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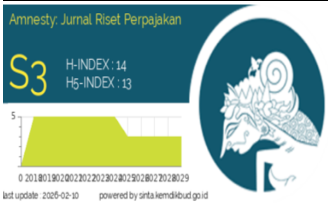

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Digital Transformation in Local Tax Administration: A Study on Increasing Revenue through Online Payment in Nunukan Regency

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ABSTRACT

This study aims to examine the implementation of an online regional tax payment system in efforts to increase regional tax revenue at the Regional Revenue Agency (Bapenda) of Nunukan Regency, as well as to identify the supporting and inhibiting factors affecting the effectiveness of the system, particularly in remote areas. This research employs a descriptive qualitative approach, with data collected through in-depth interviews involving eight informants consisting of relevant government officials and taxpayers. The results indicate that the online payment system contributes positively to the increase in regional tax revenue, particularly in terms of time efficiency, ease of access, and the reduction of late payment risks. However, several technical challenges remain, such as limited internet connectivity in certain areas and the low level of digital literacy among some members of the community.Supporting factors for the effectiveness of this system include the commitment of the local government, technological support, and active community participation. Meanwhile, inhibiting factors consist of limited digital infrastructure, resistance among elderly citizens, and the lack of evenly distributed socialization. This study emphasizes the importance of a collaborative strategy among the government, financial institutions, and the community in optimizing an inclusive and sustainable online tax system.

1. Introduction

Regional tax is one of the main sources of Local Own-Source Revenue (PAD) and plays a crucial role in supporting development and governance at the regional level. According to Law No. 28 of 2009 on Regional Taxes and Levies, regional taxes consist of taxes collected by local governments at both the provincial and regency/municipal levels. These taxes function to finance various public programs and services, including education, healthcare, public transportation, environmental management, and infrastructure development, thereby contributing to regional economic growth and community welfare. Effective regional tax collection also enhances local governments' fiscal independence by reducing dependence on transfers from the central government. However, regional tax revenue in Nunukan Regency still faces various challenges that hinder its optimization. One of the main challenges is the low level of taxpayer compliance, which directly affects the realization of regional revenue targets and limits the government's capacity to provide quality public services. Data from the Regional Revenue Agency (Bapenda) indicate that the taxpayer compliance rate in Nunukan Regency

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only reached 60% in 2022, which is far below the established target (Bapenda Nunukan, 2022), as shown in the following table:

Table 1. Regional Tax Revenue

Jenis Pajak Daerah	Jumlah Penerimaan Pajak Daerah				
	Tahun 2019	**Tahun 2020**	**Tahun 2021**	**Tahun 2022**	**Tahun 2023**
Hotel	710,392,955.00	428,445,165.00	529,951,244.00	920,733,584	1,019,091,710.00
Restoran	4,597,367,144.00	7,158,926,858.44	7,369,794,514.00	9,744,392,980	21,056,351,198.00
Hiburan	83,770,343.58	37,286,269.60	23,046,835.00	65,785,124	102,972,344.00
Reklame	277,176,800.00	403,614,698.00	375,392,093.00	365,603,388	396,436,808.00
PPJ	6,601,703,292.84	7,334,696,170.45	6,720,527,084.77	7,065,683,952	8,186,640,261.00
Parkir	0	0	0	-	0
Air Tanah	94,055,766.60	53,936,035.50	21,228,681.00	26,241,277	40,234,549.00
Sarang Burung Walet	47,625,500.00	28,870,000.00	23,681,950.00	50,804,640	28,467,300.00
Minerba	1,702,573,949.42	1,079,820,415.32	1,469,613,796.82	1,611,348,641	2,645,104,638.00
PBB P2	1,850,456,185.00	1,901,842,698.00	2,133,455,845.00	2,538,869,686	2,988,766,160.00
BPHTB	11,762,963,691.00	9,916,200,745.00	736,365,304.50	3,710,890,829	59,882,644,219.00
Total Pajak Daerah	27,728,085,627.44	28,343,639,055.31	19,403,057,348.09	26,100,354,101.00	96,346,709,187.00

Source: Bapenda, 2024

Regional tax revenue in Nunukan Regency experienced fluctuations during the period 2019–2023, with significant growth in several types of taxes. Restaurant tax recorded the highest increase in 2023 at 116.09% compared to the previous year, followed by the Land and Building Acquisition Duty (BPHTB), which surged dramatically by 1,513.70%. Hotel and mining taxes also showed positive trends, with growth rates of 10.68% and 64.15%, respectively, in 2023. In contrast, entertainment tax, advertisement tax, and swiftlet nest tax experienced declines during certain periods, although occasional increases occurred in specific years. Street lighting tax (PPJ) and rural and urban land and building tax (PBB-P2) continued to increase steadily, while parking tax revenue remained at zero. Overall, total regional tax revenue grew significantly from IDR 19.4 billion in 2021 to IDR 96.3 billion in 2023, indicating the effectiveness of strategies to enhance regional tax revenue in the area.

In addition, limited access to payment services remains a significant issue. Many residents living in remote areas face difficulties in accessing tax offices and making payments directly. This situation is exacerbated by the still conventional tax payment system, which often results in long queues and time-consuming administrative processes. According to a study by Sari and Rahman (2021), residents in remote sub-districts spend an average of three hours just to complete tax payments. This condition is clearly inefficient and may reduce taxpayers' willingness to fulfill their tax obligations. The implementation of information technology in the tax payment system is expected to be a solution to improve regional tax revenue (Setiawan, 2021; Leliya &

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Afiyah, 2023). Through an online payment system, taxpayers are expected to make payments more easily and quickly without having to visit tax offices. However, achieving this requires greater efforts to improve public understanding and trust in online payment systems.

