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The Impact of Quality Factors on Continuous Usage of E-Taxation Filing Reporting System

Isyaku Uba Haruna[1,3,*], Maslinda Mohd Nadzir[2], Hapini Awang[1]

[1] Institute of Advanced and Smart Digital Opportunities, School of Computing Universiti Utara Malaysia, Malaysia
[2] School of Computing, Universiti Utara Malaysia, Malaysia
[3] Department of Information Technology Federal University Dutse, Jigawa State, Nigeria

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ABSTRACT

The electronic taxation (E-Taxation or E-Tax) filing reporting system has undergone several improvements. However, there are still debates regarding the quality of information (IQ), system quality (SYQ), and service quality (SEQ) in the system. These concerns continue to be hotly debated. These concerns include the accuracy of information provided, the availability of the system and its services, and the comprehensiveness and responsiveness of the system, which can result in taxpayers being forced to wait in queues. This study explores the relationship between IQ, SYQ, SEQ, and individual taxpayers' continuous intentional usage of the e-tax system. To achieve this, a theoretical model was developed based on the DeLone and McLean IS Success Model (D&M) concepts, which focused on the targeted issues. The proposed relationship concept was analysed using SmartPLS (v. 3.2.8) on a 768 Nigerian individual taxpayers survey. The study revealed that IQ, SYQ, and SEQ are significant factors that impact taxpayers' intention to use (ITU) and the system's continuous usage (U) in Nigeria. The findings of this study suggest that tax authorities should focus more on technical quality factors to enhance the performance of the e-tax reporting system. Additionally, this study contributes to the existing literature by evaluating the concept of information system quality (ISQ) within the context of e-taxation.

1. Introduction

The success of the e-tax system is heavily reliant on Information and Communication Technology (ICT) infrastructure services [1-2]. With the emergence of a new interaction model through web-based applications, the internet, and smart-media technology, users are benefiting from decreased reliance on the traditional system, which includes office visits and mobile phone collaboration [3-5]. The integration of high-tech platforms and virtual channels has enabled interactions that no longer require physical presence from both users and service providers. As a result, face-to-face interaction is becoming less prevalent while online services continue to rise in popularity [5-7].

* *Corresponding author.*
E-mail address: ishaqkiyawa@ymail.com

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To ensure the success of e-tax systems, it is essential to focus on taxpayers' continuous intention to use these systems. Simplifying tax procedures, including filing taxes and making payments online, can improve taxpayers' compliance with tax regulations [9]. Tax agencies and their staff must learn how to maintain taxpayers' continued usage and understand the factors that influence the adoption of e-tax systems [10]. Notably, the use of e-tax systems has gained significant momentum worldwide, prompting many emerging agencies to shift from Government-to-Government (G2G) and Government-to-Citizens (G2C) models to Government-Government-Citizen (G2GC) models to sustain their intended users [11].

While previous research has examined the impact of information quality (IQ), system quality (SYQ), and service quality (SEQ) on taxpayers' intentional usage of e-tax filing reporting systems, there are still critical issues that require further investigation, such as taxpayers' continued usage to maintain their presence in the system [12]. Therefore, it is essential to analyze additional factors to evaluate the level of taxpayers' usage of the system. Prior studies have found that intentional use (ITU) and continuous usage (U) are influenced by IQ, SYQ, and SEQ [12-13]. This study focuses on how psychological factors such as ITU and U are influenced by technical quality factors (i.e., IQ, SYQ, and SEQ) in the context of e-tax systems. By adding to previous research and evaluating the concept of quality factors in the e-tax context, this study contributes to the Information Systems Quality (ISQ) literature. The three quality components are considered as the ISQ construct, which can strengthen the sustainable e-tax system environment. The rest of this paper is structured as follows

i. Section two presents the literature review, which discusses the concept of e-tax reporting systems and their introduction in Nigeria. It also outlines the evolution of ISQ and establishes the hypotheses for the study.
ii. Section three presents the research methodology. The research findings, discussions, and implications of the study are presented in the subsequent section.

