



# Influence of Interconnected Systems on Tax Audit Effectiveness in Tanzania

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## Abstract

This study examines the influence of interconnected systems on tax audit effectiveness in Tanzania. The study employs quantitative methodology informed by the Task-Technology Fit (TTF) Theory. It also utilises Structural Equation Modelling (SEM) to analyse the survey data collected from TRA tax auditors. The findings indicate a robust positive correlation between interconnected systems and audit effectiveness, with notable contributions from system integration capability and real-time data synchronization. These technical elements enable audit accuracy, efficiency, and compliance enforcement in tax auditing. This study enhances theoretical comprehension by situating digital transformation within a developing economy, thus broadening the TTF framework to the realm of public tax administration. The study recommends policymakers and tax authorities to emphasise system interoperability and real-time integration as a strategy to improve audit performance in environments with limited resources.

## 1. Introduction

Tax authorities all over the world are combining networked systems to make tax audits more effective as technology gets better (Drobyshevskaya et al., 2021). The effectiveness of tax audits means the ability of tax audits to guarantee compliance with tax laws and regulations by individuals and corporations (Collum et al., 2020). The effectiveness of a tax audit is determined by its accuracy, efficacy, and

enforcement of compliance. The accuracy of a tax audit refers to the correct assessment and appraisal of an entity's tax obligations (Meuldijk, 2017). Auditors must thoroughly examine financial records, transactions, and taxpayer liabilities. A skilled tax audit ensures precise reporting, accurate tax obligation evaluation, and proper utilization of deductions or credits (Kitsios et al., 2019). Tax auditors tend to check for accuracy in order to lower

the chance of overpaying or underpaying taxes and to build trust and fairness in the tax system (Earley, 2015).

Tax audits are more effective when they reinforce people follow tax laws and rules (Gupta et al., 2017). Taxpayers have to fill out tax forms, tell the government how much money they make, and pay the right amount. An efficient tax audit enhances subsequent voluntary tax compliance (Wu, 2020). Automating the review of tax returns and finding differences that show non-compliance may help authorities to keep an eye on compliance (Advani et al., 2021). Taxpayers who undergo audits are more likely to change how they handle their taxes, including avoiding recurring mistakes.

This subsequent period effect indicates changes in compliance behavior linked to previous tax audits (Kasper & Alm, 2022). When audits are thorough and effective, the deterrence effect makes taxpayers more likely to follow the rules (Mendoza et al., 2017).

Taxpayers may be less likely to break the rules if they are afraid of audits. The group deterrence effect happens when taxpayers change their behavior because they see how others have been audited (Wu, 2020). Audits help tax authorities to teach taxpayers how to report their income correctly, which makes them more likely to follow the rules (Mebratu, 2016).

Increasing compliance makes tax reporting and voluntary adherence more accurate thus strengthening the tax base.

Tax audit efficiency means doing audits quickly and cheaply while getting the most out of them. Efficient audits require fewer resources while still being accurate and following the rules (Meuldijk, 2017). Digital audits are quicker and use fewer resources than traditional audits because automation and real-time data analysis make work more efficient (Umar et al., 2019). Efficient tax

audits shorten the time it takes to do an audit, which makes things easier for both taxpayers and tax authorities (Collum et al., 2020b). Digital technology reduces manual work and mistakes made by people, which can lead to expensive mistakes in financial reporting and tax compliance. Interconnected systems and cloud computing improve data management, audit processes, and cooperation between auditors and taxpayers, which makes tax audits more efficient (Arezoo et al., 2023). By focusing on high-risk situations, such as like fraud and non-compliance good audits help to make better use of resources (Mebratu, 2016).

Interconnected System (ICS) is a network of connected platforms, databases, and software solutions that make it easy for digital systems to communicate, share data, and work together within or between organizations (Vishnevsky & Chekina, 2018). The goal of ICS is to create a unified and connected space where systems can easily share data (Aslam et al., 2022). ICS combines financial records, taxpayer information, and information from third parties to enhance transparency, simplifying data analysis and minimizing mistakes (Veerankutty et al., 2018). Using technology means that data must be processed quickly and accurately from a lot of digital touchpoints (Mas, 2021). Therefore, interconnected systems are essential in enhancing tax audit effectiveness. Retrospective data analysis is widely used in conventional auditing (Leocádio et al., 2024). As demonstrated by Soorietal (2023), the application of ICS in tax audit reduces auditing errors, enhances productivity, and strengthens compliance oversight. Taxpayer information, financial data, corporate registrations, and accounting systems may communicate in real-time via system integration capability Nurebo & Lekaw, 2019). Interconnected technique consolidates taxpayer data, thus enabling tax authorities to better understand compliance, tax obligations, and potential non-compliance (Mas, 2021).

Consequently, auditors can watch financial transactions and other important data in real-time in order to find compliance problems and irregularities more quickly (Wahab et al., 2024). System integration capability (SIC) organises all tax information of a taxpayer, automates data transfers, and ensures accuracy of the taxpayer's data. In so doing, it cuts down duplicates and speeds up the audit process.

Integrating systems allows tax authorities to do more audits at once and save money (Atadoga et al., 2024). Integration simplifies processes, which helps tax agencies make better use of their resources and cut down unnecessary work, thus lowering the cost of audits (Hemberg et al., 2015). Because it works well, tax authorities can audit more cases in less time and make a better use of their resources in high-risk situations (Atadoga et al., 2024). This technology is flagged with high-risk cases by allowing auditors to focus on more difficult cases and do away with manual audits (Antwi et al., 2024). By combining tax authorities with government digital registers and many taxpayer data sources on taxable capital revenues, wealth, and endowments will make tax auditing more effective (Jacobs, 2018).

