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Functionality, Reliability, and Effectiveness of Information Technology Services in Supporting VAT Administration

Petrus Hery Setyo Nuryantoro[1], Irwan Sutirman Wahdiat[2,*], Aoliyah Firasati[3]

[1,2,3] Swadaya Gunung Jati Univercity, Indonesia

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ABSTRACT

This study addresses the persistent challenges faced by taxable entrepreneurs (PKP) in utilizing information technology (IT) for Value-Added Tax (VAT) compliance, including data inconsistencies, reporting delays, and uneven system optimization. The research emphasizes the unique value of integrating IT functionality, infrastructure reliability, and overall effectiveness to improve VAT administration. Data were collected from PKP in the Cirebon 3 region through questionnaires (offline and online) and direct interviews. The data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to measure the level of IT utilization and its effect on VAT compliance. The f indings reveal that IT functionality, reliability, and effectiveness are at a high level, indicating that IT has been successfully implemented in VAT administration. Input and output tax administration scores were also categorized as high, and regression analysis demonstrated a positive and significant impact of IT on VAT compliance, both partially and simultaneously. These results highlight the critical role of the government's integrated Coretax system and PKP's capacity to adopt and optimize IT solutions. The study contributes by showing that combining functionality, reliability, and effectiveness creates a comprehensive framework that enhances compliance and reduces administrative friction in VAT management.

Corresponding Author
Irwan Sutirman Wahdiat
Master of Accounting, Graduate School of Swadaya Gunung Jati University, Cirebon, Indonesia
Jalan Terusan Pemuda No. 1
Email: irwan.sutirman@ugj.ac.id

1. INTRODUCTION

The main problem addressed in this study is the persistence of various challenges in the use of information technology to support Value Added Tax (VAT) administration. Although the Directorate General of Taxes has implemented several systems such as e-Faktur, e-Bupot, e-Filing and Coretax, taxpayers still face issues related to suboptimal system functionality, user interfaces that are not sufficiently user-friendly, and limited integration between applications. In addition, the reliability of the IT infrastructure often becomes a barrier, with issues such as server disruptions, system capacity limitations, and unstable network connections during peak reporting periods. Technical support services are also inconsistent, which reduces the overall effectiveness of IT support. These problems highlight the need for research that empirically links functionality, infrastructure reliability, and IT service effectiveness with taxpayer compliance levels.

The implementation of electronic invoicing (e-invoicing) has become a central driver of business information system transformation and tax administration modernization worldwide. Evidence from India highlights that e-invoicing adoption depends on organizational readiness, managerial commitment, technological infrastructure, and perceived user benefits [65]. Globally, bibliometric analyses covering over 50 countries including the United States, Germany, China, and Brazilshow an exponential rise in e-invoicing publications since 2020, reflecting increasing academic and policy interest in its role in promoting transparency and compliance [66]. Systematic reviews from Europe, Australia, and Asia confirm that digital transformation of tax administration, including e-invoicing and

prefilled returns, reduces administrative burdens and improves data accuracy, resulting in higher compliance levels [67]. Empirical studies in Rwanda, Uganda, and EU member states demonstrate that e-invoicing significantly decreases tax evasion and enhances VAT revenue collection [68]. Similarly, big-data analyses of Brazil's Nota Fiscal Eletrônica (NF-e) system reveal substantial gains in oversight efficiency, support for real-time economic analytics, and evidence-based policymaking [69]. Collectively, these findings underscore the strategic importance of integrating digital infrastructure to enhance tax compliance and strengthen fiscal governance.

The purpose of this study is to analyze the extent to which IT functionality facilitates taxpayers in fulfilling VAT administrative obligations, to examine the role of infrastructure reliability in ensuring smooth VAT reporting and payment, and to measure the level of IT service effectiveness from the taxpayer's perspective. Furthermore, this study aims to develop a conceptual model that connects these three aspects with VAT compliance levels, thereby providing a comprehensive understanding of IT service quality in supporting tax administration. This study provides both theoretical and practical contributions. Theoretically, it enriches the literature on the application of Information Technology Service Quality (ITSQ) in the context of tax administration, particularly VAT, and offers an empirical model that may serve as a reference for future research. Practically, this study is expected to provide data-driven recommendations to the Directorate General of Taxes to improve system functionality, strengthen IT infrastructure, and enhance the quality of technical support services, thereby promoting higher taxpayer compliance. The novelty of this study lies in its integrated approach, combining the dimensions of functionality, infrastructure reliability, and IT service effectiveness into a single conceptual framework focused on VAT administration. The study specifically measures the experiences and perceptions of taxable entrepreneurs (PKP), ensuring that the results reflect actual field conditions. In addition, this research provides evidence-based recommendations that can be directly implemented to improve the quality of IT services in the taxation sector.

Information technology (IT) refers to the set of technologies used to manage and process information efficiently and effectively [26]. The integration of IT-based systems enables process automation and enhances data accuracy [36]. Moreover, IT serves as the foundation for the development of advanced technologies such as artificial intelligence, big data, and cloud computing [27]. As technology evolves, governments worldwide have increasingly adopted digital tax systems to improve VAT compliance and administrative efficiency. The application of technology extends beyond electronic reporting and data monitoring to include data analytics for detecting non-compliance, predicting potential abuses, and supporting more targeted tax policy design. Technology-based systems are expected to improve compliance within the informal sector, which is often the largest contributor to tax evasion. However, their implementation is not without challenges. A major obstacle is the dependence on robust and reliable infrastructure, which remains uneven across many countries. Advances in information technology have significantly transformed VAT administration, particularly through systems such as e-Invoicing and e-Billing that enhance efficiency, transparency, and ease of reporting [24]. To address implementation challenges, several countries have launched initiatives to increase taxpayers' digital literacy and awareness. Developed economies, for example, have introduced digital payment platforms that facilitate online VAT payments, thereby reducing errors and improving reporting efficiency. The integration of these systems is expected to raise compliance levels and reduce tax evasion, as transaction data can be tracked more accurately and in real time [32].

Compared with other countries, Indonesia's Coretax system integrates key features such as taxpayer identification number (NPWP) registration, tax return filing, and online payments. Nevertheless, Indonesia continues to face significant technical and non-technical challenges due to varying levels of technological readiness and human resource capacity [23]. VAT-related issues in Indonesia also encompass policy, economic, administrative, and equity considerations. For example, the planned increase in the VAT rate from 11% to 12% in 2025 may further weaken purchasing power among lower-income groups, given the regressive nature of VAT [49]. Additionally, Indonesia faces persistently low levels of tax compliance, driven by limited taxpayer awareness and weaknesses in the administrative system. These issues are compounded by widespread evasion practices, including underreporting, the use of fictitious invoices, and abuse of tax refund schemes. Despite the adoption of Coretax, challenges such as incomplete system integration continue to hinder the overall effectiveness of VAT administration.

