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Assessing Taxpayer Perceptions of Service Quality and Compliance in the Evolved Digital Tax System: A Case Study of Dar Es Salaam

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ABSTRACT

The integration of digital technologies in commerce and public administration has necessitated significant tax reforms to capture revenue from digital transactions. In response to this evolving landscape, Tanzania introduced the Digital Service Tax (DST) through the Finance Act, 2022, aligning with global trends in digital taxation. While this policy marks a crucial step in regulating online economic activities, it presents unique compliance challenges, particularly for digital businesses operating beyond national borders. This study investigates the impact of service quality on taxpayer satisfaction and compliance with DST in Tanzania. A stratified random sampling technique was used to select 385 respondents from Dar es Salaam, ensuring a diverse representation of individual taxpayers, SMEs, and corporate entities. Data were collected using a structured questionnaire based on the SERVQUAL model, measuring assurance, empathy, reliability, responsiveness, and tangibility on a five-point Likert scale. Partial Least Squares Structural Equation Modelling (PLS-SEM) and Importance Performance Map Analysis (IPMA) were employed to test hypothesized relationships and evaluate the model's predictive performance using SMART-PLS software version 3.29. The findings reveal that all service quality dimensions significantly influence taxpayer satisfaction and compliance ($p < 0.001$), with assurance and reliability demonstrating particularly strong effects. These results underscore the importance of secure and efficient digital tax platforms in fostering compliance. Despite the short implementation period, DST adoption has shown promising trends, as evidenced by high satisfaction and compliance indicators. The model's predictive relevance, confirmed by Q^2_predict values, reinforces the robustness of these findings. Policymakers are advised to enhance digital tax infrastructure, strengthen security protocols, and improve user experience to sustain taxpayer trust and compliance. Future research should explore moderating factors such as demographic characteristics, digital literacy, and economic conditions, as well as conduct comparative analyses across regions to refine digital tax strategies in emerging economies.

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KEYWORDS: SERVQUAL, digital tax compliance, service quality, Tanzania Revenue Authority, PLS-SEM, tax compliance behavior, Tanzania

1.0 INTRODUCTION

The integration of digital technologies in commerce and public administration has led to significant transformations in taxation systems globally. The increasing reliance on digital platforms for business transactions has necessitated reforms in tax policies to ensure governments can capture revenue from these emerging markets (Arewa and Santoro, 2022; Musimenta et al., 2019). In 2022, the Tanzanian government introduced digital service tax (DST) through the Finance Act, 2022, marking a critical step toward the taxation of transactions conducted on digital platforms. This amendment extended the scope of taxation to include digital transactions, aligning with global trends where digital taxation frameworks have been implemented to regulate online economic activities (Baseka, 2022; Gomera, 2022).

Under the newly revised tax framework, key amendments to the Value Added Tax Act, Cap. 148 R.E. 2019 and the Income Tax Act, Cap. 332 R.E. 2019 broadened the definition of business to encompass activities within the digital marketplace, classifying them as electronic services (Gomera et al., 2021). As stipulated in section 51 of the VAT Act, the term electronic services cover a wide spectrum, including website hosting, software updates, remote maintenance, access to databases, streaming services, and various forms of online intermediation(Oreku, 2021). These services are now subject to both DST and VAT, aiming to secure revenue from

the fast-growing digital sector in Tanzania (Mbise and Baseka, 2022).

Although these reforms provide a more comprehensive tax regime, ensuring compliance poses unique challenges. Digital businesses often operate beyond Tanzania's borders, complicating enforcement (Masunga et al., 2020a). The effectiveness of this initiative largely depends on taxpayers' perceptions of the digital tax system's quality, accessibility, and fairness (Mashauri, 2021).Research in Tanzania has shown that user trust in e-government services hinges on transparent regulations, reliable infrastructure, and supportive administrative practices(Liwenga et al., 2024.). When citizens perceive the system as efficient and equitable, they are more inclined to fulfil their tax obligations voluntarily (Kessy, 2019).

This study employs the SERVQUAL model to evaluate taxpayer experiences with Tanzania's digital tax system, focusing on five dimensions of service quality: reliability, assurance, tangibility, empathy, and responsiveness (Mary et al., 2023). These dimensions are especially relevant in digital tax administration, where user experience and system performance directly impact compliance behaviours (Saputro et al., 2022). Reliability reflects the system's capacity to handle tax processes accurately, while assurance pertains to data protection and taxpayer trust(Butkus et al., 2023; Mosimanegape et al., 2020). Tangibility captures platform usability and design, empathy gauges the support provided to taxpayers, and responsiveness measures the efficiency of resolving taxpayer queries (Parasuraman et al., 1988)).

Tanzania's approach to digital taxation aligns with the global move to capture revenue from digital services (LOTARY, 2023). The country has mandated that non-resident digital service providers register with the Tanzania Revenue Authority (TRA) and comply with DST and VAT if they offer services to Tanzanian (Khamis, 2020).Although this framework aims to prevent revenue leakage and ensure fairness, local studies reveal several operational barriers. For instance, taxpayers frequently encounter technical glitches and uncertainty regarding VAT rules, particularly in distinguishing purely digital services from hybrid offerings (Kyomo and Buhimila, 2025).Absent clear guidelines to distinguish between digital and non-digital portions of a service, businesses may inadvertently face redundant levies, discouraging them from compliance(Haji et al., 2017). These issues underscore the necessity of a user-cantered perspective that prioritizes smooth taxpayer experiences while safeguarding government revenue.

Considering these developments, this study aims to assess taxpayer perceptions of service quality and examine how these perceptions influence compliance with Tanzania's digital tax system. By employing the SERVQUAL model, we systematically evaluate the strengths and weaknesses of the existing digital tax framework from the taxpayer's viewpoint. The findings will inform policymakers, enabling them to refine legislative and administrative mechanisms to encourage voluntary compliance. Furthermore, insights gleaned from this research may guide technology investments, capacity-building initiatives, and user support systems (Maro, 2023; Mlowe, 2023). Ultimately, understanding taxpayer perceptions is a critical step in fostering a more equitable, transparent, and efficient digital taxation environment in Tanzania.

2.0 LITERATURE REVIEW

2.1 Theoretical Foundation: The SERVQUAL Model

The SERVQUAL model, developed by Parasuraman, Zeithaml, and Berry (Parasuraman et al., 1988), is a widely used framework for assessing service quality. It is based on the premise that service quality is measured by the gap between customer expectations and their perceived experience. The model identifies five key dimension's reliability, assurance, tangibility, empathy, and responsiveness as fundamental indicators of service quality. Each dimension captures a unique aspect of service delivery, making the SERVQUAL model a valuable tool in evaluating public services, including tax administration systems (Tambunan, 2023).

