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Quantifying Public E-Participation through Social Media in Government Decision Making

Hapini Awang*, Isyaku Uba Haruna, Maslinda Mohd Nadzir, Osman Ghazali, Nur Suhaili Mansor, Mohamad Fadli Zolkipli

Institute for Advanced and Smart Digital Opportunities, School of Computing, Universiti Utara Malaysia

*Email: hapini.awang@uum.edu.my

Abstract

The evolution of Information and Communication Technology (ICT) has enabled governments to implement online services, enhancing citizen participation in decision-making. Within e-government initiatives, e-participation plays a critical role in shaping public policies. However, a significant gap remains—the lack of a reliable instrument to measure and assess public e-participation through social media in government decision-making. Existing studies have explored e-participation factors but have not provided a validated tool for systematically evaluating this engagement. This study aims to bridge this gap by developing a reliable instrument based on a pilot study. A structured survey instrument was designed and validated through expert review and a pilot study involving 35 respondents. Statistical validation confirmed high construct reliability (Cronbach's alpha > 0.6), ensuring the instrument's suitability for further research and practical application. The findings contribute to both academic literature and policymaking by providing a validated framework for assessing and enhancing citizen engagement in e-government.

Keywords

E-participation, E-government, Social Media, Information Systems, Survey Instrument

Introduction

The implementation of e-government initiatives is necessary to enhance the services of countries (Abdulraheem, 2012), particularly in developing countries. Various variables are required to support such initiatives (Abdulraheem et al., 2018). Over the past decades, local governments in Europe, America, parts of the Middle East, Asia, and Africa have extensively employed ICT to support their work and improve e-government. One of these variables is citizens' intentions to participate and their intention to continue participating in the process of public decision-making in e-government (Alaaraj, 2015; Yusof & Abdulraheem, 2015). Intention refers to the level of citizens' willingness to participate through intermediary means or the internet in future e-government services (Ajzen, 1991; Wu et al., 2015). Citizens' participation involves the

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active involvement of citizens through intermediary means or the internet in future e-government services (Tiago Oliveira, 2019). E-Government is the government's utilization of ICT applications to deliver information and services to citizens, aiming to ensure the availability and effectiveness of government information management and service delivery (United Nations, 2020). It enables collaborative work by administrators responsible for serving the public and addressing their concerns, thereby facilitating effective decision-making, and shaping e-governments at all stages, including planning and implementation (Abdulraheem et al., 2016; Tao & Yu, 2014).

Recently, consistent concerns have emerged regarding low levels of e-participation, indicating that e-government has not achieved its intended success. This highlights the need for further research, which requires robust tools. The aim of this study is to develop an instrument to measure e-participation through social media in government decision-making. To accomplish this, we identified factors that influence citizens' intentions to participate as well as their actual participation in public decision-making processes within e-government systems. Our focus extends across various aspects, including system factors such as E-Government Quality, Information Quality, and Service Quality, alongside user factors like Intention to Participate, User Participation, User Satisfaction, Benefits, Trust, Culture, Anonymity, and Nationalism. These elements serve as benchmarks for assessing e-participation among citizens in e-government initiatives. This article aims to present a robust and empirically validated questionnaire that researchers and professionals can utilize to evaluate citizens' e-participation in e-government. To tackle these issues effectively, this study is guided by two key research questions:

1. What are the key factors influencing citizens' intentions to participate in e-government decision-making via social media?
2. How can a reliable instrument be developed to effectively measure e-participation?

Theoretical Background

The literature has shown that the revised DeLone and McLean IS Success Model (D&M) can be used to assess IS success (William et al., 2003), as supported by previous research (Kanaan et al., 2023; Lowry et al., 2007; Valsamidis et al., 2019; Yap et al., 2022). The D&M model provides a comprehensive explanation of the interconnections between six key indicators for measuring IS success: Information Quality (IQ), System Quality (SYQ), Service Quality (SEQ), Use (U), User Satisfaction (US), and Net Benefits (NB). However, despite its extensive use in information system evaluations, there is still a gap in applying the model specifically to e-participation assessment, particularly within the government context. Current research lacks a standardized and empirically validated instrument to measure e-participation effectiveness. It is important to take into account all six dimensions to present a complete approach and improve the overall validity of the D&M model (Urbach & Müller, 2012).

Building upon the D&M model, this study aims to develop a reliable measurement tool tailored to the e-government context. Unlike previous works that primarily focus on general IS success metrics, this research extends the model by integrating additional factors that influence e-participation. When using the D&M model in research, it's essential to take into account the specific context of the IS under investigation. Instead of removing elements of IS success from the D&M model, researchers in the future should focus on consistently enhancing and refining the model to improve its validity and tailor it to different IS study environments. In line with this

approach, the questionnaire designed to measure e-participation in e-government among citizens incorporates all dimensions of the D&M.