The conventional tax payment system has several limitations that hinder the improvement of regional tax revenue. One of the main problems is long queues at tax offices, which often discourage taxpayers from making payments. According to data from Bapenda Nunukan, in 2022, the average waiting time for tax payments reached two hours, which is highly inefficient for individuals with other activities (Bapenda Nunukan, 2022). Lengthy administrative procedures also pose challenges, as taxpayers must fill out multiple forms and wait for verification by tax officers.

Limited access for residents living far from tax offices is another major issue. Many sub-districts in Nunukan Regency are not supported by adequate transportation infrastructure, making it difficult for residents to pay taxes. A study by Putra (2020) indicates that less than 30% of people in remote areas have adequate access to tax offices, contributing to low compliance rates. The limited utilization of technology in the tax payment system is also a key obstacle. Despite rapid advancements in information and communication technology, many individuals remain hesitant to use online tax payment applications. This hesitation is driven by concerns that payments may not be properly received by the local government, particularly in cases of delays in reporting or notification. Furthermore, insufficient socialization efforts remain a critical issue. Although there are partnerships between Bapenda and banks for online tax payments, information about the system is not yet fully disseminated or understood by the public.

The implementation of an online tax payment system can serve as an innovative solution to improve the effectiveness and efficiency of regional tax revenue collection. With this system, taxpayers can make payments anytime and anywhere without having to visit tax offices. This will significantly reduce long queues and waiting times, which have been major public complaints. According to Agung and Sari (2021), the implementation of online payment systems in several regions has led to a significant increase in taxpayer compliance, with an average increase of up to 30% within one year.

Another advantage of the online payment system is transparency. With an integrated system, taxpayers can easily track their payment status and ensure that their funds are properly received by the local government. This can enhance public trust in the tax system and encourage greater compliance. Additionally, online systems enable local governments to perform better data analysis. With real-time data, governments can monitor tax revenue and evaluate existing tax policies, which helps in formulating more effective strategies for future revenue enhancement. According to Santoso (2021), proper data analysis can assist local governments in identifying untapped tax potential.

However, to achieve maximum benefits from the online payment system, serious efforts are required in terms of education and public awareness. Local governments must actively disseminate information on how to use online tax payment applications and explain their benefits. Despite its advantages, the online system also has limitations, particularly related to geographical conditions and community characteristics. In Nunukan Regency, many remote areas still lack adequate internet access. According to data from the Central Statistics Agency (BPS) of Nunukan Regency (2022), approximately 40% of the region still faces difficulties in accessing the internet, which poses a major challenge to the implementation of online payment systems. The diverse characteristics of the population also influence the adoption of online payment systems. Certain groups, particularly the elderly, may not be familiar with technology and may find it difficult to adapt to online

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applications. A study by Ningsih and Prasetyo (2021) shows that 60% of respondents aged over 50 lack confidence in using technology-based applications, which can hinder adoption.

Public trust in online payment systems is another crucial factor. Many people remain concerned about transaction security and the risk of fraud. According to a survey conducted by the Institute for Economic and Social Research (LPEM) 2022, around 50% of respondents expressed distrust in online payment systems, highlighting the need to improve system security and reliability. Inadequate socialization further complicates the implementation of online tax payment systems. Residents in remote areas may not receive sufficient information about the availability and benefits of such systems. A study by Setiawan (2022) indicates that lack of information can lead to confusion and reluctance to adopt new systems, resulting in low participation in online tax payments. To address these challenges, a more inclusive and strategic approach is required in implementing online tax payment systems. Local governments need to collaborate with various stakeholders, including non-governmental organizations and local communities, to improve public understanding and trust. Through such efforts, it is expected that regional tax revenue can increase significantly.

2. Literature Review

2.1 Conceptual and Theoretical Foundations

2.1.1 Digital Transformation in Public Administration

Digital transformation in public administration refers to the integration of digital technologies into government processes to improve efficiency, transparency, and service delivery. It is not merely the digitization of existing procedures, but a fundamental change in how public services are designed and delivered to citizens. According to Vial (2019), digital transformation involves organizational changes driven by digital technologies that reshape value creation processes. Similarly, Mergel et al. (2019) emphasize that digital transformation in the public sector enhances governance by fostering innovation and responsiveness to citizen needs.

In the context of local government, digital transformation plays a critical role in modernizing administrative systems, including financial management and taxation. Digital government initiatives enable more efficient public service delivery and reduce administrative burdens. Furthermore, digital transformation strengthens accountability and transparency, which are essential for building public trust in government institutions. Therefore, the adoption of digital technologies in local administration is a strategic step toward achieving good governance.

2.1.2 Local Tax Administration

Local tax administration refers to the processes and systems used by local governments to manage tax collection, including assessment, billing, payment, and enforcement. Effective tax administration is crucial for ensuring sustainable local revenue and supporting regional development. Efficient tax administration improves compliance and reduces collection costs, thereby increasing revenue performance. In addition, local taxes are a key component of regional autonomy, enabling local governments to finance public services independently.

