



Development of an Electronic Service Model for Motor Vehicle Tax in the Regional Technical Service Unit of Panyabungan Regional Revenue Management

Nurmala Sari¹, Syafruddin Ritonga¹, Maksum Syahri Lubis¹

¹Master of Public Administration Study Program, Postgraduate Program, Universitas Medan Area

*Corresponding Author: Syafruddin Ritonga

E-mail: syafruddin@staff.uma.ac.id



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Abstract

This research aims to develop a model of motor vehicle tax electronic services in the regional technical service unit of the Panyabungan regional revenue management, as well as to determine the obstacles to the development of the motor vehicle tax electronic service model in the technical service unit of the Panyabungan regional revenue management region. This study uses a descriptive qualitative method to analyze the development of electronic service models and their inhibiting factors at UPTD PAPENDA Panyabungan. Data were obtained through observation, interviews with key, primary, and supplementary informants, and documentation. The study results are expected to provide strategic recommendations to improve the efficiency of electronic services and become a model for other regions. The results of the study show that by using the indicator Nurfina (2016; 6), namely the quality of information provided in the Dignified North Sumatra E-Samsat application, namely the existence of Vehicle Information, Payment Codes, E-SKPD, and Procedures for Paying Motor Vehicle Taxes, This can make it easier for the people of the Panyabungan Region to fulfill their obligations to pay motor vehicle taxes, the existence of protected security, ease of transaction and convenience in the use of the application.

Introduction

Public services are a government responsibility to meet the community's needs. In the ever-growing digital era, people want fast, easy, and efficient services (Ibad & Djafar, 2023; Lubis & Miftahuddin, 2013). One of the efforts made by the government is to integrate information technology into various services, including Motor Vehicle Tax (PKB) payment services (Emilia, 2019; Fachrizal et al., 2023). Mandailing Natal Regency, with a population of around 413,750 people, faces significant challenges in providing optimal services to the community. Rapid population growth and increasing use of motor vehicles demand a more modern and effective tax service system (Lubis & Lubis, 2023; Sinulingga et al., 2019; He & Kim, 2023).

One of the government's breakthroughs in improving public services is the development of the North Sumatra Dignity E-Samsat. This service allows people to pay PKB online through various payment platforms, such as ATMs, mobile banking, OVO, GoPay, and Post Offices. The presence of E-Samsat makes it easier for taxpayers to fulfill their obligations without having to come directly to the Samsat office (Ihdini & Sari, 2023; Suryadi et al., 2025). However, despite offering various conveniences, the implementation of E-Samsat in Mandailing Natal Regency still faces several obstacles that affect its effectiveness (Fachrizal et al., 2023; Nasution & Sinaga, 2014; Seniman et al., 2022; Adhisty et al., 2024).

In Mandailing Natal Regency, the target of PKB revenue through the APBD from 2020 to 2022 has been successfully exceeded. However, in 2023, the target will not be achieved. This indicates that there are obstacles in the implementation of E-Samsat. Some challenges faced include the lack of socialization regarding the requirements and use of E-Samsat, the limited number of competent operators, internet network disruptions, and the lack of supporting facilities and infrastructure. This problem shows that although technology has been adopted, its implementation has not been optimal in reaching all levels of society.

The lack of socialization is one of the main obstacles to optimizing E-Samsat. Many people do not understand how to use this service because the information provided is still limited. In addition, the limited number of operators who can manage the system efficiently is also a significant obstacle. E-Samsat operations require human resources who have special expertise in digital system management. Internet network disruptions, especially in rural areas, also hinder the implementation of this service. Inadequate infrastructure, such as computer devices and stable internet access, is also a significant challenge.

This condition has an impact on low public participation in utilizing E-Samsat services. Most people prefer to use service bureaus to take care of their vehicle tax payments. This practice creates injustice in the service, where taxpayers who take care of themselves often feel neglected. In addition, the digital literacy gap in communities, especially in rural areas, shows that implementing an online-based service system must be adjusted to local situations and needs.

On the other hand, E-Samsat has excellent potential to increase tax revenue and simplify the administrative process for the community (Dahlia et al., 2020). This technology provides more accurate and real-time PKB revenue data, thereby supporting transparency and efficiency in regional financial management (Minallah et al., 2021; Oktaviola & Safrida, 2022; Tumanggor et al., 2023; Kokogho et al., 2025). However, to achieve maximum results, developing a more comprehensive electronic service model is necessary. This model should include strategies to address existing constraints, such as increased socialization, strengthening human resource capacity, and improving technological infrastructure (Duri et al., 2022; Fauzi & Hardian, 2023; Zheng et al., 2023).