The updated D&M framework primarily focuses on the technical or quality dimensions of IS systems, which include IQ, SYQ, and SEQ. However, measuring the success of e-participation requires considering additional user-centric and contextual variables beyond the core D&M dimensions. In order to gain a comprehensive understanding of the factors influencing the successful implementation of e-participation in e-government systems, this study aims to identify additional factors through an extensive analysis of relevant literature, specifically within the Malaysian context.

Firstly, as noted by Pennington et al. (2004), users' perception of a website's technical competence is influenced by their understanding of online transaction processes. If users have confidence in the government's ability to deliver effective services, including possessing the necessary competence, skill, and experience, they are more inclined to evaluate e-government services positively. This positive evaluation, in turn, can foster trust in the government and have a beneficial effect on their ITU e-government services.

Secondly, this study acknowledges the role of anonymity, nationalism, and cultural values in shaping citizens' engagement with e-government platforms. The real-name policy in several e-government services and sites requires users to provide their real names (Ruesch & Märker, 2012). This policy is in place because authorities not only seek opinions but also need contributor information to effectively guide executive actions (Buccafurri et al., 2015). However, effective digital public management should consider the importance of netizens' anonymity in engaging virtual communities with the government (Halych & Demydkin, 2021).

Thirdly, nationalism, which prioritizes a nation's interests (Bahna, 2019), plays a significant role in encouraging citizens to contribute to the country's development. Individuals with a strong sense of nationalism are more likely to actively participate, offer suggestions, contribute ideas, or provide comments on specific government initiatives (Poncian, 2021). This study incorporates nationalism as a potential motivational factor influencing citizens' willingness to engage with e-government services.

Lastly, culture refers to the utilization of personal relationships in public services to achieve certain benefits (Aldraehim et al., 2013). It is evaluated based on its impact on streamlining procedures, enhancing interaction, and the level of reliance on cultural norms. Culture can greatly influence citizens' decision-making processes (Tlaiss & Kauser, 2011). Recognizing cultural differences in digital engagement, this research incorporates culture as a moderating factor in its measurement tool to capture diverse user behaviors.

By integrating these contextual elements into the D&M model, this study seeks to create a more thorough and dependable tool for measuring e-participation in e-government. This strategy ensures that factors beyond standard IS quality metrics—such as trust, anonymity, nationalism, and cultural influences—are taken into account when evaluating public engagement in government decision-making.

Methodology

A comprehensive review across relevant subject areas was conducted to identify the most suitable items from the literature. Consequently, a set of eleven constructs comprising ninety-nine items was generated. These items were modified to align with the study's context. The constructs were selected based on their relevance to e-participation and their proven validity in previous research on information systems success and citizen engagement in e-government (Awang et al., 2018). To ensure the robustness of the instrument, additional variables such as trust, anonymity, and nationalism were incorporated into the measurement framework, addressing factors often overlooked in traditional IS models.

A panel of experts conducted a content validity analysis to evaluate the items in the pool (Awang et al., 2018). The Content Validity Index (CVI) was employed in this case to determine consensus among the experts. The CVI is used to evaluate the appropriateness of each item in measuring the individual construct (Polit et al., 2007). For this study, the CVI method was utilized to establish item relevance and clarity, ensuring that the instrument aligns with the study's objectives and theoretical foundation.

Typically, content validation requires the input of 3 to 10 experts, although a minimum of 6 experts is needed to balance potential disagreements among them (Lynn, 1986). Consequently, the items in this study were validated by six domain experts specializing in Information Systems (IS) and public management. These experts were selected based on their research expertise and practical experience in e-government studies. To ensure consistency, each expert was provided with a clear explanation of the objectives, study questions, research model, hypotheses, and CVI rating guidelines. The experts rated the instrument items on a scale of 1 to 4, where 1 represented "Not Relevant," 2 represented "Somewhat Relevant," 3 represented "Quite Relevant," and 4 represented "Highly Relevant" (Davis et al., 1992). Only one deletion was made during the CVI analysis.

Following the content validity process, a pilot study was conducted to assess the reliability and initial performance of the measurement instrument. According to Hunt et al. (1982), a pilot study should have a sample size of at least 30 respondents. To investigate the homogeneous characteristics of the target population, an online questionnaire was created and distributed to Malaysian citizens. Respondents were selected through a purposive sampling technique, targeting individuals who actively engage with e-government services via social media. After a considerable waiting period, 35 responses were received and analyzed.

