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Evaluation of the quality constructs of a tax management system based on DeLone and McLean IS success model

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ABSTRACT

We presented a novel method to analyze the impact tax management systems have on users (individual impact) in this study. The interrelationship among the three information system (IS) quality constructs is examined. The study is based on the evaluation undertaken in this paper of DeLone and Mclean's (D & M) model. Quantitative data are gathered from a related Ghanaian enterprise. The structural equation modelling of partial least squares was utilized to model the system quality, information quality, and service quality. The result of the study shows that the three quality constructs of the D & M model positively influence the users of a tax management system (individual impact). The results also show that there is a significant positive interrelation among the IS quality constructs.

1. Introduction

Increasing their capacity and ability to collect taxes is critical for many governments around the world, particularly in developing countries. This is because these channels supply funds for government programmes (Mascagni et al., 2021). As a result, tax management systems have become widely used, allowing governments all over the world to have better data access and analysis (Antonakas et al., 2013; Tang & Feng, 2021). The majority of existing information systems (IS), however, are based on western culture, which is far more developed than that of developing countries. Therefore, when they are implemented in developing countries, they encounter significant problems from internal and external users (Moore & Slemrod, 2021). Consequently, governments in developing countries are seeking to design and implement information systems such as the Decision Support System (DSS) that are simple to integrate into their organizational structure.

DSS allows varying levels of analysis without requiring a significant amount of programming effort, and it is typically targeted at non-technical users and managers. Therefore, DSS is used to support both tactical and strategic decisions, and it is also used to utilize a manager's experience in a particular field. Herath and Wijenayake (2019) and Phaphoom et al. (2018) acknowledge that these implemented systems integrate all business processes into a single unit at a point in time and allow revenue collection firms to

customize information system (IS) functions to their own needs. However, unless they are properly implemented, tax management systems cannot constitute a major component of modern tax administration. This indicates that when there is a problem with the implementation process, such systems have a poor probability of surviving within an organization since users believe they will make their work more difficult (Frizzo-Barker et al., 2020), they may lose their employment (Zemtsov, 2020), and they will not be as productive as anticipated (Yoon, 2020). Some of these challenges, however, can be addressed with adequate education and training (Zhai et al. 2020). When this occurs, there is a significant increase in the use of the implemented system, which has both individual and organizational implications. Hence, the ability of an organization to evaluate the effectiveness of an information system is dependent on its successful deployment. It is vital to keep the end-users in mind while evaluating the success of tax management systems (Al Farizi & Harmawan, 2020; Soltani & Navimipour, 2016; Subaeki et al. 2019). Consequently, because individuals place varying degrees of emphasis on technology usage, they frequently oppose the implementation of such systems when the expected benefits are not immediately apparent or when the system introduces a large amount of difficulty (Appelbaum et al., 2018; Roky & Al Meriouh, 2015).

However, in developing countries, the impact of such taxation systems on their users has received little research attention over time (Goble et al., 2019; Tarhini et al., 2017). This is because most of the IS research carried out to measure such impacts have emanated from western countries (see Table 1). According to Mahmud et al. (2017), some end-users of information systems lack trust in modern technology. As a result, it has become necessary for organizations that have introduced such information systems into their daily business to help establish the influence that such IS have on their internal users (Chege et al., 2020; Pérez-González et al., 2017). Martins et al. (2019) acknowledged that when analyzing information system (IS) quality, inherent variables (information quality, system quality, and service quality) must be evaluated and scrutinized to see if their inherent relationships or sheer existence have any impact on the overall IS success (individual impact). Their study shows that system quality has a negative impact on an information system's overall success. However, the overall benefit gained from an IS was positively influenced by information quality and service quality. They did not, however, explore the effects of system quality on information and service quality or the impact of information quality on service and system quality. In addition, the influence service quality has on system quality and information quality was not investigated.

Chen et al. (2019) also examined how well a cross-border e-government system worked. The findings of the study show that information quality, which was examined in terms of how accurate and complete it was, has a significant relationship with efficiency, but not with effectiveness or accountability. Their study also indicates that high-quality information is associated with a high overall evaluation of efficiency and that system quality, as evaluated by the ease of use, has a strong association with only efficacy. Their study, however, utilized a single item to evaluate many explanatory variables, with no variations between the measures. Based on the reviewed literature (see Table 1), each IS construct has been measured with various items over the years (see Figure 1(a–d)), and researchers should investigate the items that have received less attention rather than using a single item to measure several explanatory variables. They also suggested that examining performance drivers in various administrative standards and

Table 1. Reviewed literature.

| Study	Region	Method	Information System	Constructs/ relationships								
				SQ→IQ	SQ→SerQ	SQ→INB	IQ→SQ	IQ→SerQ	IQ→INB	SerQ→IQ	SerQ→SQ	SerQ→INB
1	Taiwan	Quantitative	ERP systems									
2	Mauritian	Quantitative	E-government	*	*			*				
3	Turkey	Quantitative	Health information system	*		*			*			
4	Indonesia	Quantitative	Accounting Information System		*			*				
5	Taiwan	Quantitative	E-government			*			*			*
6	Pakistan	Quantitative	E-tax filing System			*			*			*
7	Portugal	Quantitative	Education management information systems			*			*			*
8	UK	Quantitative	E-government						*			*
9	Egypt	Quantitative	E-learning									
10	Jordan	Quantitative	Accounting Information System									
Total				2	2	4	0	2	5	0	0	4

