee they have access to the correct account and thus generally better their citizens’ experiences.

Attributes of SM: SM has become very important as a result of ubiquity and interactivity, two extremely exacting components (Agourram, 2013).

4.1.3 Ubiquity

From the viewpoint of the consumer, a characteristic that it uniquely defining of e-commerce constitutes its ubiquity, in other words, the means it presents by which to engage at all times and places (Agourram, 2013).

4.1.4 Interactivity

Interactive communication is facilitated via an online person-to-person or person-to-people process utilising a number of different websites (Shipps, 2013).

Intrinsic motivation (IM) emerges as a result of experimental research demonstrating that people engage in a number of different behaviours if they are driven by either playful, exploratory reasons or reasons stemming from curiosity, and that this remains true without any incentive or recompense (Ryan & Deci, 2000). A new construct named Perceived Encouragement for Technology Acceptance (Kwon & Wen, 2010) demonstrated that users with higher social identity, altruism and telepresence are more likely to receive encouragement regarding SM platform use. This paper considers three external determinants among the individual characteristics:

4.1.5 Virtual social identity

Social identity theory states that “people aim to improve their personal esteem, and that they endeavour to attain self-conceptualisation”, according to Tajfel (1998). Introducing social networking into human interactions has brought about a new dimension regarding social identity theory. Strong social identity reflects individual interest in technological use for different services and it is crucial for government agencies to give citizens a reason to build strong social identity through system quality demonstrating usability, ease of use, quality documentation, system flexibility and reliable and loyal service (Coskunçay, 2013).
4.1.6 Virtual altruism

Altruism can be classified into two types: Kin altruism and reciprocal altruism. According to Rondán et al. (2015) using social media in government context kin selection can be ruled out. Reciprocal altruism involves helping other individuals in the hope of reciprocation. In IT contexts, altruistic people are willing to share knowledge to help others (Chen, 2012). Altruistic actions are, according to Fang and Chu (2010), a significant indicator of the intention to distribute knowledge and those individuals who portray altruistic behaviour are keener to distribute knowledge in a virtual community. In one state, the factor that impacted the exchange of knowledge within SM drew on the idea of belonging (Ma & Chan, 2014), and the core motive for altruistic behaviour was found to have a direct and significant effect on knowledge sharing online. In government context, the reciprocal altruism is establishing trust between social media users C2C (Citizen-to-Citizen) C2G (Citizen-to-Government).

4.1.7 Virtual telepresence

Within the social environment, individual presence can lower efforts utilised for psychological transportation. According to Kwon and Wen (2010), telepresence on SM can be considered as transportation which shows departure, arrival and return from a facilitated place. Some academics believe that the virtual realm will grow and develop dialogue between citizens and governments (Baker et al., 2010).

4.2 Trust

Trust in the information system can be differentiated into relationship trust and system trust (Grabner-Kräuter & Kaluscha, 2003). McLeod and Pippin (2009) defined relationship trust as trust between individual human actors in the system. System trust is further differentiated into security trust, privacy trust and system logic trust. Transparency and the right to access a government’s information is marked as an important feature of government2.0 for democratic participation, enhancing end-user trust in governmental activities and information, reducing corruption, disseminating decisions and improving informational accuracy and provision (Jaeger & Bertot, 2010; Alomari, 2014). Trust has an influencing role in developed and developing countries (Al-Shafi & Weerakkody, 2010), yet remains a difficult concept to define substantively. A number of trust factors involved in the model impact the intent to use SM as a governmental communicative channel; according to Papadakis (1999), trust in government can be categorised into relationship and institutional trust. Relationship trust reflects the citizen’s trust in governments, and possesses these characteristics (Mayer, Davis & Schoorman, 1995):

- Capability: the government’s technical and organisational capability to implement e-government.
- Kindness: the government is taking care of services in the best interests of citizens.
- Integrity: the government’s honesty and best practices.

The adversarial nature of government on Web 2.0 leads to low levels of trust and citizens should be dissuaded from adopting it as its volatility supports an intermittent trust relationship. A cooperative nature means citizens exploit government2.0 just for cooperation, but avoid e-government when possible. The collaborative nature of government2.0 can cultivate strong trust relationships between citizens and government social network contexts; social activities include profile creation with personal information, sharing personal content and sharing personal status (Coskunçay, 2013). All of these activities expose privacy, thus adoption of such activities requires two objectives of trust: trust in service provider and trust in the service approach. Fulfilment of these objectives means massive end-user satisfaction towards SM adoption, demonstrating that trust has a significant impact towards the adoption of e-government services (Alsaif, 2014).

4.3 Cultural influence

ICT tools, for both developing and developed nations, are a common denominator. Nevertheless, factors like culture are significant regarding the adoption and conceiving of SM tools for interactive communication with government agencies. Culture is a multidimensional factor, and various studies have been developed to classify it (Hofstede, 1997; Schwartz, 1994, Trompenaars & Hampden-Turner, 1998). Different models highlight different elements of societal values and beliefs. According to Hofstede (1997), national culture can be defined as the collective programming of the mind, which distinguishes the members in one human group from another. This study has adhered to Hofstede’s (1997) definition and general characterisation of culture which is commonly used and presents a basis to generate cultural divides. This research projects intends to facilitate
an understanding of how culture, on an individual level, may impact citizens’ behaviour when utilising SM tools. Hofstede identified four dimensions of national culture difference:

- **Power Distance (PD):** Refers to the inequality of power between the higher and lower ranks.
- **Uncertainty Avoidance (UA):** The extent to which the members of group or society feel threatened by unknown situations.
- **Individualism vs. Collectivism (IDV):** The degree to which people within a nation prefer to act as individuals or group.
- **Masculinity vs. Femininity (MAS):** The distribution of emotional roles between genders.

Although Hofstede’s classification (1980) has been commonly used and accepted by the academic community, some contend its applicability, arguing that it is founded on the presumption of a homogenous culture and that cultural virtues remain unchanging, thus ignoring pluralism in the cultural dynamic (Ford & Chan, 2003). A number of research studies have discovered that cultural elements have a significant part to play regarding IT/IS and ICT adoption, according to Dwyer et al. (2005).

### 4.3.1 Power distance (PD)

PD factors mirror a critical connection with culture, reflecting its influence on SM acceptance. Those nations that have a larger PD then have a more negative opinion of the implementation and utilisation of ICTs (Hofstede, 2001). Allen, Deragon and Orem (2008) argue that the higher the PD in a culture is, the lower SM acceptance is. However, the technological paradigm shifts that altered society’s operations have also altered the power distribution of societies. Some think SM has a part to play in the development of political discourse, particularly in those social orders where important limitations apply to media practices. Where authorities exert power over their populations, people look for alternative communicative and informative channels of political engagement. More contemporaneously, studies and media specialists have concentrated on citizens’ employment of mobile media and SM during times of antisocial behaviour (Mansour, 2012; Van Niekerk, Pillay & Maharaj 2011). New media channels such as these mean that hitherto “otherwise marginalized voices”, according to Nersom, Lengel and Cassara (2011), are now given a platform on traditional media. The perceptions regarding the regulations imposed over traditional media and political action were seen by Skoric et al. (2012) as factors increased activity on SM platforms, and opinions of citizens impacted the use of SM, with content production on SM sites increasing along with political action and self-expression via SM in nations where traditional media outlets were more regulated. Others stress that a relationship exists between culture and e-governmental development and that this relationship is mutual and two-way (Zhao, 2011). For instance, efficacious regulation of e-government can alter the extant power structure or hierarchy of a social order as it permits citizens to interact with their government at all times and locations and thus reduces the power distance index.

### 4.3.2 Uncertainty Avoidance (UA)

Low-UA nations are able to capitalise on more contemporary technologies (Hofstede, 2001). Two forms of uncertainty, behavioural uncertainty and environmental uncertainty, are naturally present in online transactions (Pavlou, 2003). Bertot et al. (2010, p. 265) have identified that culture, as a significant factor, has affected government openness, anti-corruption efforts, level of political action and citizens’ engagement, social interactions, group formations and acceptance of legal changes. Culture has been thought of as a critical factor towards the adoption of technology, especially in developing countries (with high UA). Indeed, despite this significance, limited contributions are available with which to explore this factor (Al-Hujran, Al-Dalahmeh & Aloudat, 2011). Initial inquiries into the characteristics of e-citizens who tend to interact with governments have been undertaken. Hart-Teeter (2003) and Dimitrova and Chen (2006) discovered younger users were more likely to visit government websites and utilise e-government. Additionally, Mergel et al. (2009) have discovered that digital natives (those who have from birth existed within the digital environment) are a significant motive for the adoption of SM. Additionally, a single characteristic that is significant in these digital natives is that they want to express their sentiments on the web, although they wish to avoid the various repercussions of exposing their personality or their identity online if their accounts are traced (Body, 2007). Aida and Majdi (2014) also upheld the opinion that those nations that have a high UA are generally those that have high levels of e-government services operation and adoption. The young generation are generally perceived as agents who will manifest the desire for change within their society (Shah & Abraham, 2009). Indeed, by 2010, 85% of all the world’s youth will inhabit developing nations, assuming culture is not immovable and alters over time (Moghadam & Assar, 2008).
4.3.3 Individualism vs. Collectivism (IDV)

The adoption of a new idea like that of e-government may be seen as a sentiment of content with regard to the group that holds power (Zhao, 2011). Therefore, those nations that have a greater stress in this group may demonstrate a smaller extent of e-government adoption (Kovacic, 2005). Individuals or nations that are more individualistic in their outlook are educated as regards stating their personal opinions and thus are keener to be innovative and utilise new concepts (Ebrumban & de Jong, 2006). Despite this, one more stalwart of developments in recent history is that of mobile devices and mobile services, and this is especially true of developing nations and the least-developed countries too (United Nations E-government Survey, 2010). The rate of adoption and use of mobile devices will probably result in the evolution of e-government within highly collectivist nations, as the cultures of these nations will follow trending information and trends more fastidiously than non-collectivist cultures (Zhao, 2011).

4.3.4 Masculinity vs. Femininity (MAS)

One could also argue that, in those nations which are of high masculinity in nature, there may be a more lenient perspective on the implementation of ICT (Hofstede, 2001), assuming the technology is able to boost efficacy or expediency or assist competitiveness, all of which are significant aspects of a masculine culture. Others maintain the opposite, as females are more caring of those in vulnerable positions, and prefer relationships as well as a higher quality of life. Thus, the femininity dimension may have a positive impact on e-government services too (Aida & Majdi, 2014). In short, the masculinity/femininity dimension could have a mixed influence of IT technology, according to Rhaman (2009).

5. Proposed Research Model

The UTAUT model is extended by integrating cultural factors identified by Hofstede: masculinity, uncertainty avoidance, power distance and collectivism. Trust is a significant factor of the SM environment to examine and predict the user’s adoption, and increases the user’s intent to utilise SM platforms; thus the UTAUT model is extended to integrate trust as an external variable to examine the influence of trust on UTAUT constructs towards citizens’ adoption of SM. To involve the motivation factors, the model is extended and the factor split into extrinsic motivation (from governments as service providers and from attributes of SM) and intrinsic motivation (from individual characteristics). The independent variables are the original UTAUT model factors: performance expectancy, effort expectancy and social influence. Facilitating conditions as determinants of behavioural intention or use behaviour have been excluded from this study as the authors believe that the sample population was already utilising SM. They also had the necessary hardware and software to facilitate this use. Utilisation of SM in e-government remains relatively nascent; the authors selected behavioural intention as their dependant variable, and so the actual usage behaviour was therefore excluded from the model proposed herein. This, the authors believe, does not limit the model in any significant way, and according to Venkatesh and Davis (2000), there exists considerable empirical assistance concerning behaviour and intention.

The proposed model is depicted in Figure 1. The arrows show the relationship among constructs and the hypotheses established for each relationship.
5.1 Research hypotheses

On the basis of the literature review and the discussions above, the following hypotheses can be developed:

Core factors of UTAUT

\[ H1, H2 \text{ and } H3: \text{ Performance Expectancy, Effort Expectancy and Social Influence of SM for e-government services will have a positive and significant influence on the citizen’s behavioural intention towards the adoption of SM for communication with the government.} \]

Perceived motivation

\[ H4a: \text{ Incentives, as motivation, will have a positive and significant influence on the performance expectancy of SM adoption for communication with the government.} \]

\[ H4b1, H4b2: \text{ Accessibility will have a positive and significant influence on performance expectancy and upon effort expectancy of SM adoption for communication with the government.} \]

\[ H5a1, H5a2: \text{ Ubiquity, as an attribute of SM, will have a positive and significant influence on performance expectancy and effort expectancy of SM adoption for communication with the government.} \]

\[ H5b: \text{ Interactivity, as an attribute of SM, will have a positive and significant influence on performance expectancy of SM adoption for communication with the government.} \]

\[ H6a, H6b \text{ and } H6c: \text{ Virtual social identity, Virtual altruism and Virtual telepresence will have a positive and significant influence on citizens’ behavioural intention towards the adoption of SM for communication with the government.} \]
Trust factors

H7a, H7b: Trust in government and trust in technology will have a positive and significant influence on citizens’ behavioural intention towards the adoption of SM for communication with the government.

Culture influence

H8a, H8b, H8c and H8d: Power distance, uncertainty avoidance, Individualism / Collectivism and Masculinity / Femininity factors, from a cultural perspective, will have a positive and significant influence on citizens' behavioural intention to adopt SM for communication with the government.

6. Proposed methodology

According to Blalock (2005), the three main criteria of any theory are: identifying the constructs; specification of relationships between constructs; testing of relationships. The first two criteria have been expounded upon, while the third criterion, the connection between the above-mentioned constructs from the basis for the research hypothesis to measuring the significance of these factors, and will be examined in the light of a quantitative research approach. The quantitative research approach has a significant impact on testing, analysing and validating hypotheses. Therefore, a survey will be utilised for the data collection stage on the consideration of participants from different SM user citizen groups, and will be administered through web surveys; social networking sites will be used to share the survey link, and the statistical methods below used to analyse the survey.

7. Conclusions, contributions to knowledge and limitations

SM has been utilised by several governments in order to provide an alternative communication channel with their citizens. Many people use SM for social and commercial purposes, avoiding governmental communication, and the argument propounded within this research recommends making SM a more useable channel of communication channel for government-citizen dialogue. Those factors affecting citizens’ adoption of SM must be investigated. The importance of identifying these factors stems from their potential to enhance governmental implementation of SM, and their ability to devise more efficacious policies and strategies based on knowledge of the most important factors. Those critical factors and hypotheses discussed herein play a significant role in understanding and analysing SM adoption.

This paper seeks to contribute at both a theoretical and empirical level towards an improved understanding of using SM tools in the government context. The primary advantage of this paper is that those predictors of government2.0 are derived from previous empirical evidence and behavioural theories. This guarantees that the theoretical model suggested herein is sounder, more viable and reliable, and that it creates a basis upon which prospective empirical studies may be conducted on the adoption of SM in the context of e-government. This model can utilised for comparable assessments using different data or a different sample, thereby enabling comparisons of different nations’ data.

This research’s main limitation was its restriction to SM-user citizens. Therefore, this study excluded some factors such as facilitating conditions and other potential factors that may impact SM adoption among non-SM-user citizens. Thus, the results of this research may be difficult to generalise for a nation’s total citizenry. Furthermore, only four cultural dimensions have been chosen, and the fifth dimension to this model, long-term orientation (LTO), was excluded, which covers only a limited number of countries. Although the study by Hofstede, Hofstede and Minkov (2010) presented new measurements concerning almost all countries with a score in other dimensions, such a dimension remains unutilised as the information remains comparatively contemporaneous.

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References


E-Availability and E-Accessibility of Financial Documents: A Cross-State Examination of U.S. County Websites

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Abstract: This article examines the e-availability and e-accessibility of financial documents through county websites in the United States (U.S.). E-availability and e-accessibility of financial documents supports a stakeholder-centric approach for evaluating performance and fiscal conditions of county governments, while also promoting democratic values of transparency and accountability. Previous research addresses e-availability and e-accessibility for cities, only one analysis reviews popular reports in both cities and counties, and only one study exists that exclusively focuses on the 100 most populous U.S. counties. Our review extends earlier research by examining 237 U.S. counties, up to five in each of the 48 states with county governments. Additionally, this research makes a limited comparison with an earlier study to indicate changes in the e-availability and e-accessibility of financial documents over a four-year period. Using systematic sampling and content analysis, this study contributes to fuller understanding of the significance of financial documents as a feature of e-government, while reviewing more counties and highlighting variations among counties of differing population sizes. This research also conducted Chi-square tests to examine the relationship of the variables, and the value of Cramér’s V was calculated to measure the strength of the relationship between the variables. In addition to finding variations in the e-availability and e-accessibility of financial documents among counties of different population sizes, this analysis also demonstrates dramatic e-availability improvements for two of the three selected financial documents while noting a modest decrease in the overall e-accessibility of financial documents on county websites. After reporting and analyzing the findings, research limitations are disclosed, and recommendations are offered to advance the state-of-practice and for further studies. This form of benchmarking may assist other local governments in the U.S. with improving their websites, while internationally this analysis supports developing countries with refining their e-government strategies by improving online information disclosure.

Keywords: E-government; e-availability; e-accessibility; financial documents; state-of-practice; transparency; accountability

1. Introduction

1.1 Background

The aftermath of the Great Recession has increased concern among stakeholders regarding financial issues at all governmental levels, including at the county level. These stakeholders include, but are not limited to, citizens, vendors, municipal bond investors, managers, elected policymakers, employees, academic researchers, and the news media. The obtainability of essential financial information provides the necessary means for evaluating operational performance and fiscal conditions of county governments. Hence, the e-availability (EAV) and e-accessibility (EAC) of county financial documents are salient features of e-government, as these documents provide a cost-effective medium for disclosure of pertinent financial information.

The Internet has unleashed mediating technology that can be used to generate and to distribute government information efficiently (Baker, 2009; Baker and Rohm, 2013; Roman and Miller, 2013). This efficiency provides an opportunity “to create a more transparent and connected democracy” (Knight Commission, 2009: XIII). While some evidence suggests potentially undesirable effects associated with information transparency (Bannister and Connolly, 2011), such information availability serves as a staple of a respectable government (Harrison and Sayo, 2014; McMurray, 2013), and may foster political efficacy as well as influence political participation (Lee and Huang, 2014). The EAV and EAC of online government data is correlated with positive attitudes towards governmental transparency and accountability, and increases the trust constituents have with the government (Belanche, Casaló, and Guinàliu, 2012; Welch, Hinnant, and Moon, 2005). The citizens who evaluate local government favorably with regards to sharing information tend to be more satisfied with other parts of civic life (Lee and Huang, 2014; Miori and Russo, 2011; Mousa, 2013; Rainie, Purcell, Siesfeld, and Patel, 2011). When citizens feel empowered with reliable information, they are more likely to engage with...
local government operations in a satisfying way (Yavuz and Welch, 2014). Those who are satisfied and content with their local government’s effort to promote transparency tend to have a more positive feeling towards the performance of local institutions.

1.2 Context

Stakeholders seek to monitor and constrain public agency spending through attentiveness and accountability. The oversight of limited financial resources compels public vigilance and fiscal transparency (Mikesell, 2014); however, usability problems continue to plague many governmental websites (Huang and Benyoucef, 2014), including those related to the EAV and EAC of financial documents.

Normatively, transparency is one of the main principles of an open and transparent government (Linders and Wilson, 2011), and transparency ranks as a stakeholder-centric public service value (Chatfield, 2009; Ettioni, 2010; Monlina and McKeown, 2012; Park and Blenkinsopp, 2011). While the concept is revered as a public service virtue (Heald, 2012), the concurrence on a definition for transparency is contentious and elusive (Florini, 2007). This study operationalizes transparency as the availability (or disclosure) and accessibility of information (Wijnhoven, Ehrenhard, and Kuhn, 2015) by an organization that enables stakeholders to assess the organization’s financial performance (Grimmelikhuijsen and Welch, 2012; Heald, 2006). EAV and EAC make information visible to stakeholders (Monlina and McKeown, 2012) and therefore allow citizens to scrutinize their government. The use of government websites is a core feature of contemporary governmental transparency (Grimmelikhuijsen, Porumbescu, Hong, and Im, 2013) with the potential to deter government corruption (Hood, 2001).

Transparency is also a prerequisite for public accountability (Bovens, 2007; Hood, 2001), in that it clarifies to stakeholders “who is responsible for what” (Norris, Bennett, and Entman, 2001: 102). “Democratic accountability requires governments to increase transparency, disclosing more information to citizens, hence promoting public expenditure scrutiny and preventing corruption and wasting of public resources” (Lourenço, Moura e Sá, Jorge, and Pattaro, 2013: 280). Public agencies must demonstrate they are carrying out their constituency’s preferences (Page, 2006) or risk an adverse reaction.

1.3 Review of Existing Studies on EAV and EAC of Local Government Financial Documents

The literature review identifies six existing studies of EAV and EAC of local government financial documents, four of which cover cities, another of which reviews both cities and counties, and one of which examines only counties. The two studies of cities focus on municipalities beyond U.S. borders. Laswad, Fisher, and Oyelere (2005) find that leverage (ability to borrow), municipal wealth, press visibility, and council type are associated with EAV and EAC of financial documents in New Zealand, while Perez et al. (2008) examine Spanish municipalities and concluded that cities are motivated to reduce public financing costs through EAV and EAC of financial documents through websites. The two studies posit that better transparency through websites improves stakeholders’ confidence in the performance of public agencies.

Groff and Pitman (2004) analyzed the EAV and EAC of financial documents on the websites of the 100 most populous U.S. cities. They scrutinized the EAV and EAC of city budgets, comprehensive annual financial reports (CAFRs), and summaries of those documents relative to the population size. They found that population size influences the posting of financial documents on city websites. Styles and Tennyson (2007) reviewed the EAV and EAC of financial documents from 300 U.S. cities, and concluded that cities use the Internet effectively to promote transparency and accountability. Their study finds, among other factors, that financial documents are more available and accessible in the more populous cities. Yusuf et al (2013) focused on “popular financial reporting” and surveyed both U.S. cities and counties. Popular financial reports refer to simplified versions of more legally regulated reports (GFOA, 2015). Their research found that 75% of large cities and counties provide some form of popular financial reports on their respective websites, and those documents attempt to improve transparency and accountability.

There is only one study that investigates the EAV and EAC of the 100 most populous counties (Baker and Rohm, 2013). The authors established an earlier and smaller baseline than the current analysis and included comparisons with the 100 most populous cities in the Groff and Pitman (2004) study. The current study replicates the Baker and Rohm research and expands knowledge and comprehension about the EAV and EAC in counties. This study provides a more current and updated inquiry, examines more county websites, and
covers additional states that previous studies have omitted. This research also provides a limited comparison with 33 of the Baker and Rohm counties which were studied four years earlier.

1.4 Contribution

The aim of this comprehensive study is to permit a broader foundation from which to advance recommendations to improve the current state-of-practice. This review provides the most current and broadest examination of the EAV and EAC of county financial documents to date. Contrary to other studies (Groff and Pitman, 2004; Baker and Rohm, 2013), this research considers various population sizes rather than exclusively focusing on the most populous local governments. In the U.S., this form of benchmarking assists and informs other local governments on methods of improving their websites, while internationally, the analysis supports developing countries in refining their e-government strategies by responding to the need for critique methodologies that assess online information disclosure (Lourenço et al, 2013).

To begin, we review the Government Finance Officers Association (GFOA) best practices pertaining to the posting of financial documents on local government websites. The counties are then introduced and critical reporting elements are characterized, and the research design explained. Finally, we provide the findings concerning county websites, and contemplate the stakeholder implications, study limitations, contributions to the state-of-practice, and ideas for future research.

2. Review of Local Government Financial Documents

2.1 Local Government Financial Documents on Websites

Financial documents provide fiscal disclosure about local governments, while e-government websites supply attractive advantages as a reporting medium (Baker, 2006; Baker and Rohm, 2013; Eyob, 2004; Perez, Bolivar, and Hernandez, 2008; Perez, Hernandez, and Bolivar, 2005; Roman and Miller, 2013). These websites provide interested users a fairly inexpensive method to review essential documents at the user’s convenience. There are many documents local institutions may disclose to interested individuals, but the best practices guidelines recommend posting of budgets, comprehensive annual financial reports (CAFRs), and audits (GFOA, 2015).

The GFOA promotes public financial management by developing fiscal strategies, policies, and best practices for local government institutions. In particular, the GFOA also evaluates the benefits of posting local government financial documents, including transparency, accountability, and user friendliness, to local government stakeholders (GFOA, 2015). Table 1 provides a summary of the nine GFOA best practices that support provisions for EAV and EAC of financial documents.