Overall, the pilot study found that the gender distribution of participants was 45.7% male and 54.3% female, with the age group 20-24 years being the largest at 28.6%. Regarding social media usage, 37.1% of participants spent 5-7 hours daily on social media, and the same percentage (37.1%) visited government social media for 5-7 hours per month. Most participants (65.7%) had about one year of experience using government social media.

Lastly, the internal consistency of each construct in the questionnaire was evaluated using Cronbach's alpha (α) value. A value of 0.7 is the threshold for ensuring the reliability of an item, although 0.6 is acceptable for exploratory studies (Hair et al., 2010)The reliability analysis procedure involves eliminating items that do not contribute to overall reliability. However, in this instance, no items fall below the threshold value, which ranges from 0.789 to 0.979, indicating a high level of internal consistency and construct reliability.

In addition to reliability analysis, factor analysis was performed to ensure construct validity, confirming that the instrument measures the intended dimensions of e-participation. This statistical validation process strengthens the credibility of the developed instrument, reinforcing its applicability for future studies on public engagement in e-government.

Results and Discussion

After undergoing several systematic procedures, this study has successfully developed a robust, substantial, reliable, and valid instrument to measure citizen e-participation in e-government. The finalized questionnaire consists of 53 items, refined from an initial pool of 91 items, ensuring that only the most relevant and meaningful items were retained. This refinement process involved expert validation, reliability testing, and statistical analysis to establish the instrument's effectiveness.

The pilot study included 35 respondents from diverse demographic backgrounds. Table 1 summarizes the respondents' demographic characteristics, including gender, age distribution, and level of experience with e-government platforms.

Table 1
Demographic Profile of Respondents

Demographic Factor	Categories	Percentage (%)
Gender	Male	45.7%
	Female	54.3%
Age Group	20-24 years	28.6%
	25-29 years	22.9%
	30-34 years	20.0%
	35+ years	28.5%
Daily Social Media Usage	1-3 hours	25.7%
	3-5 hours	37.1%
	5-7 hours	37.1%

The demographic analysis reveals a nearly balanced gender distribution, with 45.7% male and 54.3% female respondents. In terms of age, the largest group of respondents falls within the 20-24 years category (28.6%), followed by 25-29 years (22.9%), 30-34 years (20.0%), and 35 years and above (28.5%), indicating a broad age range of participants. Furthermore, a significant proportion of respondents are highly engaged, with 37.1% spending 3-5 hours daily and an equal 37.1% spending 5-7 hours daily on social media platforms, while 25.7% reported lower usage (1-3 hours per day). This pattern indicates that most respondents are frequent social media users, making them a suitable sample for evaluating e-participation in government decision-making through social media platforms.

The internal consistency of each construct in the questionnaire was evaluated using Cronbach's alpha (α) values. All constructs exceeded the minimum threshold of 0.6 for exploratory studies, confirming the instrument's reliability. Table 2 displays the Cronbach's alpha values for each construct.

Table 2

Reliability Analysis (Cronbach's Alpha Values)

	Cronbach's Alpha (α)
Information Quality (IQ)	0.879
System Quality (SYQ)	0.905
Service Quality (SEQ)	0.921
Trust	0.811
User Satisfaction (US)	0.789
Participation Intention	0.835
Nationalism	0.802
Anonymity	0.814
Culture	0.798

The reliability analysis of the measurement instrument, assessed using Cronbach's Alpha (α), confirms strong internal consistency across all constructs. SEQ achieved the highest reliability (0.921), followed closely by SYQ (0.905) and IQ (0.879), indicating robust consistency in evaluating e-government system performance. Constructs related to user behavior and perceptions, such as Trust (0.811), Participation Intention (0.835), and Anonymity (0.814), also demonstrated high reliability, ensuring stable measurement of public engagement factors. Meanwhile, User Satisfaction (0.789), Nationalism (0.802), and Culture (0.798) exhibited acceptable reliability, reinforcing their relevance in understanding citizens' motivations and attitudes toward e-participation. Since all values exceed the recommended threshold of 0.7, and most surpass 0.8, the instrument can be considered highly reliable for assessing public e-participation in government decision-making. Figure 1 illustrates the reliability of the constructs based on Cronbach's Alpha values.