1. Hsu et al. (2015); 2. Veeramootoo et al. (2018); 3. Sebetci (2018); 4. Nugroho and Prasetyo (2018); 5. Chen et al. (2019); 6. Akram et al. (2019); 7. Martins et al. (2019); 8. Alruwaie et al. (2020); 9. AbdelKader and Sayed (2022); 10. Al-Okaily et al. (2020); IQ → Information quality; SQ → System quality; SerQ → Service quality; INB → Individual Impact.
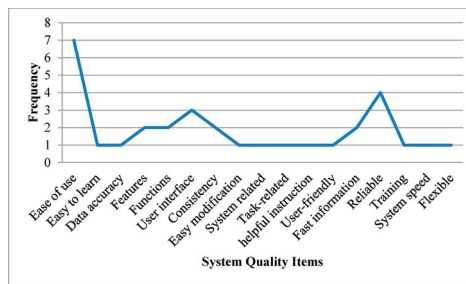
a. System Quality Items.
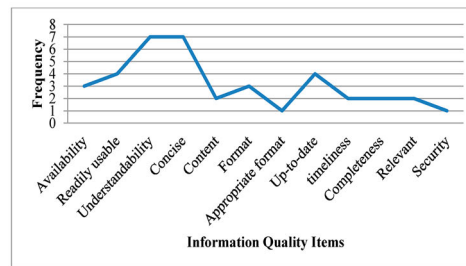
b. Information Quality Items.
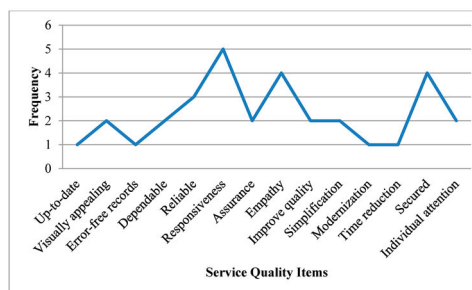
c. Service Quality Items.
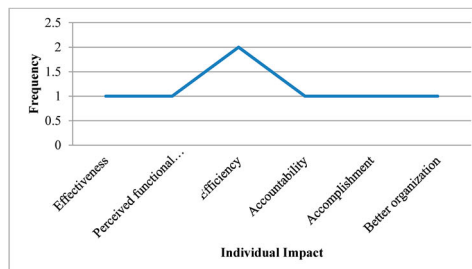
d. Individual Impact Items.

Figure 1. (a) System quality items. (b) Information quality items. (c) Service quality items. (d) Individual impact items.

degrees of centralization in one or more countries would be beneficial. As a result, similar studies in Africa are necessary because such systems are rapidly gaining traction.

To evaluate the efficacy of an IS (tax management system) at the individual level, businesses must devise ways to cover these research gaps. To fill the gaps, the current study proposes a novel method for analyzing the effect tax management systems have

on their users, which is based on the DeLone and McLean IS success model as a theoretical foundation. Previous studies have investigated comparable consequences using the DeLone and McLean (2002, 2003) IS success model. This model takes into account quality constructs (system quality, information quality, and service quality) as well as the intention to use, actual use, user satisfaction, and net benefit. According to DeLone and McLean (2003), quality constructs help in exhibiting how successful and efficient an information system is or should be. This study adds to the growing literature on the integration of information systems into tax administration in developing nations in three areas. First, we establish that the quality constructs (system quality, information quality, and service quality) in tax management systems have significant interrelations. Second, we show that the quality constructs of tax management systems have a direct and significant relationship with the users (individual impact). Finally, we propose a model for tax authorities to use in measuring their success at the individual level after deploying information systems. The rest of the paper is laid out as follows. In Section 2, we conduct a literature review. Section 3 summarizes the theoretical foundations and proposed model. In Section 4, the research methodology is described in depth. Section 5 presents the empirical findings, while Section 6 presents a discussion of the findings. Section 7 discusses the study's theoretical and practical implications, while, finally, Section 8 discusses the study's limitations, future research, and conclusion.

2. Literature Review

Ulhas et al. (2015) developed a theoretical framework based on the DeLone and McLean IS success model to highlight the impact of collaborative information system (CIS) features on the individual, organizational, and project success. According to their findings, system quality, information quality, and service quality all have a significant impact on individual users. A further study by Cidral et al., (2018) sought to learn more about how Brazilians rate their satisfaction with their learning, as well as their usage of e-learning tools and the overall impact they have on their lives. They designed a theoretical model for e-learning systems based on higher education institutions and university centers, which included theories of information systems satisfaction and success. The findings also show that information quality, service quality, and systems quality all have a significant effect on individual users. They also concluded that the system quality of an information system explains its impact at the individual level. In addition, Chan and Lau (2018) examined how system quality impacts service-oriented business intelligence architectures. Based on the theory underlying the information system success model, their study assessed the variables that may have an impact on both the individual and the organization as a whole. Their study was carried out in Malaysia with the support of information technology professionals in managerial positions. The findings show that system quality has a significant influence on individual impact. Additionally, Fiaz et al. (2018) assessed healthcare employees' perspectives on how to improve the quality of services in healthcare facilities through the use of an information system platform. Their study incorporated medical specialists from five Pakistani healthcare institutions, and the findings showed that information quality and systems quality have a significant effect on service quality.

An enhanced electronic filing continuity-of-use model was also validated by Veeramootoo et al. (2018). Their model has been expanded to include two additional structures: hypothetical threats and behaviors, both of which are relevant to the use of electronic filing continuity. Their findings show that system quality, user satisfaction, and habits all have an impact on the objective of individuals using electronic filing regularly. Their study also examined the relationships between system quality, information quality, and service quality, as well as between information quality and service quality. It did not, however, address the relationship between information quality and system quality, or the relationship between service quality, information quality, and system quality. On both the user and organizational levels, Nur and Irfan (2020) evaluated the consequences of deploying an IS-based accounting information system. The findings also show that when enterprises listed on the Indonesian Stock Exchange are used, service quality has a significant impact on information quality.

According to the reviewed literature, there is a research gap when it comes to the relationship that exists between the DeLone and McLean IS quality dimensions and their impact on individual users over time (see Table 1). This gap exists as well, based on the various items utilized to measure each IS construct (see Figure 1(a–d)). The outcomes of Hsu et al.'s (2015) study, which investigated how different qualities of an ERP system affect its post-implementation success from the user's perspective, show that service quality interacts significantly with information quality and system quality to promote an ERP system's post-implementation success by increasing employees' extended use. Their study also shows that after ERP systems are implemented, there is a need to address a lack of understanding of the interrelationships between information quality, system quality, and service quality. This was because these relationships were not taken into account in their study. It should also be highlighted that it focused on the manufacturing industry; as a result, when other industries are researched, different conclusions are likely to emerge.

