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<th>Understanding net benefits: a citizen-based perspective on e-government success</th>
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Abstract

eGovernment promises more efficient services and a more responsive government. Despite substantial investment, increasing failure rates have prompted critics to argue that policy makers are not achieving this vision. Surprisingly, there is very little research on what citizens define as important in eGovernment services and how aspects of government web sites affect that perception. The inclusion of the citizen perspective has largely been absent, denying a deeper understanding of the factors that drive usage. This research proposes an important and unique development of the D&M IS Success Model. By combining elements from public administration research and eGovernment success, this study constructs a comprehensive model of Net Benefits centred on the perspective of the citizen. The novel paradigm of Public Value is used to create a balanced success model, tailored for the public sector and is situated within the D&M IS Success Model. This research therefore aims to understand what citizens regard as important in the success of eGovernment services and what aspects of IT Quality affect eGovernment success.

Keywords: D&M IS Success Model, eGovernment, Public Value, Net Benefits
Introduction

Most developed countries and supranational bodies have for the last 10 years set efficiency and effectiveness gains at the core of their eGovernment strategies (Commission of the European Communities, 2003; US Government, 2002). To this has recently been added the goal of improved democratic engagement, in recognition of the potential of information & communications technologies (ICT) to provide innovative methods of citizen interaction (Commission of the European Communities, 2006). Much research has been conducted on eGovernment supply-side metrics, analysing the provision and sophistication of these services, however the inclusion of the citizen perspective in determining success has largely been absent (Helbig et al., 2009; Reddick, 2005; Reddick, 2006). Citizen needs or perceived values have not been adequately accounted for (Streib and Navarro, 2006) and there remains an evident gap between design and reality in eGovernment service provision (Heeks, 2002; Kolsaker and Lee-Kelley, 2008). Self-motivation plays a critical role in Internet-based usage, increasing the imperative to understand what citizens’ value in the services they use and what features of the system influence that perception (Muhlberger, 2005).

eGovernment promises more efficient services and a more responsive government. Despite substantial investment, critics argue that policy makers are not achieving this vision (Heeks and Bailur, 2007; Helbig et al., 2009). This factor, coupled with a high failure rate for eGovernment initiatives (Goldfinch, 2007), increases the need for studies that seek to uncover the determinants of success in eGovernment. More and more citizens are using eGovernment and it is therefore important to measure the success of eGovernment services from a citizen perspective (Wang and Liao, 2008). This research aims to contribute to an important gap in understanding what citizens’ value in eGovernment services and what quality features contribute to that perception. The motivation for this study is a response to a growing call in the eGovernment field for approaches that go beyond efficiency and technological determinism, to adopting an appreciation of the social values that underlie the success of Internet-based services. This study will utilise the DeLone and McLean (D&M) IS Success Model to develop a Net Benefits measure from the perspective of the user (citizen) and to assess what elements of quality affect success in eGovernment systems.

eGovernment

Electronic government consists of using technology, particularly the Internet, as a means to deliver services to citizens, businesses and other entities, with the purpose of providing convenient access to government information and services (Gronlund and Horan, 2004; Hughes et al., 2006). Proponents of eGovernment promise better government through improved quality services, cost savings, more effective internal processes, wider political participation and the creation of public value (Grimsmo and Meehan, 2007; Helbig et al., 2009). The EU defines the broad goals of eGovernment as, “the use of ICT in public administrations to improve public services and democratic processes.” (Commission of the European Communities, 2003). Recently the rhetoric has evolved from putting citizens online to more extensively involving citizens in all phases of the democratic process (Commission of the European Communities, 2006).

Technology was first included as a component of mainstream public administrative reform in the early 1990’s but it was through the impact of the Internet in the late 1990’s that the potential of ICT was perceived as a vehicle of greater more fundamental reform. These reform objectives were strongly influenced by private sector management practices and envisaged improved accountability in Government, more convenient access for “customers”, greater internal efficiency and increased levels of productivity. This vision was founded on strategies promoting innovation and entrepreneurship and sought to enable joined up government through sophisticated process integration (Torres et al., 2005a; Yildiz, 2007). The genesis of this movement is referred to as New Public Management (NPM) (Hood, 1991; Hood, 1995).