The best practice summaries contribute to the evolving interest in posting local government financial documents. An examination of the best practices entitled “Presenting Official Financial Documents on Your Government’s Website” is especially germane. This GFOA (2015) practice, adopted in 2009, urges the timely Internet posting of governmental financial documents to demonstrate transparency and accountability. The benefits of website presentation include: (1) communicating through Internet availability; (2) serving the widest possible audience without charge; (3) increasing interaction avenues; (4) facilitating data analysis by users; (5) providing a one-stop venue for financial documents; (6) economizing on document dissemination costs; and (7) broadening the scope of information through hyperlinks.

2.2 Counties

The state governments are divided geographically into 3,066 county regions, with 48 states having county governments (National Association of Counties [NACO], 2014). Counties fill a broad and critical public service delivery role across most of the U.S., partially supported in part by public debt financing. The NACO estimates that county governments receive over $482 billion in revenue (2014) and the U.S. Census Bureau (2007) calculates that short- and long-term debt outstanding for counties is approximately $262 billion. The large size of the numbers underscores stakeholder interest in the EAV and EAC of financial documents through county websites. Consequently, NACO advocates the use of county websites as an effective communications channel (NACO, 2013), but only one exclusively county-based review of county postings exists (Baker and Rohm, 2013).
Table 1: GFOA Best Practices Related to the EAV and EAC of Financial Documents

<table>
<thead>
<tr>
<th>Year</th>
<th>Best Practice Title</th>
<th>Summary of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Using websites to improve access to budget documents and financial reports</td>
<td>Posting of budgets and CAFRs on government websites.</td>
</tr>
<tr>
<td>2006</td>
<td>Preparing popular reports</td>
<td>Post popular reports covering CAFRs designed for those requiring only an overview of a public agency’s financial condition.</td>
</tr>
<tr>
<td>2008</td>
<td>Improving the timeliness of financial reports</td>
<td>Improve the timeliness of financial reports to inform decision making.</td>
</tr>
<tr>
<td>2009</td>
<td>Presenting official financial documents on your government’s website</td>
<td>Demonstrate transparency and accountability through availability and accessibility of financial documents on your governmental website.</td>
</tr>
<tr>
<td>2010</td>
<td>Using a website for disclosure</td>
<td>Use a website to disseminate information to the municipal securities markets regarding debt, financial condition, and related information.</td>
</tr>
<tr>
<td>2010</td>
<td>Preparing an effective summary plan description for retirement systems</td>
<td>Prepare and post a retirement system plan description on government websites.</td>
</tr>
<tr>
<td>2010</td>
<td>Understanding your continuing disclosure responsibilities</td>
<td>Adopt a continuing disclosure policy including voluntary financial information that is readily available to stakeholders if your jurisdiction is pursuing a debt management program.</td>
</tr>
<tr>
<td>2010</td>
<td>Maintaining an investor relations program</td>
<td>Provide full and comprehensive disclosure including annual budgets, CAFRs, and financial information sent to governing bodies.</td>
</tr>
<tr>
<td>2014</td>
<td>Communicating capital improvement strategies</td>
<td>Develop communication plans using multiple methods, including a website.</td>
</tr>
</tbody>
</table>


2.3 Financial Documents for Counties

The GFOA recommends posting the budget to a public agency’s website because they convey critical financial information about the county, identifying revenues, appropriations, planned services, staffing, operational programming, and capital outlays. The county budgets also trace year-to-year changes, community priorities, performance measures, and spotlights troublesome fiscal issues. The budget presents policy perspective with a long-term viewpoint, link resources to organizational objectives, and communicates the service vision to stakeholders (GFOA, 2015).

Municipal bond investors are not only concerned with initial disclosure when public agencies seek bond financing, but they also demand ongoing disclosure to monitor the security of their investments, which depends on timely financial information. As a consequence, the U.S. Securities and Exchange Commission (SEC) requires counties, as municipal securities issuers, to furnish financial information (GFOA, 2015). The GFOA recommends that all state and local governments publish a CAFR to meet fiscal reporting responsibilities. The GFOA urges local institutions to issue the report within six months of the fiscal yearend and allow the CAFRs to be available on their websites.

Audit standards for the spending of federal funds by sub-national governments fall under the U.S. Office of Management and Budget, Circular A-133 (U.S. Office of Management and Budget, 2014). This covers counties that function as service agents for certain federal services, and counties that are receiving federal funds of $500,000 or more in a year are required to have a single county audit (SCA), which encompasses financial reports and federal awards. The SCA findings may be embedded in a jurisdiction’s CAFR, but stakeholders look for these audits independent of a county’s CAFR (Baker and Rohm, 2013). The SCA is not directly identified by the GFOA for website display; however, the audit provides stakeholders with essential information regarding internal controls and financial accuracy for a given county. The SCA is in the class of documents that the GFOA encourages for website posting. The Baker and Rohm study (2013) included reviews of SCAs, while the Groff and Pitman analysis (2004) did not address audit reports. In this study, we provide a report on whether SCAs are available and their accessibility independent of the CAFR.
3. Research Design

3.1 Content Analysis Methodology of County Websites

This research utilized content analysis to study the EAV and EAC of financial documents on websites as established by previous researchers (Baker, 2006; Baker, 2009; Baker and Rohm, 2013; Groff and Pitman, 2004). Content analysis examines manifest content in such studies, and this relates to what is visibly discernible (Babbie, 2013). The investigators developed a coding protocol for measurement, and the reviewing and reporting of the results will interprets patterns, trends, and themes reflective of the data (Baker, 2009).

There are two principal advantages to utilizing content analysis for website-focused research. First, this technique structures a methodology for quantifying the website contents and interpretive analysis, therefore permitting a systematic scrutiny for making inferences (Chambliss and Schutt, 2012; McNabb, 2013). Second, content analysis has the advantage of being unobtrusive (Babbie, 2013). The observation has no effects on the subject of analysis, hence the researchers are able to experience the usability of a county website as a stakeholder would while reviewing the available posted financial documents.

Conceptually, the EAV of a financial document is the dichotomous observation of whether a website visit locates the document of interest. Website visits determine the EAV of three current fiscal documents, and timeliness is established by the publication dates. All website visits occurred during July and August 2014 and the reporting parameters of the financial documents are specified in Table 2. Financial documents that were outside of the established Table 2 date parameters are not included in the study.

<table>
<thead>
<tr>
<th>Timeliness for Financial Documents</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2014-2015 Proposed Budget</td>
<td>Budget</td>
</tr>
<tr>
<td>2 June 30, 2013, CAFR</td>
<td>CAFR</td>
</tr>
<tr>
<td>3. June 30, 2013 Single County Audit</td>
<td>SCA</td>
</tr>
</tbody>
</table>

3.2 Research Design

The research design expanded on previous work and contributes to a broader descriptive baseline of financial documents that are posted on county websites. This analysis sufficiently replicated the Baker and Rohm (2013) study to make qualified, general comparisons between 33 of the 100 most populous counties that were studied earlier and the 237 current stratified samples. The earlier Baker and Rohm study’s data collection took place in April and May 2010, which was four years earlier than the evaluation conducted by the present research.

The unit of analysis was the individual county websites from the 237 stratified samples. Data were collected through online visits that reviewed manifest content of the individual county websites. First, EAV of financial documents were recorded dichotomously, indicating whether the documents were available or omitted from the government website. Second, the number of navigational clicks from a website’s home page to a document operationally established the EAC. Baker and Rohm (2013) calculated the mean distance (number of clicks) between budget, CAFR, and SCA documents to determine EAC and whether certain financial disclosures are favored over others. This study is enriched beyond the Baker and Rohm effort by considering a relatively new accessibility feature referred to as Quick Links (QLs). The QLs feature is conceptually and operationally defined in the next section. The data collection is summarized through tables that report on the EAV and EAC of financial documents among the 237 counties. There is also a comparison made between the relative changes of EAV and EAC among the 33 counties from 2010 to 2014.

3.3 Sampling for the Study Population

The process of implementing systematic sampling at standard intervals provides an appropriate resource saving strategy (Särndal, Swensson, and Wretman, 2003) to glean data regarding the posting patterns of county websites. This study used 2010 population data reported by NACO (2014) in July 2014 for selecting the stratified samples. Using systematic sampling, starting with the most populous county to the least populous county, five counties were selected from each state at standard intervals. Where a state has less than five
counties (i.e. Delaware and Hawaii) all counties were counted. Where the number of counties within a state is not divisible by five, the counties selected were at standard intervals, rounded to the nearest whole number, commencing with the most populous county.²

The use of systematic sampling is designed to provide a more balanced view on the state of EAV and EAC of financial documents across a more extensive representation of counties in the U.S. The implementation of systematic sampling in the research design was appropriate due to the heterogeneity of U.S. counties. A systematic sample at standard intervals was used for three reasons. First, it provided a wider range of websites compared to the previous Baker and Rohm (2013) study. This established a much broader county baseline of the EAV and EAC of county financial documents. Second, this method permitted aggregation of segments of the study population for analysis. In this study, we divided the 237 county websites into three tiers of 79 websites each. As a result, the data generated an impression of the higher population counties (ranked 1-79) and labeled “largest counties.” Similarly, the mid-tier population counties (ranked 80-158) are called “medium counties” while the lower tier population counties (ranked 158-237) are considered the “smallest counties.” The population ranges in these three tiers are displayed in Table 3. Finally, systematic sampling ensured the relative comparison groups were evenly disbursed and eliminated the biases caused by clustering when using random sampling.

Table 3: Range of County Population Groupings (N=237)

<table>
<thead>
<tr>
<th>Groupings</th>
<th>Most Populous Within Group</th>
<th>Least Populous Within Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largest (N=79)</td>
<td>Los Angeles, CA 9,818,605</td>
<td>Fond du Lac, WI 101,633</td>
</tr>
<tr>
<td>Medium (N=79)</td>
<td>Tompkins, NY 101,564</td>
<td>Fayette, TX 24,554</td>
</tr>
<tr>
<td>Smallest (N=79)</td>
<td>Lamoille, VT 24,475</td>
<td>Lake and Peninsula, AK 1,631</td>
</tr>
</tbody>
</table>

3.4 EAV and EAC Comparisons Over Time

A secondary objective of this research was to make EAV and EAC change comparisons, albeit limited, over time. The systematic sampling methodology permitted limited comparisons with data collected on the “largest” counties from the Baker and Rohm (2013) study four years earlier. The current study covers 33 counties in its 79 largest counties grouping which also were visited in the Baker and Rohm study. The counties visited in both studies are identified in the Appendix.

3.5 EAC of Financial Documents for Counties

The navigational distance between a website’s home page and the user’s page of interest measures the EAC of a financial document by the most direct route (Baker and Rohm, 2013). This includes the navigational features of (1) search, (2) sitemap, and (3) QLs. According to Baker and Rohm (2013), a search feature refers to a content locator and may be operationally defined as a specific site content locator. A sitemap conceptually equates to a simplified website map and is operationalized as a simplified website map for the novice user. Since the Baker and Rohm study, QLs are increasing in popularity with website designs. Conceptually, they are navigational routes on the website to provide expeditious access to popular information. Operationally, QLs offer novice users the ability to quickly navigate information that is frequently requested on the website. Hence, the number of clicks from the home page to the desired content operationalizes EAC through a single accessibility measure.

3.6 Data Collection Protocol

A data collection process and codebook was developed for recording data from county websites identified through the previously described methodology. The data collection instructions were compiled to train the second investigator and inter-rater reliability was maintained by anomaly referral to the principal investigator (PI) for resolution. Additionally, the PI reviewed all data collected and randomly revisited a minimum of one county website per each state for consistency with the guidelines. In total, the PI revisited 31% of the websites, checking the data worksheets for accuracy.
4. Results of the Cross-State Review

This study conducted Chi-square tests to determine the relationship between the variables in Tables 4, 5, and 6. In addition to the Chi-square tests, the value of Cramér's V was calculated to measure the strength of the relationship between the variables.

4.1 The EAV of Financial Documents

The majority of counties make at least one of the three essential financial documents available on their website. Table 4 reveals that 127, or 53.6%, of the websites visited posted at least one financial document while 110, or 46.4%, did not provide any financial documents at all. Among financial documents posted, current budgets were provided most frequently (47.6%), followed by CAFRs (34.2%), and then SCAs (17.3%). Ideally, to maximize transparency of local government, counties would make the postings of these financial documents a priority. However, the budget, CAFR, and SCAs were available together only 11.8% of the time on the websites examined. The budgets and CAFR postings were available together only on 17.3% of the websites.

While examining the research based on the population size of the counties, the largest counties were found to be more attentive to the EAV and EAC of these pertinent financial documents. The frequency of posting all three financial documents on the larger counties' websites was 31.6%; the budget and CAFR were posted together occurred 30.4% of the time, and the budget and SCA were posted together 5.1% of the time. The results of this study are consistent with earlier studies of cities and counties that found larger counties disclose budgets and CAFRs more frequently than less populated counties (Baker and Rohm, 2013; Groff and Pitman, 2004; Syles and Tennyson, 2007).

In this research, medium counties tended to post the budget with a frequency rate of 46.8%, almost as frequently as the largest counties at 47.6%. CAFRs are posted at the rate of 25.3% with SCAs trailing at 7.6%. The smallest counties post budgets the most frequently of all the financial documents at a rate of 19.0%. SCA and CAFR postings follow with rates of 6.3%. The smallest county posting-freQUENCY bucks the largest and medium frequency of budget, CAFR, and SCA. It is concerning that the smallest counties post no financial documents 77.2% of the time.

Table 4 examined the relationship between the county size and the EAV of financial documents. There is a statistically significant relationship between EAV of financial documents and county size because “Pr” is less than 0.05 (95% confidence) with a Pearson Chi-square of 102.2845 with 14 degrees of freedom. The Cramér’s V is 0.4645, indicating a moderate relationship.

Table 4: EAV of Financial Documents by Counties

<table>
<thead>
<tr>
<th>Financial Document Types</th>
<th>Total 237</th>
<th>Largest 79</th>
<th>Medium 79</th>
<th>Smallest 79</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget, CAFR, &amp; SCA</td>
<td>28 (11.8%)</td>
<td>25 (31.6%)</td>
<td>3 (3.8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Budget &amp; CAFR-only</td>
<td>41 (17.3%)</td>
<td>24 (30.4%)</td>
<td>14 (17.7%)</td>
<td>3 (3.8%)</td>
</tr>
<tr>
<td>Budget &amp; SCA-only</td>
<td>10 (4.2%)</td>
<td>4 (5.1%)</td>
<td>2 (2.5%)</td>
<td>4 (5.1%)</td>
</tr>
<tr>
<td>CAFR &amp; SCA-only</td>
<td>1 (0.4%)</td>
<td>1 (1.3%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Budget-only</td>
<td>34 (14.3%)</td>
<td>8 (10.1%)</td>
<td>18 (22.8%)</td>
<td>8 (10.1%)</td>
</tr>
<tr>
<td>CAFR-only</td>
<td>11 (4.6%)</td>
<td>6 (7.6%)</td>
<td>3 (3.8%)</td>
<td>2 (2.5%)</td>
</tr>
<tr>
<td>SCA only</td>
<td>2 (0.8%)</td>
<td>0 (0.0%)</td>
<td>1 (1.3%)</td>
<td>1 (1.3%)</td>
</tr>
<tr>
<td>No financial documents posted</td>
<td>110 (46.4%)</td>
<td>11 (13.9%)</td>
<td>38 (48.1%)</td>
<td>61 (77.2%)</td>
</tr>
</tbody>
</table>

Pearson Chi-square (14) =102.2845 Pr <0.001 Cramér’s V= 0.4645

*Some websites disclose non-current budgets, CAFRs, and SCAs. Stale-dated disclosures are not counted.

4.2 Navigational Aids and EAC for Financial Documents

Since the ease of use or user friendliness of a website is an important component of promoting transparency, we also reviewed the website navigational features associated with the EAV and EAC of financial documents. Similar to the Baker and Rohm (2013) analysis, budgets, CAFRs, and SCAs are universally supported by portable document formatting (PDF), yet, search, sitemaps, and QLs are used relatively infrequently. The search assistance feature is available more commonly than other navigational assistance, followed by sitemaps, and
lastly, QLs. All three navigational aids focus predominantly on the budget, followed by the CAFR, and then the SCA.

Table 5 reports the frequency of search, sitemap, and QLs as navigational aids for locating the budgets, CAFRs, and SCAs. The budgets are favored once again with the search feature, which was available 37.9% of the time. The sitemap and QLs are available 15.6% and 4.6% of the time, respectively. The search feature in 26.2% of the instances supports the CAFRs, while sitemap follows at 25%, and CAFR at 2.5%. SCAs are poorly supported by the search function (14.3%) and sitemap (5.1%). There was only one county that provided QLs to assist the user with locating the SCA (0.4%).

The largest counties are more likely to supply navigational aids than the medium and smallest counties. This ranges from twice to four times as likely for search on budgets. On the CAFRs, the search feature is available on the largest counties’ websites over three times as frequently. The smallest counties trail substantially behind the largest and medium counties on the availability of sitemaps. All counties use QLS relatively rarely to support user accessibility to CAFRs. While the largest counties use the search feature only 31.6% of the time for SCAs, the medium and smallest counties rarely use the search feature for SCAs, 6.3% and 5.1% of the time, correspondingly. The largest counties provide the sitemap feature occasionally, at 11.4% of the time. The findings stand in stark contrast with the sitemap assistance in medium and small counties, which are at 3.8% and 0% respectively. There was only one county, among the largest counties, that uses QLS for accessing SCAs.

Table 5 analyzed the relationship between county size and the ability to locate financial documents using search, sitemap, and quick links navigational tools. All the results indicate a statistically significant relationship. For the budget, the Pearson Chi-square is 58.5450 with 12 degrees of freedom. The Cramér’s V is 0.3514, suggesting a moderate relationship. The CAFR has a Pearson Chi-square of 77.6431 with 10 degrees of freedom. The Cramér’s V is 0.4047, suggesting a moderate relationship. The SCA has a Pearson Chi-square of 33.1296 with 8 degrees of freedom. The Cramér’s V is 0.2644, indicating a moderately weak relationship.

### Table 5: Frequency of Search, Sitemap, and Quick Links Navigational Aids for the Budget, CAFR, and Single Audit

<table>
<thead>
<tr>
<th>Financial Document Types</th>
<th>Total 237</th>
<th>Largest 79</th>
<th>Medium 79</th>
<th>Smallest 79</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budget</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>90 (37.9%)</td>
<td>52 (65.8%)</td>
<td>26 (32.9%)</td>
<td>12 (15.2%)</td>
</tr>
<tr>
<td>Sitemap</td>
<td>37 (15.6%)</td>
<td>17 (21.5%)</td>
<td>17 (21.5%)</td>
<td>3 (3.8%)</td>
</tr>
<tr>
<td>QLS</td>
<td>11 (4.6%)</td>
<td>6 (7.6%)</td>
<td>4 (5.1%)</td>
<td>1 (1.3%)</td>
</tr>
<tr>
<td>Pearson Chi-square (12)</td>
<td>=58.5450</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.3514</td>
<td></td>
</tr>
<tr>
<td><strong>CAFR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>62 (26.2%)</td>
<td>45 (56.9%)</td>
<td>13 (16.5%)</td>
<td>4 (5.1%)</td>
</tr>
<tr>
<td>Sitemap</td>
<td>25 (25%)</td>
<td>12 (15.2%)</td>
<td>12 (15.2%)</td>
<td>1 (1.3%)</td>
</tr>
<tr>
<td>QLS</td>
<td>6 (2.5%)</td>
<td>4 (5.1%)</td>
<td>1 (1.3%)</td>
<td>1 (1.3%)</td>
</tr>
<tr>
<td>Pearson Chi-square (10)</td>
<td>=77.6431</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.4047</td>
<td></td>
</tr>
<tr>
<td><strong>SCA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>34 (14.3%)</td>
<td>25 (31.6%)</td>
<td>5 (6.3%)</td>
<td>4 (5.1%)</td>
</tr>
<tr>
<td>Sitemap</td>
<td>12 (5.1%)</td>
<td>9 (11.4%)</td>
<td>3 (3.8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>QLS</td>
<td>1 (0.4%)</td>
<td>1 (1.3%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Pearson Chi-square (8)</td>
<td>=33.1296</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.2644</td>
<td></td>
</tr>
</tbody>
</table>

As mentioned before, the EAC of the budgets, CAFRs, and SCAs is pertinent for local governments. The process of promoting transparency and accountability with local governments requires the ability for stakeholders to readily access financial records. The distance between a jurisdiction’s homepage and the document measures the relative accessibility, as established by previous studies (Baker and Rohm, 2013; Groff and Pitman, 2004). Consequently, the page counts (navigational clicks) from a home page via the most direct route to a document is tracked in this study. A click of “1” represents a direct line from the home page or a direct link from a navigational aid (e.g., sitemap) (Baker and Rohm, 2013). The clicks serve as the unit of measure for the webpages antecedent to a financial document.

Table 6 notes the EAC from the home page to the budgets, CAFRs, and SCAs where posted. All posted budgets may be reached within six clicks while 89 (76.1% of those posted) are accessible within three clicks or less. All of the disclosed CAFRs are accessible within a slightly higher count of seven clicks, while 55 (67.9% of those disclosed) can be accessed within the three clicks benchmark. Like budgets, all 41 SCAs are accessible within six clicks, while twenty-three (56.1% of those accessible) achieve the three-click benchmark.
Table 6 observed the relationship between the size of the county with the number of clicks from the homepage to the financial documents. The results were all statistically significant and indicate a moderate relationship. The budget had a Pearson Chi-square of 74.2452 with 12 degrees of freedom. The Cramér’s V is 0.3958. The CAFR has a Pearson Chi-square of 88.9466 with 14 degrees of freedom. The Cramér’s V is 0.4332. The SCA has a Chi-square of 44.6577 with 12 degrees of freedom. The Cramér’s V is 0.3069.

Table 6 Web Pages Preceding Financial Documents from the Homepage

<table>
<thead>
<tr>
<th>Financial Document Type</th>
<th>Clicks</th>
<th>Total</th>
<th>Largest</th>
<th>Medium</th>
<th>Smallest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>(N=113)</td>
<td>2</td>
<td>33</td>
<td>15</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>43</td>
<td>30</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>19</td>
<td>10</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pearson Chi-square (12) = 74.2452</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.3958</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFR</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>(N=81)</td>
<td>2</td>
<td>16</td>
<td>9</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>38</td>
<td>26</td>
<td>8</td>
<td>4</td>
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<td></td>
<td>4</td>
<td>14</td>
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<td>0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pearson Chi-square (14) = 88.9466</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.4332</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>(N=41)</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>16</td>
<td>11</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pearson Chi-square (12) = 44.6577</td>
<td>Pr &lt; 0.001</td>
<td>Cramér’s V = 0.3069</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 provides an EAC analysis of the county websites that were examined, demonstrating our findings that budgets are the most accessible financial document, at just 2.85 mean clicks from the homepage; this is 15.8% more accessible than CAFRs, at 3.30 mean clicks, and 21.4% more accessible than SCAs, at 3.46 mean clicks. Further, the mean web pages preceding the financial documents from all counties is 2.85, or just under the three clicks. However, when the documents are available in small and medium counties, they are available quite readily with a mean of the medium (2.76) for medium sized counties, and a mean of 2.2 for the smallest counties, which is lower than both the largest (3.07) counties and the mean total of all counties (2.85).