The study undertaken by Veeramootoo et al. (2018) shows that system quality is a good predictor of information quality which, in turn, impacts service quality. In order to identify these factors, it was necessary to examine the interrelationship among the three quality components of the IS Success model and pinpoint the factors that affect users' willingness to keep using e-filing. It was observed in their study that the information quality has an impact on the service quality. However, their study did not consider the relationship between information quality and system quality, or the impact of service quality on information quality and system quality. Their study focused on the impact of the three IS quality components on individual users of the existing e-filing system. They used a survey method to obtain data for their investigation. They also suggested that future studies should try testing the DeLone and McLean conceptual model using an extensive variety of design methodologies, such as experiments and observations.

Sebetci (2018) offered a new strategy for user satisfaction that may be used and implemented anywhere in the world. The implications of contemporary technologies were investigated while using Aggelidis and Chatzouglou's EUCS techniques on previous health information systems (HISs). Their model considers the impact of system quality on information quality and users. They also examined the impact of information quality on the users of the information system (IS) they studied. They did not, however, examine the impact of system quality on service quality or the impact of information quality on

system quality and service quality. Neither was the impact of service quality on information quality and system quality explored or their impact on users, which necessitates additional research to fill in these research gaps. When using an organization's information systems, Nugroho and Prasetyo (2018) gained a better understanding of the information system's user perception. The findings of their study show that information quality and system quality have an impact on service quality. However, the study did not investigate the relationship between other IS quality variables, such as the effect system quality has on information quality and users. The information quality influences the quality of the system and the users, and the service quality impacts the information quality, the system quality, and the users.

Chen et al. (2019) examined the performance of a cross-boundary e-government system and found that information quality evaluated in accuracy and completeness has a strong association with efficiency but not with effectiveness or accountability. Additionally, high-quality information is positively associated with a high overall rating of efficiency, and system quality evaluated by the ease of use has a strong relationship solely with the efficiency of a deployed e-government system. However, their study measured multiple explanatory variables with a single item, and there was a lack of differentiation across the measures utilized. To measure the variables in the DeLone and McLean model, therefore, more research is required to study additional variables. Further, their study suggested that it would be beneficial to evaluate performance drivers in various administrative standards and degrees of centralization in one or more countries. Akram et al. (2019) explored the interrelationships between technological predictors and behavioral mediators to explain users' propensity to continue online tax filing. The findings of their research indicate that the combination of the ESC-ISC model and the D&M IS success model provides a sufficient basis for evaluating IS success and continuation, such as e-tax filing. However, additional research is required to explore the influence of system quality on information quality and service quality; information quality on system quality and service quality; and service quality on information quality and system quality.

Focusing on student use of EMIS and the resulting net benefits, Martins et al. (2019) acknowledged that when evaluating the quality of an information system (IS), its inherent variables (information quality, system quality, and service quality) must be analyzed and scrutinized to see if their intrinsic relationships or mere existence have any impact on the overall success of the information system. More study on the direct influence of these quality characteristics on IS users is thus essential. Alruwaie et al. (2020) also investigated the factors that influence individuals' continued utilization of e-government services. According to their findings, information quality and system quality do not influence personal outcome expectations. However, their model did not examine the impact of service quality on personal outcome expectations.

Further studies show that information quality, service quality, and training quality all contributed to the organizational advantages in a positive and meaningful way (Al-Okaily et al., 2020). However, in the context of their investigation, system quality had no substantial impact on organizational gains. There is, nevertheless, a likelihood that future studies concentrating on the individual benefits obtained from the influence of the three IS quality constructs could contribute to the body of literature. As AbdelKader and Sayed (2022) explain, there is no direct relationship among the three dimensions of quality and net benefits (individual level).
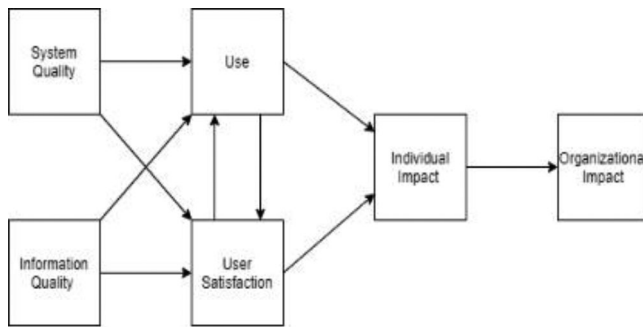
Figure 2. DeLone and McLean IS success model (1992).

3. Theoretical Foundations

3.1. DeLone and McLean Model

DeLone and McLean (1992) defined six variables that contribute to the success of information systems (IS): system quality, information quality, use, user satisfaction, individual impact, and organizational impact. These variables, however, were not contingent on success metrics. Seddon and Kiew (1996) extended DeLone and McLean (1992) modification of the *use* construct by suggesting that individuals are more concerned with *usefulness*. Seddon and Kiew's (1996) suggestions were comparable to the Technology Acceptance Model (TAM) (Davis, 1993). Seddon and Kiew (1996) also explained that although the variable *use* is an acceptable metric in voluntary systems when *use* is required, usefulness becomes a more direct indication of an information system's performance. DeLone and McLean (2003) contested Seddon and Kiew's (1996) view, arguing that even in mandatory systems, there is still a degree of diversity in *use* and argued for its retention, as shown in Figure 2.

DeLone and McLean (2003) revised their model to include service quality as a construct, following Pitt et al.'s (1995) recommendations. Individual impact and organizational impact were integrated into a net benefit to better measure the benefits at various levels. Net benefit was introduced as a consequence of a suggestion by Myers et al. (1997) and Seddon and Kiew (1999). The next modification addressed the *use* construct. According to DeLone and McLean (2003), although *use* in the process sense predates *user satisfaction*, a positive experience with *use* in the causal sense leads to increased *user satisfaction*. Additionally, they showed that an increase in *user satisfaction* results in a rise in *intention to use*, which eventually results in greater usage. The updated model consisted of six variables. As shown in Figure 3, the *intention to use* and *use* constructs replaced the initial *use*, and *individual impact* and the *organizational impact* were combined into a single *net benefit* construct.