The trend towards the adoption of eGovernment represents a substantially increased role for ICT (Heeks, 1999; Li, 2003). Several studies have identified the influence of NPM reform initiatives, highlighting the transformation of service-based processes and citizen-centric service delivery as examples of how these reform policies influenced the development of eGovernment (Kudo, 2008; Saxena, 2005; Torres et al., 2005a; Torres et al., 2005b). Within this discourse, the rhetoric of “re-engineering”, “reinvention” and “entrepreneurship” were central in defining the NPM influenced modernisation agenda (Homburg, 2004). These models have been criticised recently, as overtly technical and deterministic, oversimplifying what is a highly complex task (Anderson and Henriksen, 2006; Cordella, 2007).
There is a growing recognition that eGovernment strategy has been overtly focused on gaining process efficiency to the detriment of achieving more effective democratic reform (Helbig et al., 2009; Jaeger, 2005). Recently, the aims and objectives of national and supranational governments and agencies have evolved from targeting the online delivery of public services to loftier ambitions of improving relations between the citizenry and the administration through enhanced participation in democratic processes. While success is evident in providing services online, engaging citizens online in a meaningful way remains a challenge (Kolsaker and Lee-Kelley, 2008). This challenge recognises the advances that have been made through enabling key services online, but argues that public agencies are falling short of the transforming potential of eGovernment (West, 2004).

Public Value

To date, the dominant paradigm that has influenced the evaluation of government policies, including eGovernment initiatives, can be traced to NPM. These practices have been criticised for emphasising narrow concepts of cost-efficiencies, often ignoring whether the quality of the service improved. As a result, the search for new ways of thinking about public management has begun in part to address these perceived weaknesses (O'Flynn, 2007). The Public Value approach, first articulated by Moore (1994, 1995), is gaining considerable interest as a new method for meeting the challenges of efficiency, accountability and equity. Public value can be understood as the value or importance citizens attach to the outcome of government policies and their experience of public services (Moore, 1994).

Kelly et al (2002) define three key building blocks of public value: services, outcomes and trust. Public services are critical in the creation of public value as they represent the vehicle for the delivery of fairness, equity and other values in actual service encounters with the citizen. These building blocks provide a new way of thinking about the evaluation of government activity, as a new conceptualisation of the public interest is defined in an effort to best balance efficiency and effectiveness (O'Flynn, 2007; Stoker, 2006).

Hefetz and Warner (2004) outline the challenge for public managers by arguing that while private sector firms focus on efficiency, quality and reliability, public managers must combine these concerns with accountability, the creation of trust and public preferences. The nature and breadth of the purposes and proposed outcomes of public value serves to distinguish the task of eGovernment evaluation from commercial endeavours (Grimsley and Meehan, 2007; Grimsley et al., 2007).

Stoker (2006) has recently developed Kelly’s et al (2002) analysis to suggest that public value provides a method for reconciling democratic effectiveness and efficiency through a path of engagement and participation. Public value is not the property of any political group or citizen; it is achieved as a result of engagement and consultation through a collective, constructivist process of defining and redefining what is of public value. This contrasts sharply with the “aggregated” view of individual preferences commonly seen in NPM initiatives (O'Flynn, 2007). In assessing public value from this perspective the measurement of user satisfaction is essential (Kelly et al, 2002).

Stoker (2006) explicitly identifies innovation in ICT as playing a critical role in providing mechanisms to enhance the engagement of citizens in this process. As such, eGovernment has a critical role to play in the challenge of delivering public value. Within the eGovernment context, the notion of public value argues that eGovernment policy makers must balance tangible criteria of efficiency and economic gains, to include social objectives associated with the broader remit of public value such as trust, social inclusion and sustainability (Grimsley and Meehan, 2007). The tension inherent in this challenge, between delivering effective public services and gaining procedural efficiencies, has been noted in prior research (Aberbach and Christensen, 2005; Cordella, 2007), with some improvement identified in service provision but potentially at the cost of a less equitable service (Batley and Larbi, 2004). In order to achieve a true synergy, the importance of the traditional bureaucratic organisation, as a bastion of equality and impartiality, has been highlighted in contrast with the market-based efficiencies promoted through NPM initiatives (Cordella, 2007). The achievement of these core public value objectives has important implications, for example, in the ability of marginalised groups to be equally recognised alongside more powerful social partners (Aberbach and Christensen, 2005).