The main benefits and challenges of value added tax (VAT) administration include efficiency in tax collection and reduction of distortion effects on the economic sector (state revenue). With the implementation of this tax, the government can generate stable revenue without significantly affecting the competitiveness of products in the international market. However, to achieve this efficiency, the design and implementation of VAT must consider aspects such as tariff settings, tax coverage, and exemptions granted. One of the main challenges is ensuring that VAT remains fair and does not burden low-income groups. Many countries use exemption schemes or zero rates for basic necessities as a way to reduce the tax burden on these groups. In addition, tax avoidance such as fraud in the form of "carousel fraud" remains a major challenge in many countries. Entrepreneurs and MSMEs in the regions still find it difficult to access or use the digital taxation system. Business actors, especially MSMEs, do not yet fully understand their VAT obligations, resulting in incorrect reporting or unintentional failure to collect/report VAT. The business sector in Indonesia faces various obstacles in the implementation of Value Added Tax (VAT), especially for small, medium, and newly developing businesses. Some of the main obstacles they face are the complicated administration of VAT reporting through CoreTax or online applications, which requires technical understanding. Many businesses find it difficult to fulfill obligations such as creating tax invoices, managing VAT inputs and outputs, and reporting VAT returns due to a lack of understanding and tax education. Many entrepreneurs, especially SMEs, do not fully

understand VAT regulations. The role of information technology in business can increase efficiency and productivity. In the business sector, especially MSMEs, higher rates increase production costs and reduce competitiveness [39]. The integration of IT into business operations enables the automation of routine tasks, which ultimately reduces costs and increases accuracy [47]. Information security is an important aspect of IT that aims to protect data from threats and attacks. Information security encompasses various practices and technologies designed to protect information from unauthorized access and data leaks [33]. The use of encryption and firewalls are some of the methods commonly used to maintain information security [16].

Information Technology (IT) functionality plays a crucial role in the transformation of tax administration, particularly in the management of Value Added Tax (VAT). The main functions of IT in this context are the automation of administrative processes, efficient data management, and increased transparency and accuracy in tax reporting. Systems such as e-Invoicing and e-Filing make it easier for taxpayers to issue invoices and submit tax returns online, thereby reducing the administrative burden and increasing the speed and accuracy of reporting [35]. In Indonesia, the use of this technology also provides significant benefits in terms of efficiency and supervision. Through the Core Tax system, the Directorate General of Taxes can monitor transactions and tax activities in real time and cross-validate with third-party data to detect potential violations such as fictitious invoices and underreporting [48]. In addition, information technology strengthens the tax monitoring function by enabling the use of data analytics and artificial intelligence (AI). This system helps detect patterns of violations, analyze potential tax risks, and support evidence-based law enforcement actions [22]. Ease of access is also an added value of IT implementation in the taxation system, where taxpayers can access the system through the DJP Online platform from anywhere and at any time, thereby increasing flexibility and convenience in carrying out their obligations.

Information security is essential in tax digitalization. Digital taxation systems require robust protection measures such as data encryption, two-factor authentication, and firewallsto safeguard taxpayer information [22], [33]. Information technology also enables integration across systems and agencies, for example linking tax, financial, licensing, and reporting systems, which improves data accuracy and reliability [26]. Research indicates that digital tax administration enhances compliance and revenue. Electronic reporting systems, in particular, facilitate MSME compliance through simpler and more transparent procedures [30]. Thus, IT in VAT administration not only supports technical processes but also strengthens fiscal policy, oversight, and fairness in the national taxation system [9]. The effectiveness of IT is reflected in tangible outcomes, including efficiency, accuracy, and improved compliance and supervision, contributing to a modern, accountable, and reliable taxation system. VAT is an indirect tax on domestic consumption, paid by the end consumer but collected and remitted by Taxable Entrepreneurs (PKP). It applies to the supply of Taxable Goods (BKP) and Taxable Services (JKP) within the Customs Area, as well as imported goods and services from abroad. VAT regulations are set out in Law Number 8 of 1983 and have been revised multiple times, most recently under Law Number 7 of 2021 on the Harmonization of Tax Regulations (HPP).

VAT in Indonesia applies a tax credit mechanism, allowing Input Tax on purchases to be credited against Output Tax on sales. The difference becomes the amount payable to the state treasury, or, if Input Tax exceeds Output Tax, it may be refunded or carried forward to the next period. This mechanism makes VAT a multi-stage but non-cumulative tax, preventing double taxation at each distribution stage. VAT contributes significantly to state revenue, but its success relies on PKP compliance and the effectiveness of tax administration. To strengthen this, the Directorate General of Taxes has adopted digital solutions such as e-Invoicing, e-Filing, and the Coretax system to enhance transparency, supervision, and real-time reporting.

Survey results show that IT infrastructure is perceived as reliable and stable, with systems and networks supporting smooth tax reporting. The functionality of IT services is considered adequate to meet administrative needs, while their effectiveness is seen as improving efficiency, accessibility, and the speed of VAT administration. High scores for VAT administration further indicate that companies comply with their obligations in an orderly manner. These findings highlight the positive impact of IT systems in strengthening compliance and improving the overall efficiency of VAT administration. Information technology components consist of several key components that work together to manage and process digital information. The following are some of the main components: (a) Hardware is all the physical parts of a computer system, including the computer itself, servers, storage devices, and network equipment. According to [6], hardware is the physical component that forms the IT infrastructure, such as computers, servers, and network devices [26]. Hardware is the physical component that forms the IT infrastructure, such as computers, servers, and network devices [26]. (b). Software plays an important role in supporting information technology operations and ensuring that data can be accessed and processed efficiently. Software includes programs and applications that run on hardware to perform various tasks. Software allows users to interact with computers and run the applications needed to perform their work [8]. Specialized applications, such as accounting software, also increase business productivity [36]. (c) Networking refers to systems that connect various computer devices to enable communication and data exchange.