3.2. The Proposed Model and Hypotheses

The purpose of this study is to examine the impact of tax management systems on individual users. The proposed model aimed to explore the interrelationship between the IS quality constructs (*System quality* (SQ), *Information quality* (IQ), *and Service quality* (SerQ)). The proposed model also aimed to examine the interrelationship among the three quality constructs and individual impact. Figure 4 shows the model that has been proposed:
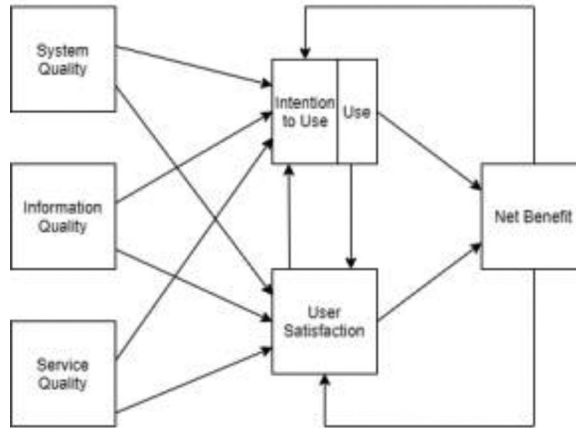
Figure 3. Updated DeLone and McLean IS success model (2003).

Where, $IQ_A = IQ$ availability; $IQ_R = IQ$ relevance; $IQ_T = IQ$ timeliness; $IQ_S = IQ$ security, $IQ_{RL} = IQ$ reliability; $SerQ_S = SerQ$ support; $SerQ_A = SerQ$ assurance; $SQ_E = $ Ease of use; $SQ_{SF} = SQ$ system features; $SQ_S = SQ$ speed; $SQ_F = SQ$ flexibility.

$$\bigcup_{i=1}^{2} A_i = IQ_{(i)} + SerQ_{(i)} = SQ \tag{1}$$

$$\bigcup_{s=1}^{2} A_s = IQ_{(s)} + SQ_{(s)} = SerQ \tag{2}$$

$$\bigcup_{q=1}^{2} A_q = SerQ_{(q)} + SQ_{(q)} = IQ \tag{3}$$

$$\{SQ \cup IQ\} \cup \{SQ \cup SerQ\} \cup \{IQ \cup SerQ\} = \varphi \tag{4}$$

$$\varphi = \bigcup_{r=1}^{3} A_r = SQ + SerQ + IQ \tag{5}$$

where φ is the individual impact, $i =$ items, $A_i =$ combination of IQ and SerQ items, $A_s =$ combination of IQ and SQ items, and $A_q =$ combination of SerQ and SQ items. According to Figure 3, the IQ items and the SerQ items – namely IQ_A, IQ_R, IQ_T, IQ_S, IQ_{RL}, $SerQ_S$, and $SerQ_A$, when properly integrated – lead to system quality (SQ) and this is what is explained in Eq (1). Similarly, a combination of service quality items, namely speed and flexibility, and that of IQ items leads to service quality (SerQ), given Eq (2). Following the same explanation, information quality is deduced from the relation between service quality and system quality as explained in Eq (3). We proposed further that there is a critical interrelationship between the three constructs, SQ, IQ, and SerQ as depicted in Figure 3. This interrelationship is represented by Eq (4), which soundly leads to the individual impact.

We updated DeLone and McLean's (2003) IS success model by analyzing the relationships between quality dimensions and individual impact. The *intention to use, use,* and *user satisfaction* constructs from the original DeLone and McLean (2003) IS success
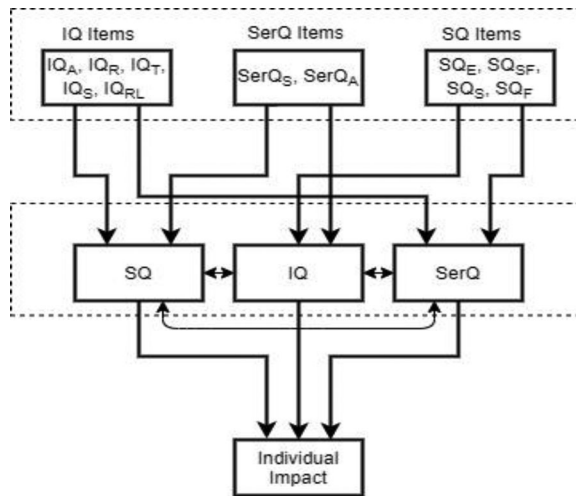
Figure 4. Proposed research model.

model are omitted from this model because preliminary studies we conducted in some business organizations, combined with previous research from numerous researchers, indicated that these constructs pose undesirable problems in many business environments, particularly in developing economies, where this study is being conducted. For example, Rahi and Ghani (2019) and Tam and Oliveira (2016) show that, in various cultures, IS *use* does not play a significant role in the DeLone and McLean (1992, 2003) IS success model. In line with prior studies such as Petter et al. (2008, 2013), Petter and McLean (2009), and Seddon (1997), we contend that DeLone and McLean's conceptualization of IS *use* and *satisfaction* is questionable. The use of a system that represents future usage in the context of behavior and the use of those outcomes in a system's ultimate benefit, according to Seddon (1997), has no place in the IS success model because they do not define success. Again, the majority of quantifiable instruments used to verify IS *user satisfaction* relates to items used to assess *information quality* and *system quality* (Gable et al., 2003; Melchor Medina-Quintero et al., 2018). This implies that information quality and system quality may be utilized to indirectly assess IS *user satisfaction*. As a result, we propose that the construct of IS *user satisfaction* and *use* be excluded from this study.