In the context of digital taxation, the SERVQUAL model provides a structured approach to assessing the efficiency, user-friendliness, and effectiveness of tax systems. It helps identify specific areas of improvement that influence taxpayer satisfaction and compliance behaviour(Musimenta et al., 2019; Vella, 2020). By integrating the SERVQUAL model into this study, we aim to analyse how service quality dimensions affect taxpayer satisfaction, which in turn influences compliance with Tanzania's digital tax system.

The SERVQUAL model has been widely applied across various sectors, including financial services, healthcare, and government services, to assess the impact of service quality on user satisfaction and behavioural intentions(Rexhepi et al., 2022; Yesmin et al., 2023). In tax administration, the model offers a practical framework for evaluating taxpayer experiences with digital tax platforms. The digitalization of tax services has gained prominence worldwide, with governments striving to enhance service delivery, minimize tax evasion, and improve revenue collection efficiency (Ting, 2020). However, digital taxation also presents challenges, including technical issues, cybersecurity threats, and user adoption concerns, making the SERVQUAL model essential for evaluating service effectiveness (Becker et al., 2022)

2.2 Empirical Review of Service Quality in Tax Administration

Several studies have applied the SERVQUAL model in evaluating government service efficiency, particularly in tax administration. Hammouri and Abu-Shanab, (2017) found that taxpayer satisfaction is significantly influenced by perceptions of fairness, ease of use, and transparency in tax procedures. Similarly, Saptono et al., (2023) noted that service quality in taxation enhances voluntary compliance,

reducing the need for enforcement mechanisms. Research in Tanzania has also highlighted the role of digital infrastructure in improving tax compliance. Demonstrated that user-friendly digital platforms contribute to higher satisfaction and compliance rates, while Munoz et al., (2022) emphasized that accessibility and support services significantly affect taxpayer experiences.

A study conducted by Mvanga, (2023) explored the role of taxpayer education and technological interventions in improving compliance levels, concluding that simplification of tax procedures through digitalization significantly increases taxpayer satisfaction. Similarly, Makundi, (2020) found that when taxpayers perceive digital tax systems as easy to navigate and free of technical issues, compliance rates improve. In a Tanzanian context transition to digital tax platforms reduced administrative bottlenecks but also introduced challenges such as system downtimes and difficulties in accessing support services, which negatively impacted satisfaction and compliance levels (Ibrahim, 2022)

Studies in African economies have shown that digital tax systems can either facilitate compliance or create additional barriers, depending on the quality of implementation (Simbarashe, 2020). A study by Mlowe, (2023) on Tanzania's e-tax system found that while automation improved efficiency, technical failures and inadequate support services hindered satisfaction and compliance. These findings align with global research emphasizing the need for user-centered digital tax systems (Ting, 2020).

2.3 Integration of SERVQUAL in Digital Taxation

The integration of SERVQUAL into tax administration involves assessing the five service quality dimensions in relation to taxpayer satisfaction. By applying this model, tax authorities can identify gaps in service delivery and develop targeted interventions to improve compliance rates. Each SERVQUAL dimension plays a unique role in shaping taxpayer perceptions and compliance behaviours through satisfaction.

2.3.1 Reliability

Reliability refers to the ability of a service to perform accurately and dependably (Tambunan, 2023). In tax administration, reliability encompasses system uptime, accurate tax calculations, and the consistency of service delivery. If taxpayers experience frequent system failures or errors in tax assessment, their trust in the digital tax system diminishes, leading to lower satisfaction and compliance rates (Stević et al., 2021). Empirical studies have demonstrated that system reliability significantly influences taxpayer satisfaction and trust in digital tax services

H1a: Reliability of the digital tax system positively influences taxpayer satisfaction.

H1b: Reliability of the digital tax system positively influences taxpayer compliance.

2.3.2 Assurance

Assurance pertains to the confidence that users have in the service, including the knowledge and courtesy of service providers and the security of transactions (Francisco John Mark and Neri, 2023). In the context of digital taxation, assurance is linked to cybersecurity, fraud prevention, and data privacy. Research has shown that taxpayers are more likely to be satisfied when they feel their information is secure and that tax authorities are knowledgeable and supportive (Nguvava and Chao, 2024). In Tanzania, studies indicate that inadequate security measures in digital tax systems deter satisfaction.

H2a: Assurance in the digital tax system positively influences taxpayer satisfaction.

H2b: Assurance in the digital tax system positively influences taxpayer compliance.

2.3.3 Tangibility

Tangibility refers to the physical aspects of service delivery, including website design, user interface, and accessibility of tax portals (Shigella, 2013). In digital taxation, a well-structured, easy-to-navigate system improves user experience and fosters satisfaction. Studies have found that poorly designed tax portals increase frustration and discourage taxpayers from engaging with the system (Pushkareva, 2021). In Tanzania,(Mashauri, 2021) found that enhancements in the design and accessibility of tax websites improved taxpayer satisfaction.

H3a: Tangibility of the digital tax system positively influences taxpayer satisfaction.

H3b: Tangibility of the digital tax system positively influences taxpayer compliance.

2.3.4Empathy

Empathy involves understanding and addressing taxpayers' concerns, providing personalized support, and ensuring accessibility for diverse users (Khamis, 2020). In tax administration, empathy translates to responsive customer support, multilingual assistance, and guidance for taxpayers unfamiliar with digital systems. Prior research has highlighted that personalized assistance significantly improves satisfaction, particularly among small business owners and informal sector participants . A study by Massawe, (2021) in Tanzania found that lack of personalized support in digital tax systems resulted in reduced satisfaction and increased errors.

H4a: Empathy in the digital tax system positively influences taxpayer satisfaction.

H4b: Empathy in the digital tax system positively influences taxpayer compliance.

2.3.5 Responsiveness

Responsiveness refers to the willingness of service providers to assist users and resolve issues promptly (Parasuraman et al., 1988). In the context of digital taxation, responsiveness includes the efficiency of help desks, the speed of system updates, and the ability to address taxpayer complaints. Studies show that when tax authorities respond swiftly to

inquiries and technical issues, taxpayer satisfaction improves, a study by Mashauri, (2021) in Tanzania suggests that delays in resolving digital tax issues contribute to frustration and lower satisfaction.

H5a: Responsiveness of the digital tax system positively influences taxpayer satisfaction.

H5b: Responsiveness of the digital tax system positively influences taxpayer compliance.

2.3.6 Satisfaction and Compliance

Taxpayer satisfaction plays a crucial role in shaping compliance behaviour (Slemrod, 2019). When taxpayers perceive a system as efficient, transparent, and user-friendly, they are more likely to voluntarily comply with tax regulations (McKerchar and Hansford, 2019). Studies have confirmed that satisfaction acts as a mediator between service quality and compliance (Saptono et al., 2023; Saputro et al., 2022). In Tanzania ,Khamis, (2020) found that higher satisfaction levels significantly increased voluntary compliance rates.

H6: Taxpayer satisfaction positively influences compliance with the digital tax system.