However, traditional tax administration systems often face challenges such as inefficiency, lack of transparency, and limited accessibility. These issues can lead to low taxpayer compliance and suboptimal revenue collection. Improving administrative systems is essential for enhancing tax compliance and revenue performance. Therefore, modernizing local tax administration through digital innovation is necessary to overcome these challenges and improve overall system effectiveness.

2.1.3 Online Payment Systems in Tax Administration

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Online payment systems represent a key component of digital transformation in tax administration, allowing taxpayers to fulfill their obligations electronically without physical interaction. These systems provide convenience, reduce transaction time, and minimize administrative costs. Digital payment systems enhance efficiency and user experience by enabling real-time transactions and reducing manual processes. Additionally, electronic payment systems can improve accuracy and reduce errors in tax collection.

From a behavioral perspective, the availability of online payment systems can significantly increase taxpayer compliance. Davis (1989) explains that perceived ease of use and usefulness influence individuals' willingness to adopt technology. Similarly, that trust and perceived convenience are key factors in adopting e-government services. Therefore, implementing online tax payment systems can encourage voluntary compliance and improve revenue collection outcomes.

2.1.4 Increasing Local Revenue through Digital Payment

The implementation of online tax payment systems has been shown to positively impact local revenue by improving efficiency and compliance. Digital payment systems simplify the payment process, making it easier for taxpayers to meet their obligations on time. Digitalization in tax administration enhances revenue performance by reducing compliance costs and increasing transparency. Similarly, that digital tax systems can significantly improve revenue collection efficiency in developing countries.

Moreover, digital payment systems contribute to reducing tax evasion and increasing accountability in financial management. Transparency in digital transactions allows for better monitoring and reporting of tax payments. The use of digital financial systems strengthens fiscal capacity and supports sustainable economic development. Therefore, the integration of online payment systems in local tax administration is a strategic approach to increasing regional revenue and improving public financial management (Leliya & Afiyah, 2023; Fitriyani & Hendri, 2021).

2.2 Review of Empirical Studies

Recent empirical studies consistently demonstrate that digital transformation significantly improves public sector performance, particularly in tax administration. Abrori et al. (2024) found that digital tax transformation enhances regional revenue by improving administrative efficiency and increasing taxpayer compliance. Similarly, Susilowati et al. (2023) concluded that regional digital taxation contributes to sustainable local revenue management within decentralized government systems. At the international level, Akitoby et al. (2020) also reported that modernization of tax administration positively affects revenue performance in developing countries.

Studies focusing specifically on online tax payment systems have produced similar findings. Mandasari et al. (2024) demonstrated that electronic tax payment systems improve taxpayer acceptance by increasing convenience and reducing administrative complexity. Mulatsih (2023) further identified perceived usefulness, perceived ease of use, and trust as important determinants of taxpayers' behavioral intention to adopt digital public services. Likewise, Hidayat et al. (2025) found that electronic tax service innovation significantly improves administrative efficiency and public service quality in local taxation.

Institutional and contextual factors have also received considerable attention in recent studies. Sukasih et al. (2025) emphasized that institutional trust and organizational commitment are critical for successful digital transformation in tax administration. Meanwhile, Dong et al. (2025) showed that disparities in digital infrastructure and internet accessibility remain major obstacles to implementing digital public services in remote regions. Similarly, Khasanah and Aldiyanto (2023) reported that unequal technological

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readiness continues to limit the effectiveness of digital taxation programs at the regional level.

Overall, previous empirical studies consistently indicate that digital tax systems improve efficiency, transparency, and taxpayer compliance. However, most investigations employ quantitative approaches and focus on measuring technology adoption or taxpayer behavior. Comparatively limited research has qualitatively explored how online tax payment systems are implemented within local governments, particularly in geographically isolated border regions where digital infrastructure and community readiness differ substantially from metropolitan areas.

2.3 Identification of the Research Gap

Although previous studies have demonstrated the positive relationship between digital transformation and tax administration performance, several important research gaps remain.

First, most empirical studies focus on evaluating technology acceptance, taxpayer compliance, or digital service quality using quantitative methods, while relatively few studies investigate implementation processes through qualitative approaches that capture institutional experiences and contextual challenges.

Second, existing research predominantly examines metropolitan or urban local governments with relatively adequate technological infrastructure. Consequently, empirical evidence regarding the implementation of online tax payment systems in border and remote regions remains limited.

Third, previous studies generally emphasize technological and behavioral dimensions without comprehensively exploring the interaction among institutional commitment, technological infrastructure, community participation, and local geographical conditions that collectively determine implementation success.

Accordingly, this study addresses these gaps by employing a descriptive qualitative case study to investigate the implementation of the online regional tax payment system at the Regional Revenue Agency (Bapenda) of Nunukan Regency. By focusing on one of Indonesia's border regions with unique geographical characteristics, this study provides contextual evidence regarding both the supporting and inhibiting factors influencing digital tax administration and its contribution to increasing regional revenue.

2.4 Development of the Conceptual Framework

This study does not develop a conceptual framework because it is designed as a descriptive qualitative case study rather than a causal explanatory study. The research aims to explore the implementation of the online regional tax payment system, identify supporting and inhibiting factors, and understand its contribution to increasing regional revenue. Therefore, the study is guided by the theoretical perspectives discussed in the conceptual and theoretical foundations instead of employing a variable-based conceptual model. This methodological approach is consistent with the qualitative research design adopted in this study.