Table 7 Mean Clicks of Web Pages Preceding Financial Documents from the Homepage

<table>
<thead>
<tr>
<th>Financial Document Type</th>
<th>Mean total</th>
<th>Mean largest</th>
<th>Mean medium</th>
<th>Mean smallest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>2.85 (N = 113)</td>
<td>3.07 (N = 61)</td>
<td>2.76 (N = 37)</td>
<td>2.2 (N = 15)</td>
</tr>
<tr>
<td>CAFR</td>
<td>3.30 (N = 81)</td>
<td>3.5 (N = 56)</td>
<td>2.85 (N = 20)</td>
<td>2.8 (N = 5)</td>
</tr>
<tr>
<td>SCA</td>
<td>3.46 (N = 41)</td>
<td>3.67 (N = 30)</td>
<td>3.17 (N = 6)</td>
<td>2.6 (N = 5)</td>
</tr>
</tbody>
</table>

4.3 EAV and EAC Changes Over Time

Our research also seeks to monitor accessibility of financial documents over time. Thus, we recorded the difference between the data for the 33 counties captured in both the Baker and Rohm (2013) and the current study. The Appendix identifies those counties that are among the most populous 100 counties from the earlier study and revisited four years later under the current study’s 79 largest grouping. This allows reporting changes in EAV and EAC of financial documents in Table 8. In summary, budget EAV remains the same over the four-year gap while CAFR EAV has increased by 71% and SCAs by 90%.
Table 8 Baker and Rohm (2013) Financial Document EAV Comparisons to the Current Analysis ($N = 33$)

<table>
<thead>
<tr>
<th>Financial Document</th>
<th>Baker and Rohm</th>
<th>Current Study</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>29</td>
<td>29</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>CAFR</td>
<td>17</td>
<td>29</td>
<td>+12 (71%)</td>
</tr>
<tr>
<td>SCA</td>
<td>10</td>
<td>19</td>
<td>+9 (90%)</td>
</tr>
</tbody>
</table>

Table 9 Baker and Rohm (2013) Mean Click Comparisons to the Current Analysis ($N = 33$)

<table>
<thead>
<tr>
<th>Financial Document</th>
<th>Baker and Rohm</th>
<th>Current Study</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>3.0 ($N = 29$)</td>
<td>3.4 ($N = 29$)</td>
<td>+0.4 (+13.3%)</td>
</tr>
<tr>
<td>CAFR</td>
<td>3.5 ($N = 17$)</td>
<td>3.9 ($N = 29$)</td>
<td>+0.4 (+11.4%)</td>
</tr>
<tr>
<td>SCA</td>
<td>3.7 ($N = 11$)</td>
<td>4.1 ($N = 17$)</td>
<td>+0.4 (+10.8%)</td>
</tr>
</tbody>
</table>

5. Discussion

The intuitive expectation is that as website best practices evolve, the financial documents that are posted would become more accessible. Instead, the county financial documents maintain the approximate same distance from the home page as measured by mean clicks with a slight accessibility decrease. There are at least three possibilities for these results. First, assuming that counties understand the benefits of EAV and EAC of financial documents to stakeholders, public officials are insensitive to these user issues. Second, counties may be making more information available on their websites without periodic redesigning of the website to ensure the maintenance or improvement of accessibility of existing content, including financial documents. Third, counties may be intentionally placing a lower priority on the standalone website posting of SCAs since it is permissible to incorporate them within the CAFR.

The improvement of transparency and accountability are major benefits of posting financial documents on county websites. The emphasis on counties merits further study to encourage the advancement of EAV and EAC of financial documents, because further analysis gives empirical perspective to the differences between counties by relative population groupings. Further, making comparisons with the Baker and Rohm (2013) earlier county financial document research allows a view on the comparative progress of accessibility over a four-year span. One perspective is that the majority of counties (53.6%) post at least one essential financial document on their website, but if said differently, almost half of the counties reviewed (46.4%) fail to post at least one of the three essential financial documents on their websites, and disappointingly, this represents a lost opportunity to increase transparency and accountability through county websites.

The results of this sampling analysis suggest that all counties, regardless of population size, need to be more attentive to improving the EAV and EAC of financial documents. The citizens who employ the many public servants have the desire to be informed of the current financial and budgetary status of their counties. The county financial documents provide critical overviews on public service issues, liquidity, financial solvency, employee compensation, and pensions that seize media attention (Baker and Rohm, 2013). The lack of attentiveness and responsiveness to the desire of the constituents with regards to these critical documents presents a risk of losing an important method for promoting transparency and accountability among local governments.

Researchers interested in county governmental transparency, accountability, and the advancement of e-government are required to periodically evaluate the usability of county websites. Proactive website evaluation could help identify areas needing substantial improvements, such as website usability or user-friendliness for stakeholders. This can, in turn, lower the sense of distrust and cynicism some may have towards county governments. This research offers external data for county managers and elected policymakers to spur greater efforts to ensure the EAV and EAC of county financial documents.
6. Conclusions

This research advances the study of the EAV and EAC of financial documents and substantially adds to the knowledge of U.S. counties, especially since only one previous study considered counties exclusively. Moreover, the breadth of the research dramatically expands our foundational comprehension of the state-of-practice by examining and grouping the 237 counties in the U.S. by relative population size across the 48 states with county governments.

6.1 Limitations and Future Directions

The research design captured a larger and broader sample of county websites than the previous county-focused research. This study analyzed 237 counties, or approximately 7.7% of the counties in the U.S. using systematic sampling. However, this methodology does not preclude inadvertent sampling bias, which could possibly influence external validity. The methodology permits making distinctions among the largest, medium, and smallest counties as defined by the study. Nevertheless, the sample size is limited and a larger sample size may extract further subtleties among the varied county population groupings with even greater reliability.

Triangulating the EAV and EAC analyses with surveys from (1) county managers, and (2) elected policymakers could be revealing. Earlier studies established content analysis as the methodology of testing the usability of the EAV and EAC of local government websites, but content analysis does not disclose or explain the considerations of county managers and elected policymakers concerning these issues. Such additional insights from county government leaders may enable stakeholders to influence future content availability and design features that affect relative accessibility of government websites.

Research regarding EAV and EAC of financial documents from local governments tends to scrutinize more populous jurisdictions, while relatively smaller jurisdictions are passed over. Future research should examine the issues of EAV and EAC in smaller jurisdictions as well.

More broadly, research on the EAV and EAC emerges as a topic where existing approaches may not suffice and this topic could benefit from further quantitative analysis. The purpose of conducting quantitative and statistical analyses is to provide an overarching evaluation of factors that may affect the underlying effectiveness and inclusivity of the EAV and EAC of financial documents. Even though this research provides a good indicator, the findings did not identify the factors that may contribute to why some counties are better at posting as compared to others. A panel regression analysis could determine what, if any associations exist and could further broaden our knowledge. A regression analysis might examine, for example, geographic location of the counties, unemployment rates, minimum wage rates, number of county employees, incomes per capita, educational levels of the residents, and the racial and gender composition of the counties. These or other variables could provide a more encompassing overview and identify the similarities between counties that do or do not promote the EAV and EAC of financial documents.

There is a possibility that some counties may not have the necessary resources to improve the postings of pertinent financial documents for stakeholders. For example, some counties may have a weak economic base because their region has residents of low socio-economic status. Other counties may have more resources if the counties are located in a different region and have residents of higher socio-economic status. Identifying factors that correlate with increased EAV and EAC may assist public officials with effective policy design and implementation.

6.2 Recommendations

Counties routinely supply intra-document navigational support for the financial documents they post on governmental websites. However, user-friendly support features vary, namely search, sitemap, and QLs, and the differences in navigational support may reflect insensitivity on the part of county officials, or the lack of public demand for the EAV and EAC of financial documents in some communities. The democratic values of transparency and accountability nonetheless call for steadfast adherence to the EAV and EAC of essential financial documents through county websites. County budgets are the most accessible of financial documents among counties followed by CAFRs, and the least accessible are SCAs. This pattern of relative EAV and EAC of county financial documents parallels the pattern reported by prior studies, but the measured decrease in the EAC of financial documents over time is problematic. In comparing previous results to the current analysis, EAC
has eroded. This research has speculated about the possible reasons for this, but clearly further study needs to explore the trend.

The GFOA is a highly influential public financial management resource with national and even international salience. The GFOA currently promotes several “best practices” related to EAV and EAC. Based on the results from our findings, this leads to the following recommendations to the GFOA and public agencies for improving the current state-of-practice:

- Define EAC of financial documents on public agency websites as reachable within the shortest number of clicks from the homepage and no more than three clicks.
- Require the posting of SCAs as a separate document even if the SCAs are included within the CAFR.
- Require the posting of all audits on governmental websites.
- Modify best practices to include guidance on the importance of navigational aids to enhance EAV and EAC through multiple routes (e.g., search, sitemap, and QLs).
- Expand the award criteria for budgets and CAFRs to include an assessment of website EAV and EAC of these documents.

The incorporation of these recommendations into the existing GFOA best practices and similar organizations throughout the world would help public agencies, including counties, to improve the EAV and EAC of financial documents. This strategy would instrumentally assist public agencies, including counties, to improve transparency and accountability. In turn, this could enhance stakeholder trust and collaboration efforts to enrich benchmarking of the EAV and EAC of financial documents among public agencies.

Footnotes:

- Although portals are used to disclose documents for different entities at a single point (Lourenço and Serra, 2014), the GFOA recommends a one-stop venue by jurisdiction for financial documents as a best practice (GFOA, 2015). Regardless of the added value of some portals including multiple entities, our research unit of analysis is individual county websites. Hence, we examine whether financial documents for a particular county are available on a county’s website.
- For example, in a state with 17 counties, the first, fourth, eighth, eleventh, and fifteenth counties would be selected [17 divided by 5 = 3.4 interval. Therefore, rounded calculations are derived as follows: first (1), fourth (1 + 3.4 = 4.4), eighth (4.4 + 3.4 = 7.8), eleventh (7.8 + 3.4 = 11.2), and fifteenth (11.2 + 3.4 = 14.6)].

References


**Appendix: 33 Counties Covered in Baker and Rohm (2013) study and the Current Study**

<table>
<thead>
<tr>
<th>County Name and State</th>
<th>County Name and State</th>
<th>County Name and State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles, CA</td>
<td>Hennepin, MN</td>
<td>Marion, IN</td>
</tr>
<tr>
<td>New York, NY</td>
<td>Fairfax, VA</td>
<td>San Francisco, CA</td>
</tr>
<tr>
<td>Cook, IL</td>
<td>Salt Lake UT</td>
<td>Suffolk, MA</td>
</tr>
<tr>
<td>Harris, TX</td>
<td>Fulton, GA</td>
<td>Multnomah, OR</td>
</tr>
<tr>
<td>Maricopa, AZ</td>
<td>St. Louis, MO</td>
<td>Jefferson, KY</td>
</tr>
<tr>
<td>Miami-Dade, FL</td>
<td>Montgomery, MD</td>
<td>Oklahoma, OK</td>
</tr>
<tr>
<td>Wayne, MI</td>
<td>Milwaukee, WI</td>
<td>Norfolk, MA</td>
</tr>
<tr>
<td>King, WA</td>
<td>Shelby, TN</td>
<td>Jefferson, AL</td>
</tr>
<tr>
<td>Clark, NV</td>
<td>Mecklenburg, NC</td>
<td>Monmouth, NJ</td>
</tr>
<tr>
<td>Philadelphia, PA</td>
<td>Honolulu, HI</td>
<td>Bernalillo, NM</td>
</tr>
<tr>
<td>Cuyahoga, OH</td>
<td>Bergen, NJ</td>
<td>El Paso, CO</td>
</tr>
</tbody>
</table>
Warm Experts in the age of Mandatory e-Government: Interaction Among Danish Single Parents Regarding Online Application for Public Benefits

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¹IT University of Copenhagen
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Abstract: Citizens’ adoption of e-government channels has been the focus of both academic studies and public policy for over a decade. Current efforts seek to reduce citizens’ interaction with caseworkers through traditional channels in favor of increased use of e-government self-service channels. To increase adoption rates and reduce the costs of public administration, the Danish e-government strategy has made e-government self-service channels mandatory thereby attempting to turn citizens into their own caseworkers. The channel choice branch of e-government studies how citizens and businesses choose interaction channels in a public service encounter. Until now, studies of citizens’ channel choice have taken place at the level of the individual and ignored the influence of group processes. Moreover, although the importance of digital literacy has been widely recognized in relation to citizen channel choice and e-government adoption, citizens’ knowledge of public administration and administrative processes has received less attention. To cover this gap, we conducted a qualitative study of how citizen-to-citizen interaction influences channel choice in public service encounters, and how citizens share advice for seeking public benefits. The study entailed five focus group discussions and nine follow-up individual semi-structured interviews with Danish single parents who receive public benefits. We employ domestication theory and the concept of ‘the warm expert’ to inform our analysis. Our findings show that the interaction and advice sharing among citizens extends beyond the choice of channels and also covers how the selected channels are used and evaluated. In addition to helping each other with how to use e-government self-service channels, citizens also share practices for negotiating with public authorities. This negotiation requires the use of traditional channels and concerns areas such as increasing the likelihood of being granted benefits and ways of getting around the mandatory requirement for e-government self-service channels. Based on our findings we present contributions to the channel choice field and offer suggestions for how to expand and update a previous channel choice process model.

Keywords: channel choice, citizen-to-citizen interaction, domestication theory, e-government, multichannel, public benefits, single parents, warm experts

1. Introduction

The digitization of the public sector impacts both administrative processes within government, and government-to-citizen interaction (Bertot & Jaeger, 2008; Chadwick & May, 2003). Citizens’ increased use of self-service e-government channels is regarded as critical to achieving economic savings in public administration (Kernaghan, 2013; Reddick & Anthopoulos, 2014). In Denmark, e-government channels (websites, digital post, online self-service applications) have been made mandatory for multiple public services to lower the costs of public administration.

The channel choice (CC) branch of e-government studies citizens’ and businesses choice of communication channels in public service encounters (Madsen & Krammergaard, 2015; Pierson, 2010). Most CC studies are conducted at the level of the individual citizen. Field experiments and case studies have shown how public authorities can influence citizens’ CC through marketing efforts and by improving communication surrounding a service encounter (Madsen & Krammergaard, n.d.; Teerling & Pierson, 2011; van de Wijngaert, Pierson, & Teerling, 2011). However, there are few studies investigating whether, or how, citizen channel choice, use and evaluation can be influenced by other external parties besides public authorities.

According to domestication theory ‘people construct their own technological practices, but in interaction with other people’s practices’ (Sørensen, 2004). In line with this theory, Bakardjieva (2005) has developed the term ‘warm expert’ to explain how people learn to use information and communication technology (ICT) from someone in their personal network. We contribute to the CC literature, by applying domestication theory and
the concept of ‘the warm expert’ in a study of how citizen-to-citizen interaction influence online public service
counters. The research question guiding our study is:

- How does citizen-to-citizen interaction influence channel choice, use and evaluation for government-to-
citizen interaction?

Our study revolves around single parents’ interaction with the new public authority Udbetaling Danmark
(Payments Denmark) (UDK) regarding family and housing benefits. Family benefits is an umbrella term for
multiple benefits for parents with children under the age of 18. Single parents can receive additional benefits if
they are not living with other adults under ‘marriage-like conditions’. Housing benefits are rent-supplements
to citizens with low household incomes. Some single parents are eligible for additional economic benefits,
which are administered by other authorities. Citizens are required to find information and apply for benefits
on the public web-portal borger.dk (The Danish Government, Danish Regions, & Local Government Denmark,
2011). Following the digitization strategy, traditional letters from public authorities have been replaced by
digital post, a system much like e-mail. Digital post is accessible via borger.dk and the privately run e-Boks. All
of these services require the citizen to login using NemID (EasyID), a digital identification system.

This paper is structured as follows: We first present the CC field, and the gaps we seek to cover. Section three
presents domestication theory and the concept of ‘the warm-expert’, the theoretical lens guiding our study.
Section four presents the methodology for the empirical study. Sections five and six present and discuss the
findings, and implications for research and practice. The final section contains concluding remarks, limitations
and suggestions for future studies.

2. Channel choice literature

Madsen and Kræmmergaard (2015) conducted a literature review of the CC field analyzing 36 papers
published from 2005 – 2014, and divide these into two groups; papers which focus on CC at the level of the
individual citizen, and those who focus on multichannel management (MCM) at the organizational level.
Statistical modeling, especially in the shape of variance models, is the most common method in CC studies.
These studies focus on how factors such as channel characteristics, task and personal characteristics,
situational constraints, and satisfaction with previous encounters influence CC and the resultant satisfaction
with the encounter (Pietersen & Ebbers, 2008; Pietersen, Teerling, & Ebbers, 2008; Reddick, Abdelsalam, &
Elkadi, 2012; Reddick & Anthopoulos, 2014; Reddick & Turner, 2012; Reddick, 2010). Results from CC studies
show that citizens prefer to use the Internet to look up information, but prefer traditional channels such as the
telephone or face-to-face to solve problems (Madsen & Kræmmergaard, 2015). Although social influence has
been found to impact the adoption of technology (Fulk, Schmitz, & Steinfeld, 1990; Venkatesh, Morris, Davis,
& Davis, 2003), there are no studies of citizen CC at the group level.

Teerling and Pietersen (Teerling & Pietersson, 2011) present an alternative to the variance models by studying
individual’s CC behavior through a process model, which is presented in Figure 1. The model is reprinted with
the permission of both authors and publishers.

![Figure 1: Citizen multichannel behavior](image-url)

According to the model, citizen multichannel behavior can be divided into three steps; channel choice, use and
evaluation. When citizen are faced with a task involving public authorities they begin by choosing a channel
among those that are available. They proceed to use this channel, but may switch to, or include, traditional
channels in the interaction if problems arise. Citizens then evaluate the channels used and the overall service
encounter and it becomes part of their experience. In this way their experience can also impact future CC. If
people have had a bad experience with a certain channel, they are less likely to choose this channel again.
Finally, the model shows that an external force, in the case of a government agency, can influence CC through marketing efforts.

Although the model describes the choice and use of an individual channel, the authors highlight that actual use can entail simultaneous use of multiple channels (Teerling & Pieterson, 2011). The model differs from previous CC studies by acknowledging that CC is not just the result of an individual’s cognitive processes, but can also be influenced by external parties. Moreover, it regards CC as a process, which extends beyond the point where a channel is chosen and includes the use of the channel, and evaluation of the interaction afterwards. The model developed by Teerling and Pieterse resembles the expectancy-value models from the Uses and Gratifications tradition in media science (McQuail, 1994; Palmgreen & Rayburn, 1985), which propose that people choose media to obtain certain perceived gratifications, and the evaluation of their media experiences feed back into future choices. Teerling and Pieterse’s model differs from the expectancy-value model, however, in that it does not include people’s beliefs as a factor which might influence CC.

Teerling and Pieterson (2011) identify four instruments a government agency can employ to increase citizens’ choice of e-government channels; communication, legislation, economical incentives, and the quality of the web service itself. Through a mixed method study they measure how citizens perceive these instruments. They find that ‘the combination of well-designed web services and communication regarding these possibilities seems to be the strongest combination that influences citizen multichannel behavior.’ (Teerling & Pieterson, 2011, p. 179).

The process model is supported by empirical studies. Teerling and Pieterson (2010) conducted an experiment which showed that a letter could be used to guide citizens online. Madsen and Kræmmergaard (n.d.) present a case study of how a public authority experienced increased use of an online self-service application, and a large reduction in calls, after re-designing an online application and improving the surrounding communication.

However, Teerling and Pieterson do not examine if and how other external parties can influence CC. Nor do they study the influence of external parties on channel use and evaluation, which occurs after a channel has been chosen. By including other citizens as influential external partners, we wish to address these gaps and expand the existing knowledge about CC. To do this we conducted an empirical study, which examines how citizens influence each other’s CC and interaction with public authorities. Having presented the gaps we seek to cover, we now turn to our theoretical lens; Domestication theory and the concept of ‘the warm expert’.

Theoretical lens: Domestication theory and ‘the warm expert’

Domestication theory was developed by British and Scandinavian researchers in the 1990’s by combining elements from anthropology and consumption studies with Science and Technology Studies (STS) and reception analysis (Berker, Hartmann, Punie, & Ward, 2005; Haddon, 2011). Domestication theory has mainly been used to study the processes whereby people reject or make media technologies their own by adapting and integrating them into the routines of everyday life. Domestication scholars reject traditional adoption models for being technologically deterministic assuming not only that technologies will be adopted according to pre-defined patterns, but also that people’s actual use will occur the way designers or producers intended. Drawing upon the related concepts of ‘configuring the user’ (Woolgar, 1990) and ‘scripts’ (Akrich & Latour, 1992) from STS, domestication scholars acknowledge that technologies are designed to be used in certain manners (Bakardjieva, 2005; Liste & Sørensen, 2015). However, inspired by reception analysis, domestication scholars claim that technologies are also open to interpretation by its users (Bakardjieva, 2005; Haddon, 2011; Lie & Sørensen, 1996; Sørensen, 2004).

Domestication scholars argue that people are not passive receivers but active subjects whose backgrounds, habits, and values influence how they perceive and use technology. Rather than focusing on the impact of technologies, domestication scholars are concerned with the practical and symbolic value people assign to technology, and how these values are expressed and exchanged through use, display, and conversation. In this way domestication scholars have extended the transformation of technology from something only occurring in the design stage to also taking place after the point of adoption, and by end users as well as designers.

The adoption of new technology, social processes, and the sharing of skills and practices are all brought together in Bakardjieva’s concept of ‘the warm expert’ (Bakardjieva, 2005). Bakardjieva draws upon the domestication framework in her study of how immigrants in Canada learn to use information technology (IT),
such as computers and the Internet. She found that her participants were often introduced to IT via personal
contacts, whom she refers to as “warm experts”.

“The warm expert is an Internet/computer technology expert in the professional sense or simply
in a relative sense compared with the less knowledgeable other. The two characteristic features
of the warm expert are that he or she possesses knowledge and a skill gained in the System world
of technology and can operate in this world but, at the same time, is immediately accessible in
the user’s lifeworld as a fellow-man/woman. The warm expert mediates between the
technological universal and concrete situation, needs and background of the novice user with
whom he is in a close personal relationship.” (Bakardjieva, 2005, p.95).

The warm experts are characterized by their accessibility, their skills, and finally their knowledge of the novice,
which allows them to explain how IT works in a manner that makes sense to the novice. Although Bakardjieva
focuses on the warm experts’ IT skills, other studies show that citizens’ lack of knowledge of the specific public
service in question and bureaucracy in general also affects CC and can hinder the use of e-government
channels (Bertot & Jaeger, 2008; Grönlund, Hatakka, & Ask, 2007; Skaarup, 2012). Therefore we will
supplement with an examination of citizens’ ‘administrative literacy’, defined by Grönlund et al. (2007) as “the
ability to navigate bureaucracy, which includes having a good idea of how society’s institutions work, the
terminology involved and hence being better able to know where to go to find the forms, procedures, contact
information etc. necessary, and indeed understand the information once found and being able to act upon it”
(Grönlund et al., 2007, p. 217).

Thus, CC studies have found that the type of problems citizens have influence their CC and subsequent
interactions with a public authority. Domestication scholars argue that people share practices regarding
technology use through everyday interactions and discussions. Bakardjieva shows how people get help from
others in their close personal network, and that these helpers offer identification and possess specific skills. To
operationalize our theoretical lens and answer our research question of how citizen-to-citizen interaction
influences channel choice, use and evaluation for government-to-citizen interaction we start by asking three
sub-questions. These questions relate to Teerling and Pieterson’s model and previous CC studies, but we seek
to answer them through a qualitative study informed by domestication theory and the concept of ‘the warm
expert’.

- What are the main problems encountered by single parents in relation to public benefits, and what
  channels are used to solve them? [Channel choice]
- How do single parents get help to interact with public authorities? [Channel use]
- How do single parents share their evaluations of public service encounters? [Channel evaluation]

Our theoretical lens, domestication theory, emphasize that technologies should be studied in the natural
contexts where they are used. Domestication scholars seek insight into people’s understanding and evaluation
of technology, and therefore primarily rely on qualitative methods and observations with several participants.
We follow this tradition as it allows us to study people’s practices, the underlying values informing them, and
the social processes whereby these values and practices are shared and shaped. Having presented our
theoretical lens, we now turn to how the empirical studies were conducted.

3. Methodology

To answer our research question, we first conducted five focus group discussions with 28 single parents. These
were followed by nine individual semi-structured interviews. A recruitment company was used to find
participants for the study from two Danish municipalities. To maintain their anonymity all participants have
been given aliases in the published material. Appendix A presents the focus group composition.

The focus group discussions were conducted in April and May 2013. The purpose was to simulate social
processes surrounding channel choice, use and evaluation occurring in everyday life. Unlike group interviews,
where the interviewer repeatedly asks the same questions to multiple participants, focus group discussions
allow the researchers to study social interaction whereby a group create and discuss their perception of a
particular phenomenon (Krueger, 1994). Although focus group discussions take place in artificial settings, they
are useful to facilitate discussions and explore people’s views and practices, and are frequently used within
domestication studies (Bertel, 2013; Ling & Thrane, 2001). To stimulate discussion and interaction among the
participants we employed a series of activity oriented questions and exercises (Colucci, 2007). As moderators
we deliberately stayed in the background and intervened only to ask follow-up questions (Krueger, 1994). Thereby the participants themselves would bring up topics that mattered to them in their own words.