2.4 Conceptual framework

The conceptual framework on figure 1 on this study is based on the SERVQUAL model, illustrating the relationship between service quality dimensions, taxpayer satisfaction, and compliance. The five service quality dimension's reliability, assurance, tangibility, empathy, and responsiveness are expected to influence taxpayer satisfaction and compliance. Satisfaction, in turn, serves as a mediating factor influencing compliance behaviour. This framework provides a structured approach to understanding how the quality of digital tax services impacts compliance levels, thereby assisting policymakers in identifying areas for improvement in the tax administration system. By applying this model, the study seeks to provide empirical evidence on how service quality dimensions drive taxpayer behaviour in the context of digital taxation in Tanzania.

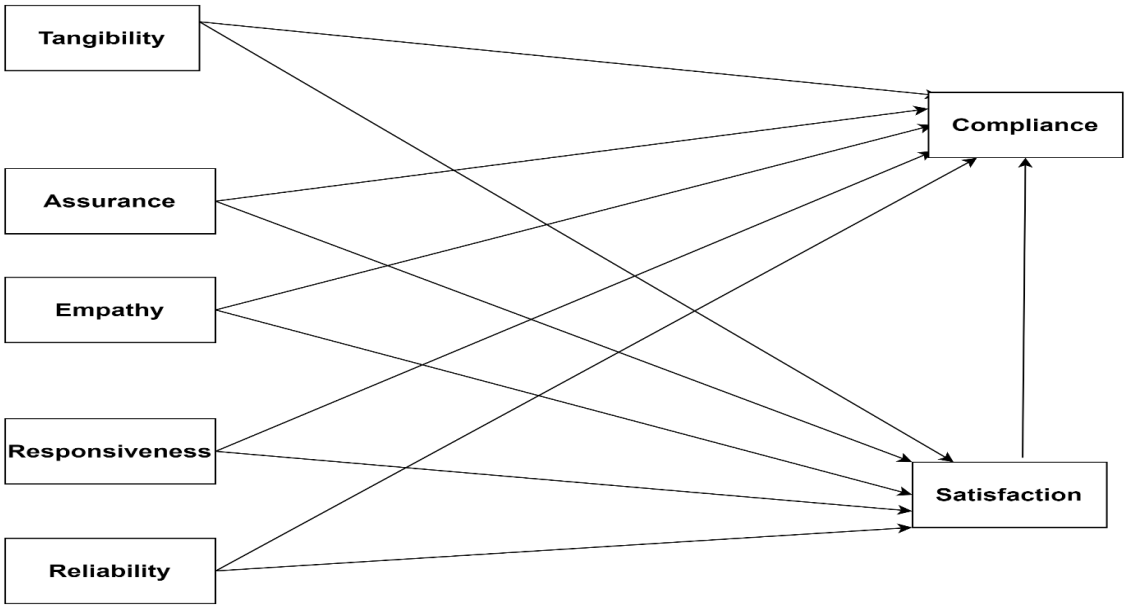

Figure 1: The conceptual framework for this study

3.0 MATERIALS AND METHODS

3.1 Research Design and Study Area

This study adopts a descriptive and explanatory research design to assess taxpayer perceptions of service quality and compliance in Tanzania's digital tax system. A descriptive approach is used to understand the current state of service quality as experienced by taxpayers, while the explanatory aspect seeks to establish the relationship between service quality dimensions, satisfaction, and compliance. The study focuses on Dar es Salaam, the economic hub of Tanzania, where digital tax services have been widely implemented. Dar es Salaam is home to a large concentration of businesses and individuals who interact with the Tanzania Revenue Authority (TRA) through digital tax platforms, making it an ideal location for this study.

3.2 Sampling and Procedure

The study employs a stratified random sampling technique to ensure a diverse representation of taxpayers. The target population includes individual taxpayers, small and medium enterprises (SMEs), and corporate taxpayers who have interacted with the digital tax system. The sample size is determined using Cochran's formula which is acceptable in this study according to (Krejcie and Morgan, 1970) for an unknown population proportion as in equation (1)

$$n = \frac{Z^2 p(1-p)}{e^2} \qquad \ldots\ldots\ldots (1)$$

Whereby n = required sample size, Z = standard normal deviation (1.96 for a 95% confidence level), p = estimated proportion of the population using digital tax services (assumed 50% or 0.5 for maximum variability), e = margin of error (5% or 0.05).

Substituting the values

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$n = 385$$

Thus, the required sample size for this study is 385 respondents. The stratified sampling ensures representation from different taxpayer categories to provide a holistic understanding of perceptions across diverse groups.

3.3 Data Collection

Primary data is collected through a structured questionnaire distributed to taxpayers in Dar es Salaam. The questionnaire is designed based on the SERVQUAL model, capturing five key dimensions of service quality: reliability, assurance, tangibility, empathy, and responsiveness. It also includes measures for taxpayer satisfaction and compliance. A five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) is used to gauge respondents' perceptions as shown on (Appendix 1). To ensure data validity and reliability, a pilot test is conducted with 30 respondents before full-scale data collection.

3.4 Data Analysis

Data analysis is conducted using both descriptive and inferential statistics. Descriptive statistics (means, standard deviations, and frequencies) summarize taxpayer perceptions of service quality. Inferential analysis includes Structural Equation Modeling (SEM) using Partial Least Squares (PLS-SEM) to test the hypothesized relationships between service quality dimensions, satisfaction, and compliance. The SEM approach is chosen for its ability to model complex relationships while addressing measurement errors (Hair Jr et al., 2017). Additionally, Average variance extract and Cronbach's Alpha were used to assess the reliability of the measurement scales, with an acceptable threshold of 0.70 (Purnomolastu, 2021). The study also employs bootstrapping techniques to estimate path coefficients and assess statistical significance. The results provide insights into the strength and direction of the relationships between service quality, taxpayer satisfaction, and compliance in Tanzania's digital tax system.

4.0 RESULTS AND DISCUSSION

4.1 Preliminary characteristics of respondents

The sample consists of 69.4% male and 30.6% female respondents, reflecting a gender imbalance among digital tax users. This may indicate that men are more engaged in digital tax-related businesses or more comfortable with technology-based taxation platforms, a trend observed in previous studies on digital financial inclusion ((Victor, 2024)). Most respondents (49.9%) fall within the 18–28 age group, suggesting that younger individuals are more likely to adopt digital taxation. However, a significant portion of respondents (22.3%) are aged 46–60, indicating a growing acceptance of digital tax services among older taxpayers, aligning with findings by (Sichone and Mbamba, 2021), who noted that digital tax platforms are becoming more accessible across different age groups.