The Mandailing Natal Regency Government is committed to improving tax services through an integrated administrative system. However, the challenges demonstrate the need for continuous innovation and evaluation in developing electronic services. With barriers such as internet network disruptions and a lack of socialization, governments must adopt a more inclusive approach to ensure that all levels of society can take advantage of these services.

Various studies show that the E-Samsat service provides convenience in paying Motor Vehicle Tax (PKB), although it still faces multiple challenges (Defrian et al., 2021). Highlighting service innovations in Samsat Pandeglang Regency, which are running well but require improvements in terms of suitability and complexity (Oktavianto et al., 2021). Found an increase in the effectiveness of PKB receipts in Makassar after the implementation of E-Samsat, although it has not reached 100% (Zubaidah & Lubis, 2021). Noted that the E-Samsat application in Riau facilitates tax payments with a low level of complexity and through technological developments. Instead, Maranatha (2019) found that PKB receipts in West Jakarta still fluctuate, showing that their effectiveness is unstable (Yuvina et al., 2021). Revealed that the flow of the E-Samsat procedure in Surabaya was less effective, hampering optimization. Overall, E-Samsat shows great potential but needs strengthening to achieve better effectiveness.

This study aims to analyze the development of an electronic service model for motor vehicle tax in the Regional Technical Service Unit of the Panyabungan Regional Revenue Management. In addition, this study also aims to identify factors that are obstacles to the development of these services. Thus, this study is expected to provide strategic recommendations to improve the quality of motor vehicle tax services in Mandailing Natal Regency.

The development of an electronic service model for motor vehicle tax aims to overcome technical obstacles and create a service system more responsive to the community's needs. This step is expected to increase public participation in paying taxes, thereby supporting an increase in regional revenue. With a holistic approach, the development of this service model is expected to support the achievement of good governance and contribute to sustainable regional development.

Methods

This study uses a qualitative method with a descriptive approach, aiming to understand and explain the in-depth phenomenon related to developing an electronic service model for motor vehicle tax in the Regional Technical Service Unit of Panyabungan Regional Revenue Management. This method allows researchers to describe research subjects' behaviors, perceptions, and actions in a given context through systematic, actual, and accurate descriptions. The primary focus of this study includes the analysis of the development of electronic services and the identification of inhibiting factors in the application of the model.

This research was conducted at the Regional Samsat Office of Mandailing Natal Regency, which is located on Jalan Pempembangunan, Panyabungan, North Sumatra. The implementation of the study lasted for several months according to a schedule that included the stages of preparing proposals, collecting data, analyzing, and preparing the final report. The data used is divided into primary data and secondary data. Primary data is obtained directly through observation and interviews with key informants. In contrast, secondary data comes from official documents, records, and archives at the Samsat Office relevant to developing electronic services.

This research involved three categories of informants: key informants (Head of UPTD PAPENDA Panyabungan), primary informants (implementing employees such as operators and administrative staff), and additional informants (community leaders and customers). Data was collected through direct observation, structured interviews, and documentation in the form of official archives. Data analysis is done by collecting, reducing, presenting, and drawing conclusions to understand the relationship between variables. The study also uses indicators of information quality, convenience, security, and user convenience to evaluate the development of electronic services. The results are expected to provide strategic recommendations to improve the efficiency of electronic services in Samsat Panyabungan and become a digital service model for other regions.

Results and Discussion

Development of an Electronic Service Model for Motor Vehicle Tax in the Regional Technical Service Unit of Regional Revenue Management of Panyabungan

The development of electronic services to pay Motor Vehicle Tax (PKB) at the Regional Technical Service Unit (UPTD) of Panyabungan Regional Revenue Management aims to provide convenience, security, comfort, and efficiency for the community in fulfilling tax obligations. Through applications such as E-Samsat North Sumatra Dignity and SIGNAL, this electronic service allows people to make PKB payments online anytime and anywhere without

visiting the Samsat office. This model is designed to reduce queues, speed up the payment process, and improve the accuracy of tax data collection in Mandailing Natal Regency. However, the development of these services faces technical challenges such as signal limitations and infrastructure issues.

Information quality is one of the main factors in developing electronic services. The E-Samsat Sumatra Berdignity application information includes vehicle details, payment code, e-SKPD, and PKB payment procedures. Based on interviews with the Head of UPTD PAPENDA and related staff, this information is designed to make it easier for the public to understand the payment process and carry out their tax obligations. According to the Head of the Revenue Services Section, the quality of information provided by the application has helped increase public enthusiasm to use this service, as transparency and easy access to information support fast and efficient decision-making.

This application also provides convenience in ratifying the annual STNK, which previously required a physical visit to the Samsat office. The availability of complete and easily accessible information encourages the public to take advantage of the application, increase tax compliance levels, and support a more structured PKB management.