3.3. Hypotheses Development

3.3.1. System Quality (SQ)

System quality refers to the characteristics of an information system, its ease of use, its reliability, ease of learning, responsiveness to time, and its flexibility (Petter et al., 2008). According to DeLone and McLean (2003) and Petter et al. (2008), the perceived ease of use, reliability, quality of information, and user-friendliness of a system are all indicators of system quality. Eight characteristics of system quality were also defined by Rivard et al. (1997). These characteristics are made up of the economy, verifiability, sustainability, effectiveness, comprehensibility, user-friendliness, portability, and usability. The present study evaluates system quality by focusing on its ease of use, system features,

speed, precision, and versatility. A well-designed and executed information system is a sufficient prerequisite for giving tax management systems a competitive advantage. The core objective of utilizing an IS in an organization is to harness operational performance but for a tax administration system that is not adequately designed, it is likely to have frequent system failures, which have the ripple effect of increasing the institutions' product prices (Gorla et al., 2010). Cidral et al. (2018) concluded that system quality positively relates to individual impact, and they suggested further that the driving forces are user-perceived satisfaction, usage, and influence of e-learning. They argued that information is crucial and that mishandling of it has the potential to cause negative consequences that affect its quality (Abasi et al., 2015; DeLone & McLean, 2016; Scott et al., 2016). A highly scalable system, on the other hand, can deliver relevant and up-to-date information in terms of maintenance and helpful features while still fulfilling users' information needs (Cidral et al., 2018; Gaardboe et al., 2017; Rana et al., 2015). The system quality of a tax administration ERP system is critical in helping internal users. Additionally, it has been identified as having an impact on service quality and information quality (Fiaz et al., 2018; Gorla et al., 2010; Veeramootoo et al., 2018). According to DeLone and McLean (2002), Chan and Lau (2018), and Cidral et al. (2018), system quality has a direct and positive influence on individual impact. Thus we propose the following hypotheses:

H1: System quality positively influences information quality.

H2: System quality positively influences individual impact.

H3: System quality positively influences service quality.

3.3.2. Information Quality

The accuracy of information system outputs relates to the information quality (DeLone & McLean, 2003, 2016). In the study conducted by Iivari (2005) and Rainer and Watson (1995), five aspects of information quality were identified: availability, relevance, timeliness, security, and reliability. An information system that does not meet the requirements of its users results in unnecessary expenditure for the business (Gorla et al., 2010; Zheng et al., 2013). The availability of dependable operational information gives rise to individual advantages including improved individual effectiveness, work effectiveness, task performance, and job simplicity (Chmielarz, 2015). Support for the relationship between information quality and individual impact has been established by Petter et al. (2008), although more study is needed. Using the appropriate and accurate tax administrative information allows users to have information of excellent quality concerning usefulness, understandability, and reliability (DeLone & McLean, 1992). Multiple studies have shown that high-quality information has a positive impact on overall system quality and customer satisfaction (Cidral et al., 2018; Fiaz et al., 2018; Veeramootoo et al., 2018). On the other hand, the individual impact can also be influenced by information quality (DeLone & McLean, 2002). Thus, we advance the following hypotheses:

H4: Information quality positively influences individual impact.

H5: Information quality positively influences system quality.

H6: Information quality positively influences service quality.

3.3.3. Service Quality

Service quality is the support system users get from IT support personnel and is related to responsiveness, technical competence, support for staff, and reliability. SERVQUAL is the most used metric, and it indicates that potential usage and user satisfaction are favorably linked to the active position of the technical staff (DeLone & McLean, 2003; Irawan & Syah, 2017). A recent study by Veeramootoo et al. (2018) shows an inter-relationship between the IS success model's three quality constructs. Two measures, support and assurance were used to evaluate the construct of service quality in this study (Chang & King, 2005; Pitt et al., 1995). Support requires elements that assess the degree to which the IS personnel can assist and provide timely service to users of the implemented information systems (IS). Assurance is the IS staff's capacity to create the confidence that IS users need in the system. IS services provided by the IT unit on schedule and with error-free results can lead to prompt and accurate decision-making, which in turn leads to improved internal organizational effectiveness (Althonayan & Althonayan, 2017; Hsu et al., 2015). Increased decision-making efficiency and profitability result from the engagement of experienced IS specialists who maintain effective touch with IS users through thoughtful communications and can better comprehend their demands. This also supports arguments that service quality has a positive impact on information quality. The influence of tax administration IS service quality may be seen in the effect it has on users (workers). Service quality is a requirement for the use and continuous use of an implemented IS by users. This also shows that service quality has a positive influence on information quality. An IS staff's ability to assist users with the integrated system and timely service would make it easier for users to use the system, perceive the system as efficient, and quickly learn how to use the system. This signifies that if an organization hires IT experts with IT/business expertise and managerial IT skills, who are comfortable with users and can build stronger relationships with them (assurance), and who can consider the specific needs of users (empathy), creativity will emerge through the addition of new features to existing products or the development of new products at a low cost. Current studies show that service quality influences individual impact, as well as system quality and information quality (Cidral et al., 2018; Nur & Irfan, 2020). Based on these studies, we propose the following hypotheses:

H7: Service quality positively influences system quality.

H8: Service quality positively influences information quality.

H9: Service quality positively influences individual impact.

4. Methods

The current study used a mixed-methods case study design (MM–CS). Creswell and Clark (2017) state that in a mixed-method case study, a parent mixed method is used, which contains a nested case study for the qualitative component. Qualitative exploratory research was conducted in three regions in Ghana hosting large offices of the Ghana Revenue Authority (GRA). The study elucidated how employees interact with the tax management system and also established the most suitable design

approach for the research model. The three regions were selected because they have large numbers of employees and their units at the time operated the implemented tax module. We further used a quantitative method to survey 600 users. The quantitative method entails the systematic and empirical examination of phenomena via the use of statistics and mathematics, as well as the processing of numerical data (Chirkov & Anderson, 2018). In quantitative research, the process of estimation serves as a vital connection between empirical observation and the mathematical representation of quantitative relations. For privacy purposes, the implemented tax management system used in this study is referred to as ERPx.

4.1. Research Design

The current study adopts an objectivist (epistemological) approach, suggesting that things exist as meaningful entities outside of consciousness and experience, that they contain objective truth and meaning as objects, and that rigorous investigation can reveal that objective truth and meaning (Crotty, 1998, pp. 1–256, 2020). The objectivist approach was also adopted for this study because it is the epistemology that underpins the positivist perspective; thus, this study also embraces the positivist perspective. This viewpoint states that reality exists outside of the researcher's control and must be investigated scientifically (McChesney & Aldridge, 2019). The researchers were able to obtain the truth, which is both verifiable and an explanation for an objectively existing reality, owing to the positivist approach used in this study. As a result, the truth and explanation concerning the impact of an ERP system's quality constructs on users were uncovered through this viewpoint.