Most respondents (70.4%) are married, while 22.3% are single, and a small percentage (1.6%) are widowed. This distribution suggests that married individuals may be more engaged in formal business operations requiring tax compliance. Regarding business experience, 41.0% of respondents have less than three years of experience, while 40.3% have 3–5 years, and 18.7% have over five years. This indicates that newer entrepreneurs are actively using digital tax services, supporting findings by Ngowi et al., (2021) that digital taxation is lowering entry barriers for new businesses. The respondents' education levels show that 50.6% have completed primary education, 28.6% secondary education, 9.4% college/university education, and 11.4% have not attended school. This distribution suggests that digital tax services are accessible across different educational backgrounds. However, individuals with lower educational attainment may require additional support to navigate the digital tax system effectively, consistent with findings from Massawe, (2021),who highlighted the importance of digital literacy in tax compliance.

A majority (53.8%) of respondents have been using digital tax services for one year, while 23.9% have two years of experience, and 22.3% have three years. This suggests that digital tax adoption is relatively recent, but its uptake is expanding. Regarding access to credit, 59.2% of respondents reported having access, while 40.8% lacked credit facilities. This aligns with prior research highlighting that financial accessibility influences compliance with tax obligations (Fischer et al., 2017).

Among the types of businesses represented, accessories (36.6%) account for the largest segment, followed by home decoration (16.6%) and handicrafts (14.0%). The presence of diverse business types underscores the broad applicability of digital tax systems. Prior studies (Au et al., 2023; Mader et al., 2022) indicate that service quality plays a crucial role in increasing digital tax compliance among SMEs across different industries.

Table 1: Socio-economic characteristics of respondents (n=385)

Variable	Category	Frequency	Percentage (%)
Sex	Female	118	30.6
	Male	267	69.4
Age	18 - 28	192	49.9
	29 - 35	29	7.5

	36 - 45	50	13.0
	46 - 60	86	22.3
	Above 60	28	7.3
Education level	Primary	195	50.6
	Secondary	110	28.6
	College/University	36	9.4
	Not attended school	44	11.4
Marital status	Divorced	22	5.7
	Married	271	70.4
	Single	86	22.3
	Widow/Widower	6	1.6
Business experience (years)	3 -5	155	40.3
	Above 5	72	18.7
	Below 3	158	41.0
User experience on Digital tax	1 Year	207	53.8
	2 Years	92	23.9
	3 Years	86	22.3
Access to credit	No	157	40.8
	Yes	228	59.2
Nature of business	Accessories	141	36.6
	Cosmetics	46	11.9
	Drugs	25	6.5
	Fashion	27	7.0
	Foods	28	7.3
	Handicraft	54	14.0
	Home decoration	64	16.6

Source: *Researcher survey (2025)*

4.2 Model fit assessment.

Model fit assessment evaluates how well the proposed model aligns with the collected data, ensuring that the measurement and structural model accurately represent the relationships between variables. In this study, several key model fit indices were assessed using Smart-PLS 3.29, including the Standardized Root Mean Square Residual (SRMR), Chi-square, Normed Fit Index (NFI), and other diagnostic measures.

The SRMR (Standardized Root Mean Square Residual) value of 0.039 is well below the acceptable threshold of 0.08 (Hair Jr et al., 2017), indicating a good model fit and minimal residual discrepancies between the observed and predicted correlations. The chi-square value of 740.246 reflects the overall goodness-of-fit of the model. Although chi-square values are often sensitive to sample size, a significant value suggests that the model reasonably fits the data (Byrne, 2016).: The NFI (Normed Fit Index) value of 0.906 exceeds the recommended cutoff of 0.90, indicating an adequate fit between the proposed model and the observed data (Bentler and Bonett, 1980). The d_ULS (Squared Euclidean Distance) and d_G (Geodesic Distance) values of d_ULS (0.623) and d_G (0.317) indicate a minimal discrepancy between the empirical and model-implied correlation matrices, confirming good model performance (Hair Jr et al., 2017).

Table 2 Model fit assessment.

Criterion	Saturated	Estimated
SRMR	0.039	0.039
Chi-square	740.246	740.246
NFI	0.906	0.906
d_ULS	0.623	0.623
d_G	0.317	0.317

Source: *Researcher (2025)*

Overall, these fit indices suggest that the structural model provides a strong representation of the data, supporting its validity in assessing the relationships between service quality, taxpayer satisfaction, and compliance with digital tax systems.

4.3. Measurement model assessment.

The measurement model assessment is a crucial step in ensuring the validity and reliability of the constructs used in the study. This step helps to confirm whether the observed variables accurately measure their respective latent constructs and ensures that the model's predictive power remains robust (Hair Jr et al., 2017). The assessment involves evaluating the measurement items using factor loadings, reliability measures, and validity tests. By employing the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, we ensure that the measurement model meets the necessary criteria before proceeding to the structural model evaluation.

Key indicators for assessing the measurement model include construct reliability, convergent validity, and discriminant validity. Reliability ensures that the constructs consistently measure the intended variable, while validity confirms that the measurement items appropriately capture the theoretical construct, they are associated with (Carlos Pinho et al., 2007; Hair Jr et al., 2017). Figure 2 illustrates the measurement model, which visually depicts the relationships between latent constructs and their observed indicators.