Previous studies have consistently shown that digital transformation and strengthening human resource capacity are two key elements in promoting a higher quality and more accountable taxation system. The quality of tax audits is not only influenced by work experience, but is more determined by the technical competence of auditors and the extent to which information technology is optimized in the audit process [4]. This emphasizes the importance of technology-based training and digital capacity building in the tax administration. Another quantitative study shows that Coretax significantly affects accountability and tax transparenc, but it is still limited due to several operational

constraints [28]. Digitalization as a global strategy to improve VAT compliance, with the implementation of the e-invoice system, transaction data becomes more transparent and integrated, which not only facilitates tax reporting but also speeds up the audit process and reduces the potential for data manipulation by taxpayers [48]. The implications of these findings indicate that tax authorities in various countries need to continue to innovate in updating their digital taxation infrastructure.

The growing e-commerce ecosystem, user-friendly digital systems, and adequate tax knowledge are key to improving personal tax compliance [25]. This situation reflects the need for synergy between tax education and the provision of technology-based services that are easily accessible to the digital community, especially the younger generation as the dominant players in the e-commerce sector. Financial technology (Fintech) has a significant driving force in bringing the tax system closer to taxpayers. Through ease of access, transaction speed, and service flexibility, Fintech is able to bridge the gap between the obligation and willingness to pay taxes. Therefore, Fintech is not just a transaction tool, but also plays a strategic role in shaping a new culture of compliance among modern taxpayers [40]. Digitalization in tax administration not only improves the internal efficiency of tax institutions, but also contributes directly to increasing state revenue [9].

Structured digital transformation enables a reduction in face-to-face interactions, minimizes the potential for irregularities, and strengthens the country's fiscal database as a whole. When viewed holistically, the overall results of the study reinforce the assumption that technological innovation and knowledge capacity building are the main foundations of tax reform, from the perspective of auditing and administration to improving compliance. The use of information technology not only provides convenience but also increases public trust in the taxation system itself. In addition, aspects of taxation competence and literacy, both on the part of the tax authorities and taxpayers, are determining factors in creating an effective, transparent, and sustainable taxation system. The digitization of tax administration and the readiness to use a Single Identity Number (SIN) have also been proven to improve the accuracy of tax reporting, as they increase data efficiency and integration [44].

This study differs from previous research by providing an empirical examination of the integration of information technology specifically functionality, infrastructure reliability, and effectiveness within the context of VAT administration in Indonesia. Unlike Olaleye et al. [70], which focus on global bibliometric trends, our research investigates real-world taxpayer experiences and compliance outcomes. In contrast to Hesami et al. [71], which offer a systematic review without direct field data, this study employs SEM-PLS analysis on primary data collected through surveys and interviews with taxable entrepreneurs (PKP). While Kotsogiannis et al. [72] and Vasconcelos et al. [73] focus on African, European, and Brazilian cases, this research contributes context-specific evidence for Southeast Asia, capturing the unique challenges of infrastructure readiness, digital literacy, and policy implementation in Indonesia's evolving tax ecosystem

Tabel 1 . Empirical Evidence from Previous Studie

No	Authors & Year	Key Findings	Research Gap / Difference
1	S. A. Olaleye, I. T. Sanusi, O. A. Dada, F. J. Agbo (2023)	Publications on e-invoicing have risen sharply since 2020, indicating a strong global adoption trend and growing academic attention.	Focuses on global bibliometric trends but does not analyze country-specific implementation challenges such as infrastructure gaps in developing economies.
2	S. Hesami et al. (2024)	E-invoicing and prefilled returns reduce administrative burdens, improve data accuracy, and promote higher taxpayer compliance.	Provides a systematic review but lacks empirical testing in emerging markets like Indonesia where digital infrastructure adoption is uneven.
3	C. Kotsogiannis, L. Salvadori, J. Karangwa, I. Murasi (2025)	E-invoicing significantly reduces tax evasion and increases VAT revenue in the countries studied.	Focuses on Rwanda, Uganda, and EU; findings may not directly reflect the regulatory and compliance context in Southeast Asia.
4	L. F. Vasconcelos et al. (2022–2025)	Brazil's NF-e data supports real-time economic analytics, enhances oversight efficiency, and strengthens evidence-based policymaking.	Strong big-data approach but does not address taxpayer behavioral aspects or adoption challenges in smaller-scale tax environments.

Source: Author's Processed Data (2025)

2. RESEARCH METHOD

This study aims to conduct a descriptive and verificative analysis of information technology usage from the perspectives of functionality, infrastructure reliability, effectiveness of information technology services, and value-added tax (VAT) administration processes. This study uses latent variables, so the researchers distributed questionnaires using a Likert scale (1-5). This study also directly observes the efficiency and effectiveness of technology use in the context of VAT administration, so that the researcher objectively observes business actors or

taxpayers as the most observed unit of analysis. The observation unit of this study is Taxable Entrepreneurs (PKP) at the Tax Office (KPP) in the Cirebon 3 region. The technique used in this study is random sampling, which is a data collection technique that is not based on selection with specific criteria or characteristics to obtain relevant results from a research objective. Random sampling takes samples randomly using purposive sampling, which emphasizes certain characteristics or features as the basis for sampling. The data sources were derived from primary data through interviews and questionnaires (physical and online). This research was conducted over a period of three months (May, June, and August 2025). Data analysis in this study was conducted using two types of analysis methods to obtain results.

Tax (VAT) compliance. Purposive sampling was selected because the population of taxable entrepreneurs (PKP) in the Cirebon 3 region is heterogeneous in terms of business scale, digital readiness, and tax compliance history. By deliberately selecting directors, managers, and staff who have worked for at least five years, the study ensures that respondents are capable of providing informed assessments of the functionality, reliability, and effectiveness of the Coretax system. The sample size of 100 respondents was determined based on the requirements of Structural Equation Modeling Partial Least Squares (SEM-PLS), which recommends a minimum sample of 10 times the largest number of structural paths directed at a latent construct [74]. This number is also consistent with Sekaran & Bougie [75], who suggest that a sample of 30–500 is adequate for behavioral research, and Creswell [76], who emphasizes representativeness over sheer size when studying a specific population. A sample of 100 thus provides sufficient statistical power for hypothesis testing, ensures robust model estimation, and allows for generalizable insights regarding IT adoption and VAT compliance among PKP in the study area.