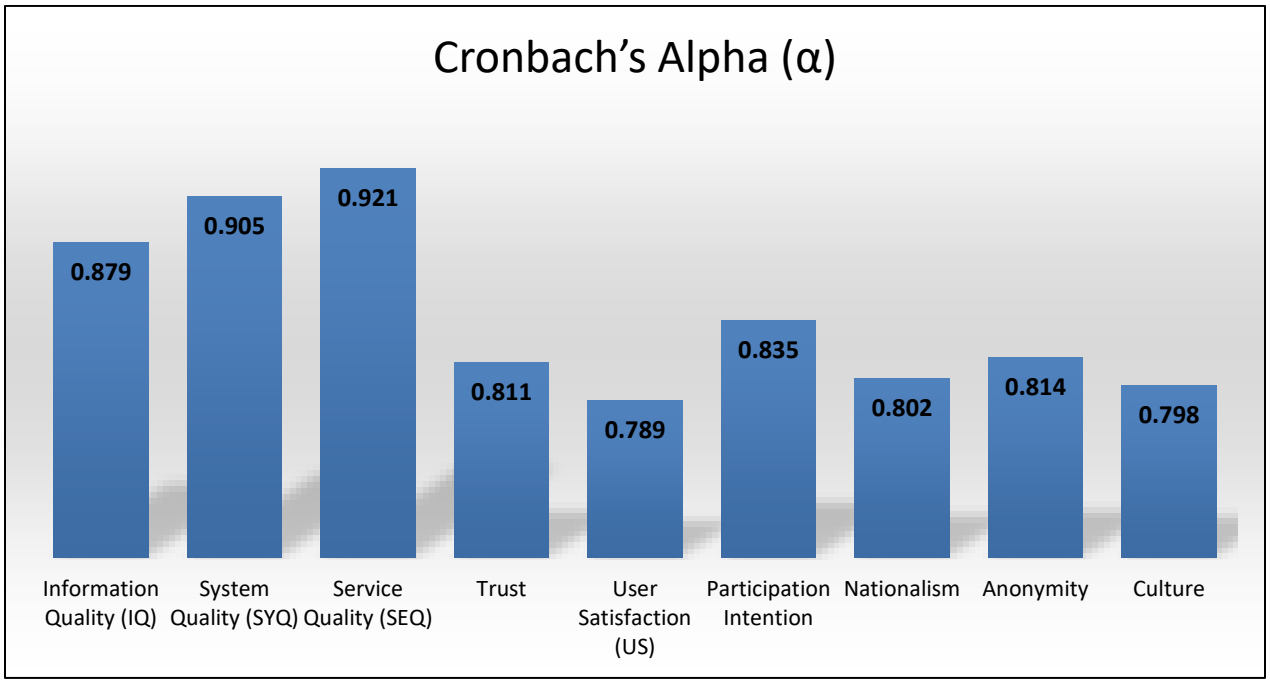


Figure 1. Cronbach's Alpha Values for Each Construct

Conclusion

The questionnaire produced by this study holds practical value for e-government implementation. Evaluation has been recognized as a crucial step in managing various types of IS, including e-participation in e-government (Aljazzaf et al., 2020; Haruna et al., 2021). However, one aspect that is often overlooked during evaluations is their holistic nature. Consistent with the recommendation of DeLone and McLean (2003), the evaluation of e-participation in e-government should encompass all perspectives, including the technical-semantic level and effectiveness level. Therefore, the proposed validated questionnaire is suitable for supporting this comprehensive evaluation. Furthermore, the main advantage of this questionnaire lies in its ability to enable stakeholders to assess the success of e-government implementation from the citizens' perspective. This evaluation will provide prompt feedback that can be utilized to make further improvements to the system.

The success of an Information System (IS) involves interdependent and multi-dimensional constructs; therefore, it should not be evaluated based on a single indicator, such as usage or user satisfaction (DeLone & McLean, 2003). In light of this premise, trust, culture, anonymity, nationalism and e-participation (continuous usage) have been included as companions to the construct of e-government usage. This inclusion allows researchers to examine the continuous usage of e-government. As a result, it is hoped that this questionnaire will yield a more precise interpretation of e-government success. Additionally, the questionnaire is well-suited for researchers to analyze hypotheses related to e-government success. For instance, by utilizing this questionnaire as a measurement tool, researchers can explore the relationships between e-government success constructs or compare the strength of those relationships among specific user groups. The study aims to assess the success of e-government and has developed a validated questionnaire for future research. However, the questionnaire's applicability to different settings may be limited, and further studies should investigate local factors affecting e-participation. The study highlights the need for empirical evidence on obstacles to e-participation in the Malaysian e-government system. Nonetheless, the seven main constructs of the e-government success model remain relevant across different contexts, and researchers should integrate external factors into existing constructs of e-participation in e-government.

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