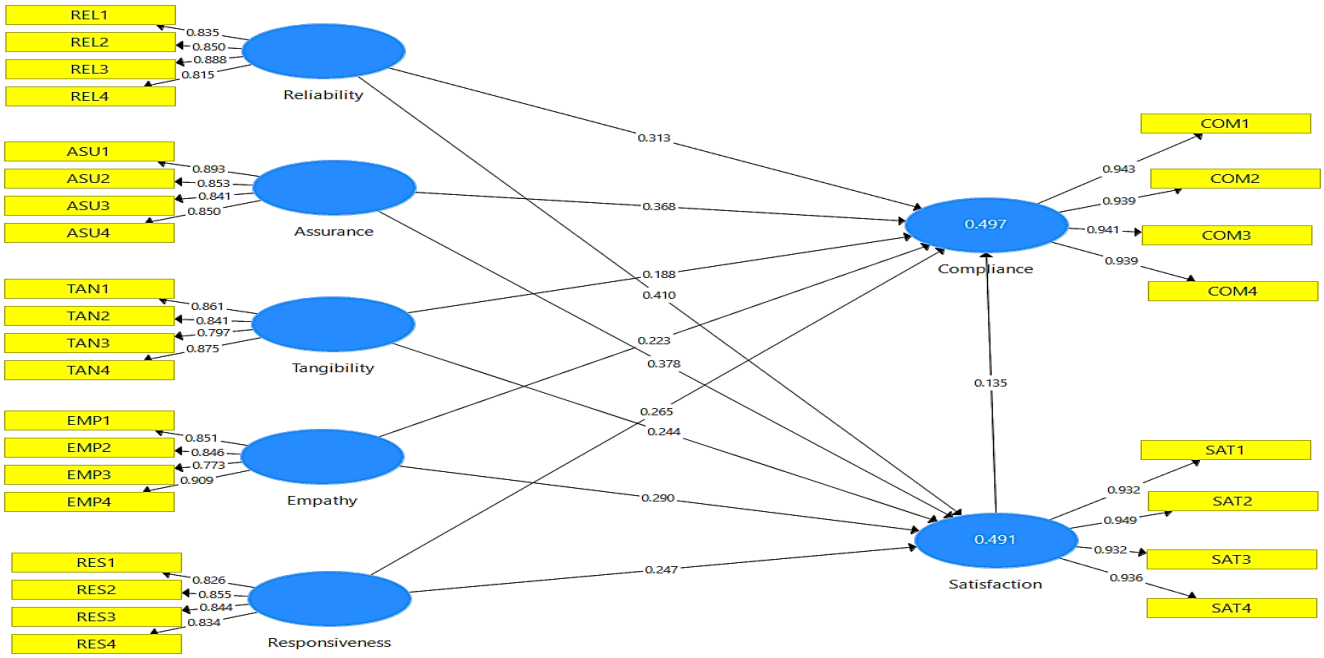

Fig. 2. Measurement model (Source: Researcher, 2025)

4.3.1 Construct reliability and validity and Outer loadings of indicators

Construct reliability and validity are critical components in assessing the measurement model's appropriateness and ensuring that the observed variables accurately measure the underlying latent constructs. In this study, the evaluation of construct reliability and validity was conducted using Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE), as recommended by Hair, Hult, Ringle, and Sarstedt (2017). These measures help determine whether the constructs exhibit internal consistency, convergent validity, and discriminant validity, which are essential for structural equation modeling (SEM).

The outer loadings of the indicators were assessed to determine item reliability. As per Hair et al. (2017), an outer loading of 0.70 or higher is considered acceptable, indicating that the indicator has a strong correlation with its associated latent construct. In this study, all the indicators demonstrated outer loadings above the acceptable threshold, confirming their reliability in measuring the intended constructs. The lowest outer loading observed was 0.773, which is still within an acceptable range, supporting the argument that all selected indicators contribute meaningfully to their respective constructs.

Cronbach's alpha values were evaluated to measure the internal consistency of each construct. According to Hair Jr et al., (2017), a Cronbach's alpha value of 0.70 or higher suggests good internal reliability. The results from this study indicate that all constructs had Cronbach's alpha values exceeding 0.86, demonstrating a high degree of internal consistency among the measurement items. Similarly, rho_A values, which provide an alternative measure of construct reliability, were also above the recommended threshold, further supporting the reliability of the constructs.

Composite reliability (CR) was examined to determine the overall reliability of the measurement model. Hair Jr et al., (2017) recommend that CR values should exceed 0.70 to indicate strong construct reliability. The findings from this study revealed that all constructs had CR values ranging from 0.908 to 0.968, which surpasses the minimum threshold, affirming the reliability of the constructs. The high CR values suggest that the measurement items collectively provide a consistent and accurate representation of the latent constructs.

Convergent validity was assessed using the average variance extracted (AVE), which measures the extent to which a

construct explains the variance of its indicators. Hair et al. (2017) suggest that an AVE value of 0.50 or higher indicates adequate convergent validity. The results indicate that all constructs had AVE values above 0.70, signifying that the latent variables explain a substantial proportion of variance in the observed indicators. This confirms that the constructs effectively capture the underlying theoretical concepts they are intended to measure.

The results from the measurement model assessment confirm that the constructs exhibit strong reliability and validity. The high outer loadings indicate that each indicator significantly contributes to its respective construct, while the robust Cronbach's alpha, rho_A, and composite reliability values demonstrate high internal consistency. Moreover, the AVE values confirm that the constructs possess strong convergent validity. These findings align with the recommendations by Hair et al. (2017), reinforcing the credibility and robustness of the measurement model in this study.

Table 3: The measurement model assessment of indicators

Indicator	Outer loadings	Cronbach's alpha	rho_a	Composite reliability	AVE
ASU1	0.893	0.882	0.888	0.919	0.739
ASU2	0.853				
ASU3	0.841				
ASU4	0.85				
COM1	0.943	0.956	0.957	0.968	0.884
COM2	0.939				
COM3	0.941				
COM4	0.939				
EMP1	0.851	0.867	0.876	0.909	0.716
EMP2	0.846				
EMP3	0.773				
EMP4	0.909				
REL1	0.835	0.869	0.869	0.911	0.718
REL2	0.85				
REL3	0.888				
REL4	0.815				
RES1	0.826	0.861	0.866	0.905	0.705
RES2	0.855				
RES3	0.844				
RES4	0.834				
SAT1	0.932	0.954	0.955	0.967	0.878
SAT2	0.949				
SAT3	0.932				
SAT4	0.936				
TAN1	0.861	0.866	0.883	0.908	0.713
TAN2	0.841				
TAN3	0.797				
TAN4	0.875				

Source: *Researcher (2025)*

4.3.2 Discriminant validity

Discriminant validity is critical in assessing how well constructs within a model distinguish themselves from one another, thereby ensuring that each latent variable measures a unique concept (Hair Jr et al., 2017). Establishing strong discriminant validity is particularly essential in studies that include multiple service quality dimensions such as assurance, compliance, empathy, reliability, responsiveness, satisfaction, and tangibility to confirm that each construct is theoretically and empirically distinct. In this context, two methods are commonly used: the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio.

As shown in Table 4, the Fornell-Larcker criterion compares the square root of the Average Variance Extracted (AVE) of each construct (bolded on the diagonal) with its correlations with other constructs. For discriminant validity to hold, these diagonal values should exceed any off-diagonal correlation. The diagonal values in Table 4 range from 0.840 to 0.940, surpassing all inter-construct correlations, indicating that each construct shares more variance with its own indicators than with those of any other construct (Zubairu et al., 2025). For instance, Satisfaction has a diagonal value of 0.937, which is greater than its correlations with Assurance (0.328) and Compliance (0.554), confirming that it remains conceptually separate from these constructs.

Table 4: Discriminant validity under Fornell-Larcker criterion

	Assurance	Compliance	Empathy	Reliability	Responsiveness	Satisfaction	Tangibility
Assurance	**0.739**						
Compliance	0.371	**0.884**					
Empathy	-0.038	0.294	**0.716**				
Reliability	-0.063	0.333	0.019	**0.718**			
Responsiveness	-0.052	0.281	0.090	-0.032	**0.705**		
Satisfaction	0.328	0.554	0.322	0.379	0.233	**0.878**	
Tangibility	0.001	0.222	0.066	-0.020	-0.032	0.248	**0.713**

Bolded numbers on the diagonal are AVE of Constructs

Table 5 presents the HTMT ratios, an alternative and stricter approach to testing discriminant validity (Henseler et al., 2015). All HTMT values remain well below the suggested threshold of 0.85, with the highest observed value around 0.580 (between Satisfaction and Compliance). This outcome further supports the idea that each construct is unique and not excessively overlapping with others.