Success in eGovernment

The goals of eGovernment, particularly related to service innovations, are to improve the quality of the service, increase the efficiency of administrative processes and enable wider and more effective participation and
engagement with service users (Ask and Gronlund, 2008; Helbig et al., 2009). Reddick (2005) suggests that studies evaluating the success of these initiatives can be clustered into two main areas: supply side studies, those that examine eGovernment offerings and demand side, those that examine citizen interaction with eGovernment services. It has been consistently noted in the literature that the majority of studies have favoured the supply side approach (Helbig et al., 2009; Reddick, 2009).

The supply side approach

In the literature, the area of assessing eGovernment web sites has been extensive, predominantly evaluating the number, types, level of sophistication and usability issues of services (de Jong and Lentz, 2006; Panopoulou et al., 2008). Within the practitioner community there are many studies engaged in benchmarking eGovernment services, for example Accenture and Cap Gemini. These studies primarily evaluate the presence of types of services and assume that resulting benefit will accrue from its presence (Bannister, 2008).

Most of the available work does not however attempt to postulate any relationship between these features, nor do they examine causal links between constructs. There is little effort to understand user demand for services and consistent with criticism of the NPM approach, there is a belief that simply providing the service is enough of and in itself; the imperative to seek and account for user satisfaction is not apparent (Kelly et al., 2002). Wang, Bretschneider, & Gant (2005) argue that while specific features of government web sites are important, this approach does not account for the specific ways in which individuals react, nor is it an appropriate method to account for the variation in the type of service provided. Kelly et al (2002) for example cite numerous citizen satisfaction studies where differences in opinion are evident across a range of government services. Individual characteristics and attributes of services are therefore important in the evaluation of Web-based e-government services. As a result these are limited tools of measurement in understanding or determining success in service delivery.

The demand side perspective

On the whole there is evidence of progress in the provision of services according to the transformational stages of eGovernment. However success cannot be measured by service provision without accounting for usage. Self-motivation plays a critical role in Internet-based services and the challenge of understanding what users value is crucial in improving adoption of services and continued usage (Muhlberger, 2005; Teo et al., 2008). There is a need therefore to understand use and antecedents to usage of services (Akman et al., 2005; Wang et al., 2005). However, the vast majority of research efforts thus far have favoured supply-side studies resulting in numerous recent calls for more research to examine the citizen perspective in eGovernment services.

The EU and the US government similarly define the benefits of eGovernment initiatives to encompass improved effectiveness and efficiency in service provision and an increase in citizen engagement (Commission of the European Communities, 2003; US Government, 2002). More recently the rhetoric has refocused the emphasis towards achieving enhanced democratic participation. In this context, the benefits of eGovernment service provision have been suggested to range from efficiency gains such as faster response times, cost savings, to effectiveness improvement in services such as greater control and personalisation of the service, to more intangible outcomes such as the creation of trust in government, enhanced democratic engagement and well-informedness.

While many studies have espoused these potential benefits, there are few studies that seek to empirically examine or identify factors from the perspective of the citizen (Reddick, 2005). Kolsaker & Lee-Kelley (2008) and Gilbert, Balestrini, & Littleboy (2004) examine some of the above benefits in an attempt to understand the reasons individuals choose to use or value online services. Gilbert, Balestrini, & Littleboy (2004) propose six factors relating to efficiency benefits of eGovernment services, identifying items representing avoid interaction, cost and time as most significant to users. In a similar study, Kolsaker & Lee-Kelley (2008) undertake an examination of citizens’ attitudes towards eGovernment and find that in relation to service usage the ability of the portal to satisfy personal needs ranked higher than other benefits. The authors suggest this is in part influenced by the experience of commercial web sites. This study also examined attitudes in relation to web-based interaction mechanisms designed to increase engagement and found that feelings of active contribution to democracy were key to citizens’ value perceptions of participation. Grimsley & Meehan (2007) further identify benefits particular to the public value paradigm in a study on evaluation led eGovernment design. The authors focus on control, well-informedness and influence based on their analysis of the work of Moore (1995). These studies define the benefits for citizens in
accessing e-services and taken as a whole represent key eGovernment goals: efficiency, effectiveness and improved democratic participation.