The study also employed the case study research approach, which allows researchers to collect information from a variety of sources (Mason et al., 2018; Yin et al., 2011). The researchers employed three phrases in their effort to comprehend the ERPx system in use and its impact on its users. The first phase comprised collecting empirical data on senior management, notably administrators who were at the vanguard of the ERPx system's early implementation, by a combination of interviews and non-participant observation. This was to help elicit their perceptions of the implemented ERPx system during the change process, to discuss what motivated the introduction of the ERPx system and the departments that use it, to discuss the system's challenges and benefits, and to assist the researcher in understanding the ERPx system's operations and the impact the system's features have on the users. The non-participant observation method was also employed to gain a better understanding of ERPx users' behavior. During the second phase, focus groups were organized to gather input on ERPx usage, functionalities, problems, and benefits, to assist with the development of a questionnaire and to propose a model for assessing the impact of ERPx system quality constructs on users. The data were validated during the third phase. The focus group, observation, and interview results were all part of this phase.

4.2. Data Collection Procedure

Interviews, observation, focus groups, and questionnaires were used to gather data for the study. Two main deputy administrators who have been responsible for ERPx

implementation from the beginning were interviewed to get a better knowledge of the implemented ERPx and to help in conceiving the study model. The interview method used was a serial interview with open-ended interview questions that typically allow for more discussion (Read, 2018; Weller et al., 2018). Each interview lasted around an hour to an hour-and-a-half. A purposive selection process was used to select the administrators rather than a random selection method to ensure a wide range of perspectives on how long they have worked with ERPx; what is the ERPx execution speed; is it simple for them to obtain ERPx services; what are their views on ERPx's information quality, and what steps may be taken to ensure ERPx's success? This interviewing approach was also adopted because it has the benefit of revealing crucial data about the respondents and the setting, such as languages, social cues, opinions, attitudes, beliefs, and feelings (DeJonckheere & Vaughn, 2019; Powney & Watts, 2018).

Direct observation aided in grasping the workers' behavior (users) and issues we felt users were not willing to give clear answers to. Direct observation is a technique of gathering evaluative data in which the evaluator observes the subject in their natural surroundings without altering anything (Halil et al., 2016). The researchers chose this strategy because it allowed them to document operations, behavior, and physical elements of the system in place without having to rely on ERPx users' desire or capacity to reply appropriately to questionnaires. The study ensured that the participants were a good representation of ERPx users. As a result, our observation was less likely to be biased as a result of this. Three researchers were responsible for the observation and the observation procedure lasted thirty (30) days.

We also utilized the focus group method (respondent moderator) to elicit information on the ERPx usage, function, challenges, and merits. The focus group approach is a data-gathering strategy in which a group of people is gathered for a planned discussion to explore a specific topic of interest to researchers in a non-threatening, non-judgmental setting (Adler et al., 2019; Morrison et al., 2020). It was employed in the current study to help the researchers get the most out of their interactions with ERPx users who offered their thoughts, responses, and opinions on the study's topic. However, it should be highlighted that the unit of analysis for a focus group is not its individuals but the group itself. According to the substantial literature on the subject, focus groups should have at least six people, with most researchers recommending between five and twelve as the best number (Nyumba et al., 2018). This is because a large focus group can be inefficient since it can be difficult to incorporate comments from all participants, and the debate may be split into a succession of mini-conversations (Sim & Waterfield, 2019). As a result, the current study's focus groups comprised six (6) participants, two from each of the three regions (GRA offices) where the ERPx has been implemented. The proposed research model was validated using survey data. Surveys are an efficient method of collecting information on practices and complicated conditions because they illuminate respondent behavior, institutional inequalities, and organizational paradigms (Li et al., 2021). The survey collected data on the four (4) construct dimensions as defined by DeLone and McLean (1992, 2003) and Petter et al. (2008).

The study gathered demographic information on the implemented ERPx module users (employees). The survey was designed to take no longer than 15 min to complete. The survey questionnaire was designed and evaluated by four researchers and 10 ERPx

users from each of the three regions. This was to establish comprehension, redundancy, and clarity in the questionnaire. Each region received the questionnaire in person. We used the accidental (convenient) sampling method following the COVID-19 guidelines. Thus, where accessible, individual responders were surveyed because respondents were uninformed of the survey before they were contacted. This technique avoids prejudice. Five hundred and fifty-five (555) questionnaires were collected, with a response rate of 92.5%, from the 600 distributed. The questionnaire was gathered within six months (October 2020–March 2021). The majority of employees who responded to the questionnaire were male (50.8%) and females (49.2%), with the majority aged between 35 and above (41.1%). Additionally, they had 6–10 years of ICT use experience (47.9%).

4.3. Measures of the Constructs

We utilized four (4) components to assess the impact of information systems quality on individual impact in a tax management system. The constructs and items used in the study were modified from prior research to guarantee their validity. The four (4) constructs are IQ (information quality), SerQ (service quality), SQ (system quality), and INB (information impact) (Petter et al., 2008). The questions used to assess the four (4) constructs are listed in Table 1. A seven-point Likert scale was employed, with strongly agree (7), agree (6), slightly agree (5), neither agree nor disagree (4), slightly disagree (3), disagree (2), and strongly disagree (1). The study included five (5) items to assess information quality, four (4) items to assess system quality, three (3) items to measure individual impact, and two (2) items to assess service quality based on prior research (see Table 2). The exploratory qualitative research conducted in the three (3) regions established that there have been many attempts over the years to explore the correlations between the quality construct of tax administrative ERP and its influence on users.

4.4. Data Analysis

The data was analyzed using partial least squares structural equation modeling. Partial least square (PLS) yields meaningful and durable equations when the independent variables are the number of experimental observations. We utilized PLS because it predicts more accurately and consistently when independent variables are correlated rather than orthogonal (Leguina, 2015). We used SmartPLS 3.2.8 and SPSS version 23. This was done in two stages: first, the measurement model was established, followed by the structural model (Hair et al., 2020).