Tax audits that work well are an important part of good tax administration, especially in developing countries like Tanzania (Mbise & Baseka, 2023). In these contexts, audits and fraud detection often have problems because of broken systems and limited technology (Komba, 2020; Maguta, 2019). Previous studies indicate that multiple developing nations relying on traditional tax audit systems face significant challenges, including elevated levels of non-tax compliance and inefficient tax audits (Wahab et al., 2024). Studies by Kasper & Alm (2022); Ruzgas et al. (2023) indicate that ineffective tax audits lead to revenue loss for the government and increased non-compliance with tax regulations. Recently, the

Tanzania Revenue Authority has implemented several digital tax audit systems (Mbise & Baseka, 2023) in order to enhance the effectiveness of tax administration. Being a recent intervention, little is known about it in scholarly cycles, especially in the context of Tanzania. Therefore, this study seeks to examine the direct effects of interconnected systems on tax audits in order to furnish empirical evidence regarding their effectiveness. The primary aim of this study is to assess the influence of interconnected systems on the effectiveness of tax audits in Tanzania through Task-Technology Fit (TTF) Theory. In particular, the study examines the influence of system integration capability and real-time data synchronization in enhancing the effectiveness of tax audit in Tanzania.

## 2. Literature Review

### 2.1 Theoretical Perspective of the Study

The study of digital technology aims at examining how technology affects job performance (Fu et al., 2020). Technology and performance are linked by the utilization and task-technology fit (TTF) models (Irick, 2008). The utilization model argues that increasing usage improves performance based on user attitudes, beliefs, and behaviors (Fit et al., 2022). However, Keil et al. (1995) argue that task-technology fit is more significant than information system user interface. According to Task-Technology Fit Theory, as argued by Goodhue & Thompson (1995), the better the technology fits the job, the better it is at helping people work efficiently (Goodhue, 1995).

TTF assists digitalization professionals in understanding how interconnected systems enhance job performance. According to Goodhue's (1995) hypothesis, information systems that are well-suited to tasks work better. It fits the needs of the task, the skills of the person doing it, and how the technology works and interacts with people (Goodhue, 1995). Using technology correctly increases productivity (Komba, 2020). User ratings

of task and technology fit are good signs of how well digital technology is working (Ali & Younes, 2013). TTF Theory looks at how tasks and technology are related (Goodhue, 1995). Data analysis, fraud detection, risk assessment, and compliance monitoring are job related tasks that must be completed (Fit et al., 2022).

Technology characteristics include processing power, data storage, communication, and analytical capability (Fit et al., 2023; Goodhue, 1995). The TTF model says that technology that meets job needs improves performance (Abugabah et al., 2010). Fit between Task and Technology ensures that the technology can do what the task needs it to do (Fit et al., 2023; Goodhue, 1995).

A good fit means the technology helps to complete the job, whereas a weak match means it may not (Komba, 2020). Proper technology use and job fit are needed for an information system to improve individual performance (Goodhue, 1995). Komba's (2020) research indicates that task and technology alignment may enhance productivity, precision, and efficacy.

The current study highlights the underestimated impact of technology on individual performance, especially in relation to tax audit effectiveness. The TTF hypothesis facilitates the analysis of technology-task relationships, although with limitations (Fit et al., 2022). However, its concentration on technology fit alone may make it unsuitable for judging individual performance (Irick, 2008). TTF is used to assess the influence of interconnected system on tax audit effectiveness.

Interconnected systems are technological platforms and databases that let different parts of an organization talk to each other and share data easily (Soori et al., 2023). Tax authorities gain advantages from improved auditor access to various data sources, which enhance compliance evaluation capabilities (Ilori et al., 2024). These systems

facilitate seamless data sharing, real-time collaboration, and effective data collection and analysis. A robust alignment between interconnected systems and the collection and analysis of varied data is essential for auditors to perform comprehensive investigations (Arshad et al., 2024). A poor fit could happen if the systems are not well integrated or if there are problems with interoperability between platforms (Fit et al., 2022). Using interconnected systems makes tax audits more accurate and efficient, which helps auditors quickly find mistakes and possible tax evasion (Antwi et al., 2024). The TTF theory explains how interconnected systems make audits more thorough and efficient, which leads to better tax compliance results (Fit et al., 2023). The TTF Theory provides a framework for organizations to evaluate the impact of interconnected systems on tax audit effectiveness, especially regarding performance thus suggesting that the success of technology adoption depends on its congruence with the designated tasks (Abbas & Michael, 2022).

It is important to know what TTF can and cannot do. TTF does a good job of explaining how task- technology fit works, or how well task and technology attributes match up. However, the theory often ignores factors that are specific to the context and organization, such as resource constraints, policy culture, and political will, that affect the adoption of ICT systems. The contextual factors in the Tanzanian public sector, including insufficient infrastructure, bureaucratic inertia, and supervisors' digital literacy, may affect the positive impact of technology task alignment on audit performance. This study suggests that while TTF offers a solid theoretical foundation for analysing the congruence between technology and task attributes, additional research could incorporate a broader range of organizational and environmental factors.

## 2.2 Empirical Review and Development of Hypotheses

### *System Integration Capability (SIC) and Tax Audit Effectiveness (TAE)*

Tax auditing authorities can use integrated systems to get, share, and analyse data from taxpayer databases, financial systems, regulatory bodies, and third parties (Jacobs, 2018). In complicated auditing situations, it is important to be able to quickly get to and cross-check data from different sources (Garanina et al., 2022). For example, Estonia made a data interchange system called "X-Road" that uses an advanced digital identification system to reliably send internet-based data between government information systems and tax authorities (Corydon et al., 2016). For tax auditing to be effective, information from many sources must be reliable and well-organized (Blanco & Vargas, 2014).

SIC combines data from many different platforms to give tax authorities complete and up-to-date information about taxpayers. This makes tax audits more accurate, thorough, and efficient (Garanina et al., 2022). SIC helps tax authorities to find fraud, keep an eye on compliance, and speed up the audit process, which makes tax auditing more thorough and useful (Soori et al., 2023). For instance, Carrillo et al. (2017) evaluated the usefulness and downsides of tax auditing as an enforcement tool in Ecuadorian enterprises using third-party information and found that the self-reported income was 24% lower than third-party reports. Integrated systems made it easier to get and check data, which saved auditors time compared to checking data manually.