Descriptive analysis in this study was conducted to provide an overview of the characteristics of respondents and their assessment of the research variables, which consisted of information technology infrastructure, functionality and effectiveness of IT services, and Value Added Tax (VAT) administration. The majority of respondents in this study were male with a bachelor's degree as their highest level of education, and most held managerial and senior staff positions in companies, reflecting their capacity to understand taxation policies and the use of information technology systems. The age and work experience of the respondents also varied, indicating demographic diversity but still relevant to the administrative context under study. Verificatory analysis in this study was conducted to test the hypothesis regarding the influence of independent variables on dependent variables using inferential statistical analysis based on a quantitative approach. The researcher used the Partial Least Square Structural Equation Modeling (PLS-SEM) method to test the causal relationship between latent variables, with the help of Smart PLS software. This approach was also chosen because it is capable of handling models with reflective indicators and data formats that are not always normally distributed. This study uses a quantitative approach with the Structural Equation Modeling (SEM) method to test the causal relationship between information technology service variables in supporting taxpayer compliance with VAT administration in Region 3 Cirebon. SEM was chosen because of its ability to analyze latent constructs while simultaneously testing the validity and reliability of instruments [46], [14].

The unit of analysis in this study is an entity that uses technology and administers VAT and has become a Taxable Entrepreneur (PKP). The unit of analysis in this study is taxpayers who carry out Value Added Tax (VAT) obligations, especially those involved in the implementation of information technology, fiscal competence, and operating in various business sectors. The selection of this analysis unit is based on VAT administration issues that occur among business actors, especially MSMEs and companies with digitalized taxation systems in documents. This study aims to determine the effect of information technology implementation on Value Added Tax (VAT) administration. This analysis was chosen because business actors are directly involved in reporting, collecting, and depositing VAT through digital systems such as e-Faktur and CoreTax. In addition, business actors are also subject to tax administration issues such as reporting discrepancies, the use of fictitious invoices, and errors in tax return reporting.

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3. RESULT AND DISCUSSION

3.1 Information technology

Based on statictic measurement Information Technology be seen that the average response to the eight items of the Information Technology (IT) variable was 4.173, which is in the 3.67–5.00 range, indicating that the average response to the items in the Information Technology (IT) variable was high. This shows that companies place great importance on information technology (IT) in administration for various reasons, such as strategic and operational reasons, for example, tax administration efficiency. Companies recognize that information technology accelerates the process of recording, calculating, reporting, and paying VAT. Systems such as e-Faktur and e-Bupot enable companies to manage their tax obligations automatically and more quickly than manual processes. Companies understand that information technology reduces the risk of errors and penalties, as IT systems minimize the risk of human error in calculations or data input. Errors in VAT reporting can result in administrative sanctions or fines, so digital systems help reduce this risk. The companies studied use IT to help them reconcile input and output VAT data quickly and accurately, thereby facilitating VAT return reporting and supporting the refund process (refund of overpayments) if necessary. It can therefore be concluded that the companies studied already understand that information technology is an important tool in VAT administration because it supports efficiency, compliance, accuracy, and speed in the taxation process. In this digital era and with increasingly strict tax regulations, IT is no longer an option, but a key requirement for companies.

3.2 Value Added Tax (VAT).

Based on statictic measurement the Value Added Tax (VAT The average response to the six items of the Value Added Tax (VAT) Administration variable was 4.478, which falls within the 3.67–5.00 range, indicating that the average response to the items in the Value Added Tax (VAT) Administration variable was high. This is because companies understand that VAT administration is both a legal obligation and part of good financial management, which is the main reason why companies must administer VAT. 1) Compliance with tax regulations. Companies are required to collect, deposit, and report VAT in accordance with the provisions of the VAT Law (Law No. 42 of 2009 in conjunction with the 2021 HPP Law). Failure to do so may result in administrative or criminal sanctions by the Directorate General of Taxes. Example: Every sale subject to VAT must be issued a tax invoice and deposited into the state treasury no later than the 15th of the following month. 2) Transparency and financial accountability of VAT administration ensures that companies have clear records of transactions between sales (output VAT) and purchases (input VAT), which is important for preparing accurate financial reports and for internal and external audits. 3) Tax Credit (Input VAT): With good administration, companies can credit input VAT against output VAT, meaning that VAT paid when purchasing goods/services can reduce the VAT that must be paid when selling. 4) Neat administration can avoid the risk of audits and SP2DK. Untidy VAT administration has the potential to cause data discrepancies (for example, between tax returns and e-invoices), which can trigger a Request for Explanation of Data and/or Information (SP2DK) or a tax audit. 5) A well-organized VAT administration business process facilitates tenders, audits, cooperation with third parties, and VAT refund applications. 6) VAT administration also has an impact on the reputation and credibility of companies that comply with tax regulations, which tend to be considered more professional and credible by investors, business partners, and financial institutions. Conversely, tax issues can tarnish a company's reputation. Verifiable Analysis:

Table 2. Model Fit

Model Fit	Saturated model	Estimated model
SRMR	0.079	0.079
d_ULS	0.567	0.567
d_G	0.401	0.401
Chi-square	122.544	122.544
NFI	0.765	0.765

Source: Results of SEM-PLS data analysis

Based on the results of the Structural Equation Modeling (SEM) analysis, several goodness-of-fit indicators can be evaluated to assess the model's overall adequacy. The SRMR (Standardized Root Mean Square Residual) value of 0.079 indicates that the model has an acceptable level of fit, as it falls just below the commonly accepted threshold of 0.08. This suggests that the discrepancies between the observed and predicted covariance matrices are relatively small. The dULS (Unweighted Least Squares Discrepancy) value of 0.567 and the dG (Geodesic Discrepancy) value of 0.401 do not have universally accepted cut-off values, but generally, lower values indicate a better-fitting model. In this case, both values appear to be within a reasonable range and do not raise immediate concerns, although comparative benchmarks would be necessary for more precise interpretation.

However, the NFI (Normed Fit Index) value of 0.765 indicates that the model does not yet meet the desired fit standards. Ideally, an NFI value should exceed 0.90 to indicate good fit, or at the very least fall within the 0.80–0.90 range to be considered acceptable. Since the current value is below 0.80, it suggests that the model may not adequately represent the data and may require modification, such as revising the structural paths or reconsidering the measurement indicators. Additionally, the chi-square value of 122.544 cannot be fully interpreted without information on the degrees of freedom and p-value, which are essential for determining the statistical significance of the model fit. In summary, while the SRMR suggests a reasonably fitting model, the low NFI indicates that improvements are

needed. It is recommended to reassess the model structure, refine the constructs, and consider additional fit indices such as CFI, TLI, or RMSEA for a more comprehensive evaluation of model quality.