The follow up interviews took place 6-12 months after the focus group discussions. Nine participants were selected from among the focus group discussants. We included participants who had either mentioned being warm experts themselves, or getting help from warm experts. Further, we included both participants that had been single for a long time, and those that had only recently become single to cover various levels of experience with the family benefit system.

The interviews were conducted as semi-structured interviews following a script which was adapted for each participant (Kvale, 1994). They were carried out in the homes of the participants, as this gave access to contextual information related to their interaction with UDK. After the interviews the participants were asked to solve tasks related to borger.dk and the benefits they received, while the interviewer observed and took notes. The purpose of these observations was to gain first hand access to the participants’ practices for public service encounters.

The focus group discussions were recorded on videotape, while the follow-up interviews were recorded with an MP3 recorder. Immediately after each session the moderators took notes of the most striking findings. We initially paid special attention to the parts of the focus group discussions where the participants discussed problems, shared information and practices, and mentioned warm experts to find participants for the follow-up interviews.

The data from the focus group discussions, follow-up interviews and observations were transcribed and imported into Atlas.ti for analysis. The transcriptions were first coded using selective coding following Strauss & Corbin (1998), related to the three sub-questions. We applied color coding to group the key concepts related to our questions such as problems, channels, evaluations of the encounter, and warm experts. We then grouped these concepts into a table to get an overview of the relationship between them (Dahler-Larsen, 2008). For the participants in the follow-up interviews we also created documents with their biographies, their evaluation of public authorities, and their preferred channels. This aided our analysis of the relationship between participants’ values and their CC, and in structuring our findings according to the three questions.

4. Findings

Next we present our findings according to the three sub-questions previously asked concerning channel choice, use and evaluation.

4.1 What are the main problems encountered by single parents in relation to public benefits, and what channels are used to solve them?

The problems encountered by the participants in the focus groups concerning their interaction with public authorities take place at two different stages; when they are applying for benefits, and when they are receiving benefits.

Getting an overview of benefit eligibility is difficult according to our participants. UDK administers several benefits areas, which are handled individually by different sections and have individual websites at the portal borger.dk. Some single parents are eligible for additional benefits, administered by other authorities, which also have their own websites. Thus, the information is presented from an administrative point-of-view according to benefit area rather than the citizen’s point-of-view and life-situation, e.g. getting a divorce. This represents a catch-22, as single parents need to know the official names of the benefits before they can search for them on the official portal. As a consequence, some participants had spent considerable time trying to find out which benefits they were eligible for, before they could apply for them. Here lies another frequently mentioned problem, namely understanding the bureaucratic and legal terms used by public authorities. This lack of administrative literacy created many problems for the participants. Thus, the ability to translate information is an important part of the help offered. It is directly in line with Bakardjieva’s concept of the warm expert, who she describes as mediating between the system world and the life-world of the novice. This mediation contains two aspects – understanding public authorities’ information, and translating it to the single parent, and informing them of what this means to them, and what they have to do. The easiest way to get an overview of benefit eligibility is to talk to another single parent. Belinda has been a single parent for more than a decade and has worked within the public administration. She has extensive experience in dealing with public
authorities due to an accident, which left her with a disability as a child. From her professional background and personal experiences she has gained skills that makes her able to help her sister and others following their divorces.

Belinda: “After many years of marriage she [sister] becomes single and needs to find out, what am I eligible for, because she’d never received anything except the regular check [basic child benefit]. So she called me, what do I do, and where do I do it? And then I told her, well you have to apply for reduction in childcare, increased and extra family benefits, and you need to look into whether you can get housing benefit. And then she started [applying], and ended up asking, where do I do this and where do I do that?

The example illustrates the importance of Belinda’s personal experience with the benefits in question. She is able to provide help regarding not only benefit eligibility, but also for how and where to apply. Her help cuts across the individual benefit areas and authorities, and covers the entire situation from the single parents’ point-of-view. This also entails suggesting which channels to use when applying for specific benefits:

Belinda: “And here [UDK website] you can see the different [benefits] they can apply for, including housing benefits. And I would clearly recommend that they call, because I remember you have to fill out all this information, which I cannot find on the rent papers.”

According to our participants, most problems occurring while one is receiving benefits revolve around changes to the benefit tariff and payment frequency, due to one’s children becoming older or changes in one’s income. Our participants did not receive any information concerning the reasons for the changes, which caused many to call either friends or the authorities.

The participants in our focus groups have different strategies for dealing with these problems. Some contact public authorities directly through traditional channels. Others use search engines and third party websites to look for answers. Search engines are popular, as they allow people to use their own search phrases, and offer suggestions in case of misspellings. Third party websites offering legal advice or support groups for single parents provide answers and questions written by other single parents. One participant noted how such information is easier to understand, and more credible, because it is written by fellow citizens in similar situations.

In line with Bakardjieva’s notion of the warm expert our participants frequently mention getting help from or helping family members (children, siblings, and fathers), colleagues, neighbors, friends and former partners. They are people with whom the single parents have a relationship, and often someone they know well and regularly meet. The warm experts mentioned by our participants all have ICT access and skills. However, this applies to most single parents and most of our participants as well. ICT skills can be regarded as prerequisites, which let one carry out online tasks related such as using a search engine to find information, browse websites, and successfully conduct transactions via self-service applications. However, for someone to successfully apply for public benefits they need administrative literacy as well.

4.2 How do single parents get help to interact with public authorities?

We found considerable variation in how the help was offered; from a quick phone call to a friend or sharing information by chance during a social encounter, to fixed arrangements with the expressed purpose of finding and applying for benefits. These fixed arrangements often occur in settings where the interlocutors are together, either face-to-face or on the telephone. The help offered extends beyond applying for benefits, and also covers other ICT-related and economic issues. In line with previous domestication studies of single parents, they also extend to other areas such as looking after children or fixing things around the household (Bakardjieva, 2005; Haddon & Silverstone, 1994; Russo Lemur, 2006).

During one of the focus group discussions we witnessed how practices for interacting with public authorities was shared first hand. One participant, Anne, became aware that she should have filled out an online-form to re-affirm that she was still single. The other participants quickly helped her out.

Anne: “I’m thinking is there anything I should have printed from my computer and signed?” [Looks at the other participants]

Elizabeth: “No there isn’t. You used to get it by mail. But you don’t anymore, now you have to use the computer. (...) But this one went to the computer, you have to sign it. (...) . It’s in your e-Boks [a website which stores digital post].(...) My e-Boks sends an e-mail to my personal mail-address
whenever there is a new post in e-Boks. (...) And that’s where the single’s declaration is, you need to sign it.”

Suzanna: [Interrupts] “Do you have web-banking?”

Anne: “Yes I do, but I don’t use it.”

Suzanna: “You can go through web-banking to your e-Boks, that’s the easiest way of doing it. (...) You need to get a friend to come visit.”

Anne: “Well my oldest boy, he also knows how to do those things.”

Dorte: “(...) I’m also a complete illiterate with the computer but there are just some things you have to do when you have kids (...). But if you’re totally lost you can go to the local municipality. And you can get guidance there. I tried to fill out this declaration as well, but my computer wasn’t set up to receive it, so I had to go there and they helped me.”

Anne: “I’ll do it tomorrow, I’ll go tomorrow.” [Laughs].

Glen: “What I do, during those kind of troubles, with something to fill out, I have repeatedly kind of exploited, acted a bit stupid in front of those at the municipality and said ‘Can you please do this for me? (...) I can’t receive it, my computer is down.”

The other participants inform Anne what channels to use, how to use them, and why it is important. They provide tips for saving time and offers suggestions of people she can turn to for help. Dorte provides empathy and a means of identification, by letting Anne know that she’s not the only one who has experienced having problems with the declaration. Glen shares a way of tricking the caseworkers and getting around the mandatory requirement. His example shows that citizens’ actual interaction with public authorities can be opposite to the government’s intention, and how citizen-to-citizen interaction, whereby such practices are shared, does not always serve the government’s interests or increase the e-government adoption rates.

5.3 How do single parents share their evaluations of public service encounters?

We found that participants’ evaluations of other organizations sometimes carried over to their perception of UDK as well. We found an interesting connection between our participants’ perception of public authorities and the strategies and channels they employed in public service encounters. Their evaluation and strategies were often shared and exemplified in personal stories and anecdotes. Broadly speaking, the participants who use traditional channels would be more likely to indicate that the benefit system is subjective. They argue that they can influence caseworkers by charming them and negotiating. Whether such negotiation actually works is heavily contested among the participants. Participants who prefer e-government channels disagree, and argue that the system is regulated and has fixed tariffs.

Some participants provided examples of how they got different answers depending on which case-worker they spoke to, and how they had to negotiate with case workers to get information about benefit eligibility or to be granted benefits. This belief informed both their channel choice and use, as negotiation requires telephone or face-to-face contact with a human partner. During the focus group discussion Linda repeatedly referred to the subjectivity of the benefit system.

Linda: “I absolutely do not take no for an answer.”

Louise: “Why not?”

Linda: “Because I know, if she [caseworker] says yes [to a request for a benefit] she’ll get more paperwork, and they’re on a schedule, so it’s easier for her to say ‘No Linda, you can’t have that.’”

During the follow-up interviews, Linda went into more detail with this aspect, and mentioned how it influenced her channel choice, as well as the nature of the interaction.

INT: “The second aspect (...) is the likelihood that you’ll be granted these benefits.”

Linda: “Yes, definitely, I still believe in that. (...) I see myself as friendly, groomed and all that. And I know how to communicate. So I’ll get further if I show up in person at the counter, right? And I think it’s like that in many situations, right? (...) if I say, ‘Oh that’s a nice bracelet you’re wearing’, then I can charm her, and she’ll think I’m nice and say ‘Of course you can get that Linda’.”

Similarly, Belinda would mention how her neighbors would call her as an expert, because they got different answers from different caseworkers.
Belinda: “Many of the rules are open to interpretation. I’ve seen that in relation to my disability, according to one caseworker I could get this and that, and when they were replaced with a new one, then all of a sudden I couldn’t get it. And I was like, but it’s the same disability, and I’m still enlisted at the same education, well I couldn’t. (…) So there’s no doubt that it depends on how they interpret the legislation within the area, because you’ll notice if you read it, that it is quite vague, right?”

Belinda’s example demonstrates how warm experts, due to their experiences with the specific benefits and with public authorities in general, can help challenge the caseworkers’ decisions. Here, as with the mandatory requirement for e-government channels, we note that citizens interpret the rules regarding public benefits and share their interpretation with each other. In the same way as the previous example, this interpretation is not necessarily in line with the public authorities’ intention.

Having presented our findings of how citizen-to-citizen interaction can influence CC use and evaluation the next section discusses these findings in relations to previous CC studies.

5. Discussion

In the following we discuss our findings by taking Teerling and Pieterson’s conceptual model as a point of departure. This section is divided into sections which discuss each step of the model; channel choice, use and evaluation. Then we discuss areas where our results differ from previous studies, and offer suggestions to update the conceptual model according to our findings. As these suggestions are the result of a single qualitative study, they should be regarded as preliminary until they are confirmed by further studies.

There is a five-year interval between our empirical study and the study conducted by Teerling & Pieterson’s (2011), and e-government channels are mandatory in Denmark. However, the studies also share several similarities. They revolve around public service encounters regarding public benefits for parents. Additionally the Netherlands and Denmark are relatively similar in terms of citizens’ high levels of trust in public authorities, Internet access and use of e-government services (Marozzi, 2014; Statistics Denmark, 2014). In spite of the differences, we still believe the studies can be compared at the conceptual level.

5.1 Channel choice

Like Teerling & Pieterson we find that communication influences CC. However, we find that the external source of the communication can be fellow citizens, as well as a government organization. Thus our results suggest, that CC is not just the result of a cognitive process in the individual citizen, but also of a social process whereby citizens share information. Further, we find that CC is not only influenced indirectly by an individual’s perception of what others do, and how one thinks they will react to one’s choice, but also directly through social interaction, such as people helping each other interact with public authorities.

We found considerable differences in the level of trust people place in information from external sources. Some participants prefer the information they receive from other citizens, as it is easier to understand and identify with fellow citizens than public authorities. Some also distrust caseworkers and believe that there are other reasons than legal behind benefit processing. This is a contested issue, some participants distrust caseworkers, while others clearly state that they fully trust public authorities and prefer their advice, especially in comparison to advice from online strangers. Either way, our findings suggest that a person’s beliefs also influence their CC and their response to external forces.

5.2 Channel use

Although Pieterson and Teerling’s model includes both CC and use at the conceptual level, they do not distinguish between these aspects in their study. They focus on how public authorities can influence citizen’s CC, not the way the channels are used.

By conducting a study at the group level rather than the individual level, we find that the practices shared not only concern which channels to use, but also how channels should be used, and why they should be used in certain manners. The results suggest that social influence is more than just a factor, which leads to lower or higher adoption rates, but also affects how the actual use occurs. Inspired by domestication studies, we found practices that do not follow the intentions in the digitization strategy. On the contrary, some practices relate to how citizens can charm caseworkers to spend more time on their cases, increase the likelihood of being
Christian Madsen and Pernille Kræmmergaard

granted benefits, or getting around the mandatory requirement for e-government channels. Through citizen-to-citizen interactions, people share and shape their interpretation of not only technologies, but also public policies. It is important to note people’s interpretation of e-government policies and technologies is not necessarily in line with public authorities’ intentions, and citizen-to-citizen interaction may reduce the adoption of certain technologies.

5.3 Channel evaluation

Finally, we found that other people can influence the evaluation and perception, not only of channels, but, more importantly, also of the public authorities and the task in question. In the focus group discussions participants shared perceptions of public authorities and their experiences in communicating with them through various channels. Other people’s practices, especially if coming from someone in one’s personal network, can have a significant influence on one’s own perception of public authorities, and public service encounters.

We find that discussion concerning channel practices in public service encounters is related to how one regards public authorities, as subjective or objective, the task in question, and the available channels. In line with previous studies on social influence we found that such evaluations are often shared through the use of stories and anecdotes (Schmitz & Fulk, 1991).

5.4 An expanded process model for channel choice, use and evaluation

Returning to Teerling & Pietersen’s process model, we find that citizen-to-citizen interaction occurs in all three steps of the public service encounter. Thus we suggest that the process model can be expanded by including co-citizens who may influence each of these steps.

We also find that public service encounters do not start at the point of channel choice. Rather an event, either in one’s life, or one generated by the public service system, generates a need to interact with public authorities to solve a task. Determining what this task is, and how to solve it, happens before a channel is chosen. Once the task has been determined, it influences both channel choice and use. This task awareness is often created through citizen-to-citizen interaction, either in person or on third party channels. We therefore suggest that another step in the model called ‘Task awareness’ can be inserted.

Finally, we repeatedly found that our participants perception of public authorities influence how they interact. This suggests, that it is not only one’s prior experience with a public service encounter, that influence future encounters, but also the underlying belief that one has in public authorities. Therefore we also suggest that citizens' perception of public authorities is added to the model.

Figure 2 presents our suggestions for how to extend the process model to include citizen multichannel practices. This includes citizen-to-citizen interaction, task awareness, and perception of public authorities. The original model’s elements are formatted in bold to distinguish it from our additions. Although our findings are generally in line with previous domestication studies, the suggested extensions are based on a single study as mentioned earlier. Thus, more research using quantitative methods is needed to validate the extension of the model.

Figure 2: Suggestions for expanding the CC process model.
6. Conclusion

We set out to study how citizen-to-citizen interaction influences channel choice, use and evaluation for government-to-citizen interaction, and have done so by conducting focus group discussions followed by individual interviews and observations. By applying qualitative methods, we have gained insight into how citizens share their practices and the underlying perceptions informing these practices. Our study offers several contributions to the e-government and channel choice literature.

Unlike previous studies, which have focused on individual citizens’ CC in voluntary settings, we studied actual use among groups of citizens in a mandatory setting. Applying domestication theory as our theoretical lens, we demonstrate that citizens are not only informed by public authorities, but also by each other. Our results suggest, that channel choice, use and evaluation are not just the result of cognitive processes within an individual but also social processes between citizens. Digital literacy is not the only requirement to use e-government self-service channels; administrative literacy and knowledge of the benefits in question are also important. Although citizens may want to use e-government channels, their situation might not fit to the system’s requirements, or they may not know what to do. Having a friend or relative explain this, perhaps from personal experience, is of great help.

We also found that citizen-to-citizen interaction is not necessarily in line with the intentions of public authorities, for instance by sharing ways of getting around the mandatory requirement. This finding follows from our application of a social constructionist framework, domestication theory. The understanding that people do not always do as they are told, but also make technologies and policies their own is something which we believe both e-government scholars and practitioners should take into consideration. Our study suggests, that citizens perceptions’ of public authorities also influence the channels they choose in public service encounters. These perceptions are shared through personal stories and anecdotes along with practices for how to negotiate with caseworkers. Government organizations who wish to utilize social networking services should consider this first.

We chose to study citizen-to-citizen interaction through direct methods of observation. Thus we have not conducted in-depth studies of citizen interaction on third party websites. However, our results indicate that such interaction is important, and influences peoples perception of public authorities and public service encounters. One important limitation of our study is that all of the participants are between the age of 36 and 51, and the majority are women. Moreover, among the 28 participants only one had a non-Danish background. Had we conducted our study with elderly citizens for instance, digital literacy might have received more attention. If we had done a study among immigrants, language would likely be an important factor.

Future studies can examine how people’s perception of authorities are shared and shaped online. One topic, which would be particularly timely for such an analysis, is how people share their perceptions and practices related to mandatory e-government. Another suggestion is to repeat the study, but conduct it among different population groups; young people, the elderly, or non-native citizens for instance. As we have applied qualitative research methods we cannot quantify or test the impact of citizen-to-citizen interaction, nor can we validate the suggested extensions to the process model. Scholars who wish to do so, should apply quantitative methods and/or conduct field experiments.

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References


Appendix A. Focus group composition and participants

<table>
<thead>
<tr>
<th>Alias</th>
<th>Age</th>
<th>Gender</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monica</td>
<td>42</td>
<td>F</td>
<td>Nurse</td>
</tr>
<tr>
<td>Maja</td>
<td>36</td>
<td>F</td>
<td>Student</td>
</tr>
<tr>
<td>Tina</td>
<td>42</td>
<td>F</td>
<td>Office clerk (unemployed)</td>
</tr>
<tr>
<td>Lis</td>
<td>42</td>
<td>F</td>
<td>Self-employed</td>
</tr>
<tr>
<td>Lene</td>
<td>41</td>
<td>F</td>
<td>Student</td>
</tr>
<tr>
<td>Tanja</td>
<td>41</td>
<td>F</td>
<td>Actor</td>
</tr>
<tr>
<td>Sten</td>
<td>47</td>
<td>M</td>
<td>Carpenter (unemployed)</td>
</tr>
<tr>
<td>Ulla</td>
<td>45</td>
<td>F</td>
<td>Psychologist</td>
</tr>
<tr>
<td>Louise</td>
<td>42</td>
<td>F</td>
<td>Student, hairdresser</td>
</tr>
<tr>
<td>Hanna</td>
<td>38</td>
<td>F</td>
<td>Student, graphic designer</td>
</tr>
<tr>
<td>Linda</td>
<td>39</td>
<td>F</td>
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<tr>
<td>Susan</td>
<td>42</td>
<td>F</td>
<td>Office clerk</td>
</tr>
<tr>
<td>Belinda</td>
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<td>F</td>
<td>Office clerk</td>
</tr>
<tr>
<td>Tine</td>
<td>41</td>
<td>F</td>
<td>IT project coordinator</td>
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<tr>
<td>Maria</td>
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<td>F</td>
<td>Head stewardess</td>
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<td>Director</td>
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<td>Dorte</td>
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<td>F</td>
<td>Pedagogue</td>
</tr>
<tr>
<td>Glen</td>
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<td>M</td>
<td>Painter</td>
</tr>
<tr>
<td>Anne</td>
<td>43</td>
<td>F</td>
<td>Pre-school teacher</td>
</tr>
<tr>
<td>Elizabeth</td>
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<td>F</td>
<td>Childminder</td>
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<tr>
<td>Susanna</td>
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<td>F</td>
<td>Accountant</td>
</tr>
<tr>
<td>Tom</td>
<td>45</td>
<td>M</td>
<td>Canteen manager</td>
</tr>
<tr>
<td>Laila</td>
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<tr>
<td>Sanne</td>
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<tr>
<td>Kim</td>
<td>47</td>
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<td>Civil servant</td>
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Abstract: Public sector organizations are supposed to increase productivity by large-scale investments in IT. This research investigates the municipalities’ capabilities to increase productivity through IT investments, and what major challenges must be overcome to do so. The research identifies several problems that reduce productivity gains. These problems persist even though they seem trivial and easily remedied. They are however symptoms of a more general challenge: Difficulties achieving a proper alignment between IT and organizational processes. This alignment gap is related to the way service production is regulated and organized and the way IT is developed and acquired, the lack of local technology and task control that emerges and the resulting lack of managed coordination between task and technology design.

Keywords: e-Government, Productivity problems, Task and Technology design challenges

1. Introduction

As the demographic and economic situation puts pressure on the public sector in Denmark, the municipalities must deliver more services at lower costs. IT is perceived as one of the solutions to this challenge. Central government expects large productivity improvements through investments in eGovernment solutions. However, investigations (e.g. Ashurst et al., 2008) emphasize that realizing benefits from IT investments is difficult. Whether the expected benefits are actually realized is not even evaluated by the Danish municipalities. Consequently we lack knowledge about the outcome of these investments and the challenges to the realization of the expected productivity improvements. Since this government level employs approximately 500,000 people (10% of Denmark’s total population) and is responsible for the major part of public service production, it is relevant to look into the municipalities’ capability to exploit and benefit from IT investments in terms of increased productivity, and the problems that they face when attempting to do so. This paper therefore investigates the following research question:

What characterizes the municipalities’ capabilities to increase productivity through IT investments, and what major challenges must be overcome to do so?

This paper uses “IT business-value” theory to answer the research question. Though it is not explicitly stated in literature reviews (e.g. Schryen, 2013; Kohli & Grover, 2008; Melville et al., 2004; Dedrick et al., 2003; Devaraj & Kohli, 2000; Soh & Markus, 1995), the focus of IT business-value research is on IT investments in private-sector organizations addressing private sector concerns such as competitive advantage. This paper adapts one of these models for use in a public-sector context in order to address the research question. Public-sector organizations have different concerns from those of private-sector organizations (e.g. Pang et al., 2014): Gaining competitive advantage is less important, and there are other kinds of values such as democratic accountability (e.g. Moon et al., 2014). However, when it comes to using IT as a production technology to increase organizational productivity, our assumption is that many of the same concerns apply across the sectors. The IT business value theory is complemented by eGovernment research that focuses on barriers for eGovernment success in municipalities (e.g. Beynon-Davies & Martin, 2004; Dhillon, Weerakkody, & Dwivedi, 2008; Nurdin, Stockdale & Scheepers, 2011) as well as eGovernment research studying barriers on a more general level (e.g. Ebrahim & Irani, 2005).

Most IT business-value research studies the relation between IT investments and outcomes at an aggregate level by quantitative methods and without differentiating between different kinds of investments (Schryen, 2013). This output-oriented research has resulted in important findings and increased our understanding of the relationship between IT investments and benefits at an aggregate level. We know what kind of benefits IT investments might have, but we don’t know much about the actual value-creating process (e.g. Schryen, 2013). There is widespread consensus that organizational productivity improvement based on IT investments is mediated by improved process productivity (e.g. Schryen, 2013). This research therefore starts by analyzing organizational processes in the municipalities and then focusing on how the IT investments affect the productivity of these processes from the perspective of the employees and first-level managers. These findings are subsequently explained with an IT business-value model. Section 2 reviews the literature regarding IT business value. Section 3 describes the research process. In section 4 the analysis is presented, section 5 discusses the results, and section 6 concludes and describes the research limitations.
2. Productivity and IT investments

To observe the relation between IT investments and productivity we use the same productivity concept as Brynjolfsson & Hitt (1998): Productivity is the amount of output produced per unit of input. Though the definition is simple it can be difficult to apply because both inputs and outputs can be difficult to quantify and measure. We measure the impact on productivity from IT investments in qualitative interviews with end-users and first-level managers.