SIC allows tax auditors to keep an eye on financial transactions and other important indicators as they happen, which helps them to find compliance issues and strange things faster (Nembe et al., 2024). SIC helps tax authorities to finish

audits faster, especially when they have to deal with a lot of data from different places (Jamwal et al., 2021). Tax authorities can do more audits without losing quality and can make tax auditing better because of this efficiency (Garanina et al., 2022). To make digital tax audits more efficient, accurate, and useful, tax authorities need to be able to integrate systems (Bleicher & Stanley, 2016).

SIC makes data flow easier and makes information systems work better, which is necessary for thorough tax audits (Hemdan et al., 2023). SIC streamlines data collection and makes audits more transparent, fair, and trustworthy in the audit process (Metropolitan, 2024). SIC also eliminates manual data input and reconciliation thus helping auditors to avoid mistakes and inconsistencies (Chen et al., 2015). SIC improves data accessibility and dependability, thus enabling more extensive audits, faster audits, and better fraud detection (Corydon et al., 2016). By combining data sources and making it easy for systems to talk to each other, SIC does audits that are accurate, timely, and efficient (Kroon et al., 2021). In their study, Aslam et al. (2022) discovered that countries possessing greater system integration capabilities exhibited enhanced tax audit effectiveness. We therefore hypothesize as follows: *H1: System Integration Capability positively influences Tax Audit Effectiveness.*

### *Real-Time Data Synchronization (RTDS) and Tax Audit Effectiveness (TAE)*

The digitalization of tax administration has highlighted the need for third-party information for efficient audits and equitable tax collection (Pomeranz, 2015; Vuković & Taxation, 2017). As Jacobs (2018) points out, governments get and use taxpayer information from businesses, public and private organizations, and other third parties. Digital information includes taxpayers' income, assets, debts, government transactions, job status, and other economic activities that happen

throughout the year (Jacobs, 2018). In the private sector, especially in financial and high-tech cooperation, digital information is always being recorded in real time. This creates a data economy where every online search, in-store purchase, and other digital activity leaves a digital trail (Aslam et al., 2022). To improve voluntary tax compliance, the UK tax authority tends to employ a digital platform to develop a profile of each taxpayer's total income based on third-party government and company data as well as digital footprints (Slemrod, 2018). Jacobs (2018) argues that real-time data synchronization could help tax auditors and taxpayers to deal with information asymmetry by making it easier to check the accuracy of economic results.

Combining data from different sources into one system makes audits easier by cutting down on the need to collect and check data by hand (Pomeranz, 2015; Vuković & Taxation, 2017). When systems are connected, they can share and sync data in real time, so changes made to one system are reflected in all connected systems (Ndung, 2018). RTDS speeds up the process of getting financial, transactional, and taxpayer data from different sources, which helps auditors to focus on analyzing and interpreting the data (Wahyuni, 2020). Real-time data synchronization also gives tax auditors a complete and consistent dataset by combining data from different places. This lowers the chance of mistakes caused by missing or incomplete information (Bleicher & Stanley, 2016; Jacobs, 2018). This synchronized process lets auditors look at all the important data thus ensuring that the audit is correct and complete (Hashimzade et al., 2016). Carrillo et al. (2017) assessed the advantages and disadvantages of tax auditing as an enforcement mechanism in Ecuadorian businesses utilizing third-party data. The findings revealed that self-reported income is 24% lower than third-party reports. Real-time data synchronization made data easier to obtain and cross-check thus saving

auditors time on manual data verification (Verification, 2020).

Real-time data synchronization also makes audits more accurate and complete by combining company records, financial data, and customs data to give auditors a full picture of what a taxpayer has done (Ndung, 2018). Using computerized interfaces and specific reporting formats, RTDS lets tax authorities access huge amounts of data from financial institutions, like bank transaction data (Olbert & Spengel, 2019). Tax auditors can also check a company's revenue against its activities and cash flows in real time by linking its accounting records to government databases (Yoon, 2020). Tax authorities can use a larger data set from RTDS to look at all parts of a taxpayer's financial activity to make sure that they don't miss any income or transactions. RTDS enables a comprehensive audit approach that improves audit effectiveness and compliance by identifying anomalies, tax evasion, and underreporting (Bleicher & Stanley, 2016; Jacobs, 2018).

Internal & Service (2016) found that real-time data synchronization makes it easier for auditors to keep an eye on taxpayer activity by making it easier to share and integrate data across platforms. This helps them to find fraud and make sure that rules are being followed. Real-time data synchronization can use data from many sources to find patterns of fraud (Kitsios et al., 2019). Real-time data synchronization also helps auditors to find suspicious behavior and tax evasion, which makes the tax system more honest (Jacobs, 2018). RTDS's better fraud detection helps tax authorities to find high-risk situations and make the best use of their audit resources (Umar et al., 2019). RTDS also allows automated algorithms and data analytics to identify suspect transactions, detect fraud early and boost compliance monitoring (Bleicher & Stanley, 2016).

Real-time data synchronization and updating of data sources enhance data consistency and integrity in tax auditing (Zhang et al., 2015). Better data integrity means that auditors can make smart decisions based on accurate information, which makes tax audits better. When different systems sync their data in real time, it cuts down on errors and differences in data during the tax audit process (Carrillo et al., 2017). RTDS gives auditors accurate, up-to-date, and consistent data, which makes it possible for them to have trustworthy, reliable, and consistent data. Blaufus et al. (2020) discovered that providing tax auditors with third-party statutory audit information enhances tax compliance, increases revenues, and elevates audit frequency.