2.5 Hypotheses or Research Propositions

This study does not formulate research hypotheses or research propositions because it does not seek to test causal relationships among variables. Instead, the research adopts an exploratory and descriptive qualitative approach to understand the implementation of the online regional tax payment system within its real-life institutional context. The analysis is therefore guided by theoretical perspectives and supported by empirical findings obtained through interviews, observations, and document analysis rather than hypothesis testing.

3. Research Methods

3.1 Research Design

This study employs a descriptive qualitative approach to explore the implementation of the online regional tax

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payment system and its impact on increasing regional tax revenue at the Regional Revenue Agency (*Bapenda*) of Nunukan Regency. This approach allows for an in-depth understanding of real-world phenomena without manipulating variables. The research adopts a case study design, enabling a comprehensive exploration of the implementation process, challenges, and outcomes within a specific institutional context.

3.2 Research Context and Setting

The study was conducted at the Regional Revenue Agency (*Bapenda*) of Nunukan Regency, Indonesia. This institution is responsible for managing local tax collection, including the implementation of online tax payment systems. The selection of this setting is based on its relevance to the research focus, particularly the ongoing efforts to improve regional revenue through digital transformation in tax administration.

3.3 Population and Sample / Research Participants

The participants in this study were selected using a purposive sampling technique, focusing on individuals directly involved in the implementation of the online tax payment system. The key informants include the Head of *Bapenda*, the Head of the Collection Division, a Bank Kaltimtara officer, and several taxpayers. These participants were chosen to provide diverse perspectives and comprehensive insights into the system's implementation and effectiveness.

3.4 Data Sources and Data Collection

Data in this study were collected from both primary and secondary sources. Primary data were obtained through in-depth interviews with key informants, direct observations of the system's operation, and field notes. Secondary data were collected from official documents, regional regulations, institutional reports, and relevant literature. To enhance data credibility, triangulation of sources and methods was applied by comparing information obtained from different participants and data collection techniques.

3.5 Measurement of Variables and Research Instruments

As a qualitative study, this research does not employ variable measurement in a quantitative sense but focuses on thematic exploration. The researcher serves as the primary instrument, supported by several tools, including interview guidelines, observation sheets, and document analysis frameworks. These instruments are designed to capture information related to system implementation, user experience, operational effectiveness, and its impact on regional tax revenue.

3.6 Data Analysis Techniques

The data analysis technique used in this study is descriptive qualitative analysis, following the interactive model of data analysis. The process includes data reduction, data display, and conclusion drawing. Data reduction involves selecting and simplifying relevant information, while data display organizes findings into structured forms such as narratives and matrices. Conclusions are drawn through systematic interpretation to address the research objectives.

3.7 Validity, Reliability, and Trustworthiness

To ensure the trustworthiness of the findings, this study applies several criteria, including credibility, transferability, dependability, and confirmability. Credibility is achieved through triangulation of data sources and methods. Transferability is ensured by providing detailed descriptions of the research context. Dependability and confirmability are maintained through systematic documentation and consistency in the research process.

3.8 Ethical Considerations

This study adheres to ethical research principles, including obtaining informed consent from participants, ensuring

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confidentiality and anonymity, and using data solely for research purposes. Participants were informed about the objectives of the study and their rights to withdraw at any time without consequence.

3.9 Research Procedure

The research procedure consists of several stages:

a. Preliminary study and problem identification.
b. Data collection through interviews, observations, and documentation.
c. Data organization and analysis using qualitative techniques.
d. Interpretation of findings and formulation of conclusions.
e. Reporting of research results in a systematic and academic format.

3.10 Methodological Limitations

This study has several limitations. First, it focuses on a single case study in Nunukan Regency, which may limit the generalizability of the findings. Second, the qualitative approach relies heavily on participants' perspectives, which may introduce subjectivity. Third, the study is conducted within a limited time frame, which may not capture long-term impacts of the online tax payment system.

4. Results and Discussion

4.1 Research Results

4.1.1 Sample Description and Descriptive Statistics

This study employed a qualitative case study approach involving eight purposively selected participants who possessed direct experience with the implementation of the online regional tax payment system at the Regional Revenue Agency (Bapenda) of Nunukan Regency. The participants consisted of the Head of Bapenda, the Head of the Tax Collection Division, a representative from Bank Kaltimtara as the official payment partner, and several taxpayers representing different backgrounds and levels of technology utilization. These participants provided comprehensive information regarding the implementation process, operational challenges, supporting factors, and the perceived contribution of the online payment system to regional tax revenue.

Data were collected through in-depth interviews, direct observations, and documentation. The integration of multiple data sources enabled the researcher to obtain a comprehensive understanding of the implementation process and ensured that the findings reflected actual conditions in the field.

4.2.2 Data Quality and Preliminary Analysis

To enhance the credibility of the research findings, data obtained from interviews were compared with observations and official documents issued by the Regional Revenue Agency of Nunukan Regency. Source triangulation was conducted by comparing information provided by government officials, banking representatives, and taxpayers, while methodological triangulation involved combining interviews, observations, and document analysis.

The consistency of information obtained from different participants indicates that the findings are sufficiently reliable to describe the implementation of the online regional tax payment system and its contribution to improving regional tax revenue.