Table 3. R-square

	R-square	R-square adjusted
Administration VAT	0.491	0.460

Source: Results of SEM-PLS data analysis

Based on the results of the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, the construct Administration VAT has an R-square value of 0.491, indicating that approximately 49.1% of its variance is explained by the independent variables included in the model. This value falls within the moderate category, suggesting that the model has a reasonable level of explanatory power. In other words, the predictors in the model are fairly effective in explaining changes in the Administration VAT construct, although there is still room for improvement. The Adjusted R-square value is 0.460, which takes into account the number of predictors and slightly lowers the R^2 to correct for possible overfitting. The small difference between the R^2 and Adjusted R^2 (0.031) indicates that the number of predictors used is appropriate and does not overly complicate the model. Overall, these results suggest that the model performs adequately in explaining the target construct, but further refinement such as reviewing the existing variables or adding new relevant predictors may help improve its predictive power.

The test results show that the variables of IT infrastructure reliability, IT service functionality, and IT service effectiveness have a significant effect on VAT administration, both partially and simultaneously. The R^2 value obtained is classified as strong, indicating that the model has good predictive power for the dependent variable. Hypothesis testing was carried out by looking at the t-statistic and p-value values of each relationship between variables. As a result, all hypotheses proposed in this study proved to be significant, because the t-statistic value was > 1.96 and the p-value was < 0.05. This shows that the implementation of information technology, as measured by these three dimensions, has a statistically significant effect on Value Added Tax administration. Thus, the results of the verifiable analysis reinforce the descriptive findings that positive perceptions of IT are also reflected in a real impact on the effectiveness of the company's taxation system.

Outher model and Inner Model:

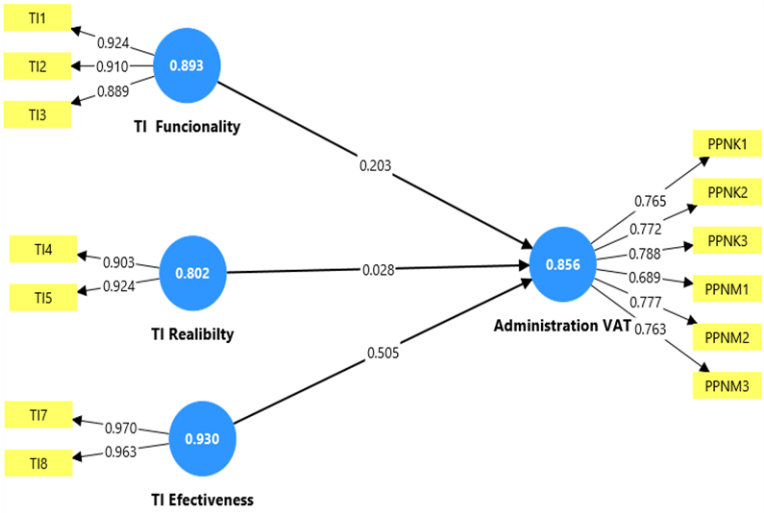

Figure 1. Research Model Result

Source: Results of SEM-PLS data analysis

The SEM-PLS model in the figure illustrates the relationships between three latent constructs representing the quality of information technology services (TI Functionality, TI Reliability, and TI Effectiveness) and the latent construct Administration VAT. This model consists of two main components: the outer model (measurement model) and the inner model (structural model).

In the outer model, each construct is measured by several indicators that display high loading factors. The construct TI Functionality is measured by three indicators (TI1, TI2, TI3) with loading factors of 0.924, 0.910, and 0.889, respectively. All of these values exceed the recommended threshold (≥ 0.70), which means that these three indicators are valid representations of the TI Functionality variable. The Average Variance Extracted (AVE) value of 0.893 indicates that 89.3% of the variance in the TI Functionality indicators is explained by this construct, demonstrating excellent convergent validity. A similar result can be observed for TI Reliability, which is measured by two indicators (TI4 and TI5) with loading factors of 0.903 and 0.924 and an AVE value of 0.802, indicating that this

construct is also reliable and valid. Meanwhile, the TI Effectiveness construct has two indicators (TI7 and TI8) with very high loading factors of 0.970 and 0.963 and an AVE value of 0.930, showing that these indicators are very strong representations of the TI Effectiveness variable. The endogenous construct Administration VAT is measured by six indicators (PPNK1–PPNK3, PPNM1–PPNM3) with loading factors ranging from 0.689 to 0.788. Although one of the indicators has a relatively low loading factor (0.689), it is still above the minimum acceptable threshold of 0.6 and can therefore be retained. Overall, the outer model meets the criteria for validity and reliability, meaning that the constructs used are appropriate and can be interpreted confidently.

In the inner model, which represents the structural relationships among the constructs, TI Effectiveness is shown to have the most dominant influence on Administration VAT, with a path coefficient of 0.505. This indicates that increasing the effectiveness of IT utilization directly contributes the most to improving VAT administration performance. The TI Functionality construct also shows a positive effect on Administration VAT, with a path coefficient of 0.203, although its contribution is relatively smaller compared to TI Effectiveness. Meanwhile, TI Reliability has only a path coefficient of 0.028, suggesting that its effect on VAT administration is very small and possibly statistically insignificant. Nevertheless, all three constructs together explain 85.6% of the variance in the Administration VAT construct, as indicated by an R^2 value of 0.856. This R^2 value falls into the “very strong” category, suggesting that the research model has high explanatory power. Overall, the results of this SEM-PLS model indicate that the effectiveness of information technology is the key factor in supporting VAT administration, carrying more weight than the mere availability of features (functionality) or infrastructure reliability. This finding provides practical implications that organizations should focus more on ensuring that IT is used effectively by usersthrough initiatives such as training, accessibility improvements, and system integration rather than concentrating solely on technical aspects or system reliability. Hence, strategies to improve IT service quality should prioritize maximizing the benefits perceived by users in performing VAT administration tasks, as this factor has the greatest impact on administrative performance.

Functionality of Information Technology Service To Support Taxpayer on Value Added Tax Administration. TI Functionality also has a positive influence, albeit weaker, with a coefficient of 0.203, indicating a moderate effect means The implementation of functional information technology has become an important pillar in improving the effectiveness of Value Added Tax (VAT) administration in today's digital era [35]. Integrated information systems, such as e-Invoicing, e-Filing, and Core Tax, enable taxpayers to report their obligations in a timely and accurate manner [43]. The presence of this technology not only speeds up the administrative process, but also reduces the potential for errors in tax reporting and payment [8]. Moreover, a well-functioning system also provides space for tax authorities to conduct real-time monitoring and data verification, thereby increasing the reliability of the country's fiscal system [22]. The use of big data and predictive analytics enables the government to recognize suspicious transaction patterns and respond proactively [11]. In this context, technology acts not only as a tool, but also as a reinforcement of an adaptive and responsive oversight structure [15].