Table 2. Dimensions of constructs

Construct	Items names	No. of Items	Literature
Information Quality	Availability, Relevance, Timeliness, Security, Reliability	5	(Iivari, 2005; Rainer & Watson, 1995)
Service Quality	Support, Assurance	2	(Chang & King, 2005; Pitt et al., 1995)
System Quality	Ease of use, System features, Speed, Flexibility	4	(Gable, Sedera, & Chan, 2008; Iivari, 2005; McKinney, Yoon, & Zahedi, 2002)
Individual Impact	Individual productivity, Job effectiveness, Task performance	3	(Gable et al., 2008; Sedera, Gable, & Chan, 2004)

5. Results

5.1. The Measurement Model

The indicators used to assess the model's (outer) validity include reliability, convergent validity, and discriminant validity. The item loadings were more than 0.5, indicating a high degree of dependability. As demonstrated in Table 3, all-composite reliability (CR) and Cronbach's alpha (a) values were more than 0.7. The AVE values were similarly greater than 0.5. The reliability and convergent validity test results indicate that the construct variables and indicators employed in the research are valid and reliable to evaluate the structural model.

Discriminant validity is shown in Tables 4 and 5. This metric indicates the degree to which a construct is different from other constructs in terms of empirical evidence (Hair et al., 2020). The discriminant validity of the constructs is shown in Table 4 and the heterotrait-monotrait ratio (HTMT) is computed in Table 5. The HTMT provides an estimate of the true correlation between two constructs assuming they are measured correctly.

5.2. Measurement of Structural Model (Inner)

We evaluated the importance of the path coefficient (hypotheses), the level of the R^2 values, and the predictive relevance Q^2 while evaluating the structural model proposed for the study. We utilized the standardized root mean square residual (SRMR) and root mean square residual covariance (rms Theta) (Hair et al., 2020). The SRMR obtained is 0.078 and rms Theta is 0.129. The obtained value of 0.078 indicates that the model is a good fit. The rms Theta value of 0.129 shows that the model is well-fitting.

Table 3. Measurement model.

Constructs	Loadings[a]	AVE[b]	CR[c]	Rho_A[d]
System Quality (SQ)		0.760	0.927	0.902
Using ERPx is easy for me (SQ1)	0.842			
Functions provided by ERPx are useful for my work (SQ2)	0.869			
The use of ERPx speeds up my work operations (SQ3)	0.879			
The services of ERPx are always available for my work (SQ4)	0.897			
Information Quality (IQ)		0.638	0.898	0.879
ERPx ensures information availability (IQ1)	0.818			
ERPx provides me with relevant information (IQ2)	0.839			
ERPx guarantees the reliability of information (IQ3)	0.752			
ERPx allows me to access information securely (IQ4)	0.852			
ERPx provides me with timely information (IQ5)	0.726			
Service Quality (SERQ)		0.770	0.870	0.713
I always receive support for ERPx when needed (SerQ1)	0.896			
Support availability for ERPx is prompt (SerQ2)	0.858			
Individual Impact (INB)		0.733	0.892	0.849
The use of ERPx improves my performance on the task assigned to me (INB1)	0.794			
The use of ERPx improves my efficiency at work (INB2)	0.903			
The use of ERPx helps me to reduce errors in my work (INB3)	0.868			

[a]All Item loadings > 0.5 indicate indicator reliability.
[b]All Average Variance Extracted (AVE) > 0.5 as indicates Convergent Reliability.
[c]All Composite reliability (CR) > 0.7 indicates internal Consistency.
[d]All Cronbach's alpha > 0.7 indicates indicator Reliability.

Table 4. Discriminant validity (Fornell-Larcker criterion).

	SQ	IQ	SerQ	INB
SQ	0.872*			
IQ	0.688	0.799*		
SerQ	0.216	0.220	0.878*	
INB	0.703	0.712	0.279	0.856*

*The diagonal is the square root of the AVE of the latent variables and indicates the highest in any column or row.

5.2.1. Hypothesis Testing

After the constructs' reliability, convergent validity, and discriminant validity were established, Table 6 shows the standardized coefficient of the pathways in the model. Five thousand (5000) samples were generated using a bootstrap sampling approach to determine the path coefficient using SmartPLS. Hair and Sarstedt (2021) proposed that 5000 bootstrap samples should be used as a rule of thumb. Table 6 also shows the standardized beta for each hypothesized path, as well as the associated *t*-values that indicate the coefficients' significance (*t*-values >1.96 signify significance level $p = 0.05$). All of the paths that have been proposed are significant. For path, system quality → information quality ($\beta = 0.672$, $t = 27.748$, $p = 0.000$), path system quality → individual impact ($\beta = 0.394$, $t = 10.512$, $p = 0.000$), and path system quality → service quality ($\beta = 0.218$, $t = 4.972$, $p = 0.000$). Also, for the paths information quality → individual impact ($\beta = 0.418$, $t = 11.260$, $p = 0.000$), information quality →system quality ($\beta = 0.673$, $t = 27.512$, $p = 0.000$), information quality → service quality ($\beta = 0.222$, $t = 4.865$, $p = 0.000$), service quality → system quality ($\beta = 0.218$, $t = 4.948$, $p = 0.000$), service quality →information quality ($\beta = 0.076$, $t = 2.220$, $p = 0.026$), and service quality→individual impact ($\beta = 0.102$, $t = 3.633$, $p = 0.000$). As a result, H1–H9 are accepted. Furthermore, system quality, information quality, and service quality account for 60% of the variance in individual impact. In addition, service quality and information quality account for 47% of the variance in system quality. However, information quality explains 4.9% of the variance in service quality.

6. Discussion

This study proposed a theoretical model that revenue service providers can use to measure the impact their deployed tax management systems have on the users, with specific reference to an African context, Ghana. This study further examined the direct effect of the IS success quality constructs (system quality, information quality, and service quality) on individual impact. Additionally, the interrelationship among the three quality constructs is examined. The current study's results show that the quality constructs of a tax management system have a direct and significant positive effect on individual system users. The findings are consistent with Cidral et al. (2018), Petter et al. (2008), and Nur and Irfan's (2020) studies, which all accept that system quality positively

Table 5. Discriminant validity (HTMT).

	SQ	IQ	SerQ	INB
SQ				
IQ	0.754			
SerQ	0.268	0.27		
INB	0.795	0.807	0.364	

Table 6. Direct relationship for hypothesis testing.