4.1.3 Main Analytical Results

a. Trends in Regional Tax Revenue

The findings indicate that regional tax revenue in Nunukan Regency experienced significant fluctuations during the period 2019–2023, with an overall upward trend. A substantial increase was recorded between 2021 and 2023, where total revenue rose from IDR 19.4 billion to IDR 96.3 billion. This growth reflects the effectiveness of local government strategies in enhancing tax collection. Certain tax types, such as restaurant tax and Land and Building Acquisition Duty (BPHTB), showed the highest increases, with growth rates of 116.09% and 1,513.70%, respectively. Meanwhile, taxes such as street lighting tax

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(PPJ) and land and building tax (PBB-P2) demonstrated consistent and stable growth.

However, not all tax sectors showed positive performance. Entertainment tax, advertisement tax, and swiftlet nest tax experienced fluctuations and occasional declines, indicating uneven tax potential across sectors. These variations suggest that while overall revenue has improved, optimization across all tax types remains a challenge.

b. Effectiveness of the Online Tax Payment System

The implementation of the online tax payment system has contributed positively to improving regional tax revenue (Sherenita, 2022). The system enhances efficiency by reducing the time required for taxpayers to complete payments and eliminating the need to visit tax offices. This is particularly important considering previous conditions where taxpayers spent up to three hours to complete payment processes. The online system also minimizes long queues and administrative delays, which were previously major barriers to compliance.

In addition, the system improves accessibility, allowing taxpayers to make payments anytime and anywhere. This flexibility is particularly beneficial for individuals with limited time and mobility. The findings also show that the online system contributes to increased taxpayer compliance by simplifying procedures and reducing transaction barriers (Leliya & Afiyah, 2023; Yusuf & Anwar, 2021). This aligns with previous studies indicating that digital payment systems can significantly improve compliance rates.

c. Supporting Factors in System Implementation

Several factors support the effectiveness of the online tax payment system in Nunukan Regency. First, the strong commitment of the local government plays a crucial role in driving digital transformation in tax services. Second, technological support, including collaboration with banking institutions, facilitates the implementation of the system. Third, active community participation contributes to the gradual adoption of online payment methods.

Moreover, the system enhances transparency and accountability. Taxpayers can track their payment status in real time, which increases trust in the tax system. The availability of integrated data also enables local governments to monitor revenue more effectively and design better tax policies based on accurate and up-to-date information.

d. Inhibiting Factors and Challenges

Despite its advantages, the implementation of the online tax payment system still faces several challenges. One of the main obstacles is limited internet infrastructure, particularly in remote areas of Nunukan Regency. Approximately 40% of the region still experiences difficulties in accessing reliable internet services, which significantly limits the reach of the system.

In addition, low levels of digital literacy among certain groups, especially elderly citizens, hinder the adoption of online payment systems. Many individuals lack confidence in using digital applications, leading to resistance toward technological change. Another critical issue is the lack of public trust in online transactions, with concerns about security and the risk of fraud.

Furthermore, insufficient socialization and dissemination of information about the system reduce public awareness and participation. Many taxpayers are not fully informed about how to use the system or its benefits, which limits its effectiveness.

4.1.4 Hypothesis Testing Results / Key Findings

The principal findings of this study can be summarized as follows.

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Table 2. Key findings

Research Focus	Key Findings
Regional tax revenue	Revenue increased significantly during 2019–2023, particularly after the implementation of digital tax services.
Online payment effectiveness	Improved efficiency, accessibility, transparency, and taxpayer compliance.
Supporting factors	Government commitment, banking collaboration, digital infrastructure, and community participation.
Inhibiting factors	Limited internet access, low digital literacy, security concerns, and insufficient public socialization.

Source: Author processed, 2026

4.1.5 Visual Presentation of Results

Table 2 provides a concise summary of the principal findings of this study, illustrating that the implementation of the online regional tax payment system has contributed positively to increasing regional tax revenue through improvements in efficiency, accessibility, transparency, and taxpayer compliance. The table also highlights the main supporting factors, including government commitment, banking collaboration, digital infrastructure, and community participation, as well as the primary challenges, namely limited internet access, low digital literacy, security concerns, and insufficient public socialization, which continue to influence the effectiveness of the system.

4.2 Research Discussion

4.2.1 Interpretation of Key Findings

a. Trends in Regional Tax Revenue

The trend of regional tax revenue in Nunukan Regency has shown positive development since the implementation of the online tax payment system by the Regional Revenue Agency (Bapenda). The digitalization of tax payments has contributed significantly to the increase in local own-source revenue through the expansion of service accessibility for taxpayers, particularly those who previously faced geographical barriers in making direct payments. This system enables faster, more flexible, and efficient payment transactions through digital channels such as QRIS, mobile banking, and e-billing.

The research findings indicate that increased taxpayer participation is more dominant among urban communities and younger generations with adequate internet access. This condition suggests that digital transformation not only accelerates transaction processes but also broadens the taxpayer compliance base. In addition, the ease of real-time transaction monitoring has positively affected the accuracy of reporting and supervision of regional tax revenue. These findings are consistent with previous studies emphasizing that tax digitalization contributes to regional revenue optimization through improved taxpayer compliance and administrative efficiency, particularly in regions with complex geographical characteristics (Abrori et al., 2024; Susilowati et al., 2023; Akitoby et al., 2020).

b. Effectiveness of the Online Tax Payment System

The effectiveness of the online tax payment system in Nunukan Regency can be observed through the improvement of public service quality, which has become faster, more transparent, and more accessible to the community. The implementation of this system allows taxpayers to make payments without physically visiting the Bapenda office, thereby reducing waiting time, transportation costs, and other administrative barriers. The integration of the system with digital payment platforms such as QRIS, mobile banking, and the official Bapenda website provides taxpayers with convenient access to billing

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information and enables independent payment processing. Furthermore, payment notification features via SMS and WhatsApp, as well as the availability of electronic payment receipts, enhance taxpayers' sense of security while promoting transaction transparency.