**IS Success**

The D&M IS Success Model is one of the most widely cited frameworks for measuring IS success (DeLone and McLean, 1992; DeLone and McLean, 2003). Many studies have utilised this model to evaluate IS success and in the process have developed measures for the core constructs: Information Quality, System Quality, Service Quality, Use, User Satisfaction and Net Benefits. A recent review of this literature provides strong evidence to support many of the interrelationships between these success measures (Petter et al., 2008). Much of the research in this area has focused on studying IS success at the individual level and Petter et al (2008) argue in their study that a systematic review of this work lends support to the proposed model while the interrelationships that have proven inconclusive are worthy of further investigation.

Although IS Success models have been applied in numerous contexts predominantly in the private sector, little research has been conducted in identifying measures that determine eGovernment success. As such there is a need to examine whether traditional IS success models can be extended to examine eGovernment systems success. Gable, Sedera, & Chan (2008) have developed and validated a multi-dimensional success instrument for enterprise systems from the perspective of public sector employees. Prybutok, Zhang, & Ryan (2008) also utilise the D&M Model to examine whether leadership and IT quality have positive delivery outcomes for public sector workers. Their results support a positive relationship between leadership and quality and a similar impact between IT quality and net benefits. Wang & Liao (2008) have empirically validated the DeLone and McLean IS success model in the context of G2C eGovernment systems and recently, Teo et al (2008) studied the relationship between trust and eGovernment, with results showing that trust in government is related to trust in eGovernment web sites. IT quality is also shown to have a significant relationship with constructs representing use and user satisfaction. These studies provide evidence of the explanatory power of the D&M IS Success Model in an eGovernm ent context. However, there is a lack of focus thus far on the development of eGovernment success measures and specifically an absence of research that examines Net Benefits from a citizen perspective.

**eGovernment Success Measures – Net Benefits**

Recent studies that review progress in the eGovernment field consistently call for more research to study the demand for eGovernment services from a citizen-based perspective (Helbig et al., 2009; Reddick, 2005). These studies point to an emphasis on supply-side studies that benchmark the existence of services without considering the underlying dynamics of actual usage. Those studies that analyse citizen usage tend to have a narrow focus of eGovernment benefits, none displaying a comprehensive perspective on eGovernment success.

This study aims to augment previous efforts to understand eGovernment usage by drawing together a comprehensive set of benefits. These studies were collected as a result of a systematic review of the literature in the area of eGovernment success, specifically identifying research that studied the citizen as the primary stakeholder. The concept of public value, as defined by Moore (1995), requires a balancing of efficiency and effectiveness measures and this paradigm anchors our perspective on the evaluation of eGovernment Net Benefits. In line with Moore (1995) and Grimsley & Meehan (2007) we propose a set of benefits ordered around three broad objectives efficiency, effectiveness and democracy which are further reflective of the broad separations evident in the literature and as defined by the EU, the US and the UN. This categorisation has previously been used to evaluate the outcome of eGovernment initiatives (Ask and Gronlund, 2008). The items to be included in this Net Benefits measure are presented in Table 1 and in Figure 1 below.

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<th>Measure</th>
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<th>eGov Goal(s)</th>
<th>Source(s)</th>
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<td>Cost</td>
<td>Cost saving to the user from using the online channel</td>
<td>More efficient services</td>
<td>(Gilbert et al., 2004)</td>
</tr>
<tr>
<td>Time</td>
<td>Time saved by using the online channel</td>
<td>More efficient services</td>
<td>(Gilbert et al., 2004; Kolsaker and Lee-Kelley, 2008; Wang and Liao, 2008)</td>
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eGovernment Success Measures – Use and User Satisfaction

DeLone and McLean (2003) contend that use and intention to use can be used alternately depending on whether the context involves mandatory or voluntary usage. As citizens' use of G2C systems is entirely voluntary and system use is an actual behavior (Mühlberger, 2005), this measure has been considered as the variable closer in meaning to success than behavioral intention to use (Wang and Liao, 2008). Thus, this study adopts use instead of intention to use as an eGovernment systems success measure.

