

A PROPOSED CONCEPTUAL SUCCESS MODEL OF CITIZEN-CENTRIC DIGITAL GOVERNMENT IN MALAYSIA

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ABSTRACT

The emergence of Digital Government throughout the world is reflecting how governments are trying to find innovative digital solutions towards empowering social, economic and political advantage. Effective service delivery to citizens through Information Communication Technology application such as integrated citizen service information systems is a prerequisite to achieve citizen-centric digital government. Measuring success of such systems is a growing concern. However, very few studies have attempted to find success factors using Information Systems theoretical approach in the context of digital government, particularly in Malaysia. Therefore, this study is designed to bridge the gap by identifying such factors and propose a conceptual model. This study addresses success factors from system and personal traits' perspectives, behavioral intention, satisfaction, trust and citizen empowerment as determinants of digital government success.

Keywords: Digital government; e-government; trust; digital services; information systems

1. INTRODUCTION

Traditional government-centered services are passé so new approaches are required to modernize service delivery modes by integrating digital technologies into public sector modernization efforts or digital government [1].

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According to the organization for economic cooperation and development (OECD), “Digital government (DG)” uses integrated modern technologies including Web 2.0 and disruptive technologies (e.g. Social media) to improve service delivery modes and to create public value [2], [3]. Improving digital services and raising citizen participation is essential for digital government [4], [5]. In 2015, Malaysia introduced e-Gov 3.0 also known as DG [6], [7] which provides the opportunity for every netizen to use online or digital services through single gateway [8], which is a concept of an integrated citizen service information systems (IS). These citizen-centric services are designed to provide measurable benefits to both citizens and other stakeholders by promoting productivity and work efficiency as well as act as an enabler to public service delivery transformation[9].

Though 86.14% of Malaysian government services are available online and started integrating recently prior studies argued that, they are still inadequate, lagged behind other Asian countries and the overall impact has remained limited [10], [11] thus majority of the users are not satisfied [12]. Prior studies that focus on integrated services system following IS theoretical approach are scarce [13-17]. Most of the previous studies focused on acceptance or user satisfaction by applying technology acceptance model (TAM), theory of diffusion of innovations (DOI), the unified theory of acceptance and use of technology (UTAUT), theory of planned behavior (TPB), expectation confirmation model (ECM) in Malaysian context [7], [18], [19], [20], [21]. However acceptance, adoption and user satisfaction alone, are not the same as success and few studies have attempted to investigate the success of such systems [22], [23], [24], [25]. Previous studies have confirmed that multidimensional factors should be considered in measuring complex government information systems to achieve the desired success [22]. Therefore, this study attempts to identify success factors of citizen-centric digital government by adapting the DeLone and McLean IS success model and propose a conceptual model, particularly in the context of Malaysia.

2. LITERATURE REVIEW

2.1. DeLone and McLean IS Success Model

The original DeLone & McLean (D&M) model was first introduced in 1992 which was developed based on a taxonomy of Information Systems success consisted of six (6) different and interrelated factors namely system quality, information quality, use, user satisfaction, individual impact, and organizational impact [26]. After being criticized by several scholars that the original D&M is incomplete, ten years later in 2003, DeLone and McLean published an improved and updated model of IS success. They added a new independent construct

called “service quality” and as for dependent measurement “individual impact”, and “organizational impact” were grouped into “net benefits”, “Use” was added as an alternative to “Intention to use” [17], [22], [24]. Subsequently, the updated D&M model is one of the most widely used models for IS success and several researchers used it to understand and measure the success of various IS. Prior studies also stated that this revised D&M is well suited to assess effectiveness of ISs in the Wide Web environment (WWW) [22]. As the integrated citizen services system (My Government) is in WWW environment as well as its usage nature is more citizen-centric thus, the current study adapts this as base model. Additionally, other previous IS success models proposed in e-government (EG) context were also reviewed to measure DG success due to some of their identical characteristics defined by OECD.