The effectiveness of this system is also reflected in its ability to accommodate the specific needs of border regions such as Nunukan, which possess relatively complex geographical characteristics. The findings indicate that perceived ease of use and perceived usefulness are key determinants of public acceptance of digital systems, as explained in the Technology Acceptance Model, which emphasizes that these factors significantly influence technology adoption (Davis, 1989). These findings are further supported by studies conducted by Mandasari et al. (2024), Mulatsih (2023), and Hidayat et al. (2025), which confirm that electronic tax services significantly improve administrative efficiency and public service quality.

c. Supporting Factors in System Implementation

The successful implementation of the online tax payment system in Nunukan Regency is supported by several interconnected strategic factors. One of the primary supporting factors is the commitment of the local government to promoting digital public service transformation as part of bureaucratic reform and tax administration modernization. Technical support from Bankaltimtara as the official payment partner also plays a crucial role in ensuring transaction security and operational reliability. In addition, the availability of multiple digital payment channels, including QRIS, e-billing, and mobile banking, provides flexibility for taxpayers in selecting payment methods that best suit their needs.

Another supporting factor is the increasing level of digital literacy among civil servants, younger generations, and urban communities who are generally more adaptive to technological innovation. Socialization efforts carried out by Bapenda through direct education and digital media campaigns have also contributed to raising public awareness of the importance of online tax payments (Haryono, 2022; Widiastuti, 2022). This finding aligns with institutional support theory, which asserts that the success of digital innovation implementation is strongly influenced by institutional readiness, infrastructure preparedness, and human resource capacity. These findings are supported by Abrori et al. (2024), who highlighted the importance of digital service quality in fostering taxpayer compliance, and Sukasih et al. (2025), who found that trust in digital systems and institutional support are key determinants of successful technology-based tax reform.

d. Inhibiting Factors and Challenges

Although the online tax payment system has demonstrated considerable effectiveness, its implementation still faces several obstacles and challenges that require serious attention. The primary challenge lies in the limited internet infrastructure in remote areas of Nunukan Regency, which prevents some communities from optimally accessing digital services. Low levels of digital literacy, particularly among elderly populations and rural communities, also constitute significant barriers to system utilization. Some taxpayers continue to prefer manual payment methods due to insufficient understanding of digital payment mechanisms or concerns regarding transaction security.

In addition, technical issues such as unstable servers during peak payment periods can reduce user convenience and system reliability. From a non-technical perspective, uneven socialization efforts and the limited involvement of village officials in disseminating information regarding the online payment system remain problematic. These findings indicate that the system's effectiveness has not yet been evenly distributed across all regions, thus requiring more inclusive implementation strategies. This condition is consistent with digital divide theory, which explains that

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disparities in technological access and digital literacy remain major barriers to equitable digital transformation. These findings are reinforced by Khasanah and Aldiyanto (2023), Mulatsih (2023), and Dong et al. (2025), who found that non-metropolitan areas require more adaptive policy approaches focused on public education and equitable digital infrastructure development to ensure the optimal implementation of electronic tax systems.

4.2.2 Comparison with Previous Studies

The findings are generally consistent with previous empirical studies reporting that digital transformation enhances tax administration performance and regional revenue. Abrori et al. (2024), Susilowati et al. (2023), and Akitoby et al. (2020) similarly concluded that tax digitalization contributes to improved taxpayer compliance, administrative efficiency, and revenue optimization. The present study reinforces these conclusions by demonstrating that online payment systems successfully reduce transaction costs while expanding taxpayer accessibility in geographically challenging regions.

Regarding the effectiveness of online payment systems, the findings are also consistent with Mandasari et al. (2024), Mulatsih (2023), and Hidayat et al. (2025), who reported that electronic tax services improve service quality, administrative efficiency, and user satisfaction. However, unlike many previous studies that primarily emphasize technology acceptance using quantitative approaches, this study provides qualitative evidence explaining how institutional commitment, collaboration with financial institutions, and local contextual conditions jointly determine implementation success.

Furthermore, the challenges identified in this study support the findings of Khasanah and Aldiyanto (2023), Mulatsih (2023), and Dong et al. (2025), who highlighted the importance of addressing disparities in digital infrastructure and digital literacy to ensure equitable implementation of digital public services. Nevertheless, this study extends previous research by demonstrating that geographical characteristics of border regions create additional implementation challenges that require context-specific policy interventions.

4.2.3 Theoretical Contributions

This study contributes to the literature on digital transformation in public administration by extending existing theoretical perspectives into the context of local tax administration within geographically isolated regions. The findings confirm the relevance of digital transformation theory proposed by Vial (2019) and Mergel et al. (2019), demonstrating that digital technologies improve public service delivery through greater efficiency, transparency, and accessibility.