RTDS makes it easier for tax authorities to track and check taxpayer information across systems, which makes compliance monitoring easier (Carrillo et al., 2017). Networked systems that send out real-time warnings and reports may let auditors know about issues that are not in compliance (Soori et al., 2023). RTDS helps tax authorities to keep an eye on compliance and quickly responds to non-compliance, which improves supervision and it closes tax gaps (Misra & Kurniawan, 2020). Auditors can take quick action to fix problems. In this regard, thanks are due to real-time alerts and automated reports. This lowers the risk of long-term non-compliance and increases tax compliance (Mallick, 2020). Carrillo et al. (2017) discovered that Ecuadorian business alerts regarding third-party information augmented sales by 36% relative to previously documented statistics. Thus, real-time data synchronization provides trustworthy and accurate third-party information to improve tax audit effectiveness. We therefore hypothesize as follows:

*H2: Real-Time Data Synchronization positively influences Tax Audit Effectiveness.*

The proposed relationships are summarized in the conceptual framework presented in Figure 1 below.

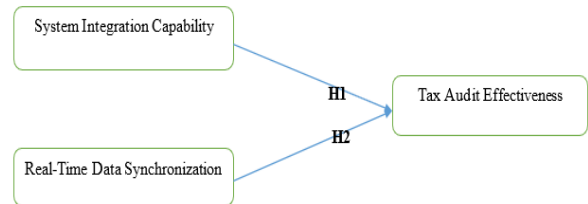


Figure 1. Conceptual framework.

### 3. Methodology

#### 3.1 Research Design and Procedures

This study employs a descriptive and explanatory cross-sectional study design to understand the influence of interconnected systems on tax audit effectiveness. It describes the relationship between interconnected systems and tax audits effectiveness (Saunders et al., 2019). The study is explanatory in nature as it tests the hypothesized causal relationships using a Structural Equation Modeling (SEM) framework within the Tanzanian context (Creswell & Plano Clark, 2017). The study's purpose is to elucidate the relationship between two or more variables, making it an appropriate research design for understanding tax audit effectiveness (Kothari, 2017).

#### 3.2 Sampling Techniques

Sampling techniques are essential for acquiring a representative sample from a population thus facilitating valid generalizations (Kothari, 2017). This study employed a random probability sampling methodology, integrating various techniques to ascertain the suitable sample size (Hair & Alamer, 2022). Probability sampling is more reliable because it makes sure that every member of the population has a known, non-zero chance of being chosen (Almaqtari et al., 2024). This method gives the researcher more control and freedom over the sampling process, especially in studies with a lot of data (Kothari, 2017). The

stratified sampling method was used to evenly choose tax auditors from four subgroups within TRA for interviews (Overall, 2007). To find the sample size for each department, the total population was divided by the full sample size and then multiplied by the proportion of each department. Simple random sampling was applied to collect data from the targeted population of each department thus reducing selection bias and allowing for generalization (Saunders et al., 2019). Using Yamane's (1967) formula and a 5% error margin, we found that the sample size was 330

### 3.3 Data Collection

A structured, self-administered questionnaire from Kobo Toolbox was used to do a cross-sectional survey of 330 Tanzania Revenue Authority tax auditors online. The survey looked at the ability to integrate systems, sync data in real time, do audits quickly, stay compliant, and find fraud. The cross-sectional survey approach offers structured and systematic data collection concepts and methodologies (Kumar & Kumar, 2024). To decrease respondent bias, a closed-ended structured questionnaire was used, asking each respondent the same standardized items (Veerankutty et al., 2018). Measurement items were modified from validated research (Abdullah & Almaqtari, 2024; Vardia et al., 2021) to suit the context of TRA. We used a five-point Likert scale to make the structured surveys because a bigger scale doesn't make ratings more reliable (Boone & Boone, 2012).

### 3.4 Data Analysis

The study uses SEM with PLS-SEM to analyze the relationship between interconnected systems and tax audit effectiveness. The structural model measurement and assessment approach depends on the model type (Hair et al., 2019). Reflective and formative models are used in social studies to explain variable relationships (Hair et al., 2014). Reflective models use latent constructs and impact

indicators, which vary with the concealed variable, showing strong relationships and interchangeability (Creswell & Plano Clark, 2017). Indicator loadings, composite reliability, and AVE assess reflective measurement models. PLS-SEM route models must be evaluated systematically to ensure validity, reliability, and substantial insights (Hair & Alamer, 2022). The evaluation involves analyzing the proposed direct relationship between the interconnected system and tax audit effectiveness.

## 4. Findings

### 4.1 Measurement Model in PLS-SEM

Figure 2 illustrates the two main processes involved in the analysis and evaluation of partial least squares structural equation modeling (Hair & Alamer, 2022). The assessment typically involves evaluating the direct relationship between measurement and structural models.

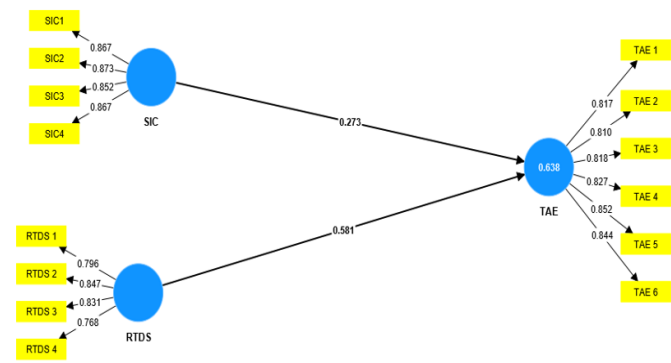


Figure 2. Measurement model.

NB: SIC-System Integration Capability, RTDS-Real-Time Data Synchronization, TAE-Tax Audit Effectiveness.

### Indicator Reliability Results

The reliability of indicators is assessed by examining the outer loadings of the indicators on their corresponding constructs. Outer loadings indicate the correlation between an indicator and its corresponding latent construct. Hair et al (2014) assert that an indicator loading of 0.7 or greater is considered acceptable, indicating that the construct

represents over 50% of the variance in the indicator. The measurement model of this study exhibits adequate indicator reliability, with indicator loadings surpassing 0.768, as illustrated in Table 1.