2.2. Related Works

A study that was based on IS success theoretical approach in examining e-government from the perspective of government employees in Serbia [22] had revealed seven constructs namely System Quality (SQ), Information Quality (IQ), Service Quality (SV), Intention to use/use, User Satisfaction (US), Net Benefits (NB) and Demographic Conditions (DC). They defined EG system as an IS in WWW environment. Their results attested that quality dimensions such SQ, IQ, SV had a positive impact on the intention to use/use of the EG system. However, only SQ had a significant impact on US. Both intention to use/use and US were found to be the significant predictor of net benefits. However DC was not statistically significant. A similar study also used D&M model to evaluate Government-to-Citizen (G2C) systems in Taiwan [25]. Their research model consists of six variables and these are system quality, information quality, service quality, use, user satisfaction and perceived net benefit. Their results indicated all the variables were valid and statistically significant towards US except System Quality [25]. Other studies found that information quality positively influenced the perceived usefulness (PU) in the Gambian EG system [27]. However, system quality was not significant towards PU. In contrast Rana et al. [17], proposed a model based on the IS success models and validated eight success measures comprised of information quality, system quality perceived usefulness, user satisfaction, intention to use, complexity, facilitating conditions (FC) and perceived trust (PT). The results revealed all eight variables and their relationship were statistically significant. Similar studies on government online tax system considered almost similar constructs such as system quality, information quality, service quality, perceived usefulness, use, user satisfaction, perceived net benefits and trust on EG websites [13], [15], [16]. Impact of

individual characteristic on system use was examined and it was found to be statistically significant [13]. Three antecedents of trust namely trust in technology, trust in government, and prior experience were introduced by another study [16]. The results show that these three antecedents have directly influenced the trust in EG websites. Information quality was most significant towards perceived usefulness and user satisfaction hence increased perceived net benefits. However, previous study could not find any significant relationship between System Quality and User Satisfaction [15]. Results by another study were also consistent with previous findings on the relationship between quality dimensions and user satisfaction and system usage hence improve net benefits [14].

Few other studies also considered trust as a success measure for digital or e- government systems [18], [24], [28], [29], [30]. Significant relationship between System Quality and Trust as well as Trust and User Satisfaction were evidenced [24]. In addition, positive relationship between Trust and Intention to use was also confirmed [18]. Another study introduced two antecedents of trust in EG website namely trust in government (TG) and trust in technology (TT) [29]. Their results indicated that only TG is significantly associated with general trust in EG website, and other relationships from trust in EG website to quality dimensions (system quality, information quality, and service quality) were found positive. Based on literature review, previous researchers argued that personalization might have an impact on trust[28].

A study related to customer empowerment and EG has considered three factors namely personalization (PR), trust, customer empowerment (CEMP) [30]. The results revealed that all relationship were statistically significant. In addition, conceptual framework based on service dominant logic to evaluate EG success [31] was developed. As a result, this study proposed personalization as the dependent measure which can be considered as net benefits in IS perspective.

Several other factors were also found by previous studies such as personal innovativeness, belief, attitude, subjective norm, image, culture, cost, behavioral intention, and perceived ease of use [18], [19], [24]. Other studies in Malaysian context also found few other factors such as legislative & policy, continuance intention, cooperation, culture awareness, confirmation, government commitment etc. [20], [21]. However these measures were mostly studied in the context of acceptance or adoption for non-integrated and single-focused services. Hence, Table 1 summarizes the most frequent related factors that are found to have more impact based on their consensus that seem to be more relevant to digital government and in the context of this study.