The findings also support the Technology Acceptance Model (Davis, 1989), indicating that perceived usefulness and perceived ease of use influence taxpayers' willingness to utilize online payment systems. However, this study extends the theory by demonstrating that technology acceptance alone is insufficient to ensure successful implementation in local government settings. Institutional commitment, inter-organizational collaboration, infrastructure readiness, and digital literacy collectively determine the sustainability of digital transformation initiatives.

Moreover, the findings reinforce perspectives on digital governance by illustrating that successful digital transformation in border regions requires the integration of technological innovation with institutional capacity building and community engagement. Consequently, this study enriches the theoretical understanding of digital tax administration by emphasizing the interaction between technological, institutional, and contextual factors.

4.2.4 Practical and Policy Implications

The findings provide several practical

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implications for local governments seeking to modernize tax administration through digital technologies. First, strengthening digital infrastructure, particularly internet connectivity in remote areas, should become a policy priority to ensure equitable access to online tax services.

Second, local governments should continuously improve digital literacy through public education programs, community outreach, and practical training for taxpayers, particularly elderly citizens and rural communities with limited technological experience.

Third, collaboration between local governments, banking institutions, and technology providers should be strengthened to enhance transaction security, system reliability, and service integration. Continuous system maintenance and cybersecurity improvements are also necessary to strengthen public trust in online transactions.

Finally, policymakers should develop more inclusive digital transformation strategies by considering local geographical characteristics and socio-economic conditions rather than adopting standardized implementation approaches. Such policies will enhance the sustainability of digital tax administration while contributing to improved regional fiscal capacity.

4.2.5 Integration with the Research Gap

This study directly addresses the research gap identified in the literature review by providing qualitative empirical evidence concerning the implementation of online regional tax payment systems within a border region characterized by geographical complexity and uneven digital infrastructure. While previous studies have predominantly examined digital taxation using quantitative approaches or focused on metropolitan areas, this research explores the practical implementation process, institutional dynamics, and contextual challenges encountered in Nunukan Regency.

Furthermore, this study demonstrates that successful digital tax administration cannot be explained solely by technological adoption. Instead, implementation outcomes are shaped by interactions among institutional commitment, technological infrastructure, community participation, and digital literacy. By integrating these dimensions, the study contributes new contextual evidence that complements existing literature on digital transformation in local public administration.

4.2.6 Acknowledgement of Study Limitations

Although the findings provide valuable insights into the implementation of online tax payment systems in Nunukan Regency, they should be interpreted within the specific institutional and geographical context of the study. The effectiveness of the implementation may differ across local governments that possess different administrative capacities, technological infrastructure, and socio-economic conditions.

In addition, the positive contribution of the online payment system to regional tax revenue should be understood alongside other potential determinants of revenue growth, including regional economic development, changes in tax policies, and fluctuations in taxpayers' economic activities. Therefore, the findings primarily provide contextual understanding of digital transformation in regional tax administration rather than universally generalizable conclusions applicable to all local governments.

5. Conclusion

Nunukan Regency has significantly contributed to improving regional tax revenue, particularly in terms of efficiency, accessibility, and taxpayer compliance. The system enables taxpayers to make payments more easily and quickly through digital platforms such as QRIS, mobile banking, and e-billing, thereby reducing administrative burdens and eliminating the need for physical visits to tax offices. The findings indicate that digitalization has expanded the tax base and increased participation, especially among urban

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communities and younger generations with adequate internet access.

However, the effectiveness of the system is not yet evenly distributed across all regions. Significant challenges remain in remote areas, including limited internet infrastructure, low levels of digital literacy, and public concerns regarding transaction security. These constraints hinder the optimal utilization of the online payment system and reduce its overall impact on tax revenue. Therefore, while the system demonstrates strong potential as a tool for enhancing regional revenue, its success is highly dependent on contextual factors such as infrastructure readiness, community capacity, and institutional support. This study confirms that digital transformation in tax administration is a strategic approach to improving public financial management. Nevertheless, achieving sustainable and inclusive outcomes requires not only technological innovation but also comprehensive support in terms of policy, infrastructure, and public engagement.

5.1 Summary of Key Findings

This study reveals that the implementation of the online regional tax payment system at the Regional Revenue Agency (*Bapenda*) of Nunukan Regency has contributed positively to improving regional tax revenue. The system enhances efficiency in tax payment processes, reduces administrative barriers, and increases taxpayer compliance through ease of access and time flexibility. Additionally, the findings indicate that digital payment systems help minimize delays in tax payments and improve transparency in financial transactions. However, several challenges remain, including limited internet access in remote areas and varying levels of digital literacy among taxpayers, which affect the overall effectiveness of the system.

5.2 Theoretical Contributions

This study contributes to the literature on digital transformation and public sector administration by providing empirical evidence on how online payment systems can enhance tax administration performance at the local government level. It extends existing theories of e-government and digital governance by demonstrating the role of accessibility, usability, and trust in influencing taxpayer compliance. Furthermore, this study enriches the understanding of technology adoption in public finance by highlighting the interaction between technological systems and user behavior in a developing regional context.

5.3 Practical and Policy Implications

From a practical perspective, the findings suggest that local governments should strengthen digital infrastructure and provide continuous user education to maximize the benefits of online tax payment systems. Training programs for both staff and taxpayers are essential to improve system usability and adoption. From a policy standpoint, the study highlights the need for integrated digital governance strategies, including collaboration with financial institutions and technology providers. Policymakers should also consider expanding digital payment systems to underserved areas and ensuring regulatory support for sustainable digital transformation in tax administration.