2. Literature Review

An e-taxation or e-tax reporting system is an online or computerized system allowing taxpayers to report and submit tax return records electronically [16]. An e-tax filing reporting system is an information system (IS) that enables users to submit their tax revenues in real time via the internet [17]. As per the Finance Act 2020 and Section 25 of the Establishment Act, Nigeria's Federal Inland Revenue Service (FIRS) is authorized to use technology to automate the tax administration process, including assessment, collection, and information gathering [18]. Implementing such technology has been beneficial, as it offers efficiency and speed to tax services [19]. Therefore, the e-tax filing system has been introduced as one of the e-Government initiatives in the tax sector, particularly to maintain tax records and facilitate easy payment. This platform was deployed in 2021 and enabled taxpayers to file their tax returns electronically/online for Value Added Tax (VAT), Tertiary Education Tax, Pay-As-You-Earn (PAYE), and Companies' Income Tax.

In Nigeria, taxpayers are required by the FIRS to make annual tax payments. While tax payment is mandatory, using the e-tax system for reporting taxes is optional. This study explores the factors that influence taxpayers continued use of the e-tax reporting system. To accomplish this goal, the study will utilize the Delone and McLean IS Success Model (D&M), which focuses on an individual's use and intention to use an IS Given the study's context, it is appropriate to use the D&M information system quality (ISQ) constructs to examine taxpayers' use level of the e-tax system in Nigeria.

2.1 Theoretical Foundation and Hypotheses Development

In the Information System Quality (ISQ) field, system usage is the critical indicator of a system's success, among other aspects. This was openly expressed by DeLone and McLean [20], Lyytinen and Hirschheim [21], Kanaan *et al.,* [22], Valsamidis *et al.,* [23] and Yap *et al.,* [24] in their studies. Lyytinen and Hirschheim [21] further argued that an interaction failure starts when a system is not utilized (overlooked) by its target users. While persistent or continuous usage does not necessarily guarantee the success of a system, a neglected or unused system is sure to fail. Before deciding whether to use a system, a psychological process occurs in the user's mind, which is referred to as intention. Predicting whether users will use a system is one of the significant concerns in Information Systems (IS) research.

The DeLone and McLean (D&M) IS Success Model is one of the well-known models for defining IS success, as many researchers acknowledge. According to D&M [20], IS success is a multi-faceted concept that cannot be measured by just one aspect. Therefore, studies that focus on only one aspect of IS success, such as 'usage' [22-24], 'User Satisfaction' [25-27], or Net Benefits [14,28,29], would be missing from the perspective of IS success research discipline. With this, D&M [30] further said there is an urgent need to identify a single dependent variable covering all facets of IS success. Furthermore, the success of an IS implementation can only be considered significant if users go beyond initial use to continuous usage [31]. Bhattacherjee [32] also asserts that while the initial use of IS is critical to its success, its ultimate success is determined by continuous usage rather than the initial use alone. Therefore, the initial use of an IS is important, but its continuous use is essential for ultimate success, as described by Bhattacherjee [32].

Continuous usage of e-tax systems has been identified as a significant challenge, as evident from the low usage rates reported in previous studies [33-34]. Despite having prior experience with the system, taxpayers have been found to be reluctant to continuously use the e-tax system, suggesting that the system may not be conducive to success [35]. Moreover, the existing literature suggests that the D&M model is a suitable framework for studying usage issues related to e-tax systems [12-15]. Delone and McLean [20] also appropriately recommended considering the model's application in the IS under investigation.

To provide a theoretical foundation for this study, the D&M model will be used, which incorporates three factors that impact the use of IS from initial use to continuous usage: information quality (IQ), system quality (SYQ), and service quality (SEQ) [36]. Meanwhile, Ajzen and Fishbein's [37] Theory of Reasoned Action (TRA) proposes that an individual's motivation to engage in a behavior is linked to their attitude and subjective norms within the theoretical literature on behavior and flow in IS. However, the relationship between attitude and behavior with regards to an individual's level of control, similar to satisfaction, is not adequately explained [38]. In addition, there is a need for a reasonable justification that explains how to ensure that the individual has control over the impacted behavior. Ajzen's [39] research is limited by correspondence within beliefs, attitudes, and behavior, specifically communication-associated elements. The Theory of Planned Behavior (TPB) includes controls on behavior by introducing perceived behavioral control, which is a restriction on voluntary control in TRA [39]. However, TPB has been criticized for failing to account for situations where the behavior has already been planned based on a specified explanation [40], thereby indicating external or personal limitations. To address this issue, Socio-Cognitive Theory (SCT), as proposed by Albert Bandura [41], considers the interaction or relationship among behavior, personal, and environmental factors.