Table 1. Indicator loading and full collinearity results for outer model.

Indicators	Outer Loading	VIF
RTDS 1	0.796	1.767
RTDS 2	0.847	1.992
RTDS 3	0.831	1.880
RTDS 4	0.768	1.502
SIC1	0.867	2.943
SIC2	0.873	2.895
SIC3	0.852	2.378
SIC4	0.867	2.531
TAE 1	0.817	2.220
TAE 2	0.810	2.083
TAE 3	0.818	2.149
TAE 4	0.827	2.262
TAE 5	0.852	2.652
TAE 6	0.844	2.451

#### **Full Collinearity Results for Outer Model**

This study employed full collinearity VIFs, a robust technique for mitigating common method bias (Chen et al., 2018). In PLS-SEM, evaluating the VIF at the indicator level assists in identifying highly correlated indicators, which may suggest multicollinearity issues (Hair & Alamer, 2022). The assessment of indicator level VIF is generally conducted during the evaluation of the measurement model to confirm that each indicator provides distinct information relevant to its corresponding construct (Henseler et al., 2015). A VIF value exceeding 3.3 or 5 indicates that an indicator may be redundant due to significant variance shared with other indicators of the same construct (Hair et al., 2017). VIF values below 3.3 threshold suggest that common bias method is not a significant concern (Chen et al., 2018). The data presented in Table 1, above, indicate that all VIF

values fall between 1.502 and 2.943, which means they are below the recommended threshold of 3.3. Therefore, it suggests that common method bias is not a significant concern in this study (Hair et al., 2019).

#### **Internal Consistency Reliability Results**

This research utilized Cronbach's alpha (CA) and Composite Reliability (CR) to assess the internal consistency of construct reliability (Hair et al., 2013). Cronbach's alpha (CA) evaluates the extent to which a collection of items effectively measures a singular unidimensional latent construct. Cronbach's alpha ranges from 0 to 1, with values exceeding 0.7 typically considered acceptable, signifying strong internal consistency (Hair et al., 2014). The CA results of the measurement model presented in Table 2 indicate a value range of 0.826 to 0.908, exceeding the acceptable threshold of 0.7. Composite Reliability (CR) or construct reliability assesses the reliability of a latent construct by analyzing the factor loadings of its indicators. It is frequently favored over Cronbach's alpha (CA) due to its consideration of actual factor loadings instead of presuming equal item weightings thus providing a more accurate reliability estimate (Henseler et al., 2015). CR values ranging from 0.70 to 0.95 are deemed satisfactory (Hair et al., 2019). Values below 0.70 indicate low reliability, whereas values exceeding 0.95 may suggest redundancy among indicators. The CR results of the measurement model presented in Table 2 indicate values ranging from 0.828 to 0.909 for RHO-A and from 0.885 to 0.929 for RHO-C, both of which fall within the acceptable range (Hair et al., 2017). The results indicate that the measurement model demonstrates high internal consistency and reliability. Consequently, both CA and CR have validated the internal consistency reliability of the measurement model according to the specified criteria.

Table 2. Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE).

Construct	Cronbach's alpha	Composite (rho_a)	reliabilityComposite (rho_c)	reliabilityAverage extracted (AVE)	variance
RTDS	0.826	0.828	0.885	0.658	
SIC	0.887	0.889	0.922	0.748	
TAE	0.908	0.909	0.929	0.686	

### Convergent Validity

Convergent validity evaluates whether the indicators of a particular construct converge or exhibit a substantial degree of shared variance (Hair & Alamer, 2022). It shows how well a construct explains the differences in its indicators. In this study, the Average Variance Extracted (AVE) was used to measure convergent validity. The AVE shows how much variance a construct explains compared to the variance that is due to measurement error (Henseler et al., 2015). An AVE value of 0.50 or higher means that the construct explains more than half of the differences in its indicators, which is a good sign of convergent validity (Hair et al., 2014). In Table 2 results show that AVE values for all variables range from 0.658 to 0.748, beyond the required minimum threshold value of 0.5 thus justifying satisfactory convergent validity of the measurement model.

### Discriminant Validity

Discriminant Validity (HTMT) evaluates if model latent variables or constructs are actually distinct (Henseler et al., 2015). HTMT enhances the model's path estimations and the reliability of the findings by differentiating constructs. HTMT values lower than 0.85 or 0.90 indicate discriminant validity between the two constructs (Hair et al., 2017). High HTMT values indicate poor discriminant validity, suggesting that the constructs

may not be distinct enough. According to Hair et al. (2014), the context and strictness of the discriminant validity requirement in the field determine the thresholds of 0.85 or 0.90. In behavioral sciences, 0.85 is normal, while marketing research and other fields may accept 0.90 (Henseler et al., 2015). Table 3 shows that the highest HTMT value is 0.892 for TAE and RTDS. This means that there is a strong connection between the two, but it is still within the allowed range for related constructs (Henseler et al., 2015).

Table 3. Discriminant validity-HTMT.

Variables	RTDS	SIC	TAE
RTDS			
SIC	0.829		
TAE	0.892	0.763	

### 4.2 Structural Model in PLS-SEM

After evaluating the measurement model, the subsequent step in analyzing the PLS-SEM results is to assess the outcomes of the structural model (Hair & Alamer, 2022). This phase entailed a structural assessment of the inner model to analyze the relationships among latent constructs and to evaluate the research hypotheses. The evaluation includes P-value, Effect Size, T-statistics, and the Coefficient of Determination (Hair et al., 2019). Figure 3 shows the proposed structural model for

the variables being studied, the interconnected system, and the effectiveness of tax audits.