While 1980s studies of the relationship between IT investments and productivity were inconclusive or unable to demonstrate a positive impact from IT investments, studies from the nineties (e.g. Brynjolfsson & Hitt, 1998; Lichtenberg, 1995) found that IT investments had a positive impact on productivity. The differences between these results have been attributed to newer and better data, an increased level of IT investment making it easier to distinguish its contribution, better analytical tools, and to the fact that organizations were learning to apply IT more productively (Dedrick et al, 2003). Though the studies typically only included hardware-acquisition costs and none included the costs of non-IT investments in training and process re-engineering etc., it is now an established fact that in general, IT investments do lead to increased productivity (e.g. Dedrick et al 2003).

IT is not deterministic in the sense that it leads by definition to certain values or any value at all – that depends on how it is designed and used (e.g. Davern & Wilkin, 2010; Brynjolfsson & Hitt, 2003; Brynjolfsson & Hitt, 2000). The technology can be used directly as a production technology to improve productivity in organizational processes, but it can also be used for many other purposes. Research has suggested IT might have its greatest impact as a technology for coordination (e.g. Shin, 1997).

Figure 1 illustrates the basic relations between the elements that have an impact on the conversion of IT investments into increased productivity. The model in Figure 1 was developed by Schryen (2013) and is based on four other models: Dehning and Richardson (2002), Dedrick et al. (2003), Soh and Markus (1995), and Melville et al. (2004). The model used here is a simpler version of the original because elements related to competitive advantage and market performance have been left out. Basically, the model claims that increased organizational performance (also productivity) is achieved by using a combination of IT (e.g. buying a new ERP system) and non-IT investments (e.g. redesigning the organizational process to exploit the features offered by the ERP system) to change organizational processes in a way that leads to increased process performance. IT only provides an opportunity for improvement; actual improvement is first achieved when IT is used to do something in a different way. These basic relations are affected by contextual factors on the organizational level (e.g. internal IT management capabilities), industry level (e.g. specific characteristics of public sector organizations) and country level (e.g. laws and regulations) that can make it more or less difficult to achieve the desired performance improvement, as well as factors that create a lag between the investments made and the emergence of performance improvements. For example organizations might experience a decline in performance during and immediately after the implementation of an ERP system and not be able to harvest the improvements before years after the initial investment was made.

![Figure 1: Investments and performance](www.ejeg.com)
There are two types of investments: IT investments and non-IT investments. IT investments are costs related to the technology itself and human IT resources such as software engineers and IT managers. Most research focuses on aggregate IT investments, i.e. doesn’t distinguish between different kinds of IT investments (e.g. replacing outdated computers or implementing a new ERP system) (Schryen, 2013). We know that IT does not create value in itself – it must be combined with non-IT investments such as organizational changes that enable the organizations to exploit the technological possibilities (e.g. Schryen, 2013; Kohli & Grover, 2008; Melville et al., 2004; Wade & Hulland, 2004; Brynjolfsson & Hitt, 2000; Devaraj & Kohli, 2000; Brynjolfsson & Hitt, 1998). Brynjolfsson and Hitt (1998) report that the needed non-IT investments are usually substantially larger than the pure IT investments. The eGovernment literature has identified the following barriers that seem to be especially related to investments:

- **Strategy:** Unclear and unrealistic visions, goals, objectives and strategies (Veenstra, Klievink & Janssen, 2011; Nurdin, Stockdale & Scheepers, 2011; Ebrahim & Irani, 2005).
- **Investment selection:** Uncoordinated IT acquisition across departments (Bannister, 2001) and lack of IT investment evaluation methods (Frisk & Ljungberg, 2009).
- **Funding:** Lack of funding (Beynon-Davies & Martin, 2004; Weerakkody & Dhillon, 2008; Rana, Dwivedi & Williams, 2013; Meijer, 2015; Ebrahim & Irani, 2005) and political, legal and cultural barriers for shared funding and e-government development across municipalities (Beynon-Davies & Martin, 2004).
- **IT investments:** Insufficient understanding of users (Veenstra, Klievink, Janssen, 2011), excessive focus on technology rather than business needs (Bannister, 2001)
- **Non-IT investments:** Generally a lack of explicit allocation of resources for Non-IT investments (Beynon-Beynon-Davies & Martin, 2004), lack of participation and collaboration in e-government projects from departments, citizens, employees and politicians (Nurdin, Stockdale & Scheepers, 2011), little reengineering of existing processes and services (Beynon-Davies & Martin, 2004), limited investment in post-acquisition implementation (Bannister, 2001), lack of staff development (Beynon-Beynon-Davies & Martin, 2004; Nurdin, Stockdale & Scheepers, 2011).

### 2.2 Performance

IT investments can contribute to performance on many different levels. Chang (2000) distinguishes between first-order (process) impacts and higher-order impacts (organizational). Productivity improvements at one level might not necessarily be visible at the next level. A process-level productivity improvement only becomes visible at the organizational level when the saved time is used for something else valuable and when that level is collaborating with other organizations through inter-organizational information systems; the power of the participating organizations determines how the outcome is shared (Melville et al. 2004).

Outcomes from investments are not easily measured. Davern & Wilkin (2010) describe how the value of certain kinds of IT investments (e.g. transformational and strategic initiatives) are especially difficult to measure and how IT investments can be without short-term impact through time lags. It is also difficult to empirically isolate and identify outcomes since many other factors also impact organizational performance (Devaraj & Kohli, 2000).

To summarize across a large sample of organizations, higher levels of IT investment are associated with higher levels of productivity, but IT investments do not automatically lead to increased productivity: Some organizations simply use IT much more productively than other organizations (e.g. Schryen, 2013; Melville et al. 2004; Devaraj & Kohli, 2000; Dedrick et al. 2003; Brynjolfsson & Hitt, 1998). Even when identical systems are implemented in very similar organizations, the outcomes might be quite different (e.g. Orlikowski, 1992). We know that the impact of IT investments on organizational performance is mediated through process performance (e.g. Schryen, 2013; Soh & Markus, 1995; Shin, 1997; Dehning & Richardson, 2002). The IT business-value literature emphasizes these factors to improve process performance:

- **Appropriate use:** The most fundamental condition for achieving better performance through IT is that it be effectively applied to the requirements of the relevant tasks.
- **Technological and organizational alignment:** A necessary condition for appropriate use is a design that establishes a high level of alignment between the technology and organizational characteristics in a broad sense, i.e. a close fit between tasks and IT.
- **The combination of investments:** How IT and non-IT investments are combined can facilitate change characterized by a high level of technological and organizational alignment.
Productivity improvements depend on appropriate use (e.g. Lucas, 1993; Soh & Marcus, 1995). “Appropriate” implies that the level of usage is optimal and meaningful: More usage might not lead to more or better impacts, and less does not exploit the full potential. Quaadgras et al. (2014) emphasize that a management commitment to “working smarter with information” is a key factor and that this requires both empowerment of individual employees and clear rules and procedures that define the scope within which employees have the freedom to make decisions and act on the information provided by IT.

“Appropriate use” depends on the quality of the design of the technology itself and the complementary organizational changes. Brynjolfsson & Hitt (1998) conclude that organizations benefit most from IT investments when they transform organizational strategies, structures and work practices by means of new approaches that exploit IT better. Several dimensions of the alignment of technology and organizations are emphasized within information systems research: Strategic fit between IT and organizational strategies and goals (e.g. Avison et al. 2004; Grabowski & Lee, 1993), strategic alignment of project portfolios (e.g. Meskendahl, 2010), alignment between organizational processes and IT (e.g. Monarchi et al. 1992; Davenport, 2013; Quaadgras, et al. 2014), alignment between individual work practices, skills and needs and IT (e.g. Lucas, 1993; Soh & Markus, 1995; Norman, 2002; Nielsen, 1994), alignment between incentives and IT (e.g. Markus & Keil, 1994), between organizational culture and IT (e.g. Leidner & Kayworth, 2006), and between social needs and IT (e.g. Mumford, 2000).

Even quite early studies indicated that IT investments combined with re-engineering bettered the outcomes, and it is generally acknowledged that non-IT complementary investments such as restructuring, new management control systems, redesign of processes, employee training etc. positively impacts the organizational outcome of IT investments (e.g. Schryen, 2013; Dedrick et al. 2003; Brynjolfsson and Hitt; 1998). While we know that these non-IT investments are vital, we know very little about the synergy between various kinds of non-IT investments and IT investments (Schryen, 2013). Dedrick et al. (2003) (based on Zuboff, 1988) suggest that the impacts of IT and non-IT investments on processes can be divided into two categories: automation and transformation. “Automation” implies that labor is substituted by IT and that access to the improved information helps employees and managers make better decisions, while “transformation” implies radically redesigned processes that can lead to significantly higher levels of productivity. Regarding the implementation process, Chang (2000) distinguishes between short-term “transaction” (single event) approaches to realizing IT value from IT investments, and long-term “relationship” (multiple event) approaches. The short-term “transaction” approach is often insufficient. In order to fully benefit from IT investments they must be managed over a longer time. The following barriers identified in the eGovernment literature are all related to the organizational processes and the technology supporting these processes:

- **Complexity:** Complex business processes (Ebrahim & Irani, 2005), complexity caused by co-production (King, 2007), complexity of information systems (Veenstra, Klievink, Janssen, 2011; Rana, Dwivedi & Williams, 2013; Ebrahim & Irani, 2005)
- **Fragmentation:** Siloed organizational structures (Veenstra, Klievink, Janssen, 2011; Bannister, 2001), lack of integration (Beynon-Davies & Martin, 2004), rigid organizational structures that make service integration difficult (Nurdin, Stockdale & Scheepers, 2011), fragmented or ill-defined decision-making responsibility (Veenstra, Klievink, Janssen, 2011).
- **Transparency:** Difficulties understanding processes and systems in order to redesign and integrate them (Ebrahim & Irani, 2005), lack of detailed descriptions of business processes (Veenstra, Klievink, Janssen, 2011).
- **Alignment:** Lack of alignment of ICT to the organization by process redesign (Veenstra, Klievink, Janssen, 2011).

### 2.3 Contextual factors

We know that contextual factors on the country, industry and organizational levels matter for value creation, but especially the country and industry factors have not been researched sufficiently to provide a clear picture (Schryen, 2013).

The outcome of IT investments depends on individual organizational characteristics that are hard to change in the short run. Some of the most important characteristics are the level of alignment between IT and the organization’s core competencies and business planning, the level of upper-management involvement in IT investments (Schryen, 2013) and the presence or absence of organizational ability to combine and manage
non-IT and IT investments: Financial performance is related more to the way IT is managed than to the level of investments (Stratopoulos and Dehning, 2000). Previous research emphasizes the following IT management capabilities: IT strategy (Markus & Soh, 1993), IT project evaluation and selection (e.g. Irani, 2002; Irani & Love, 2003; Bannister & Remeny, 2000; Markus & Soh, 1993), IT project management (Markus & Soh, 1993; Irani & Love, 2001), change management (Irani & Love 2001) including the capability to facilitate employee involvement in the design of the specific systems and how work processes are organized (Hsieh et al., 2011), benefits-realization management (Ashurst et al. 2008), information management (Mithas, 2011), customer management (Mithas, 2011), process management (Mithas, 2011) and performance management (Mithas, 2011). Within eGovernment research the following barriers can be related to the organizational level:

- Skills: Lack of IT skills and personnel (Veenstra, Klievink, Janssen, 2011; Rana, Dwivedi & Williams, 2013; Meijer, 2015; Ebrahim & Irani, 2005).
- Learning: Lack of organizational learning from other similar organizations (Nurdin, Stockdale & Scheepers, 2011), lack of post-implementation evaluation (Bannister, 2001).
- Politics: Political pressure (or lack of) (Veenstra, Klievink & Janssen, 2011; Meijer, 2015), political struggles (Bannister, 2005; Ebrahim & Irani, 2005).

There are only a few studies of the impact of the industry context, but we know that industry characteristics impact on how well an organization can benefit from IT (Melville et al., 2004). Public sector research (e.g. Pang et al., 2014) describes how the conditions for exploiting IT in the public sector differ from those of the private sector. The former has other goals than maximizing profit, and decision-making, accountability systems and stakeholder management are more complex (Almarabeh & Abu Ali, 2010), but we still don't know how these differences affect the possibilities for realizing IT-based productivity improvements in public sector organizations. Within the eGovernment literature the following barriers can be categorized as belonging to this level:

- Collaboration: Establishing partnerships with other municipalities (Nurdin, Stockdale & Scheepers, 2011), lack of synergy between local government, other public sector and private agencies’ business processes and IS/IT systems (Weerakkody & Dhillon, 2008; Ebrahim & Irani, 2005).
- Vendors: Difficulties using technologies developed for the private sector in a public sector context (King & Cotterill, 2007), dependency of software vendors for system innovation (Veenstra, Klievink, Janssen, 2011).

The macro-environment at the country level affects the degree to which firms can apply IT to organizational improvement (Melville, 2004). Some of the most important factors at the country level are national regulations and laws, and the technical infrastructure (Schryen, 2013). At the country level the eGovernment literature has emphasized barriers such as:

- Laws and policies: Restrictive laws and regulations (Nurdin, Stockdale & Scheepers, 2011; Rana, Dwivedi & Williams, 2013; Meijer, 2015) supportive policies from central government through the provision of financial, political, and technical infrastructure (Nurdin, Stockdale & Scheepers, 2011).
- Citizens’ capabilities and attitudes: Lack of technological facilities, knowledge, competences, interest, and ability to integrate e-Government into daily routines among citizens (Meijer, 2015), lack of interest, little
faith in and negative image of government, no perceived usefulness, resistance towards technology among citizens (Meijer, 2015), digital divide (Rana, Dwivedi & Williams, 2013).

- Infrastructure: Lack of development of basic infrastructural facilities (Veenstra, Klievink, Janssen, 2011; Rana, Dwivedi & Williams, 2013; Meijer, 2015), (Ebrahim & Irani, 2005).

- Coordination: Effective and efficient coordination of e-government between central government and municipalities (Nurdin, Stockdale & Scheepers, 2011; van Os, 2011).

2.4 Lag effects

There can be a considerable time span from the new IT investment to the visible outcome (e.g. Schryen, 2013; Brynjolfsson & Hitt, 1998). This time period and the period that lasts until the organization starts to benefit from these outcomes can differ rather a lot: Some systems have relatively fast payoffs, others realize payoffs only after a longer period of time; some systems have short-term impacts and others, long-term impacts (Dedrick, 2003). However, IT-based value creation is never immediate. The effort needed to adopt, develop and implement IT takes time and this alone creates a lag effect that can be in the order of years (Santhanam & Hartono, 2003). Regarding lag effects eGovernment research indicates that reengineering is especially time consuming in public organizations (Ebrahim & Irani, 2005).

3. Research approach

Most previous research on IT investments and productivity is quantitative and analyzes IT investments at an aggregate level. While this approach has delivered important results, scholars (e.g. Schryen, 2013) have suggested that we need to study IT investments at a more disaggregate level to understand how they actually contribute to increased performance, e.g. in terms of productivity. Therefore the strategy in this research paper is to study the use of IT in individual organizational processes and the impact these systems have on productivity.

The municipalities lack quantitative data both on the input side (in terms of costs) and the output side (in terms of productivity improvements). On the input side the pure costs of buying IT are known, but the costs related to the non-IT investments (e.g. organizational implementation and training) are unknown. As to output, outcomes in terms of productivity improvements are also unknown for several reasons. Generally it is very difficult to objectively quantify the impact from IT investments (e.g. Schryen, 2013). First, the implication of lag effects is that the impact of IT investments first becomes visible years after the initial investment is made (e.g. Brynjolfsson & Hitt, 1998, second, it is difficult to empirically isolate and identify outcomes since many other factors also impact organizational performance (e.g. Devaraj & Kohli, 2000), and third, even a relatively simple concept like productivity can be difficult to measure quantitatively (e.g. Brynjolfsson & Hitt, 1998). Additionally, as one of the involved municipalities explained, evaluating the realization of planned productivity improvements is politically inconvenient because budgets are already reduced by political and administrative leadership. Instead of quantitative data we use qualitative data: end-users’ and first-level managers’ perceptions of the impact on productivity from IT investments. Perceptual measures of the value of IT investments have been used in similar research the argument being that “perceptual measures could offer rich and potentially useful insights by identifying the impacts of IT on certain activities in the value chain” (Tallon & Kraemer, 2006).

The present research was conducted in collaboration between the following types of actors:

- End-users and first-level managers from the municipalities took part in the research with the goal of gaining insight into their own organizational processes, their problems and how these might be solved.
- Master’s students took part in the research with the goal of improving their skills in analysis, design and IT-enabled improvement of organizational processes.
- Researchers took part in the research with the goal of educating the participating master students, collecting research data and supporting the participating organizations.

The multiple purposes and organization of this research reflects the overall goals of the university to improve educational programs by having students engage in practical, relevant problem-solving collaboratively with both public and private sector organizations.

There is a strong tradition within systems development of analyzing organizational processes in collaboration with organizational actors. The data collection and initial analysis used the systems-development method known as “Contextual Design” of Beyer & Holtzblatt (1997). Through this method we gained specific insight into the use of IT in these processes, into how it affects productivity as perceived by end-users and first-level
managers, and how it might be improved. The process data was collected and analyzed in a two-step process: First, the individual processes were described and analyzed on the basis of interviews with end-users and by observing actual work practices (e.g. how firefighters used technology). The findings were subsequently presented, validated and discussed at workshops.

Second, the author performed a cross-process analysis attempting to identify common problems across the individual processes.

The first analysis was a collaborative effort involving researchers, master’s students, end-users and first-level managers from the municipalities. The interview and observation sessions lasted approximately three hours each (for a total of nine to twelve hours for each process). The results were documented in line with the same standards (work models as described in Contextual Design) across all processes, and the findings were presented and validated at workshops (each also lasting approximately three hours) involving end-users and first-level managers from the municipalities, master’s students and researchers.

The interview and observation sessions were conducted as contextual inquiries according to the principles suggested by Beyer & Holtzblatt (1997):

- **Context:** The interviews were conducted in the users actual workplace. The interviewer watched users do their work tasks (e.g. a senior firefighter documenting an incident) using the existing IT systems and other artifacts (e.g. a calendar or a report) they generated or used during the task. In a few cases real-time observations and interviews of a specific task were practically impossible (e.g. firefighters dealing with a real incident) and interviews were thus based on users re-telling the events.
- **Apprenticing:** The interviews were conducted following an apprenticing relationship model in the sense that users were encouraged to show the interviewers how they actually performed their work in a similar way that they would use to train a new employee.
- **Partnership:** Users and interviewers collaborated to understand the users’ work in the sense that the interviews alternated between observing and discussing what the users did and why they did it.
- **Interpretation:** The interviewers shared their interpretations and insights with the users during the interview. This turned out to be very valuable since the users quite typically enriched and corrected the understanding of the interviewers.
- **Focus:** The interviewers were responsible for keeping the interviews on track. Focus was primarily on a) understanding the specific task and b) identifying productivity impacts (e.g. issues in terms of breakdowns).

Each interview was conducted using three phases:

- **Introduction:** In good time before conducting the interviews the users were informed about the general purpose, the interview process and issues about recording and confidentiality were resolved. This took place at a joint meeting for all the users involved who worked within the same area. At the beginning of a specific interview the interviewers introduced themselves and made sure that the user had been adequately informed about the interview purpose and process. After this the user would start by providing a high-level overview of the user’s work.
- **The body of the interview:** The interviewers observed the work in accordance with the previously described principles. Typically 3-4 interviewers participated in each interview. One interviewer was responsible for the dialogue with the user, while the others were responsible for taking notes and drawing work models.
- **The wrap-up:** The interviewers summarized what they learned from the interview, offering the user a chance to make final corrections. As a vital part of the wrap-up interviewers would investigate the representativeness of the task observed and whether there were important variations in the way tasks were performed.

After the individual interviews the interviewers would (without the user) perform an interpretation session to analyze the data. During this session they also developed work models representing the user’s activities and documented all the breakdowns identified (productivity issues) in a table. The following work models from contextual design were used:

- **The flow model:** This model illustrates communication and coordination between people to accomplish work. It also shows how work is divided into both formal and informal roles and responsibilities.
- **The cultural model:** This model illustrates how culture and policy constrain how work is done and how they work around those constraints to make sure the work is done.
The sequence model: This model illustrates the detailed steps performed to accomplish each task in a process. It shows the different strategies people use, the intents or goals that their task steps are trying to accomplish.

The physical model shows the physical environment as it supports or gets in the way of the work. It shows how people organize their environments to make their work easier.

The artifact model shows the artifacts created and used in doing the work. Artifacts reveal how people think about their work - the concepts they use and how they organize them to get the work done.

Each model would also contain a graphical representation of the breakdowns identified with a typical example being inadequate IT support for a specific task in the sequence model. The breakdowns were numbered and described in a simple table:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The ODIN system doesn’t support the entire incident reporting procedure (e.g. statistics or reporting to waterworks), which means that firefighters must invent their own solutions.</td>
</tr>
<tr>
<td>2</td>
<td>There is no way a commander can see that an incident report is ready for approval.</td>
</tr>
</tbody>
</table>

Table 1: Example breakdowns

Working on the models always triggered a need for additional information from the users which was resolved by contacting the users. In some cases this involved getting information from other users than originally interviewed (e.g. a person with a deeper insight into a specific issue). All the individual process analyses in terms of work models and tables with breakdowns were subsequently validated at workshops involving students, the participants from the municipalities, and researchers. Using the above research process Data were as collected and analyzed from 12 different processes in two different local governments from 2011 to 2014 by means of identical methods. LG-2 is among the largest municipalities in Denmark. A large municipality is here defined as one having more than 15,000 employees. LG-1 is a medium-sized municipality with approximately 9000 employees. Some processes were (for practical reasons only) analyzed by several groups of students, others by only a single group. An overview of the processes is provided in Table 1. The processes were selected by the municipalities on the main criteria that the involved employees and first-level managers should be motivated and possess the resources needed to participate.

<table>
<thead>
<tr>
<th>Local government</th>
<th>Task area</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG-1</td>
<td>Accounting in firefighting (Hansen, J.S. et al., 2014)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Approving and monitoring automatic fire detecting equipment (Jensen, B.R. et al., 2014)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Incident reporting in firefighting (Askou, N.P. et al., 2014)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Checking and maintaining firefighting equipment (Nielsbæk, A. et al., 2014)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Planning parking control (Kantharoban, P. et al., 2013)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Administration of commercial use of public spaces (Kjær, F. &amp; Ballegaard, A.M., 2013)</td>
</tr>
<tr>
<td>LG-1</td>
<td>Dispatching, processing and tracking citizen requests (Leegaard, T.P., 2013; Christensen, J.S. et al. 2013)</td>
</tr>
<tr>
<td>LG-2</td>
<td>Supervision of daycare (Petersen, M.R., 2012; Bach, A. et al., 2012)</td>
</tr>
<tr>
<td>LG-2</td>
<td>Re-allocation of children in daycare (Nielsen, N. et al., 2012; Dalsgaard, P. et al., 2012)</td>
</tr>
<tr>
<td>LG-2</td>
<td>Salary processing in daycare (Jespersen, A.S. et al., 2012; Sørensen, R. et al., 2012)</td>
</tr>
<tr>
<td>LG-2</td>
<td>Vacation planning in daycare (Nielsen, A.B. et al., 2012)</td>
</tr>
<tr>
<td>LG-2</td>
<td>Employee recruitment in eldercare (Vinggaard, M. et al., 2011; Bech-Andersen, C. et al., 2011; Nygaard, T. et al., 2011; Andersen, M. et al., 2011; Ulrich, F., 2011)</td>
</tr>
</tbody>
</table>

Table 2: Task areas

The second analysis was conducted by the author. Here the specific productivity-related issues (breakdowns) identified in the 12 individual process analyses were categorized in order to get an overview across all the analyzed processes. The categories were not decided beforehand but emerged from the data. For example the...
previously described breakdown number 2 in table 1 ("There is no way a commander can see that an incident report is ready for approval") were categorized under "process organization" that contains breakdowns related to "misalignment between the organization of, and coordination between, process actors and the design of the IT systems".

Finally, having categorized the breakdowns the root causes of these productivity-related issues were identified on the basis of the previously described IT business-value model.