The implementation of information technology services in Value Added Tax (VAT) management by taxpayers in Region 3 Cirebon has seen improvements in functionality and efficiency, especially since the Directorate General of Taxes implemented the Coretax Administration System (CTAS). Coretax is the main foundation for the digital transformation of national tax administration, including in this region, through the integration of CTAS, the registration process, reporting, VAT transaction data validation, and compliance monitoring have become more automated, integrated, and accurate. This system strengthens real-time and risk-based data management, making it easier for tax officials to analyze compliance and for taxpayers to fulfill their obligations electronically. In Region 3 Cirebon, the implementation of Coretax has contributed to (1) Increased efficiency in e-Invoice and VAT Periodic Tax Return reporting through data synchronization and systemic notifications. (2) Ease of validation and tracking of transactions between taxpayers in a connected digital ecosystem. (3) Strengthening data-based supervision and risk profiling (compliance risk management) supported by CTAS. However, challenges in implementing Coretax still arise, particularly regarding taxpayer readiness for the new system, lack of digital literacy, and limited technical assistance during the adaptation process.

Some businesses, especially MSMEs, still face obstacles in understanding the increasingly complex features and technicalities of the system. Therefore, in order to optimize the benefits of CTAS, it is necessary to (1) Increase the capacity of taxation human resources and taxpayers through technical training and intensive socialization. (2) Improving Coretax features to make them more inclusive and user-friendly, especially for small and medium taxpayers. (3) Strengthening technology infrastructure and connectivity, especially in areas with limited access. (4) Collaboration with local governments and business associations in assisting the adaptation of Coretax use. With these steps, the functionality of Coretax-based information technology services in VAT management will have a greater impact on increasing tax compliance, the effectiveness of tax administration, and the optimization of state revenue in Region 3 Cirebon. Research conducted on MSMEs in North Jakarta shows that even though Coretax technology is available, tax literacy and taxpayer awareness remain more dominant factors in influencing compliance, indicating that the system is not yet fully capable of becoming a moderating variable [34].

Recent studies emphasize that information technology (IT) services play a crucial role in supporting taxpayer compliance within Value Added Tax (VAT) administration. The implementation of e-invoicing enhances VAT compliance by reducing reporting errors and facilitating audit processes, thereby improving overall tax administration efficiency. IT utilization accelerates administrative procedures, minimizes mistakes, and encourages taxpayer

adherence. Digital tax administration systems significantly improve efficiency, transparency, and VAT compliance. Evidence indicates a positive relationship between the adoption of digital technologies and VAT compliance levels, with countries possessing more advanced IT infrastructure exhibiting higher compliance rates. Other research demonstrates that digital transformation increases reporting accuracy, compliance, and the effectiveness of tax collection. Digitalization of tax administration contributes substantially to higher VAT revenues and greater fiscal transparency. From a system quality perspective, well-designed information systems enhance user satisfaction and positively influence VAT compliance. which noted that the use of E-Invoice 3.0 positively affects VAT reporting compliance and tax revenues. Additional studies highlight that reliable IT infrastructure plays a vital role in enhancing taxpayer compliance, expediting reporting, and reducing administrative errors [62]. The integration of information technology (IT) in tax administration plays a crucial role in improving efficiency, supporting taxpayer compliance, and facilitating evidence-based decision-making in Indonesia. Modern systems, such as advanced analytics and machine learning, enable the detection of irregular tax practices and assist tax authorities in prioritizing audits and improving compliance outcomes [51]. Additionally, the implementation of digital systems, such as digital tapping boxes and ITenabled fiscal incentives, demonstrates the capability of technology to support targeted tax policy implementation and integration with sustainable business practices [17][89].Collectivel, this body of evidence reinforces the argument that effective IT services including e-invoicing, digitalized administration, system quality, and robust IT infrastructureare key determinants for the success.

Reliability Infrastructure of Information Technology Service To Support Taxpayer on Value Added Tax Administration. TI Reliability has a very minimal impact, with a path coefficient of 0.028. The findings suggest that system stability, network availability, and server uptime are not the principal determinants of successful VAT digitalization, particularly within the MSME sector in the Cirebon Region III. This result may be attributed to the fact that most MSMEs in this area have already adapted to using e-Faktur, e-Billing, and other digital tax platforms, rendering minor technical disruptions less impactful on their compliance behavior. Rather, the critical challenges in VAT digitalization for MSMEs in Cirebon Region III are associated with system usability, digital literacy, and the availability of prompt and effective technical support. Consequently, policy initiatives aimed at enhancing MSME compliance in this region should prioritize streamlining reporting procedures, integrating tax systems with widely used accounting applications, and delivering sustained education and capacity-building programs. Such measures would ensure that digitalization efforts are not only technically reliable but also inclusive and capable of fostering optimal taxpayer participation, however, in companies in general, the effect is actually more substantial Moreover, at present, the system used for reporting across all levels and types of taxes, including VAT, has been integrated into a single application known as CoreTax.The reliability of information technology infrastructure is one of the important foundations in supporting the success of Value Added Tax (VAT) administration in the digital era [31]. When IT system infrastructure is built reliably, including servers, networks, software, and data centers, taxation activities such as reporting, validation, and VAT monitoring can be carried out smoothly without technical disruptions [15]. In practice, systems that experience frequent disruptions, such as delays in accessing e-Invoices or the unavailability of online reporting systems, will create a negative perception of the tax authorities [48]. Infrastructure reliability is also key to building taxpayer confidence in digital systems, as taxpayers tend to be more compliant if the tax system is easily accessible, fast, and consistent [35].

In ensuring that the Coretax system can function as intended, namely to create a more modern, transparent, and risk-based tax administration system, improving the reliability of information technology infrastructure is a must. These efforts may include strengthening the internet network throughout the region, improving the digital literacy of taxpayers, simplifying the system to make it more user-friendly, and optimizing technical support from the DGT. With reliable infrastructure, Coretax-based services will be able to improve service efficiency, encourage voluntary compliance, and strengthen the accountability of the taxation system in Region 3 Cirebon on an ongoing basis. The reliability of information technology infrastructure is a key foundation in supporting the effectiveness of digital taxation services, especially since the implementation of the Coretax Administration System (CTAS) by the Directorate General of Taxes. In Region 3 Cirebon, this reliability includes stable internet connection, adequate availability of devices, and the ability of the system to function consistently without interruption, especially during spikes in reporting activity.