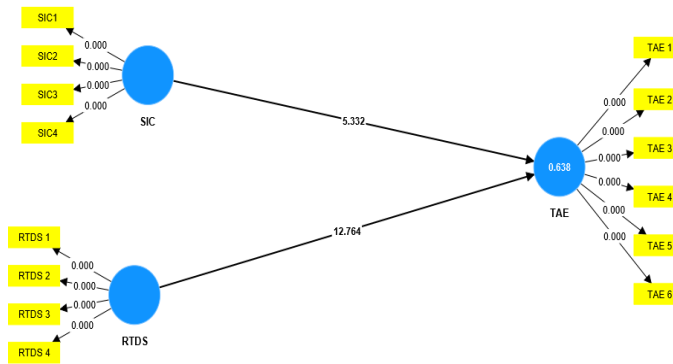


Figure 3. PLS bootstrapping of the structural model: direct hypotheses.

NB: SIC stands for System Integration Capability, RTDS stands for Real-Time Data Synchronization, and TAE stands for Tax Audit Effectiveness.

### 4.3 Presentation of Results

This part talks about what the study found about how Interconnected Systems (ICS) affect Tax Audit Effectiveness (TAE). The results correspond with the Structural Equation Modelling (SEM) analysis performed utilizing SmartPLS 4. The findings encompass the assessment of path coefficients ( $\beta$ ), effect sizes ( $f^2$ ), T-statistics, P-values, and the coefficient of determination ( $R^2$ ) (Hair et al., 2019). The PLS algorithm in smart PLS-SEM was employed to assess the significance levels of the path coefficients in the study model's hypotheses. Hypothesis testing is essential in empirical research. It enables researchers to

determine the validity of proposed relationships among variables. The study examines the influence of system integration capability on tax audit effectiveness (H1), while H2 analyzes the influence of real-time data synchronization in enhancing tax audit outcomes.

The results in Table 4 indicate that the path coefficient ( $\beta$ ) of 0.273 signifies a positive and statistically significant correlation between system integration capability and tax audit effectiveness (Hypothesis H1). A low standard deviation of 0.051 means that the estimated path coefficient is stable and reliable across the whole dataset. The T-statistic value of 5.332 is much higher than the critical threshold, which is usually 1.96 for a 95% confidence level. A high T- statistic means that the relationship is very statistically significant, which means that the chance of the relationship happening by chance is very low. A p-value of 0.000, which is less than 0.05, shows that the results are statistically significant. This supports the idea that being able to integrate systems makes tax audits more effective. The effect size ( $f^2$ ) of 0.101 indicates a moderate contribution to the overall model, implying that while it is important, SIC is less influential than RTDS. The model's  $R^2$  stays at 0.638, which shows how well both constructs can predict the outcome. Consequently, hypothesis H1 is validated, indicating that system integration among tax-related platforms significantly enhances audit effectiveness by facilitating coordinated access to pertinent data sources.

Table 4. Direct relationship and hypothesis testing result.

Hypotheses	Variables	$\beta$	STDEV	O/STDEV	$f^2$	P-values	$R^2$	Decision
H1	SIC ->TAE	0.273	0.051	5.332	0.101	0.000	0.638	Supported
H2	RTDS ->TAE	0.581	0.045	12.764	0.458	0.000	0.638	Supported

Also, the results in Table 4 show that the path coefficient ( $\beta$ ) of 0.581 shows a positive and statistically significant link between real-time data synchronization and the tax audits effectiveness (Hypothesis H2). A one-unit increase in RTDS implementation correlates with a 58.1% increase in TAE. A moderate  $\beta$  value of 0.581 shows that using interconnected digital systems makes audits much more effective by giving auditors better access to real-time data, automating tasks, and finding fraud. A standard deviation of 0.045 means that the estimated path coefficient is stable and reliable across the whole dataset. The T-statistic measures how important the link between RTDS and TAE. The T-statistic value of 12.764 significantly exceeds the critical threshold, which is generally 1.96 for a 95% confidence level. A high T-statistic means that the relationship is very important, which means that the chance of the relationship happening by chance is very low. A p-value of 0.000, which is less than 0.05, indicates statistical significance, leading to the rejection of the null hypothesis and supporting the conclusion that real-time data synchronization positively influences tax audit effectiveness. According to Fritz et al. (2012), the effect size ( $f^2$ ) of 0.458 represents a large effect size, showing that real-time data synchronization makes a substantial contribution to the explanatory power of the model. The coefficient of determination ( $R^2$ ) of 0.638 suggests that the combined influence of RTDS and SIC explains 63.8% of the variance in tax audit effectiveness. A coefficient of determination of 0.638 indicates modest explanatory power. Therefore, hypothesis H2 is supported, indicating that real-time hypothesis H2 is supported, indicating that real-time data sharing across interconnected systems significantly improves audit responsiveness, accuracy, and efficiency.

#### 4.4 Predictive Relevance Result

Predictive Relevance in PLS-SEM assesses a model's predictive accuracy, especially for

estimated data points (Hair et al., 2017). The  $Q^2$  value, calculated through a blindfolding procedure, signifies a model's predictive relevance; a  $Q^2$  greater than zero indicates relevance, while a value less than zero indicates a lack thereof (Hair & Alamer, 2022). Values close to 0.02, 0.15, and 0.35 represent small, medium, and large predictive relevance, respectively (Hair et al., 2019). The tax audit effectiveness model has a  $Q^2$  value of 0.553, indicating that it has a strong predictive power. The model also does a good job of predicting missing data points and explaining the predictors of the endogenous construct.

Table 5. Construct cross-validated communality.

Variables	SSO	SSE	$Q^2 (=1-SSE/SSO)$
RTDS	1320	761.179	0.423
SIC	1320	575.893	0.564
TAE	1980	885.161	0.553

#### 4.5 Goodness of Fit

Goodness of fit indices are used in Structural Equation Modelling to see how well a proposed model fits with real data. For this purpose, the Standardized Root Mean Square Residual (SRMR) index is used to compare the observed correlation matrix with the model's predicted correlation matrix (Hair et al., 2019). Ranging from 0 to 1, a perfect fit is indicated by 0 and a value below 0.08 is deemed acceptable (Hair et al., 2017). The saturated model records an SRMR of 0.06, while the estimated model shows 0.06, both under the 0.08 threshold, indicating a good fit. The results suggest that the estimated model fits the data nearly as well as the saturated model, which is marginally better.