The study of IS use and usage has been widely examined using the D&M model, which was first introduced in 1992. The D&M model comprises six constructs contributing to a system's use and

usage success. These constructs are information quality, system quality, use, user satisfaction, individual impact, and organizational impact. The D&M model suggests that the quality of information plays a crucial role in determining the semantic success of a system, while the quality of the system itself is responsible for its technical success. Furthermore, the effectiveness of a system's success is determined by several factors, including its use, user satisfaction, and individual and organizational impact. The D&M extended their model in a later study by introducing the "Service Quality (SEQ)" construct, which they considered a crucial determinant of success. Instead of introducing additional success factors, they integrated the various impact determinants into a new construct called "Net Benefit (NB)" in their updated model [20]. This resulted in an alternative definition of IS success [42].

The SEQ construct comprises response time, reliability, and availability, which positively influence the system's perceived ease of use and usefulness [20-43]. It describes the user's perception of service performance [44], and determines the gap between users' expectations and what the system delivers [43-45]. For instance, in a multi-communication system, SEQ enables users to receive timely and effective responses to their queries. Teo *et al.,* [46] found that users' perceptions of IQ, SYQ, and SEQ can be used to evaluate the perceived quality of an e-government website. Users' past experiences with the website shape their quality perceptions, which could impact their intention to continue using the system in the future.

The quality of information systems (ISQ) has been assessed based on four key aspects, namely completeness, accuracy, format, and currency [3-47]. In term of IQ, user perception of SYQ dimensions includes accuracy, relevance, adequacy, inclusion quality, sequencing, and timeliness [48-49]. Several studies have demonstrated that ISQ (IQ, SYQ, and SEQ) significantly impacts perceived usefulness [42,50-54]. However, not all studies have explored the relationship between ISQ and e-tax system [7,34,55-57].

This study employs the D&M model and conceptualizes the three dimensions of IQ, SYQ, and SEQ as ISQ to enable advanced technology in the e-tax filing system. Our proposed model demonstrates that ISQ affects taxpayers' behavior and influences continuous usage of the e-tax system. ISQ strengthens taxpayers' relationship mindset through a single entity of goods and services in the e-tax system, as shown in Figure 1. Based on the above discussion, we propose the following hypotheses

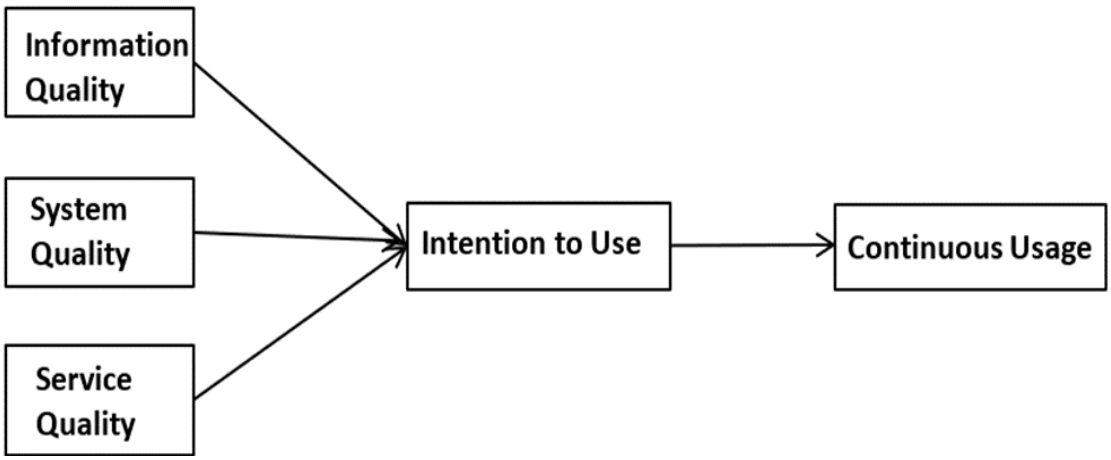


Fig. 1. The Conceptual Framework of the Study

i. H1. IQ has a significant influence on the ITU and continuous U of the e-tax system among taxpayers.
ii. H2. SYQ has a significant influence on the ITU and continuous U of the e-tax system among taxpayers.

iii. H3. SEQ has a significant influence on the ITU and continuous U of the e-tax system among taxpayers.
iv. H4. ITU significantly influences the continuous U of the e-tax system among taxpayers.