As a part of these workshops the general impact of using the existing systems as well as the root causes to these breakdowns were also investigated. Breakdown number 2 ("There is no way a commander can see that an incident report is ready for approval") from the table is subsequently used as an example. From a technical point of view it is a simple problem. Part of the work previously performed by the firefighters in the municipality is now outsourced to a private company. The private company is responsible for making an incident report in a specific system and the commander in the municipality is responsible for approving the report. The system is however not designed to support this division of work so there is no way that the private company can signal that a new report is ready for approval. As a consequence the commander has to go through all the incident reports to see if some of them need approval. In the same way there is no easy way for the private company to see whether there are issues they need to resolve after the validation performed by the commander. Basically the problem is caused by changes in the way work has been organized since the system was designed. The system is a standard system owned by a national agency and all the municipalities are required to use the system in order to establish a national database regarding various kinds of incidents. However the municipalities can organize the work in different ways and are also free to outsource different parts of the work to private companies. The local municipalities have very little influence on the design of the system, and the national agency responsible for the systems has stopped all further maintenance due to budget cuts at national level. But even if money were available it would be difficult to provide optimal support for the different ways that local municipalities might decide to organize their fire departments. This way, a minor issue that makes the collaboration between commanders and private companies cumbersome becomes very difficult to solve.

4. Analysis

The analysis is structured as our adaptation of Schryen’s IT business-value model. First we assess the process performance as experience by local end-users and first-level managers, and then we analyze how IT and non-IT investments are combined. As a part of the analysis, the impact of contextual factors and lag effects are described.

4.1 Process performance: IT usage and its impact on organizational process productivity

To exemplify how IT impacts productivity in organizational processes, a description of one organizational process and the use of IT is provided. The processes as well as the identified productivity-related problems are representative of the entire set of processes that were studied. After this initial description the identified productivity-related problems are summarized across all the other processes.

4.1.1 Firefighters

Firefighters deal with all kinds of incidents besides fires (e.g. traffic accidents, emergencies caused by extreme weather conditions etc.). Besides providing assistance after incidents they are also responsible for preventing incidents e.g. by inspecting buildings to make sure alarms are working and basic equipment to deal with minor accidents is in place. In this section we look at a single process concerning how they deal with information-processing after an incident.

Dealing with incidents can involve many different actors, but at the least, the fire department, the communication and the accounting department in the municipality. Furthermore the local waterworks, the police, a private firefighting company (PFC), citizens and various insurance companies may get involved. During larger accidents volunteer firefighters are also used. Most of the actual emergency assistance is outsourced to a PFC. The PFC receives the emergency calls from citizens. They notify the fire department in the municipality and send the needed people and equipment to the place of the accident. The municipality sends a firefighter from the department who serves as the overall commander at the scene of the accident in collaboration with a senior firefighter from the PFC.
 Afterwards the senior firefighter from the PFC is responsible for documenting the incident in a shared system (ODIN), which is mandated by national regulations. The system is owned by a national agency that decided to stop further maintenance and development of the system years ago. When the PFC has made the initial report it has to be checked and approved by the commander from the municipality. If the incident is a fire, the police are responsible for updating the data regarding the cause of the fire (basically to determine whether it is an accident or a crime).

Having approved the incident report, which in many cases means that the commander has to rewrite parts of the report in the ODIN system if he (or she) is unsatisfied with the data quality, the commander has to inform the local waterworks regarding water consumption because the waterworks has to document significant changes in water consumption. This is done by re-entering the relevant information from ODIN in an e-mail to the waterworks. The commander also has to prepare data for various statistics, e.g. regarding whether PFC has responded according to contractual service goals. He (or she) does that by entering data from ODIN into a spreadsheet.

One of the most popular types of information on the municipality homepage is information about these kinds of incidents. The commander manually updates the municipality homepage with ODIN information about the incident, using a standard CMS system.

If the incident has implications that somehow require citizens or companies involved to pay some of the costs (e.g. for a veterinarian needed to put down a seriously hurt animal or a specialist to clean up toxic material), the commander gets another firefighter (the department specialist) to prepare the input for an invoice. If the costs are relatively small, or identifying who is responsible is difficult (e.g. a foreign truck driver), the process stops there because the cost of processing the invoice may be greater than the amount received from the responsible person. When reacting to a false alarm (typically a technical error in automatic fire-detecting equipment in a building), the department specialist has to find the name and address of the company responsible for the alarm because they have to pay the cost. Doing this may be difficult if the information was stored in a mailbox or binder by another firefighter in the department.

The input to the invoice based on the ODIN report is prepared manually with word-processing software. It is printed out and manually delivered (with a paper copy of the incident report) to the accounting department. The deliveries are typically made manually once every month. If an invoice needs to be processed fast the commanders place the incident report in a specific place so that the specialist knows it is urgent. Generally though, there is no sense in hurrying because everyone knows that invoices take some time in accounting.

In order to keep track of the invoices the department specialist updates a spreadsheet on his local computer with information about the ongoing invoices. In the accounting department the papers are filed in a binder and typically they stay there for several months. It is not unusual for an invoice to be finally processed six months after the incident. When processing the invoice the employee in accounting re-enters the information (that previously was manually entered from ODIN to the word processor and printed out) into the accounting system. The invoice is now printed out on paper from the accounting system and sent by old-fashioned mail to the citizen or the company, or directly to the insurance company. If the accountant needs further information to complete the invoice, the original commander is contacted.

This way of dealing with a single incident takes months, most of the time nothing happens, and even when something happens a lot of time is wasted. Most of the isolated steps are supported by IT, but not the process as such. The firefighters are not satisfied and experience a range of problems (breakdowns) that reduce their productivity:

- The primary system used to enter incident reports by the PFC doesn’t validate the data properly. Sometimes important information is missing and nobody can remember what actually happened. This means that the commanders have to use more time than really should be necessary to manually validate the original report from the PFC.
- In some cases more than one municipality is involved in an incident, and because the municipalities cannot share data in one system, incidents might be reported twice.
- None of the systems used by firefighters are integrated. Integration is left to the employees who manually move data from one system to the next.
- Part of the needed data is stored in documents, e-mails and spreadsheets as decided by each individual employee, making it hard for other employees to find and use the data.
- The ODIN systems have functional errors that make the use of the system less efficient.
Keld Pederson

- The ODIN system has a range of usability issues that make it cumbersome to use and causes the users to repeat the same mistakes.
- The ODIN system doesn’t support the entire incident reporting procedure (e.g. statistics or reporting to waterworks), which means firefighters must invent their own solutions.
- Incident reporting involves many different actors who each do a part of the job. The technical systems are not aligned with, and don’t support, this specific allocation of work or the coordination between the actors. For example, there is no way a commander can see that an incident report is ready for approval. The commanders and the employees at the PFC therefore decided that using a specific letter in the incident report number means that the report is ready for approval. If the PFC forgets to enter this code the incident report might never be approved. In the same way, the commander can only see that the police have added or changed information by going through the incident reports.

To perform a process in municipal government, e.g. collecting national-level information about accidents, some kind of IT is essential: The task would be difficult without the ODIN system and of course the municipality needs an accounting system. The general attitude among firefighters however is that their productivity suffers because the current IT systems don’t support the processes and tasks they are responsible for in an efficient way.

4.1.2 The general picture

The fundamental condition for gaining value from IT investments is “appropriate use” (e.g. Lucas, 1993; Soh & Markus, 1995). Appropriate use of IT is not an objective or quantifiable criterion, but a look across all the studied processes reveals a common pattern: Processes are generally not supported by IT in a way experienced by end-users and first-level managers as satisfactory from a productivity perspective, and it is difficult for the users to modify anything in order to apply the IT more appropriately. Besides some technical weaknesses the primary cause is lack of alignment between, on the one hand, the organizational processes and the individual tasks, and on the other, the IT systems in use. Across processes and municipalities the productivity-related problems (break downs) can be divided into the following categories:

The identified problems seem uncomplicated and should be able to be easily remedied. It is not difficult to integrate two systems, we know how to design user-friendly systems that meet the users’ needs, and we also know how to successfully implement new technology in organizations. However, the problems persist. The same kinds of problems have consistently been identified during the period 2012 to 2014. There have been new processes but the same story. The problems were not new when they were documented, but still weren’t remedied thereafter, even though all the involved stakeholders had agreed that they affected productivity in the organizational processes.

4.1.3 Technological and Organizational Alignment: Task and Technology Control

Given that the alignment-related problems seem costly but also easy to solve, the interesting question is: Why aren’t they more easily remedied? The attempt to answer this question made us focus on two kinds of control needed to achieve a proper level of alignment between, on the one hand, organizational processes and tasks and, on the other, IT systems:

1. Technology control: The organization should be in control of the technology, in the sense that the technology can be adapted to organizational needs and that changes to it are under the control of the organization.
2. Task control: The organization should be in control of the way individual tasks and organizational processes are conducted and changed.

Without task and technology control it is very difficult to systematically make IT-enabled organizational change and obtain a reasonable level of alignment between IT and organizational processes. Even if a proper level of alignment can be achieved initially, the two parts may drift apart when changes in both the task and the technology are outside the control of the organization. A high level of task and technology control is assumed in the IT business-value literature, but this is not the case for the municipalities, as will be explained.
### Table 3: Alignment problems between tasks and IT systems

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process organization</strong></td>
<td>Misalignment between the organization of, and coordination between, process actors and the design of the IT systems.</td>
</tr>
<tr>
<td><strong>Process Information flow</strong></td>
<td>Misalignment between the need for information exchange between process actors and the design of the IT systems.</td>
</tr>
<tr>
<td><strong>Process management</strong></td>
<td>Misalignment between the need for process management and the design of the IT systems.</td>
</tr>
<tr>
<td><strong>Task scope</strong></td>
<td>Misalignment between the scope of individual tasks and the design of the IT systems.</td>
</tr>
<tr>
<td><strong>Task structure</strong></td>
<td>Misalignment between the structure of individual tasks and the design of the IT systems.</td>
</tr>
<tr>
<td><strong>Task context</strong></td>
<td>Misalignment between the context of individual tasks and the design of the IT systems.</td>
</tr>
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</table>

4.1.4 Task control

Two aspects of task control seem especially important for the specific processes of municipalities: task distribution and task regulation. The processes we have studied are distributed across internal and external organizational boundaries in the following ways, making it difficult to exercise control over how tasks are conducted:

- Task distribution across internal departments: The application of various degrees of centralization and decentralization within the municipalities can provide different possibilities for task control by decreasing or increasing the number of internal departments that take part in executing and managing a specific process (e.g. firefighters and the accounting department).
- Task distribution across public organizations: Cross-organizational service production within the public sector itself, whereby a specific service is provided through collaborating but independent public sector organizations (e.g. firefighters, waterworks and the police), makes task control more difficult.
- Task distribution across sectors: The outsourcing of selected parts of service-production also implies a lack of control, not only over the outsourced part, but also at the interfaces between the organizations (e.g. firefighters and PFC).
- Task distribution across professional organizations and citizens: The use of volunteers (e.g. volunteer firefighters) also implies lack of control – and in some aspects more than in outsourcing – since the volunteers’ contribution is not regulated contractually. The use of “co-creation” and “self-service”, involving citizens who produce their own services, also has implications for the level of task control.

A specific process might rely on many different kinds of actors. Some tasks might be performed by the municipality itself (but by different departments); others might be outsourced to various private companies or rely on contributions from volunteers, and they typically depend on cooperation by the citizens or companies that need the service. The large number of relatively independent actors in itself makes task control difficult, but task control is even further threatened by the changes in task allocation over time. What is outsourced
today might be insourced next year or the other way around (this due to changes in political leadership), or another vendor might be chosen instead of the current one. In the same way, what is centralized today might be decentralized next year. Currently, government tasks are being pushed onto the citizens themselves through for example the implementation of web-based services and co-creation, and onto the private sector in terms of outsourcing. Decisions about the use of types of actors in service production (e.g. outsourcing and co-creation / self-service) are politically sensitive and not left to individual department heads.

Service production in the municipalities is regulated by external forces. National level laws, rules and regulations as well as local political decisions define the range of requirements regarding the way tasks are performed and, not least, how they are documented. These laws, rules and regulations are subject to change in ways that can be hard to predict and decided in political processes affording little influence to the people providing the services. The changes might not be decided with operational efficiency in mind, but rather as a response to public and political interests.

Precisely in the example of the firefighters, we can see that many different actors in many different organizations take part and there is no well-defined management structure responsible for the entire process and how well it performs, or that has the authority to change it. Furthermore, the work of firefighting is regulated by rules and policies defined at the national level, for example in the documentation of incidents.

4.1.5 Technology control

Information technology can be developed and acquired in many different ways that afford different possibilities for exercising technology control. In the processes we have looked at we can recognize the following acquisition and development models:

- **In-house development**: Here, IT systems are developed internally by developers in collaboration with the future users, with the focus entirely on the specific needs of the particular organization. The resulting systems are owned by the user organization. This option potentially provides the greatest extent of technology control.

- **Outsourced custom development**: Here, IT systems are developed externally by an IT service supplier in collaboration with the future users, with the focus entirely on the specific needs of the particular organization. The resulting systems are owned by the user organization. The level of control is still high, but the user organization is dependent on the service supplier’s capability to deliver the appropriate system.

- **Community-based development**: In order to share development costs, several organizations with similar needs (e.g. municipalities) establish a formal collaboration to develop IT systems that fit the general needs of the organizations. The actual technical development is typically outsourced to an IT service supplier. The resulting IT systems are owned by the community. The level of control is however reduced in the sense that requirements, delivery plans etc. must be agreed upon by the whole community.

- **Standard applications**: Standard IT systems are acquired “off the shelf” and used. Customers buy the right to use the application, but do not own the application itself. The applications range from packaged software (e.g. word-processing) with limited possibilities for customization, to large and complicated ERP systems that can be tailored to the specific organization. These applications are developed for a mass market and the level of technology control is low.

The municipalities use options 1 and 2 only on a very limited scale – mainly because they are too expensive to acquire – but rely instead on options 3 and 4: The municipalities reduce the cost of getting the technical systems, but also must accept in the bargain a lower degree of technical control and customization. Even though municipalities are quite large organizations, they are also very diverse in the sense that they have a very broad range of tasks e.g. education, eldercare, road maintenance, social services etc. They have many departments that require highly specialized systems for a relatively small number of users, which makes it more difficult to benefit from investments in IT. By EU regulation the municipalities regularly have to invite IT vendors to bid on IT service and system deliveries for the various service areas. This means that central systems (e.g. accounting) are potentially replaceable within a few years, requiring then a re-integration with all the other systems.

Again in the firefighters’ case, we can see that there is little local influence on the IT systems in use. The primary system (ODIN) is mandatory. However the national agency stopped its maintenance and further development years ago, and the local departments have no influence on the basic design. Since the time of the original development many changes in task design have been made, such as the outsourcing of specific tasks.
from the municipality to private operators, but these changes were not incorporated into the original system design.

### 4.1.6 Synchronizing task and technology control

Obtaining a consistent level of alignment between tasks and technology depends on governance structures that have the power to exercise both technology and task control, or at least mandate the collaboration between the various actors that are in control. In the processes we have studied this is not the case, with the result that the alignment between technology design and task design, to a large degree, takes place at the level of individual employees without much management interference. The employees find their own way of working and collaborating using the existing systems and other artifacts and tools such as spreadsheets, paper archives, notes and calendars, thereby compensating for the lack of pre-designed alignment between task and technology. Furthermore the employees manually integrate the systems by moving data from one system to another. The best way to generally describe the employees’ situation is with the concept of “bricolage” (Lévi-Strauss, 1967) – making the best of the situation by using whatever is at hand. It works, but it is not efficient and the outcome of IT investments in terms of productivity gains seems less than optimal. Technology-and task-design decisions – that ultimately affect the crucial coordination of concrete processes and tasks – are made far away from the end-users and their workplaces.

### 4.2 The combination of investments

As described in the literature review section, technological and organizational alignment is achieved through combinations of IT and non-IT investments. While the IT investment decisions in the studied municipalities are taken mainly from an acquisition-cost perspective, the complementary non-IT investments are seen from a systems perspective, meaning that implementation projects are framed as systems-implementation projects, not process-improvement projects. A typical example of this: As firefighters were invited to a general-purpose workshop for all employees to learn how to use the functions of a new accounting system, the implications for the organizational processes – in this case for the fire department’s duties – were not explained. Generally we found no examples of process-level improvement efforts where IT solutions included all the actors in a specific process in order to improve it. To use the terminology of Zuboff (1988) and Chang (2000), the implementation efforts in the processes studied here can be characterized as “automation” and “transaction”: There were no radical transformations of work processes, and implementation efforts were single-event transactions, typically limited to training end-users in the use of the new systems.

One specific organizational factor has great impact on the combination of IT and non-IT investments. As described previously, improvements at the process level might not have any impact on the organizational level. Municipal politicians generally cope with this by simply cutting department budgets pre-emptively so that costs are mitigated. But then the involved departments have fewer resources for non-IT complementary investments, and since the IT has already been bought and budgets reduced, there is little interest among political and administrative leadership to risk an evaluation of whether improvements are actually being realized. The lag between investments and realized outcomes results in increased pressure on the affected departments: They should get more resources during this period to design and implement organizational changes, but they actually lose resources.

## 5. Results and discussion

In this section we will review our research question and summarize and discuss the results. The research question investigated is:

- What characterizes the municipalities’ capabilities to increase productivity through IT investments and what major challenges must be overcome?

From the perspective of first-level managers and employees the productivity gains from IT investments are less than optimal. There are numerous examples of inefficient IT-based processes in the municipalities, as described in the analysis section.

The problems manifest themselves as individual employees’ use of bricolage (e.g. inventing personal paper-based archives or spreadsheets, or using systems in unintended ways) in their attempts to design and execute a work practice that compensates for the lack of alignment between the available systems and work processes. These alignment problems can be categorized as task-level alignment problems (e.g. lack of alignment between system structure and task structure) that reduce productivity at the level of individual
employees, and process-level alignment problems that reduce process-level productivity (i.e. they make cumbersome the coordination and information exchange between individuals and organizations taking part in the process).

Comparing the findings in these cases with the previously described barriers we can see that many of these barriers apply here as well and that they contribute to the lack of alignment. This lack of alignment is explained, at least partially, by the way investments are designed, combined and managed. Because of a strong focus on reducing acquisition cost, the municipalities almost exclusively invest in standard systems, over the design of which they have relatively little control. This lack of control and dependency of vendors have previously been identified as a barrier for eGovernment (Veenstra, Klievink, Janssen, 2011). The municipalities are large organizations but also very diverse ones that offer many different services to local citizens and companies. They have many, very specialized domains with relatively few employees, for which it is difficult to establish a sound business case for the development of tailored systems. Such funding related problems are generally acknowledged as a significant barrier for eGovernment (Beynon-Davies & Martin, 2004; Weerakkody & Dhillon, 2008; Rana, Dwivedi & Williams, 2013; Meijer, 2015; Ebrahim & Irani, 2005). The municipalities engage in various shared funding arrangements that deliver standard systems but fail to standardize internal organizational processes as well.

Changing processes is generally difficult because it involves many different actors both within and outside the municipalities. Furthermore it is regulated by external actors (e.g. national-level policies and laws) and local political leadership. As a consequence, local administrative task control is reduced. The major decisions with implications for the design of IT systems and the design of processes and tasks are made in an uncoordinated manner by multiple actors who are relatively distant from the actual work processes. Not only are local task and technology control reduced, there are generally no established local management structures responsible for cross-organizational processes and their support by IT.

This lack of local control increases the need for cross organizational coordination. However, the need for coordination of eGovernment between central and local government (Nurdin, Stockdale & Scheepers, 2011; van Os, 2011), between local government and other organizations that take part in service production (Weerakkody & Dhillon, 2008; Ebrahim & Irani, 2005; Nurdin, Stockdale & Scheepers, 2011), between local governments and IT providers, and between internal departments (Veenstra, Klievink, Janssen, 2011; Meijer, 2015; Ebrahim & Irani, 2005) is not matched by the available IT management structures. This makes it difficult to establish well integrated IT systems and to transform organizational processes. Not only does the involvement of many different stakeholders across organizations make coordination difficult. Another implication is that the need for IT management capabilities is widespread and not isolated to a few organizational units or managers.

As for non-IT investments, the rationale behind them is automation (basically replacing and/or supporting human manpower with technology), not radical process change. This lack of radical change is not uncommon in municipalities (e.g. Beynon-Davies & Martin, 2004). Implementation has a system focus – not a process focus: Users are trained in the systems but process design issues are left to the employees. Just as reported in previous research non-IT investments are inadequate (e.g. Bannister, 2001; Beynon-Davies & Martin, 2004; Nurdin, Stockdale & Scheepers, 2011).

The main characteristic of software is that it technically can be changed relatively easy to fit the context in terms of organizational processes. What happens here is that the institutional context makes it difficult to actually exploit this fundamental characteristic and create a high degree of alignment between IT and organizational processes.

The primary practical implication is that realizing productivity gains from IT investments in the municipalities is difficult. Especially the municipalities should think twice before engaging in IT-enabled organizational change in areas characterized by low task and technology control combined with low IT management capabilities. There is nevertheless in Denmark a strong focus on new technologies and systems to reduce public sector service costs. However, the bigger challenge might not be technical issues, but rather how to create better local control and capabilities so that the technologies and systems can be appropriately exploited.

This research confirms and complements existing IT business-value research and demonstrates how those models (e.g. Schryen, 2013) can be used to understand productivity-related issues in public sector
organizations. By taking a process perspective combined with a qualitative approach, this paper offers some insights into the conversion of investments into value and the problems that organizations face in this domain. Knowing (e.g. Schryen, 2013) that the outcome of IT investments differs across various industries, this paper wanted to identify some of the major factors that impact productivity gains from IT investments in another specific domain.

Task and technology control is taken for granted in IT business-value literature, most likely because that research is empirically grounded in private sector company data. Within that literature there is a great emphasis on the needed capabilities, but not on the possibilities for exploiting these capabilities by exercising technology and task control. However for municipalities this assumption doesn’t apply and in fact the lack of control there makes it much more difficult to benefit from IT investments. Since public sector services provided by the municipalities have an enormous impact on our societies, it is vital that IT business-value issues be researched within this context as well, and this paper should provide some knowledge about the problem issues specific to this sector.

6. Conclusion

In the attempt to answer the research question:

- What characterizes the municipalities’ capabilities to benefit from investments in information technology, and what major challenges must be overcome to do so?

we suggest that productivity gains are difficult in the municipalities because of the lack of task and technology control and limited IT management capabilities, and that these challenges are not easily dealt with because they are caused by fundamental characteristics of the way service processes are designed and managed, and how IT is developed and acquired.

Besides providing these specific findings, the research contributes by illustrating how IT business value models might be used to analyze IT value creation in a specific domain, and how systems development methods might be used to systematically analyze organizational processes during research.

Our research has limitations in that it is based on data from only two municipalities. However, the identified challenges are similar across the studied processes and organizations.

References


Bannister & Remeny, 2000


Bonnerup 2011 http://www.tekno.dk/pdf/projekter/p01_Rapport_it_proj.pdf)


Sørensen, R., Thomsen, B.K., Rask, M.H. (2012). Salary processing in day care II. Aalborg University.


Perceptions of the Australian Public Towards Mobile Internet e-Voting: Risks, Choice and Trust

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Abstract: This paper reports on data collected from an anonymous survey on perceptions of the Australian public towards using a mobile internet e-voting platform (N = 295). It is the first such study conducted in an Australian context by an academic institution, which allows this research to be approached with a sense of impartiality. Our society has become rapidly fuelled by the mobilization of interactions and services. As the society becomes increasingly wireless connected, these mobile platforms are expected to provide an untapped universal medium by which paper based elections can be complemented or even "upgraded" to digital elections. This research is the first paper in a study which will be focusing on internet e-voting, specifically the utilisation of mobility devices within Australia. As with any research, context shapes the direction and outcome goals. Internet e-Voting (and research pertaining to) has gained momentum over recent years. Though there has been much research done in this field, there was been a gap in findings when dealing with Australian and mobility context, however similarities can be drawn from these related studies. The way the Australian context differentiates itself in one instance is Compulsory Voting. Utilising the findings from this initial study, we intend to provide a baseline from which our research can be further analysed and in turn will allow the derivation of hypotheses leading to creation of a user acceptance model towards utilisation of a mobile internet e-voting platform during an Australian election. Survey respondents were overall more in favour of using mobile internet e-voting (75.25%), with more respondents requiring greater information about the technology (15.93%) rather than being against its use (8.82%). The top appeals of the platform were towards mobility (91.40%), verifiability (72.90%) and speed (72.50%), with the top concerns towards manipulation (75.10%), retrieval (65.30%) and monitoring (63.20%) of casted votes by malicious parties or software. The initial hypothesis that were derived from the conclusion of the survey and post analysis are based on studies that were derived from Davis' (1989) TAM, as it has been identified that there is a correlation between the perceived ease of use and the perceived usefulness of a technology to its acceptance and use.