Table 6. Standardized root mean square residual.

Indices	Saturated model	Estimated model
SRMR	0.06	0.06

## 5. Discussion of Findings

The first hypothesis (H1) examined the impact of system integration capability on the effectiveness of tax audits. The results show a positive and statistically significant link ( $\beta = 0.273$ ,  $t = 5.332$ ,  $p < 0.001$ ), with a moderate effect size ( $f^2 = 0.101$ ). It shows that SIC is also important for making TAE better, but not as much as RTDS. Through system integration, tax authorities can connect different information systems, such as taxpayer registration, filing returns, payment systems, custom platforms, and third-party databases.

System integration helps to bring data together, make it consistent, and check it, which makes audit reviews more complete and accurate. The second hypothesis (H2) looked at how syncing data in real time changed how well tax audits worked. The findings indicated a significant and substantial correlation ( $\beta = 0.581$ ,  $t = 12.764$ ,  $p < 0.001$ ), demonstrating that RTDS is crucial for enhancing the effectiveness of tax audits. The effect size ( $f^2 = 0.458$ ) shows that RTDS has a bigger and more important effect on TAE than SIC. It shows that tax authorities can do audits that are quick, based on data, and take risks when they can get real-time updates on systems that are linked together, like taxpayer transactions, customs data, and banking records.

Consequently, the results are consistent with the proposed hypotheses and the Task- Technology Fit Theory. The TTF Theory highlights the necessity for tax authorities to align task and technology characteristics to achieve optimal performance outcomes. This study established task characteristics necessitating tax auditors to collect and analyze data from various sources, including taxpayer records, banking information, and other governmental databases. The study results indicate that technology characteristics necessitated tax authorities to interconnect systems with various data sources to improve data sharing, integrate information across multiple platforms, and facilitate real-time collaboration among different

stakeholders. The study indicates that achieving a strong alignment between interconnected systems and the task of collecting and analyzing diverse data will yield optimal tax audit performance. The study confirms that the effective utilization of interconnected systems by tax authorities enhances the efficiency and accuracy of tax audits thus allowing auditors to swiftly identify inconsistencies and potential tax evasion.

The findings of this study align with the assertions made by Nurebo & Lekaw (2019) and Jacobs (2018) that Interconnected Systems facilitate real-time communication among various tax-related databases, including taxpayer information, financial records, business registries, accounting systems, and other third-party data. Corydon et al. (2016) report that Estonia has effectively facilitated internet-based data exchange between government information systems and tax authorities via an advanced digital identity system implemented through a data exchange layer known as "X-Road." Reliable and well organized information from various stakeholders is essential for effective tax auditing; its absence undermines the auditing process. This study posits that connecting tax authorities with government digital registers and various taxpayer data sources regarding taxable capital incomes, wealth, and endowments will enhance the efficacy of tax auditing.

A study by Blaufus et al. (2020) demonstrates that providing tax auditors with access to third-party information during statutory audits enhances tax compliance, increases tax revenues, and reduces the frequency of tax audits. Blaufus et al's study findings aligns with the findings from the current study. With ICS in place, tax auditors can keep an eye on financial transactions and taxpayer information in real time. This makes it easier to quickly and effectively find compliance problems or irregularities. This viewpoint differs from traditional tax auditing, which relies on retrospective data analysis, where auditors examine historical records after a financial period ends.

The study supports the claim made by Sallam et al. (2023) that holistic data insights from interconnected systems enhance audit processes and foster trust and transparency within the tax system. Automating data sharing and validation makes workflows more efficient, which speeds up audits for tax authorities, especially when they need a lot of data from different sources. This networked approach lets tax authorities to keep track of all taxpayer information, which helps them to understand compliance status, tax obligations, and areas where people might not be following the rules. This helps to keep public finances stable.

The use of interconnected systems gives tax authorities the ability to do more audits while keeping quality, which makes tax auditing more effective. Ndung (2018) emphasized on the importance of Interconnected Systems in improving audit precision and comprehensiveness by consolidating data from diverse tax-related databases, such as corporate records, banking information, and customs data, which aligns with the findings of this study concerning interconnected systems. Interconnected system enhances transparency, equity, and accountability in the tax system through the optimization of data collection and the advancement of audit capabilities.

This study supports the claim by Chen et al. (2015) that interconnected systems reduce the need for manual data entry and reconciliation thus enabling tax auditors to avoid common mistakes and inconsistencies in the tax auditing process. Interconnected systems make it possible to do full audits by bringing together digital data from many different places, which leads to accuracy, timeliness, and efficiency. The accuracy of assessments is essential for ensuring fairness and precision, thereby fostering taxpayer trust in the audit process and minimizing unwarranted tax disputes. Digital information encompasses taxpayers' income, assets, liabilities, the scale and timing of transactions with the government, employment status, and other economic activities undertaken by taxpayers throughout the year (Jacobs, 2018). The enhancement of data

accessibility and reliability promotes more comprehensive audits, decreases the time needed for audits, and enhances fraud detection capabilities.

Furthermore, the research conducted by Han et al. (2023) confirms that interconnected systems effectively address the problem of information asymmetry between tax auditors and taxpayers by enhancing methods for verifying the accurate economic outcomes of taxpayers. Their findings are consistent with the findings of this study. Interconnected system facilitates real-time data sharing and synchronization by ensuring that updates in one system are consistently reflected across all interconnected systems thus minimizing the necessity for manual data collection and verification responsibilities. Also, interconnected systems give tax auditors a complete and consistent dataset, which reduces the chance of making mistakes because of missing or incomplete information, which is a common problem with traditional disconnected audit systems (Bleicher & Stanley, 2016). As a result, tax authorities can look at all aspects of a taxpayer's financial activities to make sure that no transactions or income are missed. This thorough approach helps to find differences, possible tax evasion, and underreporting, which makes audits more effective and ensures compliance.