5.4 Limitations of the Study

This study has several limitations. First, it focuses on a single case study in Nunukan Regency, which limits the generalizability of the findings to other regions. Second, the qualitative approach relies on participants' perspectives, which may introduce subjectivity. Third, the study captures conditions within a specific time frame and may not fully reflect long-term impacts of the online tax payment system.

5.5 Directions for Future Research

Future research is recommended to explore the implementation of digital tax systems across multiple regions to enable comparative analysis. Quantitative approaches may also be employed to measure the statistical impact of online payment systems on

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revenue growth. Additionally, further studies should examine the role of digital literacy, infrastructure readiness, and user trust in influencing the adoption of e-government services. Expanding the scope to include other types of local taxes or integrating advanced technologies such as mobile applications and fintech solutions would also provide valuable insights.

6. References

Abrori, M., Setiawan, A., & Kurniawati, R. (2024). Digital tax transformation and regional revenue optimization in local government administration. *Jurnal Bina Praja, 16*(1), 45–58. https://doi.org/10.21787/jbp.16.2024.45-58

Agung, R., & Sari, D. (2021). Analisis penerapan sistem pembayaran pajak online. *Jurnal Ekonomi dan Kebijakan Publik.*

Akitoby, B., Honda, J., & Primus, K. (2020). *Tax administration modernization and public revenue performance in developing countries. International Monetary Fund Working Paper, 20*(112), 1–35. https://doi.org/10.5089/9781513546842.001

Bapenda Nunukan. (2022). *Laporan tahunan penerimaan pajak daerah.*

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Dong, Y., Zhang, X., & Liu, H. (2025). Digital divide and public service accessibility in remote governance systems. *Government Information Quarterly, 42*(1), 101902. https://doi.org/10.1016/j.giq.2024.101902

Fitriyani, D., & Hendri, H. (2021). Analisis kontribusi pajak daerah. *Jurnal Akuntansi dan Keuangan Daerah.*

Haryono, S. (2022). Sosialisasi pembayaran pajak online. *Jurnal Administrasi Publik.*

Hidayat, R., Prasetyo, D., & Nugroho, A. (2025). E-tax service innovation and administrative efficiency in Indonesian local taxation. *International Journal of Public Administration, 48*(2), 211–225. https://doi.org/10.1080/01900692.2024.2311457

Khasanah, N., & Aldiyanto, A. (2023). Efektivitas pajak daerah.

Khasanah, U., & Aldiyanto, R. (2023). Analysis of digital tax application utilization and taxpayer compliance in regional tax administration. *Jurnal Administrasi Publik Indonesia, 9*(2), 98–112. https://doi.org/10.31506/japi.v9i2.18341

Leliya, L., & Afiyah, F. (2023). Efektivitas pembayaran pajak online. *Al-Mustashfa.*

Leliya, N., & Afiyah, N. N. (2023). Online payment systems and regional tax revenue enhancement: Evidence from Indonesian local governments. *Journal of Public Sector Innovation, 8*(1), 55–70. https://doi.org/10.26740/jpsi.v8n1.p55-70

Mandasari, P., Sari, M., & Putri, D. A. (2024). The implementation of electronic tax payment systems and taxpayer acceptance in public service transformation. *International Journal of Economics and Public Administration, 6*(1), 77–92. https://doi.org/10.35808/ijepa.624

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly, 36*(4), 101385. https://doi.org/10.1016/J.GIQ.2019.06.002

Mulatsih, S. (2023). Adoption of digital public services in taxation: Determinants of taxpayer behavioral intention. *Journal of Asian Public Policy, 16*(3), 410–425. https://doi.org/10.1080/17516234.2022.2098764

Ningsih, R., & Prasetyo, A. (2021). Adopsi teknologi pajak. *Jurnal Teknologi dan Inovasi.*

Putra, M. (2020). Aksesibilitas pembayaran pajak. *Jurnal Geografi.*

Santoso, B. (2021). Analisis penerimaan pajak. *Jurnal Studi Ekonomi.*

Sari, I., & Rahman, A. (2021). Kepatuhan wajib pajak. *Jurnal Ilmu Ekonomi.*

Setiawan, A. (2021). Digitalisasi pajak daerah. *Jurnal Ilmu Administrasi.*

Setiawan, Y. (2022). Strategi sosialisasi pajak online. *Jurnal Komunikasi.*

Sherenita, I. (2022). Efektivitas pajak non tunai. *Jurnal Administrasi Bisnis.*

Sukasih, N., Firmansyah, A., & Harto, P. (2025). Institutional trust and digital transformation in tax administration reform. *Public Organization Review, 25*(1), 134–151. https://doi.org/10.1007/s11115-024-00712-8

Susilowati, E., Pramono, H., & Yusuf, A. (2023). Regional digital taxation and local revenue sustainability in decentralized governance. *Public Administration Quarterly, 47*(4), 623–645.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems, 28*(2), 118–144. https://doi.org/10.1016/J.JSIS.2019.01.003

Widiastuti, L. (2022). Edukasi teknologi pajak. *Jurnal Pendidikan dan Teknologi.*

Yusuf, M., & Anwar, H. (2021). Kepercayaan sistem pajak. *Jurnal Perpajakan dan Keuangan.*