Data security is an essential element in electronic services. E-Samsat Sumatra Berdignity application users must have valid identity data, such as ID cards, vehicle registration, and email, to ensure transactions are carried out safely. The security system includes sending an OTP (One-Time Password) code via email, which protects personal data from misuse. In addition, this application has been equipped with a serial passkey to maintain the confidentiality of vehicle and taxpayer data.

According to interviews with UPTD employees, this application is designed to provide a sense of security to the public, thereby increasing trust in transactions. Advanced security technology is also supported by adequate hardware and software, such as Android and Windows-based systems. This tight security helps prevent potential data breaches and provides a better user experience.

Ease of use is a factor driving the app's public adoption. Through the E-Samsat Sumatra Berdignity application, taxpayers can make PKB payments by entering vehicle data, NIK, and email, as well as getting a payment code. This process saves time and reduces the need to visit the Samsat office.

The informants, including administrative staff and community leaders, stated that this service is very convenient for the community, especially those living in remote areas. In addition, this service eases the workload of Samsat employees, allowing them to focus more on other administrative tasks. The app also helps society adapt to technological advancements, providing efficient modern solutions for tax management. Convenience is an essential indicator in the development of electronic services. The Dignity North Sumatra E-Samsat application provides a sense of comfort to the community by eliminating the need to queue at the Samsat office. Payments can be made through ATMs or banks that have cooperated, which reduces the time and effort required to complete tax obligations.

Interviews with UPTD employees and service users show that this application increases public trust in the government. Its fast, efficient, and secure nature provides a positive experience to users. In addition, the app is designed to meet the needs of modern society, with an intuitive interface and simple processes, making it easy for various groups to use. While these services provide various benefits, some barriers must be overcome. One of them is the reliance on a stable internet connection. In some regions, poor signals can disrupt the transaction process,

lowering the effectiveness of the service. In addition, the limited infrastructure and inadequate human resources hinder further development.

According to the informant, more efforts are needed to improve the provision of supporting facilities, such as a more reliable internet network and training for operator officers. More intensive socialization is also required to ensure that the public understands the benefits and how to use this application. By overcoming these barriers, electronic services can be optimized to reach more users and improve tax management efficiency.

Several strategic steps need to be taken to overcome existing barriers and improve service effectiveness. First, local governments should invest in technological infrastructure, including expanding internet coverage and providing adequate hardware in Samsat offices. Second, intensive training for operator officers is needed to ensure they can manage the system properly. Third, a more massive socialization program must be carried out to increase public awareness of this application. Campaigns through social media, seminars, and community activities can help reach more people and educate them about the benefits of electronic services. Fourth, cooperation with internet service providers and partner banks must be improved to ensure system stability and user convenience.

Developing an electronic service model for PKB payments at the Panyabungan Regional Revenue Management UPTD is an innovative step that benefits the community and the government. With complete information quality, guaranteed security, ease of use, and convenience, this service helps improve tax compliance and efficiency of regional revenue management. However, challenges such as limited infrastructure and socialization need to be overcome to achieve its maximum potential. This application can become an inspiring digital-based public service management model for other regions with the proper strategic steps.

Obstacles to the Development of an Electronic Service Model for Motor Vehicle Tax in the Regional Technical Service Unit of Panyabungan Regional Revenue Management

Developing an electronic service model for motor vehicle taxes at the Regional Technical Service Unit (UPTD) of Panyabungan Regional Revenue Management is an innovative step in improving public services. However, the implementation of this service faces various obstacles that have the potential to reduce its effectiveness. Based on interviews with several sources, the main factors hindering this service's development include network problems, lack of supporting infrastructure, and limited socialization with the community.

One of the main obstacles in developing electronic services is the reliance on a stable internet connection. The Head of UPTD PEPENDA Panyabungan, Mr. Salamat, S.Sos, explained that signal interference often occurs in the Panyabungan area, especially when many users access the E-Samsat Dignity North Sumatra application at the same time. This condition causes the transaction process to be slow and sometimes stop, thus affecting public satisfaction with services.

This network problem is also affected by inadequate telecommunication infrastructure in the area. As a region with geographical challenges, Panyabungan needs special attention to develop a reliable internet network. Without adequate infrastructure support, internet-based applications such as E-Samsat are challenging to operate optimally. This shows that the success of developing electronic services depends on the application itself and the technological ecosystem that supports it. In addition to network issues, the limitations of supporting infrastructure, such as hardware and software, are also significant obstacles. According to Mr. Suaib, SE, as the Revenue Service Section 1 of UPTD PEPENDA, the completeness of the devices at the Panyabungan E-Samsat office is still limited. This includes computers, servers,

and other devices that support application operations. These limitations impact the efficiency of the service, especially when there is an increase in the number of users.