3. Methodology

3.1 Research Population and Sampling Techniques

In this study, a multi-stage sampling technique was employed [58]. Firstly, the Joint Tax Board (JBT) provided a list of Nigerian states (authorities) and their total number of individual taxpayers. A proportionate stratified random sampling formula of "(Sample Size/Population Size) * Stratum Size" was used to determine the proportion of each state in Nigeria based on the total population of each state (stratum). Secondly, a "purposeful nonprobability sampling" technique was employed to select individual taxpayers from each of the 36 states in Nigeria, totaling the number of respondents in every state. Data were collected using mail (courier services) and individual visits. For the postal procedure, some questionnaires were delivered by Nigerian postal service organizations and via public transport to individual research aides in certain states. These aides were given clear instructions on distributing the questionnaires to the taxpayers. In addition, students delivered some questionnaires through walk-ins, especially in the Northern states.

3.2 Measures

DeLone and McLean's IS Success Model (D&M) concept, utilizing a quantitative method, was employed in this study. The concepts were measured using multiple items, which represented the e-tax system of the Federal Inland Revenue Service (FIRS) Nigerian agency. A seven-point Likert scale was used for all items, with 1 representing "strongly disagree" and 7 representing "strongly agree." The questionnaire comprised three different sections. Section A contained background-related questions, while information about IQ, SYQ, and SEQ was included in Section B. Section C consisted of one open question for individuals who have never used the system. Respondents who have never used the system were required to answer sections A and C, whereas those who have or are currently using the system were to answer sections A to B.

3.3 Pilot Study

Before collecting primary data, a pilot study was conducted [59]. To ensure the reliability and validity of the measures, three experts were engaged to verify the items independently. The experts received adequate information to rank the instrument items using the "Content Validity Index (CVI)." Each expert rated the instrument items on four scales: 1 = "not relevant," 2 = "somewhat relevant," 3 = "quite relevant," and 4 = "highly relevant" [60]. The CVI study results indicated that all five criteria were reliable and valid, and all ambiguities were resolved to ensure the readability of the scales. The pilot study involved 60 taxpayers and citizens previously using the FIRS online tax system.

3.4 Data Collection

Overall, 627 (81.6%) of the 768 self-administered questionnaires distributed to individual taxpayers were usable from the 639 (83.2%) returned. The collected data were screened and prepared using IBM SPSS Statistical software in the first stage. In the second phase of the study, models were created, and hypotheses were tested using structural equation modelling with partial

least squares (SEM-PLS) and SmartPLS (v. 3.2.8). The respondents consisted of 248 (39.5%) women and 379 (60.4%) men. Since no minimum sample size is required to compare the two groups, this percentage is appropriate [61]. However, many respondents, 314, or 50.1%, had bachelor's degrees. In contrast, 123 respondents have diplomas, 87 have master's degrees, and 65 have Ph. Ds (Doctor of Philosophy).

4. Study Findings

4.1 Assessment of the Measurement Model

This study aimed to examine the relationships among latent variables; thus, the latent analysis technique was appropriate. The study uses p-values and p-coefficients for significance testing to assess the PLS-SEM model. The agreed-upon internal consistency reliability was described in this study using the composite reliability coefficient. Nonetheless, the internal consistency reliability interpretation using the composite reliability coefficient must be at least 0.70 or higher [62-63].

The composite reliability coefficient for Information Quality (IQ) is 0.934; System Quality (SYQ) is 0.948; Service Quality (SEQ) is 0.954; Intention to Use (ITU) is 0.934, and continuous Usage (U) is 0.918. The outer loadings for variables measuring IQ are all above 0.70. The IQ lowest loading is for IQ1 (0.722) followed by IQ6 (0.765). Similarly, the indicators of SYQ have a loading above 0.70, except for the IQ5-IQ10 (0.608, 0.658, 0.661, 0.677, 0.671, & 0.642). Both the indicators of SEQ reached a loading point above 0.70 except for SEQ15, SEQ16, and SEQ17 with 0.683, 0.670, and 0.674 outer loadings. On the other hand, US outer loading indicators are between 0.789 and 0.855, while the outer loading of ITU variable, all the items are below 0.5, which are the lowest items in the study.