Table 5: Discriminant validity under HTMT

	Assurance	Compliance	Empathy	Reliability	Responsiveness	Satisfaction	Tangibility
Assurance							
Compliance	0.402						
Empathy	0.054	0.318					
Reliability	0.078	0.365	0.036				
Responsiveness	0.072	0.307	0.099	0.056			
Satisfaction	0.355	0.580	0.353	0.415	0.256		
Tangibility	0.038	0.241	0.077	0.051	0.042	0.267	

Source: *Researcher (2025)*

4.4 Evaluation of the structural model

The evaluation of the structural model, as presented in Table 6 and figure 3, provides robust support for all hypothesized relationships between the SERVQUAL dimensions and the outcomes of compliance and satisfaction within Tanzania's digital tax system. Each relationship was tested using the original sample and further validated by the sample means and T statistics, all of which reached high levels of significance ($p < 0.001$ for most paths).Looking the paths from Assurance to Compliance (0.368, T = 9.687) and Assurance to Satisfaction (0.378, T = 10.094) clearly indicate that higher levels of perceived assurance in the digital tax service are associated with increased compliance and satisfaction among taxpayers. These findings underscore the overall adequacy of the model in capturing the dynamics between service quality dimensions and the intended outcomes (Masunga et al., 2021).

Focusing on the direct effects of the service quality dimensions on compliance, the results reveal that Assurance, Empathy, Reliability, Responsiveness, and Tangibility all contribute significantly. The positive coefficients for Assurance (0.368), Empathy (0.223), Reliability (0.313), Responsiveness (0.265), and Tangibility (0.188) suggest that improvements in these areas directly lead to enhanced compliance behaviour. The high T statistics associated with these paths (ranging from 5.005 for Tangibility to 9.687 for Assurance) confirm that these effects are statistically robust. This pattern demonstrates that taxpayers' perceptions of these service quality aspects are critical determinants of their willingness to comply with digital tax regulations, which is consistent with previous research emphasizing the role of service quality in influencing tax compliance behaviour ((Masunga et al., 2020b; Sichone and Mbamba, 2021b)).

Additionally, the structural model highlights the significant impact of the SERVQUAL dimensions on taxpayer satisfaction. The paths from Assurance (0.378), Empathy (0.290), Reliability (0.410), Responsiveness (0.247), and

Tangibility (0.244) to Satisfaction are all statistically significant, indicating that an improvement in each dimension is likely to enhance overall satisfaction. Moreover, the direct effect of Satisfaction on Compliance (0.135, T = 2.547, p = 0.011) suggests that satisfaction not only serves as an outcome of service quality but also acts as a mediator that further influences compliance.

Table 6: structural model estimation for hypothesis testing

Hypothesis	Relationship	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Remarks
H1a	Assurance -> Compliance	0.368	0.369	0.038	9.687	0.000	Support
H1b	Assurance -> Satisfaction	0.378	0.377	0.037	10.094	0.000	Support
H2a	Empathy -> Compliance	0.223	0.222	0.041	5.483	0.000	Support
H2b	Empathy -> Satisfaction	0.290	0.292	0.036	8.108	0.000	Support
H3a	Reliability -> Compliance	0.313	0.314	0.041	7.734	0.000	Support
H3b	Reliability -> Satisfaction	0.410	0.408	0.034	12.011	0.000	Support
H4a	Responsiveness -> Compliance	0.265	0.267	0.039	6.835	0.000	Support
H4b	Responsiveness -> Satisfaction	0.247	0.245	0.034	7.318	0.000	Support
H5a	Tangibility -> Compliance	0.188	0.189	0.038	5.005	0.000	Support
H5b	Tangibility -> Satisfaction	0.244	0.245	0.038	6.410	0.000	Support
H6	Satisfaction -> Compliance	0.135	0.130	0.053	2.547	0.011	Support

Source: *Researcher (2025)*

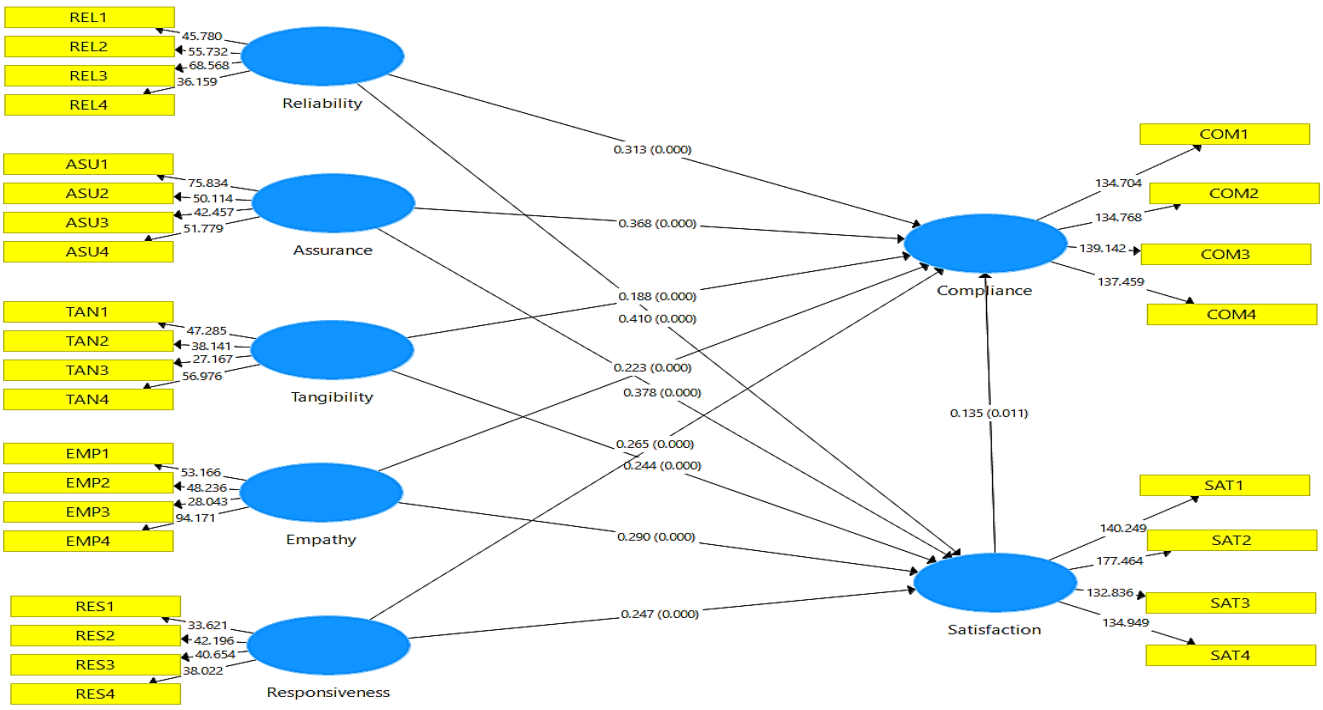

Figure 3: PLS Path Model with bootstrapped results

4.4 Assessment of PLS path prediction

The assessment of PLS path prediction provides critical insights into the predictive performance of both the measurement and structural models. Table 7 summarizes key predictive metrics Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) for each observed indicator and latent variable in the model. Additionally, the Q^2_predict values serve as indicators of the model's predictive relevance. These metrics help evaluate how well the exogenous indicators (such as COM1–COM4 and SAT1–SAT4) and the endogenous constructs (Compliance and Satisfaction) can predict outcomes in new

data, which is crucial for the generalizability of the findings (Hair et al., 2017).