In addition, the lack of technical training for operator officers is also an obstacle to the management of the system. Officers who do not have specific expertise in handling internet-based devices and systems often face difficulties when technical glitches occur. Therefore, intensive training for operator officers is needed to ensure that services run smoothly and meet the community's needs.

Another factor that hinders the development of electronic services in Panyabungan is the community's lack of socialization and education. Many residents do not fully understand how to use the Dignity North Sumatra E-Samsat application. This results in low adoption of electronic services, especially among rural communities unfamiliar with digital technology.

The socialization carried out during the launch of the application is still considered to be less than optimal. Information about the benefits, how to use, and the advantages of services has not been widespread, so many people still choose the conventional way of paying motor vehicle taxes. More intensive campaigns are needed through various media, including social media, radio, and face-to-face activities in local communities to overcome these barriers.

In facing these obstacles, UPTD PEPENDA Panyabungan has pursued various strategies. One primary strategy is providing alternative services through Samsat Outlets and Mobile Samsat Buses. With this service, people who face difficulties using the E-Samsat application can continue carrying out their tax obligations directly. Samsat Outlets and Mobile Samsat Buses are an effective temporary solution, especially for people who live in areas with limited internet access. In addition, UPTD PEPENDA also seeks to increase internet network capacity by collaborating with telecommunication service providers. This step aims to reduce signal interference and ensure the app is smoothly accessible to users. Providing adequate hardware and software is also a priority, including upgrading servers and computer devices to support application operations.

Technical training for operator officers has also been planned as part of efforts to increase human resource capacity. With this training, officers are expected to handle technical issues more quickly and efficiently, thereby reducing waiting time for the community. These obstacles have a direct impact on the quality of public services. Internet network issues, for example, cause delays in the transaction process, ultimately lowering user satisfaction. Hardware and software limitations also slow the administrative process, so Samsat employees cannot serve the community optimally. The lack of socialization also impacts the low adoption rate of the E-Samsat application. Many people continue to use service bureaus to take care of their vehicle tax payments, even though this requires additional costs. This phenomenon shows that the primary goal of developing electronic services to provide convenience and efficiency has not been fully achieved.

Based on the obstacles that have been identified, several recommendations can be implemented to optimize the development of electronic services in Panyabungan. First, local governments need to work with telecommunication service providers to improve the internet network infrastructure in the region. This step is essential to ensure the app is accessible to people across the region, including remote areas.

Hardware and software capacity building should be a priority. Procurement of computers, servers, and other supporting devices must be done to support application operations. In addition, technical training for operator officers needs to be improved to handle various technical issues better. Socialization and education in the community must be carried out more intensively. Information campaigns through mass media, social media, and community

activities can help increase public awareness about the benefits and ways to use the E-Samsat application. The government can also work with community leaders to reach communities unfamiliar with digital technology.

The development of alternative services such as Samsat Outlets and Mobile Samsat Buses needs to be continued as a temporary solution to overcome technical obstacles. This service can also educate the public about the E-Samsat application. Developing an electronic service model for motor vehicle tax at UPTD PEPENDA Panyabungan faces various obstacles, including internet network problems, limited infrastructure, and a lack of socialization. These barriers reduce the effectiveness of services and affect community satisfaction. However, with the right strategies, such as infrastructure improvements, technical training, and educational campaigns, these electronic services can be optimized to maximize the community's benefits. Collaborative efforts between governments, telecommunications service providers, and the public will be key to overcoming these barriers and creating a more efficient and sustainable service system.

Conclusion

Developing an electronic service model for Motor Vehicle Tax (PKB) at the Regional Technical Service Unit (UPTD) of Panyabungan Regional Revenue Management is an essential innovation that will make it easier for the community to pay taxes. This service provides easy access anytime and anywhere through the E-Samsat North Sumatra Dignity and SIGNAL applications, thereby reducing queues and speeding up the payment process. The quality of information available in the application, guaranteed data security, ease of use, and convenience are the main advantages that encourage public enthusiasm. However, the development of this service still faces obstacles such as dependence on a stable internet network, limited infrastructure, and lack of socialization with the community. These electronic services can be optimized to improve tax compliance, service efficiency, and public trust by overcoming these barriers through technology investments, officer training, and massive education campaigns. This strategic step makes this application an inspiring digital-based tax management model for other regions.

Obstacles to developing motor vehicle tax electronic services at UPTD PEPENDA Panyabungan include internet network disruptions, limited infrastructure, lack of technical training for officers, and lack of socialization with the community. Network issues slow down transactions through the E-Samsat application, while inadequate infrastructure and limited officer expertise reduce service efficiency. The lack of education causes many people to choose conventional methods. The strategy includes procuring alternative services such as Samsat Outlets, infrastructure improvements, technical training, and educational campaigns. A collaborative approach can optimize these services to meet the community's needs efficiently and sustainably.

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