Discriminant validity (DV) is the degree to which two conceptually connected beliefs diverge from one another [64] (p. 124). The AVE, as described by Fornell and Larcker, was employed to access the DV in the context of this study [65]. To achieve this, the relationships between the latent concept and the square root of AVE are examined and contrasted [65]. Chin [66] evaluated the indicator loadings (cross-loadings) concerning other reflecting indicators using the cross-loading index. According to Fornell and Larcker [65], the square root of the AVE must be higher than the correlations among the latent variables to attain sufficient discriminant validity.

The AVE should be higher than 0.50 to indicate that deviations from the indications of 50% or more should be considered [67] (p. 321). Average extracted variance for IQ is greater than 0.6 (AVE = 0.612); SYQ is greater than 0.5 (0.504); SEQ is greater than 0.5 (0.549); ITU is greater than 0.7 (0.703); U is greater than 0.6 (0.693). As a result, all AVE scores exceed the threshold value of 0.50. Fornell and Larcker [65] claim that DV can be evaluated using the extracted average variance (AVE).

4.2 Assessment of the Structural Model

This study assessed the significance of the path coefficient using 5,000 samples and the standard bootstrapping method [68-70]. R-squared for latent dependent variables and Fornell and Larcker's average variance extracted approaches, such as those recommended by Chin and Newsted [71], is taken into account to assess the predictive relevance of the proposed PLS-SEM model (p. 328). The R-squared for the endogenous variables is ITU = 0.587 and continuous U = 0.422.

The path coefficients for IQ and ITU of the e-tax system among taxpayers at a level of $\beta = 0.065$, $t = 3.121$, and $p < 0.002$ are significant. Therefore, this result supports H1. This has indicated the IQ provided in the Nigerian e-tax system is accurate; the taxpayers felt delighted and confident to continue using the system at other times. Similarly, in inspecting the impact of SYQ in the study, the result revealed that SYQ significantly influences the ITU of the e-tax system ($\beta = 0.078$, $t = 3.440$, $p <$

0.001). Hence, H2 is supported in the study. In addition, H3 described SEQ as positively related to the ITU of the e-tax system (*ß* = 0.090, t = 2.699, p < 0.007). In the context of this study, SEQ is believed to be among the least perfect predictor of the ITU. Therefore, this result must be regarded with carefulness. Accordingly, it indicates that taxpayers' behavioral ITU the system may be certainly influenced by the quality of the e-tax services and support they receive. The study backs up the existence of an essential link between the two constructs. H4 describes how ITU is also related to the continuous U of the e-tax system (*ß* = 0.050, t = 11.686, p < 0.000). This result is the strongest relation in the proposed model. Hence, both H1, H2, H3, and H4 proposed in this study are supported. The study's empirical model is demonstrated in Figure 2.

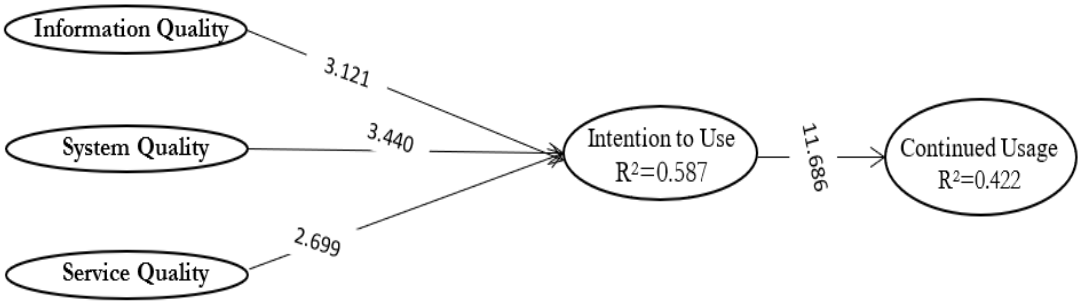


Fig. 2. Qualitative Factors Model of Continuous E-Taxation Usage for Developing Countries

Table 1 below summarizes the result of constructing correlation model.

Table 1
Assessment of the Main Hypotheses in the Structural Model

Hypotheses & Relationship		*ß*	T-Values	p-Values	Conclusion
H1	IQ -> ITU	0.203	3.121	0.002	Supported
H2	SYQ -> ITU	0.270	3.440	0.001	Supported
H3	SEQ -> ITU	0.242	2.699	0.007	Supported
H4	ITU -> U	0.587	11.686	0.000	Supported

5. Discussion

This study confirmed and concluded that applying DeLone and McLean's IS Success Model Quality concept in the Government to taxpayers or citizens (G2C) area is appropriate. The paper shows that IQ, SYQ, and SEQ significantly influence ITU, the e-tax system, among individual taxpayers in Nigeria. This result is consistent with the study from Masunga *et al.,* [34], Putri and Azwar [15], Albar *et al.,* [72], Al-Sulami and Hashim [28], Ali and Khan [73], Awang *et al.,* [74], Awang *et al.,* [75], as well as Li and Wang [76], on ITU a particular IS.