Table 1. List of the most frequent related factors

Factor Name	Author(s)	Total
System Quality	[13], [14], [15], [16], [17], [20]*, [22], [23], [24], [25], [27], [29], [33], [34]*	14
Information Quality	[13], [14], [15], [16], [17], [22], [23], [24], [25], [27], [28], [29], [32], [33], [34]*	15
Service Quality	[13], [14], [15], [16], [20]*, [22], [25], [29], [33], [34]*	10
Intention to Use	[13], [17], [18]*, [19]*, [29], [35]	6
Use/Use of E-Govt/System Usage	[14], [19]*, [25], [34]*, [35]	5
User Satisfaction	[13], [14], [15], [16], [17], [19]*, [20]*, [21]*, [22], [24], [25], [28], [29], [34]*	14
Net Benefits	[14], [34]*	2
Personalization	[28], [30], [31]	3
Customer Empowerment	[30], [36]	2
Trust	[13], [16], [17], [18]*, [24], [28], [29], [30], [32]	9
<i>Antecedents of Trust</i>		
Perceived Uncertainty	[18]*, [32]	2
Perceived Security	[18]*, [32]	2
Perceived Privacy	[18]*, [32]	2

* indicates studies in Malaysian context.

3. METHODOLOGY

A search for relevant articles in the context of digital government and e-government was conducted in order to achieve theoretical overview. Theoretical overview is a way to understand previous studies result hence appropriating the article continuity. A set of keywords and phrases were applied to find relevant articles such as “digital government”, “e-government”, “d-gov”, “e-gov”, “dgov”, “egov”, “digital service”, “citizen-centric”, “citizen-centered”, “adoption”, “Success”, “acceptance”, “diffusion” and “integrated” in all possible combinations and explored through online journal database namely ScienceDirect, Web of Science, Tandfonline, SpringerLink, IEEE Xplore, Emerald and Google Scholar. Several journals were explored such as Government Information Quality, Procedia Computer Science, Information & Management, International Journal of Information Management, Social & Behavioral Sciences, Electronic Journal of Information Systems in Developing Countries, International Journal of Electronic Government Research and others including Google scholar that covered topics on digital government or e-government research.

In this study, the literature review includes both non-empirical (conceptual) study and empirical study. Several IS success models proposed by previous researchers were further analyzed to select the relevant factors as well as their relationships (also known as test of significance outcome of each factor). A frequency analysis was performed on the selected articles to find out the most used factors. Furthermore, the selection was also done based on the relevancy of factors in Digital Government environment. Table 1 shows the extracted factors and their frequencies from the reviewed articles. Non-relevant and non-significant measures were excluded. Based on the findings this study proposed a conceptual model of citizen-centric digital government success.

4. RESULTS & FINDINGS

4.1. System traits of digital government service

In this study, system quality, information quality and service quality are classified as system traits which help to measure overall quality of My Government.

System Quality (SQ) - SQ is the desired characteristics of the IS itself and formed through user's interaction with the system while completing a specific task [24], [26]. Prior studies also found empirical evidence of this construct. It is used to measure the technical success of an IS [22]. For example- ease of use, usability, reliability, and availability. For this study SQ measures technical quality of My Government.

Information Quality (IQ) - IQ is defined as the quality of the system output and is measured

by different semantic attributes such as conciseness, up-to-date information, reliability, feedback, accuracy, timeliness, completeness [16], [22]. These attributes have broadly studied by past studies [24]. For this study IQ measures how well the information provided in the My Government system to use digital services and other information as needed without less external help.

Service Quality (SV) - SV is defined as the quality of service that users expect and receive from IS personnel [22]. It is considered as an important construct in IS success measurement [13], [26] and this includes items such as responsiveness, tangibility, assurance and empathy. For this study, SV measures users' perception towards My Government IS personnel support based on their needs.

4.2. Personal traits of digital government service

In this study, perceived uncertainty, perceived privacy, perceived security and personalization are classified as personal traits which help to measure trust and citizen empowerment towards My Government system.

Perceived Uncertainty (PUC) defined as the user's feelings about the possibility of receiving gains or losses from an IS. It is considered as a significant antecedent of trust. Prior studies also examined the role of PUC in e-government context [18], [32]. For this study, PUC measures citizen's feelings about the possibility of risk towards using My Government.

Perceived Privacy (PP) is found to be a prime concern for citizens during interaction with government systems. Users of the government online system might be afraid of sharing personal information with the government. As they might think that their personal information can be disclosed or misused without their consent [32]. Information leaking by hackers is another concern related to PP. Privacy is one of the common issues in EG research [18]. For this study similar concept implies to My Government users.