Research shows that although taxpayers in urban areas generally enjoy fairly reliable infrastructure, in some suburban and rural areas, system reliability remains an obstacle. Disruptions to access to the Coretax-based taxation system, such as delays in the e-Filing process or e-Invoice data synchronization failures, are often caused by unstable connections or incompatible hardware. This unreliability has a direct impact on reducing taxpayer compliance and undermining confidence in the government's digital systems. In addition, Coretax, as an integrated, real-time data-based system, requires a robust and always-available (high availability) infrastructure environment. In conditions where the infrastructure is not yet fully reliable, taxpayers tend to experience technological frustration, prolonging the administrative process, and even choosing to return to using manual services through intermediaries or third parties. Therefore, reliability is not only a matter of the existence of technology, but also concerns the consistency of system performance in continuously supporting user needs. Improving the quality of network infrastructure, strengthening technical support from the DJP, and simplifying the user interface on the Coretax system are important steps to ensure that the reliability of information technology services does not become an obstacle, but rather a catalyst for building compliance and efficiency. In Region 3 Cirebon, infrastructure is relatively good in the city center, but suburban areas

still experience connectivity issues that cause delays in reporting [7]. Strengthening the internet network, reliable servers, and ongoing technical assistance are urgently needed [3].

The digitalization of tax administration has been shown to have a positive impact on the effectiveness of VAT systems. Comprehensive literature reviews indicate that the implementation of e-invoicing and prefilled returns enhances tax transaction tracking and administrative efficiency on a global scale [63]. Digital tax administration can even reduce stock return volatility, particularly in regions with weak institutional governance [64]. Blockchain technology also holds significant potential in supporting VAT e-invoicing systems by increasing transparency and accountability [1]. Digital tax administration systems highlights the use of advanced technologies in public fiscal management as well as the challenges associated with their implementation [44]. However, other studies reveal that the quality of governance and ICT infrastructure does not always exert a significant positive effect on the effectiveness of digital tax administration [32]. Furthermore, machine learning and network analysis have been employed to detect VAT fraud more accurately, thereby enhancing supervisory effectiveness [61]. Research on VAT in low-income countries underscores the challenges of VAT implementation and the gap between potential VAT revenue and actual collection [27]. Additionally, strengthening VAT enforcement has been empirically shown to improve the financial performance of affected firms [44]. IT reliability is a key factor in local tax optimization, relying on effective technology utilization, up-to-date taxation databases, competent human resources, and efficient organizational structures [50]. Digital transformation strengthens operational efficiency and data management, yet challenges remain regarding digital literacy, technology adoption, and awareness of data protection regulations [19]. In the context of international business, digital tax policies require strategic approaches to manage data limitations and ensure consistent cross-border tax enforcement [18]. Overall, these findings suggest that the effectiveness of IT services in VAT administration depends not only on infrastructure but also on system design, the deployment of innovative technologies, and appropriate enforcement policies

Effectiveness of Information Technology Service To Support Taxpayer on Value Added Tax Administration. TI Effectiveness has the strongest and most significant influence on Administration VAT, with a path coefficient of 0.505, suggesting that improvements in technology effectiveness substantially enhance the administration of VAT. The effectiveness of information technology services plays an important role in improving the quality of administration and compliance with Value Added Tax (VAT). When tax information systems are designed effectively, taxpayers can access, report, and pay their VAT obligations more easily and efficiently [2]. This effectiveness is reflected in the ease of use of the system, the speed of data processing, and the system's ability to provide real-time feedback. In the context of taxation, an effective system helps minimize potential errors in the collection, calculation, and reporting of value added tax (VAT) and improves the accuracy of transaction data for both input and output VAT. In addition, an effective system enables the integration of sales and purchase data, which is important for automatic and accurate VAT calculations [41].

The effectiveness of tax information technology services among taxpayers in Region 3 Cirebon has contributed significantly to improving administrative efficiency and tax compliance. Digital systems such as e-Filing, e-Invoicing, e-Billing, and most recently, integration through the Coretax Tax Administration System (CTAS), have provided ease of access, accelerated the reporting process, and improved data accuracy. In general, these services are considered effective by most taxpayers, especially in areas with well-established digital infrastructure. Taxpayers can manage their tax obligations more independently, quickly, and with a lower risk of error compared to manual methods. In addition, the system's notification, status tracking, and automatic validation features provide added value in creating transparency and trust in tax administration. 27However, the effectiveness of these services is not yet fully evenly distributed throughout Region 3 Cirebon. In some areas with limited infrastructure or low digital literacy, the use of IT services is not yet optimal. This has led to disparities in the speed and quality of tax reporting among taxpayers. The effectiveness of information technology services also depends heavily on system reliability and user readiness. When the system experiences disruptions or the interface is not user-friendly, effectiveness immediately declines and can even lead to resistance to the use of technology. The implementation of electronic systems such as e-invoicing in Indonesia is one example of the effectiveness of information technology services that significantly improve taxpayer compliance and accelerate VAT collection (Directorate General of Taxes, 2021). When this system works well, not only does administrative efficiency improve, but public trust in the taxation system also increases [37]. Information Systems Theory. This theory was proposed [26]) and states that information systems consist of technological and human components that are integrated to process data into information to support decision making. In the context of taxation, information technology helps automate the collection and management of tax data effectively, thereby improving the accuracy and speed of services [26]. Public Administration and E-Government Theory. The application of technology in public administration, particularly e-government such as coretax (CATS), can improve the efficiency of public services, including taxation services (VAT)

The Influence of Information Technology on VAT Administration. Information technology (IT) has transformed VAT administration by making it more transparent, efficient, and accurate. Systems like CoreTax enable business transactions to be recorded automatically and in real time, allowing tax authorities to monitor, verify, and supervise transactions more effectively while reducing opportunities for tax evasion. Online VAT reporting and payment systems streamline processes, automate VAT calculations, and minimize human error. Integrated IT systems also provide real-time validation of invoices, strengthen audit capabilities through data analytics, and help detect irregularities more quickly. For taxpayers, IT simplifies compliance by offering easier access to tax information,

automatic reminders, and user-friendly reporting platforms, encouraging voluntary compliance. Overall, IT improves administrative efficiency, reduces fraud risk, and supports a more transparent and accountable tax system though reliable infrastructure remains a critical prerequisite for its success.