Keywords: Mobile voting, remote internet e-voting, voting / election technologies, e-government, online voting, electronic voting survey

1. Introduction

The Australian Secret Ballot was an innovation of its time when it was introduced in 1855 in the state of Victoria. Since that time there has been little change or alternatives to the mechanism by which eligible voters can cast a ballot. This is unlike other areas of the Australian government that have adopted a range of internet and e-commerce technologies such as health and welfare services, and the deployment of a range of new channels to deliver e-government services. Australian citizens can now access services such as their personal medical records online and control information pertaining to these records through the eHealth service website (http://www.ehealth.gov.au/). Governments around the world have also adopted e-government technologies, with the New Zealand government aiming to have all their new government services offered online by 2017 [UNPAN 2014] while Ethiopia, placed 72nd globally in online service delivery, placing its online service delivery well ahead of other countries, including Malta, Belarus, Cyprus and Indonesia [UNPAN 2014]. In fact the World average E-Government Development Index is 0.4712 as of 2014 [UNPAN 2014].

E-voting has been considered as one way for improving the electoral process. The term "E-Voting" can be viewed as describing an enabling technology or a platform by which an elector casts a ballot via electronic means [Caarls 2010]. Conceptually, the benefits that can be derived from adopting a E-voting platform include verifiability, speed of tallying ballots, reduced administration, reduced wastage of resources and time, and vote casting validation [Goodman et al. 2010; Jordi Barrat i Esteve et al. 2012; R. Michael Alvarez et al. 2012]. The E-voting technology is not without its disadvantages, with potential issues readily identified such as inequality, security, secrecy, and trust [Caarls 2010; Henrik Nore n.d.; Rodney Smith 2009]. Multiple trials of E-
voting have occurred across the globe, and the technology has already been deployed in Markham, Canada [Goodman 2014]; New South Wales, Australia [Electoral Council of Australia and New Zealand 2013]; Estonia [Estonian National Electoral Committee n.d.] and Barcelona, Spain [Riera and Cervelló n.d.], just to name a few.

In Australia, voting is compulsory, meaning that "It shall be the duty of every elector to vote at each election" [Commonwealth Electoral Act 1918]. The iVote Remote Electronic Voting system introduced initially in the March 2011 State General Elections, which was also used in the 2015 NSW State General Election held on 28th March 2015, provided eligible voters the ability to cast their ballots online. Approximately 200,000 votes were captured through iVote during the 2015 State General Election. For enrolled voters in NSW who preferred to use the iVote system to cast their votes online, they were required to satisfy one or more of the following eligibility criteria [Electoral Commission NSW n.d.]:

- real place of living is not within 20 kilometres, by the nearest practicable route, of a polling place;
- have a disability (within the meaning of the Anti-Discrimination Act 1977) and because of that disability have difficulty voting at a polling place or are unable to vote without assistance;
- will not be within New South Wales throughout the hours of polling on election day;
- vision is so impaired, or otherwise are so physically incapacitated or so illiterate, that are unable to vote without assistance.

Our society has become rapidly fuelled by the mobilization of interactions and services. As society becomes more wirelessly connected, these platforms provide an untapped universal medium by which paper based elections can be complemented or even "upgraded" to digital elections. According to the Australia Bureau of Statistics [2015], by the end of December 2014 there were 6 million wireless broadband connections in Australia. This equated to 47.8% of the different ways Australian people connect to the internet, as opposed to 1.6% at the end of June 2006. This trend is not only valid for Australia. In a report conducted by Cisco [2014], the company claimed that the global mobile data traffic had grown by 81% in 2013 with an expected forecast reaching 15.9 Exabytes per month of mobile data traffic by 2018. More specifically, with regards to the smartphone technology, the Deloitte Media Consumer Survey 2014 discovered that 81% of Australian adults (aged 18 to 75 years) own a smartphone device [Deloitte 2014]. An opportunity clearly exists to connect Australian voters to the electoral process by using their smartphone devices.

There has been some research examining how an internet e-voting platform would function and what principles it would need to follow to ensure a safe, secure and trustworthy election. Esteve, Goldsmith and Turner [2012] further clarifies why trust is an essential part for an internet e-voting system. When trust is lacking, the integrity of the overall electoral process may be called into question, which in turn undermines the legitimacy of elected institutions and the authority of the elected government. Fouard, Duclos and Lafourcade [2007] surveyed over 15 different e-voting schemes and identified a set of security properties and cryptographic primitives of each scheme. This provided a solid comparison of the different schemes and how (and if) they implemented the identified security properties and cryptographic primitives. The security properties and cryptographic primitives analysed by Fouard, Duclos and Lafourcade [2007] have relevant applications in mobile internet e-voting as they are supposed to be applicable to any form of e-voting and not directly depend on a particular medium used to cast an e-vote.

Presumably, these principles can be applied towards a mobile internet e-voting platform. Though research has been conducted on the usefulness and perceptions of internet e-voting [Carter and Campbell 2012; Christian Schaupp and Carter 2005; Carter 2008], public perceptions (specifically Australian public perceptions) on mobile internet e-voting have been lacking.

This research is the first paper in a study which will be focusing on internet e-voting platforms, specifically utilising a mobile platform within Australia. As with any research, context shapes the direction and outcome goals. Internet e-voting (and research pertaining to) has gained momentum over recent years. Though there has been much research done in this field overseas, there exists a gap in findings when dealing with the Australian and mobility context, however similarities can be drawn from these related studies. The way the Australian context differentiates itself in one instance is Compulsory Voting. Utilising the findings from this initial study, we intend to provide a baseline from which our research can be analysed and in turn will allow
the derivation of hypotheses leading to creation of a user acceptance model towards utilisation of a mobile internet e-voting platform during an Australian election.

Davis' [1989] Technology Acceptance Model (TAM) is widely used in studying the adoption and acceptance of technology. TAM has two primary constructs, perceived usefulness (PU) and perceived ease of use (PEOU). According to Davis [1989], PU is defined as the user’s perception of the system to improve one’s job performance. PEOU, on the other hand, is defined as the perception of the amount of effort required by the user to use the system. PU and PEOU influence a user’s behavioural intention to use a system, which in turn determines actual system usage [Carter and Bélanger 2005].

Carter and Campbell [2012] presented a parsimonious model based on eight behavioural models including TAM, of US citizens’ perceptions of i-voting usefulness. As with many studies conducted on internet e-voting [Carter and Campbell 2012; Riera and Cervelló n.d.; Carter and Campbell 2011; Carter 2008], there are constraints and parameters which vary when applying the findings of these studies to the context such as Australia.

In particular, when comparing the Australian to the United States contexts one key difference is that in Australia, voting is compulsory, whilst in the United States it is not [Parliamentary Education Office n.d.]. One of the main considerations with research into internet e-voting conducted in the context of countries where voting is not compulsory (such as the United States) is how to address voter turnout [Carter and Campbell 2011; Carter and Campbell 2012; Spada et al. 2015; Bochsler 2010]? Countries which implement compulsory voting also try to address the issue of voter turnout but it has a different focus and priority.

Recently the Australian Broadcast Corporation (ABC) published an article in relation to an obtained internal report by the Australian Electoral Commission (AEC) that showed more than 1 million people are currently not on the electoral roll [Ashlyne McGhee 2016]. Though compulsory voting is a law in Australia [Commonwealth Electoral Act 1918], the report states that the AEC “does not impose fines for non-enrolment”.

The Electoral Council of Australia and New Zealand [2013] has identified three different ways in which internet e-voting might impact on voter engagement;

- It may directly increase the likelihood of voting by persons who are already engaged with the electoral process and wish to vote;
- It may motivate people who currently are disengaged from the political and electoral processes, and who do not turn out to vote, to do so in future; and
- Arguably the availability of internet e-voting will not necessarily increase turnout, but it could prevent a potential disengagement from the electoral processes among younger voters which is postulated to flow from a foreshadowed growing sense of alienation not from electoral processes per se, but from the use of antiquated voting mechanisms.

Differences between government structure and electoral processes also need to be considered when comparing the results of e-voting studies.

The United States is a republic, whereas in contrast Australia is a constitutional monarchy. The Australian Prime Minister is selected by the elected members of the party/parties that have won a majority of seats in the House of Representatives, whereas the US President is directly elected by the people and must appoint non-members of the Congress to fill ministerial posts. Elections for the House of Representatives use a preferential voting system to elect one member for each electorate. Elections for the Australian Senate use a proportional voting system to fill multiple vacancies in each state and territory. In comparison, elections in the United States use the simple majority or ‘first past the post’ system for both houses [Parliamentary Education Office n.d.]. These large differences in government structure and electoral processes likely influence how a voter might utilise a mobile internet e-voting system. They might be voting for the US President or alternatively their local Australian House of Representatives member, their electorate might use preferential voting or instead ‘first past the post’ voting. Ease of use, security and urgency to cast vote might be of different importance to voters in these different electoral systems.
Finally, cultural differences between the Australian context and the others (i.e. United States) needs to be considered when gauging public perceptions and developing the acceptance models. Significant socio-economic and cultural differences exist between countries such as the United States and Australia, for instance. 

Cross-cultural research (which involves empirical studies across members of various cultural groups) has found that different cultural groups have had different experiences which lead to a predictable and significant difference in cultural behaviour [Brislin 1976]. Such differences could lead to cultural specific perceptions on the value of mobile e-voting.

It is important to point out that public perception needs to be understood in order to determine the likelihood of adoption. Carter and Belanger [2005] states that the adoption of e-government services is contingent upon citizens’ confidence in both the enabling technologies and the agency offering the service. The rollout of a mobile internet e-voting platform is likely to be both expensive and resource intensive. As a result, confidence that such a system will be adopted by their citizens is critical to the government’s support for the technology.

In order to clarify the factors that might hinder the adoption of a mobile internet e-voting platform in Australia, we believe that the voice of the Australian public must be heard so that their concerns can be analysed and addressed. Unfortunately, there is no publicly available data that we could reference for such purpose. The search for an answer to our enquiry led to the launch of a month long awareness campaign spanning March and April 2014 that, coupled with an online survey, has enabled us to collect feedback from the public.

Our goal for the survey was that it could provide an opportunity for the Australian public to help shape how they would like their mobile e-voting platform to be designed. The findings of this survey might also be useful to other countries that are considering the deployment of a mobile E-voting solution. Through the survey instrument, we have attempted to discover what the public finds appealing and likewise concerning about the technology as well as their perceptions of the current election process. Utilising the collected data, we intend to develop hypotheses for further investigations through qualitative analysis. We anticipate that these hypotheses will help us determine the PU and PEOU of a mobile internet e-voting solution, which as per Davis’ [1989] TAM, will determine the likelihood of adoption. We believe that these results will benefit the academic community and government bodies alike in understanding the public perception on e-voting.

The remainder of this article is organised as follow. In section 2, the methodology used to design the survey, completed with a description on the breakdown of the survey sections, will be given. Measures that are derived through the survey are also discussed, while a brief overview of the questions (A complete list of survey questions can be found in the electronic appendix) is also included. Section 3 presents the initial findings of the survey. Sections 4 and 5 discuss the limitations of the survey and the implications and findings of this study, respectively. Lastly, in section 6 we conclude and summarise future work.

2. Methods

2.1 Survey design

The anonymous public survey was made available online and in paper based mail format for eligible Australian voters between 16th of March and 30th of April 2015. This survey was the first of its kind that specifically aimed to derive a baseline data set from which the Australian public’s perceptions and trust in mobile e-voting could be established. In addition, the data can be used to assist in identifying key issues for future research projects that are aimed at understanding the adoption of mobile e-voting technology. The Mobile Voting website (http://mobilevoting.com.au) was launched in February 2015 as part of a public awareness campaign to inform about the existence of mobile e-voting technology. The site was not meant to promote the argument for or against mobile e-voting technology. It was primarily used to promote the survey in conjunction with various social media pages on Facebook, Google Plus and Twitter.

The survey was split into seven sections, including:

1. Information Sheet: Provide the potential respondent with information relating to the research, the survey and ethics committee approvals.
2. **Eligibility**: Confirm if the respondent was eligible to undertake the survey or not. The criteria were set to mirror the current Australian eligibility criteria for an election.

3. **Demographics**: Provided information that will be used as dimensions to the results. This included questions about gender, age, income, locality, internet accessibility, education, and disabilities.

4. **Connectivity**: Provide information on the internet and technological access, internet device and service preferences of the respondent. This information will also allow the research team to apply an additional level of categorisation on the results.

5. **Elections**: Allow respondents to indicate what they like and do not like about the current voting process.

6. **Mobile Voting**: Allow respondents to indicate what properties of mobile internet e-voting that they find of appeal and concern. This include finding out if the respondent would utilise mobile internet e-voting if it was made available at the next election. Preferences and trust towards online systems was also captured.

7. **Feedback**: Capture open ended response to any additional comments the respondent might want to make.

These sections were designed to provide classifications and identified relationships (if any) between various responses. These relationships will allow the research team to shape hypotheses based on the findings of the survey. A statistical power analysis revealed that \( N = 276 \) would be a sufficient number of respondents for the survey to detect a moderately sized effect on a normalised scale (\( \Delta = 0.30 \)) in favour or against mobile e-voting.

This survey is the first of its kind conducted by an Australian academic institution, which allows this research to be approached with a sense of impartiality. The research team attempted to capture as much information as possible from the respondents without directing answers or generating questions of bias. The survey was designed to be an anonymous and self-completing [Brace 2004] survey. By adopting this design, we aimed to remove any potential bias in the responses while making it easier for the respondents to be honest about sensitive subjects [Brace 2004]. Survey fatigue was another area that required our attention in that too many questions could cause the respondents to rush through the survey in order to get it completed quickly [Brace 2004; Porter et al. 2004]. Sharp and Frankel [1983] found that longer surveys result in lower response rates. To address survey fatigue, multiple techniques were applied and tested. The survey length and content were tested against a pilot group prior to public release, where the average completion time was approximately 10 minutes. Another technique utilised was attaching pre-coded responses and explanations to applicable questions. For example, respondents were given pre-coded response like "I'd prefer not to say" or "Other" to indicate that they did not want to answer the question or their preferred response was not listed.

The survey design also ensured that questions were ordered to prevent unintended bias of responses to later questions. Behavioural questions that are arguably easier to answer and ones which require recall were asked prior to attitudinal questions which are meant to solicit a respondent’s position towards a subject or matter. This allows us to assess the respondent’s behaviour in light of their attitudes [Brace 2004]. This was used in conjunction with the technique of “funnelling” [Brace 2004], which attempted to order questions from the general to more specific questions.

### 2.2 Measures

The survey was designed to be an anonymous survey and respondents had to satisfy a set of eligibility requirements. These requirements are the eligibility to cast a vote in an Australian election and the condition that the respondent cannot be a direct relative of a member of the research team. If a respondent met these conditions, they would be eligible to continue with the survey; otherwise, they would be redirected to a disqualification page and the survey would be terminated.

In order to determine what factors influence user acceptance in the adoption of a mobile internet e-voting platform, we resorted to Davis' TAM [1989] to measure the PU and the PEOU by means of our survey. The survey asked what the respondent Liked and Disliked about the current electoral voting process, what the respondent thought was appealing and concerning for a mobile internet e-voting platform, what devices the respondent prefers to use to access the internet, what tasks they have previously completed using the internet, etc.
The survey also included questions that are related to the current electoral process and mobile internet e-voting platform. Answers to these questions allow the research team to establish the PU of a mobile internet e-voting platform. By understanding the likes and dislikes of the current electoral process, we want to uncover what the perceived disadvantages of the current process are and how they can be addressed. At the same time, we want to ascertain what the perceived advantages are and how they might be reapplied (or enhanced) in order for the e-voting platform to be perceived as useful.

Moreover, the survey has questions that asked what devices the respondent had previously used and what tasks he or she had completed online. These data give us a baseline from which to establish the perceived ease-of-use of a potential e-voting platform. Through capturing the types of device used and the tasks respondents had undertaken to do online, we are able to establish the requirements that are needed to ensure compatibility across devices when the user interface and the interactivity (e.g. it should be as simple and intuitive as an online shopping store) of the e-voting platform are designed.

Furthermore, the demographics of the survey respondents were also recorded. These data include age group, gender, average yearly income range, current living locality, highest education level, and disabilities. By incorporating these information in our research, we attempt to achieve "universalism" [Hammer 2011] in our findings. Universalism is defined as the principle that a given value, behaviour, theory, or treatment will be the same across all groups independent of culture, race, ethnicity, gender, and other social identities (Reynolds 2008; Beins, 2009, p. 356). Hammer [2011] states that thorough description of participants allows readers and researchers to determine for whom the findings can be generalised and how they can be compared. Demographic questions will also allow the sample characteristics to be compared with the national characteristics (e.g. percentage of males to females between the age of 18 and 95 nationwide).

Direct questions were asked towards the end of the survey. These include three key questions:

- "From past experiences using secured online systems, both government and commercial, how would you best rate your trust of these systems? Examples of such systems are Online Banking systems or Welfare and Human Services systems."
- "If a mobile e-voting platform was made available during the next election, would you use it to cast your vote?"
- "Rank your preference on how you would cast your vote, if a mobile e-voting platform was made available during the next election."

By asking these questions in the survey, we attempt to objectively assess these demographical, PU and PEOU factors in coming up with a set of hypotheses that we can test to establish the Intended Use [Davis 1989] of a mobile internet e-voting platform and the levels of trust that the respondents might have towards using the platform.

3. Results

3.1 Sample

In this study there were 335 respondents, the results of 40 respondents were disqualified from further analysis due to not having completed the survey. As this was a voluntary survey, item non-response bias can be inferred, implying that these samples can be excluded (Sherman, 2000) and the results derived from the remaining N = 295 samples can be presented. Note that the original statistical power test required N be greater than or equal to 276. As such, the remaining sample is still within study parameters.

Survey respondents were given the pre-coded response of “I'd prefer not to say” (PNTS) for all demographics questions. Table 1 contains a summary of the primary characteristics of the sample. The ages of the sample ranged from 18 years and older; females accounted for 43.73% of the sample, with 2.04% PNTS. The mode average income was $0-$24,999 AUD, with 65.00% of the sample currently living in an urban location; 63.71% of respondents have undertaken or completed a tertiary university education; 8.83% had a physical or mental disability; and 3.38% were blind or vision impaired.
Table 1: Primary Characteristics of Sample (N = 295).

<table>
<thead>
<tr>
<th>Gender</th>
<th>%</th>
<th>Locality</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>43.73</td>
<td>Internationally</td>
<td>1.70</td>
</tr>
<tr>
<td>Male</td>
<td>54.23</td>
<td>Urban</td>
<td>65.42</td>
</tr>
<tr>
<td>PNTS</td>
<td>2.04</td>
<td>Rural/Remote</td>
<td>32.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Group</th>
<th>%</th>
<th>Education</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24 years</td>
<td>13.23</td>
<td>Didn’t attend</td>
<td>0.00</td>
</tr>
<tr>
<td>25-34 years</td>
<td>24.39</td>
<td>Home School</td>
<td>0.00</td>
</tr>
<tr>
<td>35-44 years</td>
<td>15.58</td>
<td>Primary School</td>
<td>0.00</td>
</tr>
<tr>
<td>45-54 years</td>
<td>16.28</td>
<td>High School</td>
<td>15.26</td>
</tr>
<tr>
<td>55-64 years</td>
<td>11.53</td>
<td>TAFE</td>
<td>21.03</td>
</tr>
<tr>
<td>65-74 years</td>
<td>0.68</td>
<td>University</td>
<td>63.71</td>
</tr>
</tbody>
</table>

| 75-84 years | 0.00 | 90.15 |
| 85-94 years | 0.68 | 8.83 |
| 95 year or above | 0.34 | No |
| PNTS | 10.85 |

<table>
<thead>
<tr>
<th>Average Income</th>
<th>%</th>
<th>Blind or Vision Impaired</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0-$24,999</td>
<td>20.35</td>
<td>No</td>
<td>96.28</td>
</tr>
<tr>
<td>$25,000-$49,999</td>
<td>17.97</td>
<td>Yes</td>
<td>3.38</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>16.93</td>
<td>PNTS</td>
<td>0.34</td>
</tr>
<tr>
<td>$75,000-$99,999</td>
<td>16.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$100,000-$124,999</td>
<td>9.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$125,000-$149,999</td>
<td>3.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$150,000-$174,999</td>
<td>1.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$175,000-$199,999</td>
<td>1.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$200,000 and up</td>
<td>2.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNTS</td>
<td>10.85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2 Connectivity to the Internet, devices and online services

For the respondent connectivity section (i.e. section 4) of the survey, 98.98% of the sample had access to the internet, with 70.85% of respondents having access to mobile internet; 88.81% of the sample are utilising a Smartphone; 10.85% have voted for an election online; and 82.37% have used social media services, online shopping and online banking (see Table 2). Table 3 ranks the usage of devices by the respondents to access the internet. As can be observed, PC/Laptop is the most preferred device, followed closely by Smartphones.

Table 2: Internet access, devices and experience with online services (N = 295).

<table>
<thead>
<tr>
<th>Types of Internet Access</th>
<th>%</th>
<th>Devices Owned</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Broadband</td>
<td>78.31</td>
<td>PC or Laptop</td>
<td>97.63</td>
</tr>
<tr>
<td>Mobile Internet</td>
<td>70.85</td>
<td>Smartphone</td>
<td>88.81</td>
</tr>
<tr>
<td>Work Broadband</td>
<td>41.02</td>
<td>Tablet</td>
<td>70.85</td>
</tr>
<tr>
<td>Work Not Sure</td>
<td>5.42</td>
<td>Smart TV</td>
<td>34.58</td>
</tr>
<tr>
<td>Other</td>
<td>5.08</td>
<td>Feature Phone</td>
<td>17.63</td>
</tr>
<tr>
<td>Home Not Sure</td>
<td>4.75</td>
<td>Other</td>
<td>4.41</td>
</tr>
<tr>
<td>Home Dial-up</td>
<td>1.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Dial-up</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Online Services

- Sending/Receiving Email | 98.64 |
- Social Media (e.g. Facebook, Twitter, LinkedIn) | 94.56 |
- BPay, PayPal or other payment facilities | 92.86 |
- Online Banking | 91.16 |
- Online Shopping (e.g. eBay, Alibaba, Woolworths Online) | 89.12 |
- Reading/Watching News | 88.44 |
- Voting Online for an Election | 10.88 |
Table 3: Ranked order of device used to access the internet (N = 295).  

<table>
<thead>
<tr>
<th>Device</th>
<th>Rank</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>N/A</th>
<th>Score²</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC or Laptop</td>
<td>1</td>
<td>46.78</td>
<td>32.20</td>
<td>15.25</td>
<td>0.68</td>
<td>0.68</td>
<td>0.68</td>
<td>3.73</td>
<td>5.26</td>
</tr>
<tr>
<td>Smartphone</td>
<td>2</td>
<td>40.34</td>
<td>32.20</td>
<td>12.20</td>
<td>1.69</td>
<td>1.36</td>
<td>1.69</td>
<td>10.51</td>
<td>5.16</td>
</tr>
<tr>
<td>Tablet</td>
<td>3</td>
<td>8.16</td>
<td>21.09</td>
<td>34.69</td>
<td>8.50</td>
<td>3.06</td>
<td>1.02</td>
<td>23.47</td>
<td>4.26</td>
</tr>
<tr>
<td>Smart TV</td>
<td>4</td>
<td>0.34</td>
<td>3.05</td>
<td>8.14</td>
<td>20.68</td>
<td>10.51</td>
<td>5.08</td>
<td>52.20</td>
<td>2.89</td>
</tr>
<tr>
<td>Other Devices</td>
<td>5</td>
<td>0.34</td>
<td>3.39</td>
<td>7.80</td>
<td>21.36</td>
<td>15.93</td>
<td>5.08</td>
<td>46.10</td>
<td>2.81</td>
</tr>
<tr>
<td>Feature Phone</td>
<td>6</td>
<td>3.73</td>
<td>3.73</td>
<td>5.42</td>
<td>4.75</td>
<td>5.76</td>
<td>13.22</td>
<td>63.39</td>
<td>2.78</td>
</tr>
</tbody>
</table>

Table 3.3 Likes and Don’t Likes about current voting process

Table 4 shows the reasons behind sample Likes and Dislikes for the current electoral process. The top 3 likes are "Ability to cast a vote anonymously" (67.03%), "Ability to send my vote in via mail (postal voting)" (33.33%) and "Sausage Sizzle"³ (30.43%). On the other hand, the top 3 dislikes are "Lining up to vote / Time taken to cast a vote" (70.73%), "Having only one day to cast a vote physically" (57.84%), and "Travelling to the polling station" (56.10%).