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	P values	Decision	f^2	q^2	95%CI LL	95%CI UL
H1	SQ → IQ	0.672	0.024	27.748	0.000	Supported	0.822	0.371	0.631	0.711
H2	SQ → INB	0.394	0.037	10.512	0.000	Supported	0.212	0.097	0.332	0.456
H3	SQ → SerQ	0.218	0.043	4.972	0.000	Supported			0.144	0.286
H4	IQ → INB	0.418	0.037	11.260	0.000	Supported	0.212	0.113	0.356	0.479
H5	IQ →SQ	0.673	0.024	27.512	0.000	Supported	0.010	0.005	0.630	0.711
H6	IQ →SerQ	0.222	0.045	4.865	0.000	Supported			0.146	0.294
H7	SerQ → SQ	0.218	0.044	4.948	0.000	Supported			0.146	0.290
H8	SerQ → IQ	0.076	0.034	2.220	0.026	Supported	0.011	0.003	0.020	0.290
H9	SerQ → INB	0.102	0.028	3.633	0.000	Supported	0.023	0.010	0.056	0.290

$p < 0.05$; $p < 0.01$; $p < 0.001$ *CI LL: confidence interval lower *CI UP: confidence interval upper R^2 (INB = 0.60; SQ = 0.475; SerQ = 0.047). Effect size impact indicator are according to Cohen (1988), f^2 values 0.35 (large), 0.15 (medium), and 0.02 (small). Predictive relevance (q^2) of Predictor Exogenous Latent Variables as according to Henseler et al. (2009), q^2 values: 0.35 (large), 0.15 (medium), and 0.02 (small).

influences individual impact, with user-perceived satisfaction and usage serving as the driving forces. They also highlighted that by utilizing relevant and precise tax administration information, users can obtain information that is of exceptional quality in terms of usefulness, understandability, and trustworthiness. This further shows that the impact of tax management systems on their users (individual impact) is dependent on the information quality, service quality, and system quality. This is a result of the remarkable improvement in user productivity, effectiveness, and performance.

The information quality and service quality of a tax management system were both positively influenced by system quality. This shows that the quality of information generated by the system in terms of reliability, availability, relevance, and timeliness is influenced when the tax management system is simple to use, has flexible features, and is fast for users. The findings are comparable to those of Gaardboe et al. (2017), Rana et al. (2015), and Martins et al. (2019), who concluded that highly scalable systems can give relevant and up-to-date information while still meeting users' information needs in terms of maintenance and useful features. Furthermore, system quality influences service quality in terms of always receiving essential support when needed, as well as a rapid response since users are aware of the issues they face and seek help from the appropriate people at the opportune moment. This result is consistent with the findings of Fiaz et al. (2018), Gorla et al. (2010), Nugroho and Prasetyo (2018), and Veeramootoo et al. (2018).

Additionally, it was reported that the service quality of a tax administration system has a significant impact on system quality and information quality. This shows that when users of a tax management system consistently receive prompt assistance when needed, it has a significant impact on their perception of the system's ease of use and flexibility. Also, with prompt assistance from the IT support unit when needed, users of the tax management system are more likely to get accurate and relevant data from the system. This data is usually timely and secured. These findings corroborate those of Althonayan and Althonayan (2017), Alruwaie et al. (2020), and Hsu et al. (2015), who acknowledge that timely and error-free information system services provided by the IS unit can result in prompt and accurate decision-making, which in turn leads to increased internal organizational effectiveness.

Finally, the information quality of a tax management system has a significant impact on system quality and service quality. As a result, it is understandable that when data produced by a tax management system are relevant, timely, secure, and reliable, this has an impact on

the support and assurance users receive. It also makes users appreciate how easy the system is to use, allowing them quickly to learn how to navigate the system's features. This is in line with DeLone and McLean (1992) and Veeramootoo et al. (2018), who concluded that employing appropriate and accurate tax administration data provides users with high-quality information in terms of usefulness, understandability, and reliability.

7. Theoretical and Practical Implications

Our findings have both theoretical and practical implications for revenue collection firms that have deployed tax management systems. We proposed a model in the context of the Ghanaian tax collection agency, and the current study presents a theoretical background that incorporates IS success measurement at the individual level. The findings show that the quality constructs (system quality, information quality, and service quality) are inter-related and have a significant influence on individual impact. Additionally, system quality, information quality, and service quality account for 60% of the variance in individual impact. Also, service quality and information quality are accountable for 47% of the variance in system quality. On the other hand, information quality accounts for 4.9% of the variance in service quality. Likewise, the system quality of a tax management system has an impact on service quality and information quality.

These practical implications can assist tax management system developers and top management of tax revenue agencies. The developers and vendors of such systems must pay close attention to their quality constructs (system quality, information quality, and service quality) since they contribute significantly to user productivity, job effectiveness, and task performance. As a result, the tax management system must share a system characteristic that makes the system easier to use. The system's features must also be user-friendly, adaptable, accurate and fast. Additionally, senior management and system providers must ensure that the data generated is accurate, relevant, and useful. It is also necessary to ensure data security. Vendor support, assurance, and internal IT personnel should all be involved in the tax management system's service quality.

8. Limitations, Future Research, and Conclusion

The current study examined the impact of IS success model quality constructs on individual users of an implemented tax management system. Also addressed was the inter-relationship between the IS success quality constructs. According to the findings, the three key quality constructs of an IS success model (system quality, information quality, and service quality) have a significant influence on individuals who use tax management systems. The information quality and system quality are both influenced by the service quality of the tax management system. Improved service quality and overall system quality will emerge from better information quality. This indicates that the IS quality constructs are highly interrelated. The study adds to the current literature by examining the DeLone and McLean IS success model using a tax management system. The DeLone and McLean IS success model is used to explain the objectives at the individual level rather than at the organizational level. However, there are a few limitations to this study. Because the study focused on the influence of IS quality constructs on users, it has generalization implications. The importance of each IS quality construct varies depending on

the industry and level of adoption. Furthermore, a potential downside is that the current study does not examine a variety of other criteria that go into evaluating the quality constructs of an IS success model. These constraints could be employed in future studies to examine the direct influence of information system quality on users (individual impact). By including enhanced conceptualization and assessment using a large number of survey questions, a future study could improve the robustness and validity by analyzing various quality components and individual effect drivers.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Notes on Contributors

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