For the exogenous indicators, such as COM1 through COM4, the RMSE values obtained from the PLS model are nearly identical to those from the linear model (LM), with values ranging from 0.671 to 0.704. Similarly, the MAE and MAPE values for these indicators are comparable between the PLS and LM models, suggesting that the PLS-SEM approach delivers prediction errors on par with traditional linear models. The Q^2_predict values for these indicators range from 0.393 to 0.425, indicating that the model has a substantial capacity to predict the variance in the observed measures. This level of predictive relevance implies that the model's indicators reliably forecast the underlying constructs and supports the robustness of the measurement model.

When considering the latent variables, the predictions for Compliance and Satisfaction further corroborate the model's predictive power. Both constructs display RMSE values of approximately 0.731 and 0.728, respectively, with MAE values around 0.588 and 0.585. More importantly, the Q^2_predict values for Compliance (0.472) and Satisfaction (0.476) confirm that a significant proportion of variance in these outcomes is being accurately predicted by the model. These results, consistent with the recommendations by Hair et al. (2017) and Sarstedt, Ringle, and Hair (2020), underscore the efficacy of the PLS-SEM approach in not only explaining the relationships among constructs but also in providing reliable predictions for future observations.

Table 7: MV and LV prediction summary of measurement of fit in Exogenous variable.

Indicator	PLS-RMSE	LM - RMSE	PLS – MAE	LM MAE	PLS-MAPE	LM MAPE	PLS-Q^2_predict	LM-Q^2_predict
COM1	0.704	0.707	0.570	0.573	15.070	15.211	0.393	0.387
COM2	0.671	0.684	0.537	0.543	14.314	14.519	0.423	0.402
COM3	0.688	0.699	0.561	0.571	14.743	15.044	0.425	0.406
COM4	0.682	0.695	0.555	0.564	14.766	15.008	0.422	0.400
SAT1	0.700	0.721	0.561	0.575	15.405	15.775	0.447	0.413
SAT2	0.728	0.749	0.592	0.610	15.605	16.041	0.427	0.394
SAT3	0.734	0.755	0.592	0.610	15.536	15.981	0.410	0.375
SAT4	0.777	0.795	0.635	0.651	16.985	17.470	0.383	0.355

LV prediction	RMSE	MAE	Q^2_predict
Compliance	0.731	0.588	0.472
Satisfaction	0.728	0.585	0.476

Source: Researcher (2025)

4.5 Importance map analysis

The Importance Performance Map Analysis (IPMA) offers valuable insights by juxtaposing the importance of each construct with its performance level, thereby enabling decision-makers to prioritize areas for improvement. In this study, IPMA was used to assess the latent variable (LV) performances of key constructs, as summarized in Table 8, and illustrated in Figure 4. This analysis not only indicates how well each construct performs on average but also helps identify which areas may have the greatest potential for enhancing overall system performance in Tanzania's digital tax environment.

According to Table 8, the Satisfaction construct exhibits the highest performance (LV Performance = 57.537), suggesting that, on average, taxpayers are relatively satisfied with the digital tax services. In contrast, Compliance shows a lower performance level (LV Performance = 42.438), indicating that there may be room for improvement in ensuring that satisfaction translates into consistent tax compliance. Other constructs, such as Responsiveness (51.87), Reliability (50.876), and Assurance (50.422), also display robust performance levels, implying that the system is performing adequately in these areas. However, constructs like Empathy (48.525) and Tangibility (48.252) are somewhat lower, suggesting potential areas where service improvements could have a beneficial impact on overall satisfaction and compliance (Hair et al., 2017).

Table 8: Importance performance map analysis of constructs

Constructs	LV Performances
Assurance	50.422
Compliance	42.438
Empathy	48.525
Reliability	50.876

Responsiveness	51.87
Satisfaction	57.537
Tangibility	48.252

Source: *Researcher (2025)*

These findings imply that while the digital tax system in Dar es Salaam is generally well-received—particularly in terms of satisfaction and responsiveness efforts to enhance aspects related to empathy and tangibility may further boost taxpayer compliance. The lower performance of the Compliance construct indicates that even if the service quality dimensions are strong, further strategic initiatives might be required to ensure that high satisfaction levels effectively translate into tax compliance. Overall, the IPMA results provide a clear roadmap for policymakers and tax administrators to prioritize interventions that could yield the most significant improvements in the digital tax system's efficacy. Such targeted enhancements, supported by the robust findings from the structural model, underscore the practical relevance of the study in refining digital tax administration practices(Do et al., 2022; Hair Jr et al., 2017).