The study by Carrillo et al. (2017) showed how important interconnected systems are for improving compliance monitoring. This is because it makes it easier for tax authorities to track and verify taxpayer data across multiple systems. This is similar to what this study found about interconnected systems. Timely alerts and automated reports from interconnected systems help tax auditors to take immediate corrective action, which lowers the risk of long-term non-compliance. As a result, interconnected systems help tax authorities to find fraud more easily, keep an eye on compliance more closely, streamline the audit process, and make tax auditing more resilient and effective.

## 6. Conclusion

The study's results provide strong evidence that interconnected systems greatly improve tax audit effectiveness. The path coefficient shows a strong positive link between interconnected systems and the effectiveness of tax audits. This means that systems that are connected digitally make tax audits much more efficient. This finding suggests that systems that are linked together are very important for improving audit practices and making tax authorities more effective. There is a statistically significant link between interconnected systems and tax audit effectiveness. This link reinforces the conclusion that interconnected systems are essential facilitators of effective tax audits, indicating that this relationship is not coincidental. Furthermore, interconnected systems can promote system integration and improve data sharing. The seamless exchange of data among various departments, governmental entities, and external stakeholders during tax audits provides auditors with a more comprehensive understanding of taxpayer information. This method reduces differences, improves the accuracy of audits, and streamlines the audit process by getting rid of unnecessary data collection.

Interconnected systems make it easier for tax authorities to get real-time data, which helps them to make faster and better decisions. Bringing together tax-related data from different sources makes it easier to understand how taxpayers act and how money flows. This method makes it easier for auditors to find tax evasion and fraud while also making it easier for everyone to follow the tax laws, since taxpayers know that their activities are being watched more closely. Tax authorities can automate routine audit tasks, which makes audits more accurate and efficient. With better data integration, auditors can focus on more complicated and risky cases instead of spending time reconciling different data sources. This leads to better use of resources and more productive overall audits.

## 6.1 Contributions

This research substantially improves the theoretical framework regarding tax audit effectiveness and the influence of a digital, interconnected system on tax administration. The study supports the established theory concerning the Task-Technology Fit Model (TTF). The Task-Technology Fit model asserts that the alignment between task requirements and technology attributes forecasts technology usage and individual performance outcomes. The results of this study support the Task-Technology Fit (TTF) Model, showing that using technology well, like a digital interconnected system, makes tax audits more effective. This study demonstrates that a digital, interconnected system significantly enhances the performance of tax audit functions by augmenting audit accuracy, efficiency, effectiveness, and decision-making capabilities. The Task-Technology Fit (TTF) Model says that when an organization task needs are in line with new technologies, like a digital interconnected system, the technology will be used effectively and performance will improve significantly. This research enhances the existing theoretical frameworks by establishing relationships with tax audit effectiveness thus providing a foundation for future studies to further investigate these constructs.

## 6.2 Practical Contributions

The results give policymakers, tax authorities, and auditors important information about how a digitally connected system can make tax audits more effective. When systems are connected, they make work easier, speed up audits, and cut down on mistakes made by people. Automated audit systems make data more accurate, find fraud, and make it easier to keep an eye on compliance in real time. Interconnected systems enhance risk-based auditing methodologies by analyzing large datasets to detect potential fraud indicators. Access to real-

time data enhances regulatory compliance by minimizing opportunities for tax evasion. Interconnected systems provide a central and safe audit trail, which makes tax audits more open and it lowers the risk of corruption. To protect taxpayers' privacy and make sure audits are reliable, it is important to improve data encryption and cybersecurity measures. Governments ought to allocate resources towards the development of strong digital infrastructures to facilitate efficient auditing processes. Tax auditors need to keep learning about new technologies so that they can make the most of interconnected systems. Tax authorities should make it a priority to invest in real-time data infrastructure and make sure that all government and outside platforms are well-connected.

### 6.3 Recommendations

The findings suggest several policy recommendations aimed at improving the impact of interconnected systems on the effectiveness of tax audits. Policymakers ought to require the establishment of interconnected systems among various departments and governmental agencies to facilitate seamless data exchange. This will help to enhance the coordination and effectiveness of tax audits. To make it easier for tax-related agencies to share data without problems, there is a need for pushing for the standardization of digital systems. For efficient data exchange, it is very important to have standardized data formats, protocols, and software interfaces. Governments should help to set up collaborative platforms that allow different groups, such as tax authorities, customs departments, and banks, to work together in real

time. It will greatly improve the effectiveness of tax audits by making sure that all necessary information is always available.

### 6.4 Limitations of the Study and Future Research

The research concentrated on interconnected systems as the independent variable, without a detailed examination of other factors affecting TAE, such as auditor experience, tax policies, and organizational culture. Future research may include further moderating and mediating variables such as artificial intelligence, block chain technologies, etc. to enhance the analysis. Also self-reported data may have common method and social desirability biases, despite procedural and statistical attempts. Cross-sectional designs make causal inferences between constructs. Difficult alternatively sustained or experimental methods may be used to provide better causal evidence. To solve these limitations and strengthen the suggested methodology, future research could use instrumental variable estimation or panel data. Furthermore, certain tax agencies do not possess the necessary financial and technical resources to deploy advanced interconnected system solutions. Resistance to change and insufficient technical expertise may impede the effective implementation of interconnected systems in tax auditing. The integration of interconnected systems presents cybersecurity risks due to the handling of sensitive financial data by tax audit systems. Therefore, future study should include longitudinal, mixed-methods, and cybersecurity moderation studies.

**CONTRIBUTIONS OF CO-AUTHORS**

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Supervision, conceptualization, methodology (study design and execution), and writing process including review and critical revision of the manuscript)

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