User satisfaction is sometimes measured indirectly through the three quality constructs. However, the concept of eGovernment systems success has been adapted, based on the DeLone and McLean (2003) model of IS success and the empirical work of Petter et al (2008), to develop a causal relationship between system quality, information quality, and service quality and the overall level of user satisfaction (Wang and Liao, 2008). Thus, the items to measure user satisfaction will be taken from previous measures of overall user satisfaction developed in an eGovernment context e.g. (Seddon and Kiew, 1996; Teo et al., 2008).

eGovernment IT Quality Measures

Online information dissemination is the primary function of e-government. Increased information quality can have an impact on levels of openness and transparency perceived by the citizen and also on levels of well-informedness (Grimsley and Meehan, 2007; Thomas and Streib, 2003; Welch et al., 2005). Studies have shown a need for information to be relevant, accurate and up-to-date (Gilbert et al., 2004). Teo et al (2008) reveal that information quality is more strongly associated with the routine requirements of the citizen, whereas system quality and service quality of Web sites are associated with a deeper use of the online facility.

System quality denotes the citizen’s perception of the technical performance of the Web site in information retrieval and delivery (Seddon, 1997). System quality is an important determinant of Web site users’ satisfaction and subsequent usage. System quality of an e-government Web site can be ease of use, response time, usability and integration (Teo et al., 2008). A better system quality and a better service quality are further related to user satisfaction (McKinney et al., 2002; Teo et al., 2008).

Service quality, the overall support provided by service provider (DeLone and McLean, 2004), has been tested by Wang & Liao (2008) in the eGovernment context. A more complex interpretation tested by Barnes & Vidgen (2006) included trust and empathy in eGovernment context. Service quality is related to increased user satisfaction (Teo et
Research Framework

The D&M IS Success Model has been successfully used to study IS in an eGovernment context and this paper proposes the development of measures to explore success from a citizen perspective. Specifically, this paper aims to develop a comprehensive Net Benefits measure, based on the paradigm of Public Value (Moore, 1995) and to evaluate the impact of IT Quality (information quality, systems quality and service quality) on eGovernment success. Our study is therefore motivated by two research questions: what do citizens define as important in the success of eGovernment services and what aspects of IT Quality affect eGovernment Success?

Figure 1 contains the schema for our proposed research model showing the hypothesised relationships and individual items within the constructs. The hypothesized relationship between Use, User Satisfaction, Net Benefits and the IT Quality constructs is based on the theoretical and empirical work reported by DeLone and McLean (2003). The expectation of causal interrelations between these constructs is further based on the empirical review conducted by Petter et al (2008). Positive user experience will logically lead to greater user satisfaction and increased use in the D&M IS Success Model and will consequently lead to a certain Net Benefit. DeLone and McLean further argue that a reciprocal effect will occur from the positive (or negative) Net Benefit, reinforcing (or decreasing) the subsequent use and user satisfaction of the system (DeLone and McLean, 2003; Wang, 2008).

Hypotheses will be derived from the model above, for example System Quality will positively influence citizens’ perceptions of Net Benefits, in line with the causal arrows indicated.

Research Method

A questionnaire survey instrument will be developed to test the model. The instrument will contain three main sections: first, to enable an assessment of the quality of an eGovernment web site; second, to allow users to report on their satisfaction and usage of an eGovernment web site; and third, a set of questions to elicit the perceived benefits of using an eGovernment web site. We intend using validated scales from existing studies to develop items for each construct, particularly incorporating those studies that develop measures from the citizen perspective. We will use a seven-point Likert scale to measure each item.