Perceived Security (PS) is vital to any system and it relates to user's confidence towards the safety of the system. PS is a major concern for users especially when they do financial transaction over internet. It deals with protection of customers' financial data such as credit card information. The deliberately use of other people identity (identity theft) can happen even in non-financial matters [18], [32]. For this study PS measures user's perceived strength of online privacy while interacting with systems like My Government.

Personalization (PSN) is defined as the process of customizing IS functionalities based on users need. It helps user to reduce unnecessary information and find their desired services within the shortest possible time [28], [30]. For example, in e-commerce websites can be used to check product prices based on color, price (high or low), availability etc. Similar concepts

can be applied on any government information system thus it should be considered as highly essential characteristic of any web-based IS.

4.3. Conceptual Model

Though prior studies used “perceived usefulness” as a success measure, this study uses “Intention to use/use”. In D&M model “Intention to use” and “use” are alternative. However “Intention to use” can be used for compulsory usage and “use” for voluntary context [22], [15]. Due to the fact that the use of citizen-centric digital service system such as MyGovernment is not totally compulsory for citizens hence “use” is more appropriate at this point in time. Likewise, the “Perceived usefulness” is recommended for compulsory usage only [25]. Previous studies confirmed that SQ, IQ, SV had positive relationship with US and Intention to use/use. Consequently, “Intention to use/use” also improves US [22]. Previous studies also found significant relationship between trust and US [24], [17]. As Malaysian government declared to create public trust in the “security and privacy” of digital information and services hence this study proposes trust as a success factor along with its antecedents mentioned in the previous section. Previous study defined customer empowerment as *“a positive subjective state evoked by the feeling of increased control over the production of desired outcomes and the prevention of undesired outcomes relative to existing or previous systems”* [30]. They also found significant relationship between customer empowerment and trust which resulted in system success. Personalization also had a positive impact on customer empowerment. In the context of this study, “customer” is renamed as “citizen”. One of the main objectives of Malaysia’s ICT strategic Plan 2016-2020 is to create public value through digital service delivery. Public value was considered by recent studies as well in the context for EG [31]. OECD also recommend to create public value in order to achieve DG [2]. Efficiency of the digital service and effectiveness of the digital service can be used to measure My Government’s public value net benefits. Based on the argument above and literature review in section 2, this study proposes the following conceptual model shows in Figure 1.

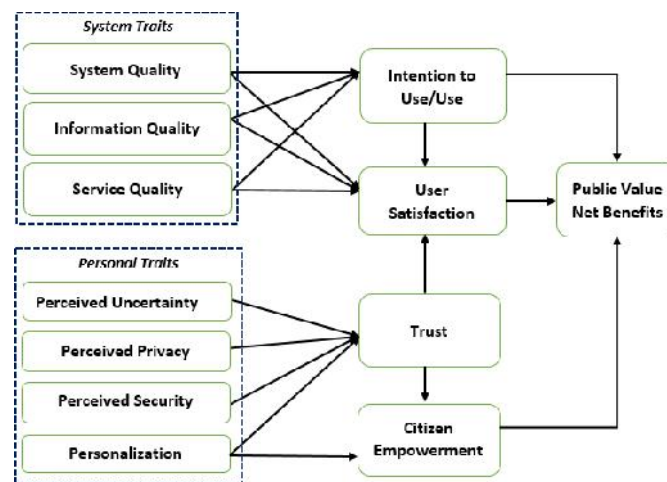


Fig.1. Proposed Conceptual Model

5. CONCLUSION & FUTURE REMARKS

In order to achieve a sustainable digital government with the help of ICT, authorities must know the factors that may affect the success of such ICT applications. Integrated citizen service information systems like My Government is an essential ICT application which can create public value by providing digital services. This in-progress research has successfully identified the success factors of DG system in the context of Malaysia and consequently a proposed conceptual model of DG success considering multi-dimensional factors was presented. Future study is required to uncover the most influential factors by validating the proposed model statistically and further understanding of the relationship between multidimensional factors can be further explored.

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