IQ, SYQ, and SEQ significantly impact ITU's e-tax system. The effect of IQ at a level of *ß* = 0.065, t = 3.121, while the effect of SYQ to ITU is at a level of *ß* = 0.078, t = 3.440, p < 0.001 as well as SEQ and ITU at a level of ß = 0.090, t = 2.699, p < 0.007. This result was consistent with earlier research argued that the ITU is vital in describing the e-tax success among taxpayers [77-78], as well as other IS studies context [74-82] but was contrary to some e-tax filing system adoption research [83-84]. Similarly, Martono *et al.,* [85] discovered that ISQ has no significant influence on ITU in a study that determined employees' ITU in the IS system.

The proposed study finding shows the impact of ITU on continuous U with the strongest relationship in the study. It shows that most taxpayers had a strong ITU to continue U e-tax system during the tax filing process. This indicates taxpayers are likelier to continue using the e-tax system

once they have a strong ITU. The results from this study are consistent with [85] as well as [86] and are in congruence with the conclusions of [87], which recommended that BI was a great predictor of actual computer usage.

The correlation analysis indicates that ITU has a strong and positive relationship with IQ, SYQ, and SEQ. This means that their ITU will likely improve when IQ, SYQ, and SEQ of the e-tax system as a paying way are improved among taxpayers. Once they have a strong ITU, their acceptance of ICT to pay taxes should be shown in their actual use of the e-tax system. These findings are in congruence with those of [51-74] and [88].

It should be noted that previous research has supported the significance of the D&M model concept and ITU and continuous U in impacting the taxpayer's belief to use or reject technology. The findings in this study indicate that IQ, SYQ, and SEQ relate significantly to ITU. In other words, this result suggests that IQ, SYQ, and SEQ should be considered to encourage and enhance taxpayers' usage level as an e-tax system. Therefore, it is vital to reduce or eliminate all the negative perceptions and attitudes, such as distrust or fear of the technology so taxpayers will use the e-tax system as a tax-paying method with an open mind.

5.1 Limitation and Future Research

Although this study sheds light on the factors influencing taxpayers' intention to use (ITU) and continuous usage (U) of the e-tax filing system, some limitations should be considered when interpreting the findings. Firstly, the study was guided by the DeLone and McLean IS Success Model (D&M) Quality concept and did not consider the level of technological advancements, usage patterns, and social and psychological aspects of individual users. Additionally, the wider contextual factors specific to Nigeria were not considered, which could influence taxpayers' ITU and continuous U of the e-tax filing system. Moreover, this study did not consider factors such as user satisfaction, net benefit, trust, and user experience that could impact ITU and continuous U of an information system (IS), which are often driven by individuals and groups that operate and control public administrations, which are beyond this study's scope. Hence, future research may be pointed toward the presence of these aspects. This may lead to an improvement in the model's descriptive capacity and result in further accurate assumptions.

Furthermore, as quantitative findings have successfully described cause and effect relationships, this method has inherent limitations. Also, the limitation of a cross-sectional study design is that it does not allow finding users' continuous usage (longitudinal study). Research in technology acceptance indicates that the usage level changes over time, explaining differences in the behaviour of early and late adopters. Hence, future longitudinal studies must assess changes in use and continuance usage situations. It is recommended that qualitative research methods be employed to investigate taxpayers' ITU and continuous U of the e-tax filing system.

A case study on e-tax systems also supported the findings of this study, a subset of the e-government initiative, focused explicitly on the FIRS e-service in Nigeria. Therefore, caution must be exercised when generalizing the conclusions. An e-system, which serves as a source and a measure of service quality, can enhance future studies, as customers are more likely to engage with its services. Furthermore, the sample frame used in this study may be a potential source of error; therefore, further improvements are necessary for future research. The data analyzed were collected from individual users of the FIRS e-taxation system; thus, the results may vary when applied to other user groups. Therefore, it is recommended to investigate other user groups and e-government systems (such as online immigration systems, e-passports, online driver's licenses, etc.) through user corporations.

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