Items representing eGovernment Net Benefits will be constructed using validated scales from existing studies (see Figure 1 and Table 1 for details). Items representing Information, System and Service Quality will be based on previous instruments validated in the eGovernment context that also utilise the D&M IS Success Model (e.g. Gable et al., 2008; Prybutok et al., 2008; Teo et al., 2008; Wang and Liao, 2008). Items for Use will be drawn from studies assessing actual usage of an eGovernment system in a voluntary context (e.g. (Gilbert et al., 2004; Wang and Liao,
This study will be conducted in the USA. Since 2002, the US Government has set efficiency, effectiveness and recently citizen engagement as key strategic priorities for eGovernment programs (US Government, 2002). Progress in eGovernment has been significant with the USA consistently ranked in first place in the United Nation’s Global E-government Readiness Report, from 2003 to 2005 (UN, 2005). The same report ranks the USA third for e-participation initiatives and is highlighted for developing best practice in this area (UN, 2005). From the citizen perspective, there is also evidence to suggest that users willingly engage with eGovernment service offerings in the USA and show a desire to use the Internet to search for information, transact with government and use this medium to participate in debates on government policy (Reddick, 2005). Given the combination of sophisticated e-service development and growing citizen usage, the USA is best positioned to provide a rich set of responses with which to test the research model.

Model Testing and Proposed Analysis Strategy

Following previous studies, we will pilot test the survey instrument on a sample of approximately 25 students (Carter and Belanger, 2005). Previous studies have shown university students to be an appropriate sample in the area of eGovernment as respondents are typically frequent users of the Internet and eGovernment services in particular (Carter and Belanger, 2005; Teo et al., 2008). In order to establish satisfactory internal consistency we intend using Cronbach’s alpha coefficient as an initial reliability measure, adopting the standard 0.70 cut-off point (Cronbach, 1970). In order to explore the underlying structure in our measures, factor analysis will be used for correlation analyses. We intend using exploratory regression tests in order to explore the predictive ability of the sets of independent variables (IT Quality) on the dependent success measures (Use, User Satisfaction and Net Benefits). Participants in the pilot study will be interviewed immediately after completing the survey to identify any items that were difficult to answer, or that appeared inconsistent or inaccurate. Problem areas and ideas for improvement will be noted as well as recording the length of time each respondent takes to complete the survey. This combined process will provide improvements and modifications for the survey instrument.

We will then test the instrument through web-based survey questionnaires distributed to university students, staff and faculty. Efforts will also be made to include mature citizens in the sample by targeting retirement communities, in order to produce a broad demographic of citizen users. Participants will be given a free choice to participate in the study and will be screened to ensure they are actual users of eGovernment web sites (Teo et al., 2008). In line with previous studies we aim to gather a minimum of 200 usable responses (Carter and Belanger, 2005; Teo et al., 2008). The analytical tests used in the pilot phase will then be repeated on this data set: Cronbach’s Alpha coefficient, confirmatory factor analysis and multiple regression tests. We then intend examining the adequacy of the overall model fit using Structural Equation Modeling (SEM) techniques.

Conclusion

This research proposes an important and unique application of the D&M IS Success Model. By integrating the literature on public sector value and eGovernment success within the D&M IS Success Model, this study provides a multi-dimensional framework for studying and understanding the success of eGovernment web sites from the citizen perspective. Understanding success and the impact of IT quality on success can act as an invaluable framework for public sector managers in the evaluation of eGovernment initiatives and the development of future web-based services.

There are two primary contributions of this research. First, this study establishes the important role of Net Benefits in the evaluation of eGovernment success. There is a significant lack of research that identifies and analyses the benefits of using eGovernment services from a citizen perspective. To the best of our knowledge, this is the first study that creates a Net Benefits measure in the context of eGovernment. Second, this study extends our knowledge of eGovernment success by examining the impact of IT Quality constructs (Information, System and Service Quality) on success measures (Use, User Satisfaction and Net Benefits). The influence of quality constructs on usage, satisfaction and net benefits is largely unclear. Various studies postulate significant relationships between IT quality constructs and success measures, however the multi-dimensional and interdependent nature of eGovernment success remains untested. The current study aims to uncover the dynamics involved in eGovernment success from the perspective of the citizen.
References