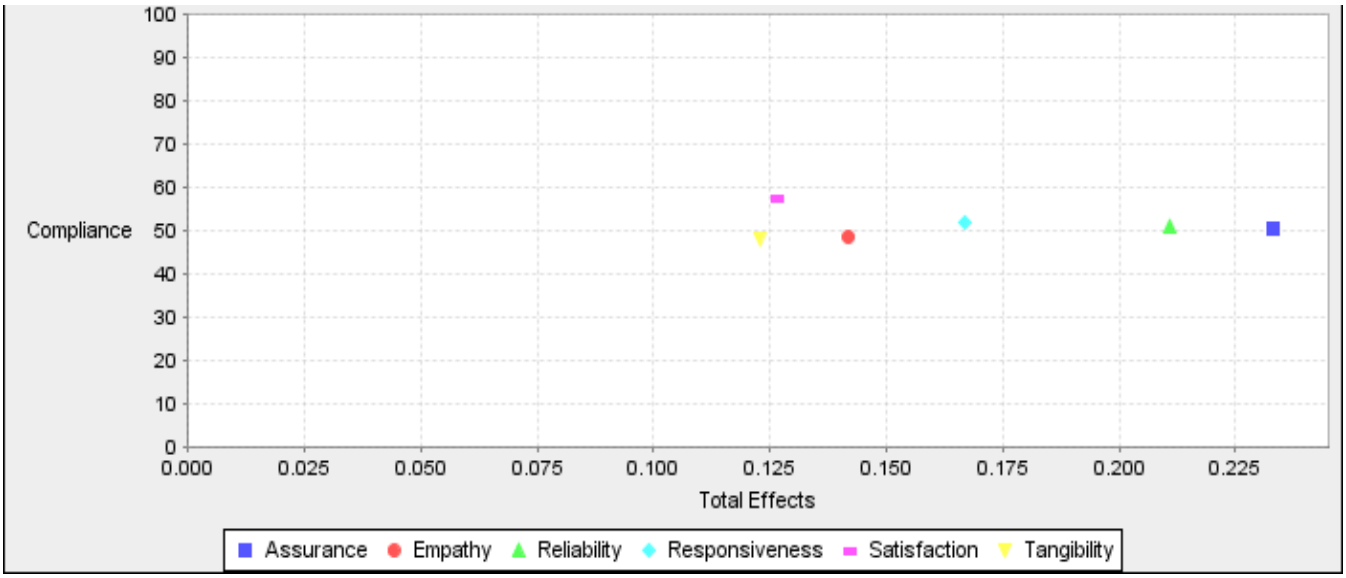

Figure 4: importance performance map of indicators

4.6 Discussion of study findings

The findings of this study are highly relevant in today's digital economy, particularly for emerging markets like Tanzania where digital tax systems are gaining prominence. Our results demonstrate that key service quality dimensions assurance, empathy, reliability, responsiveness, and tangibility—significantly influence taxpayer satisfaction and compliance. For instance, strong positive effects were observed between assurance and both satisfaction and compliance, suggesting that when taxpayers perceive the digital tax system as secure and trustworthy, they are more inclined to comply with tax regulations. This is particularly important in an era where trust in digital platforms is critical for successful e-governance, as highlighted by Hair Jr et al., (2017). The empirical evidence from this study reinforces the relevance of investing in robust, user-friendly digital tax systems to enhance overall public revenue collection and streamline administrative processes.

Moreover, the structural model's predictive performance underscores the practical significance of our findings. The high path coefficients and strong T statistics indicate that improvements in service quality dimensions can lead directly to increased taxpayer satisfaction, which in turn fosters higher compliance levels. This dual effect both direct and mediated by satisfaction illustrates how digital tax systems can be optimized to drive voluntary compliance(Hakorimana and Twesige, 2024; Kamil, 2022). In the context of Tanzania's evolving digital tax landscape, these findings are not merely of academic interest but serve as a strategic guide for policymakers(Khamis, 2020). By prioritizing enhancements in areas such as cybersecurity, customer support, and user interface design, the TRA can effectively bridge the gap between satisfaction and compliance. This is critical as governments worldwide shift toward digital tax collection to cope with the complexities of the digital marketplace (Brauner and Pistone, 2020; Saputro et al., 2022).

Furthermore, the relevance of this study extends to its contribution to the broader literature on digital taxation and public service delivery. The evidence that service quality dimensions are instrumental in shaping taxpayer behaviour provides a valuable framework for other countries facing similar challenges. The study's use of robust PLS-SEM and predictive metrics, such as Q^2_predict, highlights the capacity of digital tax systems to not only explain current taxpayer behaviour but also to forecast future compliance

trends(Belahouaoui and Attak, 2024). As digital platforms continue to evolve, continuous assessment of service quality will be essential to ensure that taxpayer satisfaction translates into effective compliance. These insights are crucial for developing targeted policy interventions and technological improvements that can be adapted in different socio-economic contexts, thereby enhancing the overall efficiency and transparency of tax administration in emerging economies.

5.0 CONCLUSION AND RECOMMENDATIONS

In conclusion, this study confirms that key dimensions of service quality—namely assurance, empathy, reliability, responsiveness, and tangibility play a significant role in shaping taxpayer satisfaction and compliance in Tanzania's digital tax system. The strong positive relationships between these constructs and both satisfaction and compliance underscore the importance of a well-functioning digital platform that not only meets technical standards but also provides robust support and user engagement. Based on these findings, it is recommended that the Tanzania Revenue Authority (TRA) focus on enhancing the security features and user interface of the digital tax system to build greater trust among taxpayers. Moreover, efforts to improve customer support services, particularly in terms of responsiveness and empathy, should be prioritized to ensure that users receive timely assistance and clear guidance during the tax filing process.

Additional recommendations include periodic evaluations of the digital tax system using updated PLS-SEM analyses and IPMA to identify evolving areas for improvement. Policymakers should also consider integrating digital literacy programs to assist taxpayers, especially those with lower educational backgrounds, in navigating the system effectively. By continuously refining the digital tax infrastructure and supporting mechanisms, TRA can further boost compliance rates, thereby enhancing overall revenue collection and fostering a culture of voluntary tax compliance.

6.0 AREAS FOR FURTHER STUDY

While the current study provides valuable insights into the relationship between service quality, satisfaction, and compliance, further research is warranted to expand on these findings. Future studies could investigate the moderating effects of demographic factors, such as digital literacy, income levels, and educational background, on the relationship between service quality and compliance. Moreover, qualitative research exploring taxpayers' personal experiences with the digital tax system could provide deeper contextual insights that quantitative methods might not capture. Comparative studies across different regions within Tanzania or between countries with similar digital tax frameworks could also be conducted to assess the generalizability of the current findings and to identify best practices in digital tax administration.

7.0 FUNDING STATEMENT

No external funding was provided for this study.

8.0 APPENDIX

Appendix 1

Indicators	Description
REL1	The digital tax system processes my returns accurately
REL2	The digital tax system calculates my tax correctly
REL3	I can depend on the system to work properly every time
REL4	The digital tax system is consistently available when I need it
ASU1	I feel secure providing my personal information to the digital tax system
ASU2	The digital tax system protects my financial data
ASU3	I trust the digital tax system with my sensitive information
ASU4	The digital tax system gives me confidence in the security of my transactions
TAN1	The digital tax interface is visually appealing
TAN2	The digital tax platform is easy to navigate
TAN3	The digital tax system is accessible across different devices
TAN4	The digital tax platform has a professional appearance
EMP1	The digital tax system provides personalized support
EMP2	The system understands my specific tax situation
EMP3	The digital tax system offers relevant guidance for my needs
EMP4	The system communicates with me in a way I can understand
RES1	The digital tax system quickly responds to my requests
RES2	When I have a problem, the system resolves it promptly
RES3	The digital tax platform provides timely updates on my tax status

RES4	I receive immediate confirmation of my tax submissions
SAT1	I am satisfied with my overall experience using the digital tax system
SAT2	The digital tax system meets my expectations
SAT3	Using the digital tax system is a pleasant experience
SAT4	I feel positive about using the digital tax system
COM1	The digital tax system makes it easier for me to comply with tax laws
COM2	I am more likely to file my taxes on time using the digital system
COM3	The digital tax system helps me report my income more accurately
COM4	I make fewer errors in my tax filings when using the digital system

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