The Influence of Information Technology on VAT Tax Administration. Information technology (IT) has a significant impact on value added tax (VAT) in several ways. IT affects VAT by increasing the transparency and efficiency of tax administration, as information technology enables more efficient and transparent data management. CoreTax, which is implemented in many countries, including Indonesia, allows business transactions to be recorded automatically and in real time. This makes it easier for tax authorities to monitor, supervise, and verify transactions that occur, as well as reduce the possibility of tax evasion. Electronic tax reporting system dimenssion, VAT payments and reporting are now mostly done online, which allows for faster and more transparent control, and facilitates the collection and verification of transaction data. IT systems enable faster and more accurate collection of transaction data. With an integrated system, authorities can immediately check whether the recorded VAT matches the actual transaction. VAT calculation automation means that the automated system can immediately calculate and classify VAT based on the type of goods or services sold. This helps reduce human error in tax calculations. Digital tax information systems significantly improve the accuracy and transparency of data management, although infrastructure challenges remain an obstacle [29]. Tax authorities can conduct audits automatically or use analytical tools to examine transaction patterns and detect potential irregularities. IT also helps reduce tax evasion. With an electronic reporting system that connects tax and corporate systems, potential misuse or manipulation of transaction data becomes more difficult. This has the potential to increase taxpayer compliance. The use of big data and analytics enables tax authorities to identify potential tax evasion more quickly. With easier tax reporting and payment systems, taxpayers have an incentive to be more compliant with their tax obligations. IT systems enable automatic reminders, clearer reporting, and easier access to tax information. Simplification of Processes: The existence of online applications or platforms for tax reporting and payment makes it easier for taxpayers to take care of their VAT obligations without having to go through complicated processes.

Better Access to Information: Taxpayers can access information related to VAT more easily, enabling them to calculate and pay taxes correctly. Improved Administrative Efficiency: Information technology plays an important role in improving the efficiency of tax administration, including VAT (Value Added Tax). Previously, tax administration was done manually, which required a lot of time and effort and had the potential for errors. With IT, especially through electronic-based systems, data collection, processing, and reporting have become faster and more accurate. Automation of Reporting Processes: Taxpayers can easily report transactions and calculate VAT payable automatically. Real-Time Data Validation: This system enables automatic validation and verification of invoices, reducing the potential for errors in reporting. Reduction of Fraud: With data recorded electronically and connected directly to the DGT, the possibility of tax invoice forgery or data manipulation is reduced. The Core Tax application has a significant impact on tax administration, particularly in Value Added Tax (VAT), as this system is designed to assist in more efficient, accurate, and integrated tax administration management. Some of the main impacts of the CoreTax application on VAT tax administration are: CoreTax can automatically calculate VAT liabilities based on transactions that have occurred, thereby reducing the potential for manual errors in calculations and minimizing the risk of reporting errors. CoreTax enables the automatic preparation of VAT Tax Returns (SPT) based on transaction data recorded in the system, facilitating the timely submission of SPT without having to calculate and process data manually. Digitalization of tax administration has proven to enhance VAT compliance, streamline tax collection, and increase fiscal transparency. Evidence from Peru shows that e-invoicing improves reporting accuracy, boosts compliance, and supports better firm performance. Literature reviews from Scopus-indexed studies confirm that digital systems automate processes, strengthen decision-making, and improve data security and budget efficiency.

However, the benefits of digitalization are not fully realized by MSMEs in Indonesia, where compliance costs remain high and are influenced by tax knowledge and perceptions of fairness. Research also shows that IT adoption positively correlates with compliance, while robust infrastructure and skilled human resources improve tax collection efficiency and reduce tax avoidance. Despite these benefits, barriers such as technological complexity and regulatory constraints still limit adoption. Studies highlight the need for user-friendly systems, continuous training, and policy frameworks to ensure broader access and effective implementation. Digitalization has been shown to reduce the shadow economy and improve operational efficiency for SMEs, though challenges in adoption persist. Overall, IT integration strengthens compliance, enhances operational efficiency, and lays the groundwork for data-driven governance its success ultimately depending on both the availability of technology and the quality of its implementation.

Digitalization is reshaping tax administration by improving VAT compliance, efficiency, and fiscal transparency. Evidence from Peru shows that e-invoicing enhances reporting accuracy and firm performance, while literature from Scopus-indexed journals highlights automation, better decision-making, and improved data security as key benefits. Yet, MSMEs in Indonesia still face relatively high compliance costs, indicating that the benefits of digitalization are unevenly distributed and require tailored solutions such as targeted training and simplified systems. Studies consistently show a positive link between IT adoption and taxpayer compliance, with infrastructure, human resources, and system design all playing vital roles in reducing tax avoidance and improving efficiency. Conceptual frameworks guide policymakers in strengthening digital tax systems, though challenges such as technological complexity and regulatory barriers remain. Evidence from Indonesia further links digital tax administration to

reductions in the shadow economy, particularly for MSMEs, but highlights the need to convert data analytics into actionable insights through user-friendly platforms. Ultimately, the effectiveness of IT integration depends not only on technology but also on user readiness, leadership, and supportive governance. When infrastructure, human capacity, and policy alignment are strengthened, IT becomes a powerful driver of compliance, efficiency, and data-driven revenue management.

4. CONCLUSION

The implementation of the Coretax system has significantly enhanced the effectiveness, efficiency, and transparency of VAT administration, both nationally and in Region 3 Cirebon. Digital services such as e-Invoicing, e-Filing, and real-time reporting streamline processes, improve accuracy, and enable direct monitoring, supporting adaptive compliance and supervision.

However, these benefits rely heavily on reliable infrastructure, digital literacy, and continuous technical support—especially in areas with limited resources. Strengthening network connectivity, simplifying systems, providing ongoing training, and fostering collaboration with local governments and business associations are crucial steps to ensure equitable access and smooth adoption.

Coretax should be continuously improved to remain user-friendly, particularly for MSMEs, while responsive technical assistance and regular user feedback evaluations are needed to maintain relevance and inclusivity. Future research can focus on measuring service quality through SERVQUAL, analyzing the effect of digital literacy on compliance using SEM, and testing infrastructure improvements in remote areas to provide empirical evidence for policy decisions.

With robust infrastructure, educated users, and collaborative governance, tax IT services can become the backbone of modern, inclusive, and sustainable VAT administration.

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