Table 4: Likes and Don’t Likes of the current voting process (N=295)⁴

<table>
<thead>
<tr>
<th>Don’t Like</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lining up to vote / Time taken to cast a vote</td>
<td>70.73</td>
</tr>
<tr>
<td>Having only one day to cast a vote physically</td>
<td>57.84</td>
</tr>
<tr>
<td>Travelling to the polling station</td>
<td>56.10</td>
</tr>
<tr>
<td>Taking time out of my day to vote</td>
<td>55.40</td>
</tr>
<tr>
<td>Party volunteers providing how to vote cards</td>
<td>52.26</td>
</tr>
<tr>
<td>Size and time to fill in a ballot paper</td>
<td>45.99</td>
</tr>
<tr>
<td>Security of ballot papers once cast</td>
<td>33.10</td>
</tr>
<tr>
<td>Compulsory voting</td>
<td>25.09</td>
</tr>
<tr>
<td>Name and address available to voting officials when signing in</td>
<td>21.60</td>
</tr>
<tr>
<td>Other</td>
<td>14.98</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Like</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to cast a vote anonymously</td>
<td>67.03</td>
</tr>
<tr>
<td>Ability to send my vote in via mail (postal voting)</td>
<td>33.33</td>
</tr>
<tr>
<td>Sausage Sizzle</td>
<td>30.43</td>
</tr>
<tr>
<td>How to vote information cards</td>
<td>18.48</td>
</tr>
<tr>
<td>Other</td>
<td>14.49</td>
</tr>
<tr>
<td>Being able to catchup with friends at the voting station</td>
<td>8.33</td>
</tr>
<tr>
<td>Being able to discuss political policy with party volunteers</td>
<td>6.88</td>
</tr>
<tr>
<td>Getting help to cast a vote from a friend or family member</td>
<td>5.80</td>
</tr>
</tbody>
</table>

¹ Values are presented as percentages.
² Score is the representation of the ranking average. Rankings are weighed in reverse order (Rank 1 = Weight 6, Rank 2 = Weight 5, etc.) and calculated using \[ \text{Score} = \frac{\sum (w \times x)}{t} \] where \( w \) = weight of ranked position; \( x \) = response count for answer choice; \( t \) = total.
³ N/A responses are not factored into the ranking average
⁴ Sausage sizzles are charity fundraising and community events that are held at various polling stations during Election Day, where volunteers cook barbecue sausages and serve on a slice of bread or on a bread roll, accompanied by onions and sauces.
⁵ Results presented in this table are not mutually exclusive categories and therefore do not add to 100%.
3.4 Appeals and Concerns of a mobile internet e-voting platform

Table 5 shows the selections of sample appeals and concerns for use of a mobile internet e-voting platform. The top 3 appeals are “Able to cast a vote from anywhere online” (91.40%), “Getting a receipt confirming vote was cast” (72.90%) and “Speed to cast a ballot” (72.50%). On the other hand, the top 3 concerns are “Hackers, malware or virus changing my vote” (75.10%), “Hackers, malware or virus being able to retrieve my vote” (65.30%), and “Hackers, malware or virus monitoring my vote” (63.20%).

Table 5: Appeals and Concerns of a mobile internet e-voting platform (N=295)

<table>
<thead>
<tr>
<th>Concerns</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hackers, malware or virus changing my vote</td>
<td>75.10</td>
</tr>
<tr>
<td>Hackers, malware or virus being able to retrieve my vote</td>
<td>65.30</td>
</tr>
<tr>
<td>Hackers, malware or virus monitoring my vote</td>
<td>63.20</td>
</tr>
<tr>
<td>Secrecy/Privacy of my vote. Being able to link my vote back to me</td>
<td>55.60</td>
</tr>
<tr>
<td>Lack of independent oversight of the system</td>
<td>44.80</td>
</tr>
<tr>
<td>System built and maintained by a contracted commercial company</td>
<td>44.40</td>
</tr>
<tr>
<td>Users of the system having the ability to sell their votes</td>
<td>41.90</td>
</tr>
<tr>
<td>The voting system not being 100% compatible with my device</td>
<td>27.40</td>
</tr>
<tr>
<td>Lack of government oversight of the system</td>
<td>26.70</td>
</tr>
<tr>
<td>Other</td>
<td>14.10</td>
</tr>
<tr>
<td>Complexity of cast a vote</td>
<td>11.90</td>
</tr>
<tr>
<td>Being influenced to vote one way by someone other than an immediate family member</td>
<td>6.10</td>
</tr>
<tr>
<td>The time it takes to cast a vote</td>
<td>4.70</td>
</tr>
<tr>
<td>Being influenced to vote one way by an immediate family member</td>
<td>4.00</td>
</tr>
<tr>
<td>The color scheme of the voting system</td>
<td>2.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appeals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to cast a vote from anywhere online</td>
<td>91.40</td>
</tr>
<tr>
<td>Getting a receipt confirming vote was cast</td>
<td>72.90</td>
</tr>
<tr>
<td>Speed to cast a ballot</td>
<td>72.50</td>
</tr>
<tr>
<td>Being able to confirm cast vote is counted as cast</td>
<td>69.40</td>
</tr>
<tr>
<td>Speed to obtain election result count after polls are closed</td>
<td>58.40</td>
</tr>
<tr>
<td>Voting system being thoroughly tested prior to an election by independent bodies</td>
<td>58.10</td>
</tr>
<tr>
<td>The voting system used to complement not replace the current system</td>
<td>51.90</td>
</tr>
<tr>
<td>Being able to SMS(^6) my vote</td>
<td>44.70</td>
</tr>
<tr>
<td>Being able to see party policies information prior to casting a vote</td>
<td>44.70</td>
</tr>
<tr>
<td>Having an online tutorial to help understand how to cast a vote</td>
<td>40.50</td>
</tr>
<tr>
<td>Being able to phone in my vote to a computer system</td>
<td>31.60</td>
</tr>
<tr>
<td>Being able to change my vote, prior to polls closing</td>
<td>27.10</td>
</tr>
<tr>
<td>Being able to cast a vote with multiple language support</td>
<td>17.50</td>
</tr>
<tr>
<td>Being able to attend a polling station to cast my vote that overrides my online vote</td>
<td>14.10</td>
</tr>
<tr>
<td>Other</td>
<td>10.00</td>
</tr>
<tr>
<td>Being able to share my preferred vote (via social media sites)</td>
<td>8.20</td>
</tr>
</tbody>
</table>

3.5 Trust in government and commercial online systems and preference towards a mobile e-voting platform

Table 6 reveals that a majority of the respondents (72.88%) either Completely trusted or Slightly Trusted government and commercial systems as opposed to (15.93%) who either Completely Distrusted or Slightly Distrusted government and commercial systems. A total of 75.26% of the respondents would use a mobile internet e-voting platform if it was made available during the next election; 15.93% were unsure and required more information; and 8.81% would not use the platform. Out of the respondents who Completely Distrusted government and commercial systems, 39.30% were unsure and required more information; and 26.30% would not use the platform. Results presented in this table are not mutually exclusive categories and therefore do not add to 100%.

\(^{6}\) Short Message Service.
or Slightly Distrusted government and commercial systems, 42.55% of them would still use a mobile internet e-voting platform.

In relation to the preference of the voting mechanism, Table 7 makes known to us that “Use my smartphone or tablet to vote using an app” was ranked first, followed by “Use my own connected device to cast a voting on a website - such as PC or Laptop” and “Send an SMS with my vote”. The current main mechanism of casting a vote in Australia by using a paper ballot was ranked as the 2nd last preference.

**Table 6:** Trust in online systems (government and commercial) (N = 295)

<table>
<thead>
<tr>
<th>Completely Distrust</th>
<th>Slightly Distrust</th>
<th>Neither Distrust or Trust</th>
<th>Slightly Trust</th>
<th>Completely Trust</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>4.07%</td>
<td>11.86%</td>
<td>11.19%</td>
<td>37.63%</td>
<td>35.25%</td>
<td>4</td>
</tr>
</tbody>
</table>

**Figure 1:** Use of a mobile internet e-voting platform if available in the next election (N = 295)

<table>
<thead>
<tr>
<th>Method</th>
<th>Rank</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>N/A</th>
<th>Score^6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>41.02</td>
<td>29.83</td>
<td>8.81</td>
<td>6.44</td>
<td>3.05</td>
<td>2.37</td>
<td>8.47</td>
<td>5.01</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>36.95</td>
<td>29.15</td>
<td>13.56</td>
<td>8.14</td>
<td>4.07</td>
<td>2.03</td>
<td>6.10</td>
<td>4.86</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>4.07</td>
<td>11.86</td>
<td>14.58</td>
<td>18.98</td>
<td>23.39</td>
<td>11.53</td>
<td>15.59</td>
<td>3.05</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>12.54</td>
<td>5.42</td>
<td>8.81</td>
<td>17.63</td>
<td>17.63</td>
<td>28.81</td>
<td>9.15</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>0.34</td>
<td>4.41</td>
<td>13.90</td>
<td>21.69</td>
<td>20.68</td>
<td>17.63</td>
<td>21.36</td>
<td>2.59</td>
<td></td>
</tr>
</tbody>
</table>

- Use my smartphone or tablet to vote using an app
- Use my own connected device to cast a vote on a website - such as PC or Laptop
- Send an SMS with my vote
- Use a computer setup at a polling place that is owned and maintained by the Electoral Commission to cast a vote on a website
- Paper vote in a polling place

2 Values are presented as percentages.

^6 Score is the representation of the ranking average. Rankings are weighed in reverse order (Rank 1 = Weight 6, Rank 2 = Weight 5, etc.) and calculated using \( \frac{\sum w_x}{t} \), where \( w \) = weight of ranked position; \( x \) = response count for answer choice; \( t \) = total. N/A responses do not factor into the ranking average
4. Limitations

This study is not without its limitations. Firstly, even though it meets the size requirement of the statistical power analysis, the sample size of 295 respondents is still significantly small relative to the number of eligible Australian voters (16,405,465 as at 31 December 2015 [Australian Electoral Commission 2015]). However, this study is still able to sample a diverse range of respondents in terms of age, gender, income and locality, thereby increasing the generalisability of the findings [Carter and Bélanger 2005] by pushing the research towards “universalism” [Hammer 2011]. Future studies should seek a greater number of responses with more diversity in education and more focused research on groups identifying as having a disability that will allow more complex model testing. The survey was presented to the public via internet and paper mail out, yet all responses to the survey were submitted online. This is not necessarily a limitation but can be seen as a bias. Future studies should attempt to get responses from members of public who have limited computer skills or internet access. Although great effort was spent on the survey question design it cannot be guaranteed that some questions might be considered leading or otherwise misinterpreted by respondents. Such issues could themselves be a result of cultural or linguistic mismatches between the study authors and the general Australian public at large.

5. Discussions

Based on the primary findings of this survey, we have developed with several hypotheses that we will examine and test in later studies. From the survey data, we are able to identify a correlation between the trust levels of online government and commercial systems and the adoption of mobile internet e-voting technology (H1 and H4). This is also apparent in the concerns of a mobile internet e-voting platform as per the findings. Based on studies that were derived from Davis’ (1989) TAM, it has been identified that there is a correlation between the perceived ease of use and the perceived usefulness of a technology to its acceptance and use (H2 and H3). In relation to mobile internet e-voting, this survey has additionally identified an area of further study, and that is whether or not the allure of a new technology that makes voting simpler, faster and more convenient (PU & PEOU) will outweigh some traditional concerns of security. Verifiability and anonymity have been identified as one of the key appeals and likes of the current voting system and therefore must be retained with any implementation of a mobile internet e-voting platform (H5).

Table 8: Hypotheses relating to the adoption of mobile e-voting in Australia.

<table>
<thead>
<tr>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1. Trust is critical to mobile internet e-voting adoption.</td>
</tr>
<tr>
<td>H2. Greater perceived ease of use will contribute to a greater likelihood of mobile internet e-voting adoption.</td>
</tr>
<tr>
<td>H3. Greater perceived usefulness will contribute to a greater likelihood of mobile internet e-voting adoption.</td>
</tr>
<tr>
<td>H4. Significant levels of trust in the government and commercial agencies contribute to the likelihood of mobile internet e-voting adoption.</td>
</tr>
<tr>
<td>H5. Verifiability and anonymity must be proven for the likelihood of mobile internet e-voting adoption.</td>
</tr>
</tbody>
</table>

6. Conclusion

This paper, and the survey it described, has provided a set of baseline hypotheses which can be further tested in relation to the adoption of mobile internet e-voting in Australian elections. Survey respondents were overall more in favour of using mobile internet e-voting (75.25%), with more respondents requiring greater information about the technology (15.93%) than being against the use of the technology (8.82%). The top appeals of the platform were mobility (91.40%), verifiability (72.90%) and speed (72.50%) with the top concerns being manipulation (75.10%), retrieval (65.30%) and monitoring (63.20%) of votes by malicious parties or software. This study also provided an insight into the current voting platform. The top 3 likes of the
current voting platform were found to be anonymity (67.03%), postal voting (33.33%) and sausage sizzle (30.43%) with the top 3 dislikes being time taken to vote (70.73%), having only one day to vote (57.84%) and travelling time to vote (56.10%). Incidentally, the like of postal voting as a mechanism of the current platform is of particular interest as it can be seen as a form of remote voting that can be used to overcome the top 3 dislikes.

Being the first study of its kind carried out by an Australian academic institution, this research provides insights into both the potential pathways by which e-voting can be successfully adopted and the potential impediments that would prevent successful implementation. This study has proved to be able to sample a diverse range of respondents over an array of demographics, which allowed the findings to push towards a “universalism” that increases the generalisability of the findings.

Future research will continue to utilise the data from this study, as well as additional data gathered from select cohorts of respondents. The results will be analysed statistically and will be used to develop a research model and a survey targeting particular demographics to study current and future hypotheses on the topic of mobile internet e-voting adoption in Australian elections.

7. Acknowledgments

The research team would like to thank the anonymous survey respondents for generously taking their time to complete the survey. They also want to thank various media outlets for their assistance in advertising to the Australian public of this study.

8. Ethics Review

Approval for this study was granted by the Human Research Ethics Committee of the University of New England, Approval No HE15-055 Valid to 13/03/2016. As this survey was anonymous and voluntary, consent was given by the respondents prior to undertaking the survey by continuing through from the information page.

References


Electoral Council of Australia and New Zealand. 2013. Internet voting in Australian election systems,
Phillip Zada, Greg Falzon and Paul Kwan

Jordi Barrat i Esteve, Ben Goldsmith, and John Turner. 2012. International Experience with E-Voting,

Online Appendix to: Perceptions of the Australian public towards mobile internet e-voting: risks, choice and trust

A. Survey Instrument

A.1 Information Sheet

The following is some information which needs to be read and understood prior to undertaking this survey.

I wish to invite you to participate in my research project, described below.
My name is Phillip Zada and I am conducting this research as part of my PhD in the School of Science and Technology at the University of New England. My supervisors are Dr Greg Falzon and A/Prof Paul Kwan.

Research Project

A vulnerability analysis on the adoption of mobile Internet e-Voting in Australia

Aim of the research

This project aims to identify the challenges that arise or are found to hinder the implementation of a mobile e-voting platform in Australia. This research utilises scholarly literature, past case studies and public surveys as sources of information and data for detailed analyses. Identified challenges will be addressed through a vulnerability analysis that will propose potential solutions.

Survey

As part of this research we will be conducting an anonymous survey to determine public perception, interests and concerns about mobile e-voting (using your mobile phone to cast a vote). The survey consists of 21 questions which you can complete either on line or via a supplied return post form. The survey will take approximately 15 minutes to complete and all responses obtained will be securely and anonymously stored on an electronic database.

Confidentiality

No personally identifiable information gathered in the course of the study and your identity will remain confidential. No individual will be identified by name in any publication of the results.
Participation is Voluntary
Please understand that your involvement in this study is voluntary and I respect your right to withdraw from the study at any time. You may discontinue the survey at any time without consequence and you do not need to provide any explanation if you decide not to participate or withdraw at any time.

Questions
The survey questions will not be of a sensitive nature: rather they are general or demographic in nature, aiming to enable you to enhance my knowledge of the issues associated with the implementation of mobile e-voting in Australia.

Use of information
I will use information from the survey as part of my doctoral thesis, which I expect to complete in August 2016. Information from the survey may also be used in journal articles and conference presentations before and after this date. At all times, I will safeguard your identity by presenting the information in a way that will not allow you to be identified.

Upsetting issues
It is unlikely that this research will raise any personal or upsetting issues but if it does you may wish to contact Lifeline 13 11 14.

Storage of Information
Any electronic data collected during the survey will be kept on a password protected online database. Only the research team will have access to the data.

Disposal of information
All the data collected in this research will be kept for a minimum of five years after successful submission of my thesis, after which it will be stored in a data curation service.

Approval
This project has been approved by the Human Research Ethics Committee of the University of New England, Approval No HE15-055 Valid to 13th March 2016.

Contact Details
Feel free to contact me with any questions about this research by email at pzada@une.edu.au. You may also contact my supervisors. My Principal supervisor’s name is Dr Greg Falzon and he can be contacted at gfalzon2@une.edu.au or 02 6773 2387 and my Co-supervisors name is A/Prof Paul Kwan and he can be at wkwan2@une.edu.au or 02 6773 2034.

Complaints
Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at:
Research Services
University of New England
Armidale, NSW 2351
Tel: (02) 6773 3449 Fax: (02) 6773 3543
Email: ethics@une.edu.au

Consent
• I have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction.
• I agree to participate in this activity, realising that I may withdraw at any time.
• I agree that research data gathered for the study may be published, and my identity will be unidentifiable due to the strict confidentiality explained in the information sheet.
• I am over 18 years of age.
• In preservation of anonymity, I understand that no name or signature is required of me to give consent. I understand that my completion of this survey implies my consent to participate in this research.

A.2 Eligibility
1. To undertake this survey, you need to meet all these conditions:
   • 18 years or above
   • Of sound mind and body
   • An Australian Citizen, or a permanent resident registered to vote (as a British subject) prior to 1984
   • Do not have any relation to the research team

   0 = No
   1 = Yes

A.3 Demographics
2. What is your age group?
   1 = 18-24 years
   2 = 25-34 years
   3 = 35-44 years
   4 = 45-54 years
   5 = 55-64 years
   6 = 65-74 years
   7 = 75-84 years
   8 = 85-94 years
   9 = 95 year or above
   0 = I'd prefer not to say

3. What is your gender?
   1 = Female
   2 = Male
   0 = I’d prefer not to say

4. What is your approximate average income?
   1 = $0-$24,999
   2 = $25,000-$49,999
   3 = $50,000-$74,999
   4 = $75,000-$99,999
   5 = $100,000-$124,999
   6 = $125,000-$149,999
   7 = $150,000-$174,999
   8 = $175,000-$199,999
   9 = $200,000 and up
   0 = I’d prefer not to say

5. What best describes your current location?
   1 = I currently live in a urban location
   2 = I currently live in a rural or remote location
   3 = I currently live outside Australia (International)
   0 = I’d prefer not to say

6. What is your highest level of Education? Either as an enrolled or graduated student.
   1 = Didn’t attend school Home School
   2 = Primary School
   3 = Secondary School (High School)
   4 = Tertiary education - TAFE
   5 = Tertiary education - University
7. Are you considered to have a disability either physical or mental (lasting six months or more)?
   1 = No
   2 = Yes
   0 = I’d prefer not to say

8. Are you blind or vision impaired?
   1 = No
   2 = Yes
   0 = I’d prefer not to say

A.3 Connectivity

9. Do you have access to the internet?
   0 = No
   1 = Yes

10. Which type of internet connections do you have access to?
    1 = Home Dial-up
    2 = Home Broadband / NBN
    3 = Mobile Internet
    4 = Work Dial-Up
    5 = Work Broadband
    6 = Work, not sure what type of internet is being used
    7 = Home, not sure what type of internet is being used
    8 = Other (please specify)

11. Which of these devices do you currently own?
    1 = Mobile Phone – Not a smartphone
    2 = Smartphone
    3 = Tablet
    4 = PC or Laptop
    5 = Smart TV
    6 = Other (please specify)

12. Which online services have you used previously?
    1 = Online Banking
    2 = BPay, PayPal or other payment facilities
    3 = Social Media Sites (e.g. Facebook, Twitter, LinkedIn)
    4 = Online Shopping (e.g. eBay, Alibaba, Woolworths Online)
    5 = Voting Online for an Election
    6 = Sending/Receiving Email
    7 = Reading/Watching News

13. Rank in order of most used to least used device to access the internet. *If you don’t use the device select N/A*
    1 = Mobile Phone (NOT a smartphone)
    2 = Smartphone
    3 = Tablet
    4 = PC or Laptop
    5 = Smart TV
    6 = Other Devices

A.4 Elections

14. Indicate what you LIKE about the current voting process. *Select one or more of the following options*
    1 = Ability to cast a vote anonymously
    2 = Ability to send my voice in via mail (postal voting)
    3 = Being able to catchup with friends at the voting station
4 = Being able to discuss political policy with party volunteers
5 = Getting help to cast a vote from a friend or family member
6 = How to Vote information cards
7 = Sausage Sizzle
8 = Other (please specify)

15. Indicate what you DON’T LIKE about the current voting process. Select one or more of the following options
1 = Travelling to the polling station
2 = Having only one day to cast a vote physically
3 = Size and time to fill in a ballot paper
4 = Party volunteers providing how to vote cards
5 = Taking time out of my day to vote
6 = Compulsory Voting
7 = Lining up to vote / Time taken to cast a vote
8 = Security of ballot papers once cast
9 = Name and address available to voting officials when signing in
10 = Other (please specify)

A.5 Mobile Voting

16. Which properties of a mobile e-voting platform are of CONCERN to you? Select one or more of the following options
1 = Secrecy/Privacy of my vote. Being able to link my vote back to me
2 = Complexity of cast a vote
3 = The time it takes to cast a vote
4 = The color scheme of the voting system
5 = Lack of Government Oversight of the system
6 = Lack of Independent Oversight of the system
7 = Being influenced to vote one way by someone other than an immediate family member
8 = Being influenced to vote one way by a immediate family member
9 = Hackers, Malware or Virus monitoring my vote
10 = Hackers, Malware or Virus changing my vote
11 = Hackers, Malware or Virus being able to retrieve my vote
12 = Users of the system having the ability to sell their votes
13 = System built and maintained by a contracted commercial company
14 = The voting system not being 100% compatible with my device
15 = Other (please specify)

17. Which properties of a mobile e-voting platform are APPEALING to you? Select one or more of the following options
1 = Able to cast a vote from anywhere online
2 = Getting a receipt confirming vote was cast
3 = Being able to confirm cast vote is counted as cast
4 = Speed to cast a ballot
5 = Speed to obtain election result count after polls are closed
6 = Being able to phone in my vote to a computer system
7 = Being able to SMS my vote
8 = Being able to cast a vote with multiple language support
9 = Being able to see party policies information prior to casting a vote
10 = Being able to share my preferred vote (via social media sites)
11 = Being able to change my vote, prior to polls closing
12 = Being able to attend a polling station to cast my vote that overrides my online vote
13 = Voting system being thoroughly tested prior to an election by independent bodies
14 = Having an online tutorial to help understand how to cast a vote
15 = The voting system used to complement not replace the current system
16 = Other (please specify)

18. From past experiences using secured online systems, both government and commercial.
How would you best rate your trust of these systems?

**Examples of these systems are Online Banking systems or Welfare and Human Services systems**

1 = Completely Distrust  
2 = Slightly Distrust  
3 = Neither Distrust nor Trust  
4 = Slightly Trust  
5 = Completely Trust

19. If a mobile e-voting platform was made available during the next election, would you use it to cast your vote?

0 = No  
1 = Not sure, more information would be required  
2 = Yes

20. Rank your preference on how you would cast your vote, if a mobile e-voting platform was made available during the next election.

1 = Use my smartphone or tablet to vote using an app  
2 = Telephone - Call into a digital touch tone service (similar to telephone banking)  
3 = Paper vote in a polling place  
4 = Send an SMS with my vote  
5 = Use my own connected device to cast a voting on a website - such as PC or Laptop  
6 = Use a computer setup at a polling place that is owned and maintained by the Electoral Commission to cast a voting on a website

A.6 Feedback

21. If you have anything else you would like to add or any other comments please do so below. As this is an anonymous please do not add any identifiable information otherwise the survey response will be deemed invalid.